

## The Leader

**The Coronavirus Pandemic: A Global Test of Resilience, Leadership and Values**

The world is facing its biggest crisis and potential economic dislocation in over a generation as it battles the coronavirus pandemic, both from a public health and from a macro-economic perspective. The US, China and Europe, which collectively account for 30% of the world's population and 65% of the global economy<sup>1</sup>, have all been badly impacted. As of 2<sup>nd</sup> April 2020, there have been 939,000 confirmed infections which have claimed over 47,000 lives<sup>2</sup>. Virtually every country in the world has also been impacted, and many that were spared in the initial waves of the contagion are now seeing their case numbers rise rapidly. In the absence of a cure or vaccine, and due to inadequate testing capacity, affected countries have had to resort to unprecedented restrictions on public life, shutting down large portions of their economies – including in some cases through a complete lockdown – in order to slow the exponential spread of the virus to a level that their healthcare systems can cope.

Covid-19 is a highly contagious pathogen, which although not as biologically virulent as those that have devastated the world in history, is nonetheless invisible, indiscriminate and knowing no borders, and it has revealed many cracks in the world's existing political, economic and governance systems, including in public health, international cooperation, economic flexibility and government effectiveness. These cracks are the results of a series of deeper underlying issues facing the world today including the problems facing inequitable and

<sup>1</sup> Source: International Monetary Fund (IMF)

<sup>2</sup> Johns Hopkins University

disparate public healthcare systems within and between countries; unaddressed market and regulatory issues exposed by the Global Financial Crisis; the loss of political cohesion stemming from populist, isolationist and exceptionalist politics across the world, and; demographic challenges facing industrialised countries with large elderly populations.

Smaller states like Singapore, Taiwan and South Korea have demonstrated that with early, decisive and focused action, the spread of the virus can be contained through a mix of social distancing, widespread testing and contact tracing to quickly isolate clusters. Larger ones like Japan and Germany have demonstrated the same too. Containing what is now a global (rather than country)-level pandemic though will require coordinated international action and the sharing of knowledge and resources across boundaries to enable effective local level strategies to be implemented. Recovering from the massive global economic shock, whose full measure has yet to be determined, will also require an international response whose coordination is commensurate with the level of integration of the global economy and global markets today. There are medical breakthroughs being urgently progressed and tested that could well save the world from the worst, however, in the meantime resilience and the quality of actions governments take will matter.

This month's Sign of the Times looks to measure the resilience of a group of major nations and draw out key factors that shed light on their preparedness to manage their people and countries through the coronavirus crisis medically and economically and a brief look at the potential impact on the world as a whole. It paints a difficult and deeply disturbing picture.

### An Unprecedented Crisis in Modern Times Creating World War Level Pressures

Less than a month after the Covid-19 outbreak was declared a pandemic by the World Health Organisation (WHO) it is clear that the scope and scale of the current crisis far outstrips other recent global crises like 9/11 and the Global Financial Crisis in terms of its social impact and likely its economic impact. While 9/11 ultimately transformed the global security landscape profoundly and drove long-term geopolitical realignments, its macroeconomic impact was limited and short-lived. The Global Financial Crisis, on the other hand, while representing a massive market failure, ultimately became a market confidence and liquidity crisis rather than a fundamental disruption of economic activity, and therefore it was effectively dealt with using monetary and fiscal tools. Its longer-term impact was on the geopolitical alignment between the US and China which made it a critical event in shaping the world order. In economic terms, the bill for the US, at US\$700bn, which seemed massive at the time is dwarfed by the US\$2tn package passed by US lawmakers in late March, and even more so by the US\$4.5tn of total global bailout bills announced across the world. But the coronavirus pandemic is not only massive in scale, it is also massive in its scope, having triggered a number of different economic and social shocks simultaneously:

- **A public health shock** that exposes the deficiencies of countries' healthcare systems and threatens to overwhelm even the most developed ones;
- **A supply-side shock** impacting productivity and output created by shutting down large parts of the economy across major industrial countries;
- **A demand-side market shock** with public life grinding to a halt, businesses closed and consumers locked down with severely limited spending options;
- **A trade shock** with quarantines and business closures half a world away disrupting global supply chains and leading to shortages of essential goods like pharmaceuticals and food stuffs;
- **A social shock** due to a spike in unemployment created by business closures as well as by the fundamental disruption to people's way of life and uncertainty about the future;
- **A market shock** as the market struggles to translate the various impacts into values of traded assets;
- **A wealth shock** due to the sharp and sudden fall in asset values and tightening of credit conditions, and

- **A human shock** as individuals all over the world see their personal plight added to spiraling statistics one would normally see in wars and disasters.

In addition to these shocks resulting directly from the pandemic, the world is also facing an oil shock in the conflict between Russia and Saudi Arabia over oil price and volume. Many other disputes and dislocations have slowed or disappeared from the news flow, waiting perhaps to return, from wars in Yemen and Syria, to the Brexit in Europe and the US-China trade dispute. Given such extreme and simultaneous shocks, the global Covid-19 pandemic is unlike many previous crises, and if left unchecked, risks approaching the level of a large-scale global war or the 1918 Spanish Flu in terms of the potential economic disruption, and potentially in terms of its human toll as well (see comparison below).

#### Comparison of Major Global Disasters

	Spanish Flu	World War II	COVID-19
<b>Total Death Toll</b>	50m <sup>3</sup>	70-85m <sup>4</sup>	40m <sup>5</sup>
<b>% Drop in Dow Jones Industrial Average<sup>6</sup></b>	(30%)	(5.0%)	(25%)
<b>% Drop in GDP</b>	(6.8%) <sup>7</sup>	(19%) <sup>8</sup>	(3.1%) <sup>9</sup>

The impact of this crisis is magnified in a 24/7 globally interconnected news and social media cycle and so the psychological impact is also profound. With fatality estimates varying wildly and in any case dependent on many decisions yet to be taken, the full toll on human life may not be clear for many months or perhaps even a year from now, but even at this stage, the suffering is real and widespread.

#### Exponential Growth in Contagion Necessitates Exponential Responses

Over the last month, while the rate of spread and mortality from Covid-19 has stabilized in China (although the accuracy of its reporting continues to be questioned by some outside observers given local government's initial attempts to downplay the significance of the outbreak there), the virus has rapidly spread across the world, first across East Asia and then to the rest of the world, with the number of global infections growing at an exponential rate.

Despite their longer lead time, in a sad and spectacular failure of leadership, many western countries have been slow to respond with policy interventions and testing, and have seen the virus' toll suddenly grow, quickly pushing healthcare systems to their limits. Some like Italy and Spain have been taken by surprise at the speed of the spread in their highly social communities and others like the US and UK have been in denial for too long or failed to learn quickly enough from the examples of the more rational early movers like Germany, Singapore or Japan. Italy in particular, with its ageing population and high population density, appears to have been an early victim, and was the first country to announce a nationwide lockdown on 9<sup>th</sup> March, by which time it already had c.7,400 confirmed cases and 366 deaths.<sup>10</sup> Despite the lockdown, Italy's death toll has rapidly grown (reaching over 12,000 at the end of March), having surpassed China's nearly fourfold, a country with a population 20-times that of Italy's. The scale and suddenness of the human toll appears to have overwhelmed Italy's healthcare system in many parts of the country.

<sup>3</sup> Source: CDC

<sup>4</sup> Source: Various estimates

<sup>5</sup> Source: <https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/> Estimated maximum death toll in the absence of major containment measures being taken

<sup>6</sup> Source: DJIA

<sup>7</sup> Source: Angus Maddison, IMF, CIM

<sup>8</sup> Source: Maddison Project Database

<sup>9</sup> Morgan Stanley Estimate (25/03/20)

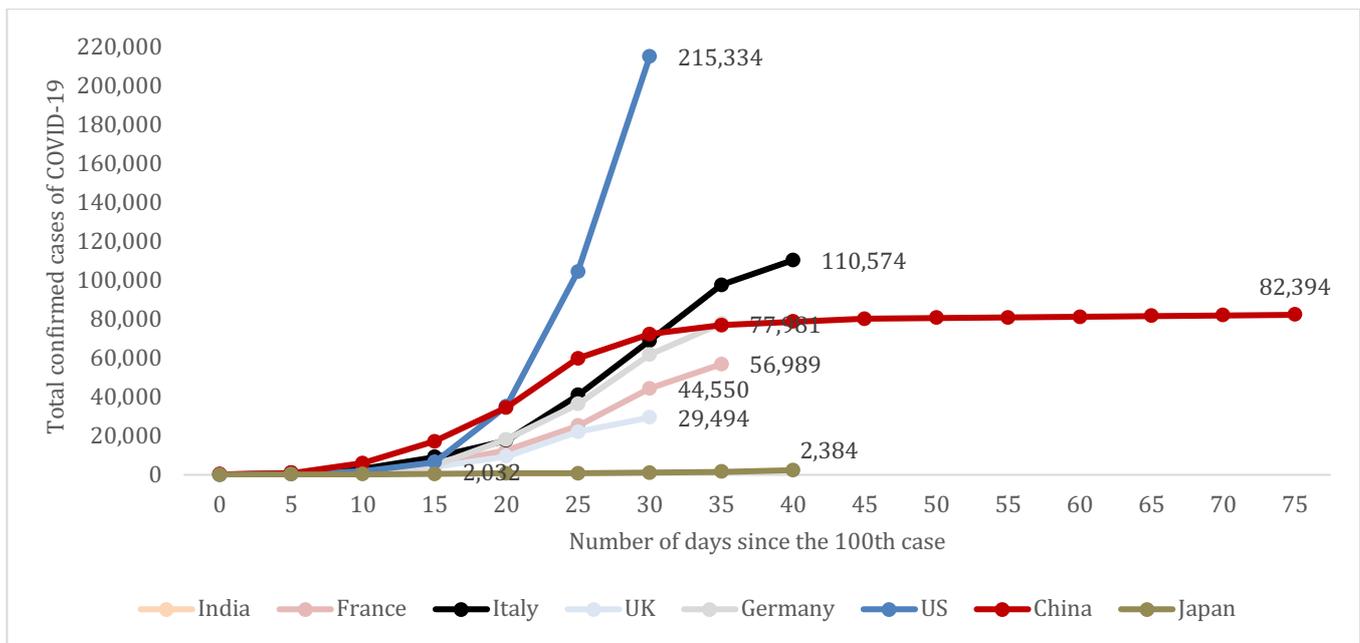
<sup>10</sup> Source: Our World in Data, underlying data from European Centers for Disease Control (ECDC)

Major western European countries including Spain, France, Germany and the UK have since announced similar national lockdowns in the second half of March, but with infection curves that track Italy’s with only one or two week delay, some of these countries are in a similarly precarious situation currently as Italy was in early March. The effectiveness of Germany’s response has differentiated it from the others in terms of its significant lower mortality rate to date.

The US also appears to have acted too late in responding to the virus and is now the epi-centre of the outbreak, surpassing 200,000 infected, and as testing is still being ramped up, several hotspots (in particular in New York, New Jersey and California) have emerged, driving lockdowns across the country’s major economic engines, exposing the limitations of healthcare systems, and highlighting the complexity of managing and coordinating the response to a pandemic in a large, federal polity, among other challenges at the top of the country too.

While the responses have been late, these countries have all managed to mostly set aside their internal dysfunction in a bid to enact unprecedented restrictions on social life, curtailing activities and rights which were taken for granted only a few weeks ago, albeit to different degrees of harshness and varying degrees of success.

Covid-19 Infection Trajectory by Country<sup>11</sup>



The economic toll of the lockdowns, while difficult to fully assess with certainty at this stage, is expected to be severe. The US economy is expected to contract by anywhere between 10% to 25% in the second quarter<sup>12</sup>, and there has been a sudden surge in unemployment with 3.4m claims filed in the week ending 21<sup>st</sup> March, the highest number in history, which suggests that unemployment could potentially spike to 20% in the coming months<sup>13</sup>. The macroeconomic impact in Europe is likely to be similarly grim, with EU-wide GDP for 2020 as a whole projected to contract by up to 10%<sup>14</sup>.

While one may argue that “this too shall pass”, and this virus is not believed to be a species-endangering threat, the question as to how resilient the major economies of the world are to such a shock is an important one in understanding

<sup>11</sup> Source: John Hopkins University as of 2 April, 2020

<sup>12</sup> Source: Goldman Sachs and JPM Morgan

<sup>13</sup> Source: Statement by US Treasury Secretary Steve Mnuchin reported in Forbes 18/03/20

<sup>14</sup> Source: Morgan Stanley Research Note

the room to course-correct in the midst of the crisis, the areas of cooperation and collaboration that may be required to do so and the damage that might unfold.

### Resilience: Risks, Preparedness and Response Capacity to the Global Pandemic<sup>15</sup>

While the virus appears to affect every country equally, the local impact it is likely to have and the economic damage it is likely to cause will vary significantly based on each country's ability to withstand shocks and the measures they are able to take in response. The public health and economic fallout across countries will depend largely on the resilience of countries and the global system they operate in. Resilience in general is a measure of how well a system can continue to function in the face of adverse conditions. For states in particular it determines their ability to withstand environmental, political, economic and social shocks and stresses.<sup>16</sup> Given the nature of the coronavirus, four areas of fundamental resilience are likely to be critical, namely, exposure to the risks created by Covid-19; preparedness to deal with the pandemic; the fundamental resilience to macro shocks in general, and; the quality of the policy toolkit to manage the ensuing economic disruption. There are a multitude of metrics possible in examining resilience, this analysis has primarily focused on the 'hard' ones and considered other factors in brief.

#### Resilience Factor 1: Population and Demographic Risk

The potential impact of Covid-19 on a country's public health in worst case scenarios is staggering. Based on the epidemiology of the coronavirus and the nature of the current policy responses, countries with older populations, a high prevalence of non-communicable diseases of affluence and/or the diseases of poverty (both of which are elevated risk factors for Covid-19 infections) and highly dense populations face greater health risks from the virus and will be disproportionately impacted by the lockdown measures in place around the world.

#### Resilience Factor 1: Population and Demographic Risk

Country	At Risk Population				Risk of Spread		Poverty/Inequality		Comm. and Information
	% of Population Aged 65+ <sup>17</sup>	% of Deaths from "Affluence" Diseases <sup>18</sup>	Population without Health Insurance <sup>19</sup>	Neglected Diseases of Poverty (in m) <sup>20</sup>	Urbanisation Rate in % <sup>21</sup>	Urban Density (pop/sq. km) <sup>22</sup>	% of Pop Below Poverty Line <sup>23</sup>	Relative Poverty Rate <sup>24</sup>	% of Pop using Social Media as Source of News <sup>25</sup>
US	15.8%	61%	9% (45%)	12.0	82.3%	10,108	1.2%	17.2%	46%
China	10.9%	75%	5%	68.9	59.2%	5,033	23.5%	28.8%	36% <sup>26</sup>
India	6.2%	47%	56%	457.4	34.0%	29,005	60.4%	19.7%	52%
Germany	21.5%	69%	0%	<1	77.3%	3,661	0.2%	9.1%	34%
France	20.0%	63%	0%	<1	80.4%	12,150	0.1%	8.3%	42%

<sup>15</sup> Data comparing performance of countries across a given resilience metric as been taken from single sources where possible, as detailed in the respective footnotes

<sup>16</sup> Source: [OECD Guidelines for Systems Resilience Analysis](#)

<sup>17</sup> Source: World Population Review

<sup>18</sup> Source: WHO, tracking the % of 2018 deaths due to heart disease, respiratory infections and cancer

<sup>19</sup> Source: OECD

<sup>20</sup> Source: IDP Journal, Modern Healthcare

<sup>21</sup> Source: World Bank

<sup>22</sup> Source: Respective national census data based on the three largest metro areas per country

<sup>23</sup> Source: World Bank, % of the population in 2011 earning less than US\$3.20/day

<sup>24</sup> Source: OECD 2016, % of population earning less than half the national median income

<sup>25</sup> Source: Reuters Institute

<sup>26</sup> Source: EMarketer: 50% of China's 1bn WeChat users access the app as their main source of news

UK	18.4%	61%	0%	<1	83.4%	4,585	0.5%	10.4%	40%
Italy	22.8%	69%	0%	<1	70.4%	1,506	1.5%	13.3%	47%
Japan	27.6%	66%	0%	<1	91.6%	19,369	0.9%	15.7%	20%
Selected Comparisons	Global Average: 8.9%	Global Average: 54%	OECD Average: 1.5%		Global Average: 55.3%		Global Average: 32.8%	OECD Average: 11.7%	

Source: GPC Research

- Aged Populations at Risk. Highest Risk: Japan, Italy, Germany, France and UK.** To date, a majority of Covid-19 related deaths have occurred among adults aged 60 or higher (in Italy the average age of patients who have died from the virus through mid-March was 79.5 years). Countries with rapidly ageing populations like Japan or major European nations therefore have a larger portion of their population at serious risk from the disease.
- Importance of Healthy Populations. High Risk: All Countries.** All Western advanced industrialised countries have a high prevalence of lifestyle diseases including heart disease, diabetes, pulmonary disorders and cancer, which are major risk factors for Covid-19. On the other end of the spectrum there are a group of infectious diseases, so called 'neglected diseases of poverty'<sup>27</sup> generally prevalent in less developed countries, where they often remain untreated, weakening victims' immune systems to Covid-19 infections. While India and China have the largest populations of affected, the US is at the top of the league table in these diseases in the developed world.
- Adequate Health Insurance Underwrites Appropriate Treatment. Highest Risk: India, and US.** The presence of well-developed health insurance clearly underpins appropriate long-term healthcare for a country's population. Following the passing of the US Affordable Care Act ("ACA") in 2010, India is the only country on the list without nationwide healthcare coverage. However, while the ACA had extended insurance coverage to over 90% of Americans, changes were made to it, and it is estimated that nearly 45% of the population continues to remain underinsured, and given how long many Americans have been in this situation, America has a large population that suffer from long term illnesses that make them more vulnerable to healthcare crises like the current one.
- Density Increases Contagion Transmission Risk. Highest Risk: India, France, Japan, US.** Countries with large, high-density urban environments are more susceptible to mass transmission risk. India, with its large number of megacities, and with large slums, is in a particularly precarious position. But the US is at risk given that it has metro areas like New York City, which is among the densest in the world, exceeding Tokyo, Hong Kong and Singapore, and its poor are mostly concentrated in specific areas of its major cities, much as they are in Indian slums.
- Poverty and Inequality. Highest Risk: India, China, US.** Economically marginalised populations are at significantly greater risk in pandemics even in otherwise wealthy societies. The substandard housing conditions these groups are exposed to increase the chance of infection (e.g. due to high housing density or poor sanitary conditions), reduced healthcare access leads to less (or lower quality) treatment for infected and the loss of income from illness or lockdown measures disproportionately impact economically marginalised families that typically lack adequate savings.
- Communication and Information Sources and the Ability to Discern Fact from Fiction. Highest Risk: India, US and Italy.** Many of the radical policies being implemented (such as national lockdowns) cannot be fully enforced top-down and require citizens to understand the need for social distancing and cooperation. The prevalence of fake news on social media makes clear and efficient communication a challenge in countries where trust in mainstream

<sup>27</sup> Source: WHO, diseases include toxocarriasis, toxoplasmosis, trichomoniasis, congenital cytomegalovirus and syphilis, cysticercosis, and Chagas disease

media is low and social networks are the major source of news for the population, particularly given the alleged existence of targeted disinformation campaigns on the coronavirus underway.<sup>28</sup>

**Risk Summary: The US stands out as among the most vulnerable from the perspective of its population, demographics and long-term provision of healthcare to its mass population. At the other extreme, India as a large developing country also faces enormous challenges.**

### Resilience Factor 2: Healthcare and Social Protection

The high variance in Covid-19 deaths among different countries is reportedly significant given their healthcare capacity and readiness levels. These differences can be examined through the lens of four metrics: healthcare and critical care infrastructure to deal with patients; virus testing capabilities to identify and isolate vectors; the breadth of public healthcare, and; the ability to fund the economic dislocations created by business closures and other government measures.

Resilience Factor 2: Healthcare and Social Protection						
Country	Critical Care Capacity			Virus Testing	Social Protections for Job Loss	Healthcare Access and Quality
	Hospital Beds / 1,000 people <sup>29</sup>	Critical Care Beds / 100,000 <sup>30</sup>	Ventilators/m population <sup>31</sup>	Testing Capacity per Week / m Population <sup>32</sup>	Active Deployment % of Unemployed Receiving Benefits <sup>33</sup>	Healthcare Access and Quality Index <sup>34</sup>
US	2.8	20.8	220	761	28%	81.3
China	4.2	3.6	NA	NA	19%	74.2
India	0.7	2.3	29	58	3%	44.8
Germany	8.3	29.2	298	4,581	100%	86.4
France	6.5	11.6	77	444	95%	87.9
UK	2.8	6.6	120	412	60%	84.6
Italy	3.4	12.5	50	NA	38%	88.7
Japan	13.4	7.3	174	415	20%	89.0
Selected Comparisons	EU Average: 5.6	European Average: 11.5				Global Average: 53.7

Source: GPC Research

- Hospital Care Capacity Critical. Highest Risk: India, UK, Italy and US.** Germany's and Japan's materially superior healthcare infrastructure may help explain their currently low-mortality rate vs the global average. At the other end of the spectrum, India and the UK, with less than 10 critical beds per 100,000 people appear ill-

<sup>28</sup> Source: FT: EU warns of pro-Kremlin disinformation campaign on coronavirus, 17<sup>th</sup> March 2020

<sup>29</sup> Source: OECD, American Hospital Association

<sup>30</sup> Source: New York Times, Intensive Care Medicine, Society of Critical Care Medicine

<sup>31</sup> Source: New York Times, Financial Times, Independent, The Print, Business Standard, NHK World

<sup>32</sup> Source: AEI, Institute, India Health Ministry, Public Health England, France-Director General of Health, German Health Ministry

<sup>33</sup> Source: ILO

<sup>34</sup> Source: HAQ Index, Institute for Health Metrics and Evaluation (2017)

equipped to easily deal with an increase in Covid-19 cases, requiring emergency buildouts as a matter of urgency. The US has a large number of critical care/ICU beds relative to most industrialised countries, however its low number of hospital beds overall means that it will need to use much of this capacity to meet the surge of even non-ICU patients expected from the virus and this places it at risk.

- **Massive Variance in Testing Capacity Across Countries. Highest Risk: US, India, France, UK, Italy, Japan.** Scaled testing increases responders' ability to isolate clusters of infections and more effectively protect at risk populations, thereby mitigating both the spread and the fatality of the virus, with Germany's scaled testing likely contributing significantly to the low fatality rate of the virus there. The US and UK did not indicate early readiness to use testing as policy and are now trying to catch up and like India, face "rationing" of their testing, thereby leading to potential delays in accurately identifying and containing the virus at a critical point in its spread, and in some cases, missing entire clusters altogether until it is too late.
- **Significant Variance in Ventilator Capacity. Highest Risk: India, France, UK and Italy.** The availability of ventilators to manage severe cases of Covid-19 varies significantly across countries, with leading countries having capacity matching or exceeding their stock of ICU beds, and others trailing far behind. However, given that the expected onslaught of patients exceeds even the capacity of the best stocked country, Germany, all are scrambling to buy up existing stocks and secure future production, even using emergency powers to compel manufacturers to scale up and accelerate production in some cases. The UK's failure to sign up to the EU ventilator programme has raised questions on its recent Brexit leading to an 'ideological' reason to now do so and the resulting effect on human lives.<sup>35</sup>
- **Dense Social Security Nets Enable Rapid Containment Measures. Highest Risk: India, US and Italy.** Countries like Germany and France have strong welfare systems and workers' rights that provide employees with mandatory sick pay and unemployment benefits to help defray the cost of containment measures. In contrast, working professionals in the US and India stand to face far greater economic displacement as a result of Covid-19 in the absence of further government protections and interventions.
- **Widespread and High-Quality Healthcare Systems Likely to Achieve Better Outcomes. Highest Risk: India and to some extent China.** Accessible, high-quality, and efficient healthcare services deliver improved health outcomes, leading to lower pre-mature mortality rates across a wide range of causes of death. By these standards, the healthcare systems of Japan, Europe and the US are projected to have significantly better treatment outcomes for Covid-19 overall than less comprehensive healthcare systems in India and, to a far lesser extent, China.

**Risk Summary: On the protection offered by the healthcare system for the population, the US stands out as the most vulnerable for its people among richer countries (its excellent cover for the well-insured notwithstanding) given its lack of testing capabilities, relative size of its hospital infrastructure, and the quality and breadth of general healthcare access. The UK stands out among the same group for its inadequate healthcare capacity but does and has provided cover for all over a long period. And India, as a developing country, has the least medical capacity to deal with such a crisis and is therefore the most exposed as a result, and so critically subject to the effectiveness of its containment and suppression measures.**

### Resilience Factor 3: Economic Strength Against Macro-Shocks

At the most basic level, the fundamental health of an economy is critical to its resilience to macro-shocks, whether these are structural (like the Global Financial Crisis) or event driven (like 9/11). Measures like economic growth, employment,

<sup>35</sup> Source: Financial Times

debt levels and the depth of financial markets have a meaningful impact on how well economies weather intermittent shocks outside of normal planning horizons.

### Resilience Factor 3: Economic Strength Against Macro-Shocks

Country	GDP Growth	Unemployment Rate	Informal Employment	Indebtedness		Structural Risk	
	Historic GDP Growth Rate <sup>36</sup>	Current Unemployment Rate <sup>37</sup>	Share of Informal Employment <sup>38</sup>	Corporate Debt as % of GDP <sup>39</sup>	Household Debt as % of GDP <sup>40</sup>	High Touch Service Sectors % of GDP <sup>41</sup>	Trade as % of GDP <sup>42</sup>
US	2.6%	3.9%	18.6%	150%	76%	8.7%	28%
China	6.5%	4.4%	54.5%	208%	54%	8.7%	38%
India	6.7%	7.7%	88.2%	55%	11%	7.4%	43%
Germany	1.5%	3.2%	10.2%	111%	54%	9.6%	89% (38%)
France	1.7%	9.0%	9.8%	201%	60%	10.2%	63% (36%)
UK	1.5%	3.8%	13.6%	171%	87%	10.9%	62% (51%)
Italy	0.9%	9.2%	19.0%	110%	41%	12.4%	60% (43%)
Japan	1.2%	2.4%	18.7%	161%	58%	12.0%	37%
Selected Comparisons	Global Growth in 2009: -0.1%		US Debt/GDP in 2009: 167%		US Debt/GDP in 2009: 97%		Global Average: 59%

Source: GPC Research

- **Major Economies Already Slowing Down Before the Virus Now More Vulnerable. Highest Risk: Western Europe and Japan.** Countries like Italy and Japan that were already flat or stagnating are more susceptible to shocks in general. And ones like the UK were vulnerable because of their Brexit and in turn had passed an economic woe to the EU. It is worth noting though that any recession caused by the coronavirus is likely to be global one, with the IMF projecting a recession at least as bad as during the global financial crisis, when the global economy contracted by 2.5%.
- **High (Quality) Employment Provides a Potential Buffer for Dislocations. Highest Risk: India and China; US, Japan, Italy and France among Developed Countries.** With double-digit, or near double-digit, unemployment rates, Italy and France stand to be the most adversely impacted, as does India. However, several countries with ostensibly low unemployment like the US, Japan and China have a large number of the population working in informal employment, whose jobs are at immediate and significant risk in a crisis. Unemployment rates in these countries are likely to spike significantly in the near term, as evidenced by the record 3.3m US workers who filed unemployment in a single week in March.

<sup>36</sup> Average GDP growth from 2017 – 2019; Source: IMF

<sup>37</sup> Source: World Bank, Centre for Monitoring Indian Economy

<sup>38</sup> Source: ILO

<sup>39</sup> Source: IMF

<sup>40</sup> Source: IMF

<sup>41</sup> Source: National Accounts, % of total gross value add of transport & storage, accommodation & food services, arts, entertainment & recreation, and personal and household services sectors

<sup>42</sup> Trade of European countries with non-EU as % of total countries mentioned in parentheses; Source: World Bank 2018

- **Corporate Indebtedness for Many Countries Higher than During GFC, with High Household Debt. Highest Risk: US and UK.** Corporate debt levels across many countries are near or in excess of the levels achieved shortly before the Global Financial Crisis, raising the risk of defaults in response to a prolonged downturn. While household debt generally remains lower than US levels during the crisis, debt levels in the US and UK remain elevated, with widespread loan and mortgage defaults likely in the absence of substantial interventions by banks and/or the government. Such defaults were important pressures to undermine the banking system during the Global Financial Crisis.
- **High Touch Service Dependence Exacerbates Economic Downside. Highest Risk: Italy, Japan, UK and France.** Countries with large 'high touch' services sectors (such as retail, hospitality, entertainment, leisure and transportation) are particularly susceptible to social distancing and other lock-down measures being enacted across most countries, which may be sustained to some degree or another for a prolonged period until a vaccine is available. The impact on Japan and the UK, France, Italy, whose economies are relatively more dependent on these sectors, can be expected to be severe too. Countries with advanced digital commerce currently appear more likely to have some sectors that may weather the crisis, if not benefit, given they are able to still deliver physical goods.
- **Travel and Border Restrictions Hitting Major Trading Nation. Highest Risk: All Countries, Note on Europe.** High trade economies stand to see a material slowdown in economic productivity from closed borders, disrupted supply chains and falling demand. Domestic consumption driven economies like the US, India and Japan, on the other hand are relatively insulated from an expected slowdown in global trade. While by this measure the EU and the UK appear to be more vulnerable, a significant portion of their trade is within the common market of the EU, whose geographic and regulatory trade risks are arguably no different than interstate commerce risk in the US. Adjusting for this effect, most EU member's trade exposure is similar to that of 'lower trade nations'.

**Risk Summary: While low growth and high levels of corporate and household indebtedness poses a risk to the US and UK on both and China, France and Japan are particularly exposed on corporate indebtedness, weak structural employment is likely to put pressure on the US in a prolonged downturn, just as Italy's dependence on these services is disproportionately impacting its economy during its lock-down.**

#### **Resilience Factor 4: Policy Capacity for Economic Stimulus**

The ability of countries to manage the economic fallout from the coronavirus pandemic depends on the quality of the policy toolkit of available measures open to them, including the headroom for central bank support, the internal economic/fiscal resources available to them.

Resilience Factor 4: Policy Capacity for Economic Stimulus					
Country	Monetary Policy		Ability to Introduce Fiscal Stimulus		
	Current Interest Rate <sup>43</sup>	Inflation Rate <sup>44</sup>	Fiscal Deficit as % of GDP <sup>45</sup>	Government Debt as % of GDP <sup>46</sup>	Sovereign Credit Rating <sup>47</sup>
US	0.3%	2.3%	-4.6%	107%	AAA
China	4.1%	5.2%	-4.2%	51%	A+
India	4.4%	6.6%	-3.3%	68%	BBB-
Germany	0%	1.4%	1.5%	62%	AAA
France	0%	0.6%	-3.0%	98%	AA
UK	0.1%	1.7%	-1.8%	87%	AA-
Italy	0%	0.1%	-1.6%	135%	BBB
Japan	-0.1%	0.4%	-3.8%	237%	A
Benchmark	2008 US levels: 0.25%	2008 US levels: 3.8%	2009 US levels: -9.8%, 2008 US levels: -3.1%	US Debt/GDP in 2009: 87%	

Source: GPC Research

- Minimal Headroom for Monetary Policy Interventions. Highest Risk: Japan, Germany, UK and US.** Interest rates are an important tool of stimulus, and with interest rates already cut to historically low levels, there is limited (if any) headroom for further easing. Japan and Germany have negative real interest rates while those of the US and the UK are close to zero, so these countries will have to rely on other measures to stimulate their economies in the near-to-medium term. China and India on the other hand appear to have greater flexibility in this regard.<sup>48</sup>
- Low Inflation Provides Scope for Increasing Money Supply. Highest Risk: China and India.** On the other hand, with inflation at or near record lows, most advanced industrialised economies have the scope for further quantitative easing by increasing money supply. Widely used by central banks in response to the Global Financial Crisis, the US Federal Reserve has already announced that it will relaunch a massive government bond buying program to provide liquidity to support the flow of credit to businesses and consumers.
- Significant Budgetary Constraints on Stimulus Packages. Highest Risk: US and China.** Germany is the only one of the eight countries in the analysis that enjoys a fiscal surplus. The US and China, on the other hand, run relatively high fiscal deficits, and as such, their trillion-dollar plus stimulus packages will likely place further strain on government finances, although US political leaders appear to be aligned on the need to further increase the country's debt to fund the measures.
- High Government Debt Burden Increasing Cost of Further Stimulus. Highest Risk: Japan, Italy and US.** Japan and Italy stand out in their government debt burden. Also, government indebtedness in the US is substantially higher than during the Global Financial Crisis. The record bailout measures recently implemented will increase

<sup>43</sup> Source: European Central Bank, Reserve Bank of India, Federal Reserve, Bank of England, Bank of Japan, People's Bank of China

<sup>44</sup> Latest Month CPI Inflation Rate, Benchmark is 2008 average for USA; Source: US Bureau of Labor Statistics, National Bureau of China, Federal Statistic office, INSEE, UK Office for National Statistics, Italy National Institute for Statistics, Ministry of Internal Affairs, Reserve Bank of India

<sup>45</sup> Source: US Treasury, Reserve Bank of India, Federal Statistical Office, INSEE, Office for Budget Responsibility – UK, Japan Ministry of Finance, China Ministry of Finance

<sup>46</sup> Source: IMF

<sup>47</sup> Source: Fitch Rating Agency

<sup>48</sup> India, with c.5% interest rates, certainly has headroom to further ease monetary supply, but needs to be wary of its inflation rate, which currently stands at a [...] year high of 7.7%.

these debt burden further and strain budgetary finances, particularly in Italy's cases whose relatively low credit rating increases the cost of any bailout measures taken.

**Risk Summary: The developed world is highly constrained in terms of headroom for monetary stimulus compared to during the Global Financial Crisis, increasing the importance of fiscal stimulus at a time when major countries, particularly the US and Italy, are already running deficits and high debt levels well above the levels seen before the crisis. However, given the potential extent of the fallout being created by the coronavirus this may not constrain them from injecting money supply into their economies and taking the impact on currencies and inflation, thereby diluting the qualities of their economies as a result.**

### Resilience Factor 5: Global Co-ordination, Collaboration and Cohesion

In an interconnected world one's own resilience is inevitably the product of others and in particular, the global macro-environment. While advanced industrial economies will (eventually) be able to scale their economic and healthcare related responses to overcome the virus, much of the developing world risks being at the mercy of the pandemic, lacking the capital, infrastructure, systems and expertise to effectively contain the virus. Given the scale of the potential financial and humanitarian disaster the coronavirus represents for the rest of the world, any long-term solution will require global collaboration, co-ordination and cohesion between major economies. Self-interest is shown to be served by ensuring that major disasters in vulnerable economies are best prevented so as not to damage developed markets and, in such a crisis, not derail the efforts of developed countries to stabilize their economies.

### Multi-Lateral Institutional Funding (and Capital Deployment)

	UN <sup>49</sup>	WHO <sup>50</sup>	IMF <sup>51</sup>	World Bank <sup>52</sup>
Pre-Global Financial Crisis (2008) Funding US\$bn	20.9 <sup>53</sup>	0.8	279 <sup>54</sup>	8.5
Actual Current (2018) Funding US\$bn	38.4	1.7	649	11.3
Target Current Funding US\$bn – benchmarked to Global GDP Growth	26.9	1.0	367	11.3
Total Capital Committed in Global Financial Crisis			>700 <sup>55</sup>	129 <sup>56</sup>
2020 Target Capital Deployment <sup>57</sup>			1,628	107.2

Source: GPC Research

### Central Bank Reserves by Country

Country	US	China	India	Germany	France	UK	Italy	Japan	Eurozone <sup>58</sup>
Amount in US\$bn	128	3,107	470	239	208	172	184	1,359	1,459

Source: IMF

<sup>49</sup> Source: UN System, 2010 data

<sup>50</sup> Source: UN System, 2010 data

<sup>51</sup> Source: IMF

<sup>52</sup> Source: World Bank Annual Report

<sup>53</sup> UN and WHO data available from 2010

<sup>54</sup> IMF Data for 2009 following change in SDR quota system in Aug-09

<sup>55</sup> Source: IMF

<sup>56</sup> Source: World Bank Response to Global Financial Crisis Report

<sup>57</sup> Assuming constant ratio of capital commitment to funding as during the GFC

<sup>58</sup> Cumulative reserves of 19 Euro members states and the European Central Bank

- **Major International Financial Institutions Well Funded Relative to Global Financial Crisis.** The Global Financial Crisis saw a systematic collapse of countries' finances and as they fell, international agencies such as the World Bank and the IMF in particular played an important role in their bailouts, committing over US\$700bn of funding with flexible structures and reformed terms to stabilise impacted economies. Since this time, funding to these institutions has increased in line with (in the World Bank's case) or well in excess (in the IMF's case) global GDP growth, leaving both bodies relatively well positioned to provide substantial structural support to prevent the widespread collapse of poorer and unstable countries so that those do not negatively impact the global economy.
- **Major Global Policy Institutions Also Well Financed, but Power Shifting Away from the US.** The UN and WHO will also have similarly critical roles to play on the health side, with their funding being a key factor in determining their ability to help the most vulnerable nations. These institutions are relatively well funded, their total budget having increased at rates well above global GDP growth rates, providing financial flexibility to support developing countries in the pandemic.<sup>59</sup> This should not affect their ability to discharge their current roles and is more a long term geopolitical matter.
- **WTO to Provide Level Playing Field.** As the economic implications of the coronavirus and the cost of economic stimulus begin to crystallise, many countries – particularly those with large National Populist movements – may be tempted to engage in winner take all behaviours, especially as economies suffer, in international trade in an attempt to pass on costs to other countries. The World Trade Organisation will have a critical role to play in ensuring a continued level playing field for trading partners to underpin a balanced global recovery from the crisis.
- **Central Bank Reserves Provide Dry Powder for International Interventions. Highest Risk: US, UK, Italy.** The US has the lowest reserves of the group followed by the UK and Italy. China and Japan have the highest, as does the Eurozone when seen as a single entity. In a scenario where substantial cross-border financing is required, China and Japan (and a coordinated Eurozone) would have the financial resources to act. This may be a time for China to mend its trade dispute with the US by standing as the backstop if need be, although it is uncertain that this would be rewarded given the sentiment around the Chinese origins of the virus. Indeed, the current US administration may see this as “reparations” for the damage wrought on their economy.
- **Additional Role of Charitable and NGO Funds.** The world's top ten charitable foundations are managing endowments in excess of US\$270bn, providing them with significant firepower for potential global deployment in combatting the virus, given sufficient coordination and prioritisation.<sup>60</sup> The US has exemplary strengths in its not-for-profit, charitable and non-governmental funds, being home to half of the world's top ten charitable foundations, allowing it to potentially reap an outsized share of any disbursements.

### Key Findings on The Resilience of Countries and the International System

The pattern that emerges when the resilience indicators are looked at as a whole paints a dire picture of the challenges facing the world and its lack of readiness to tackle the crisis at hand.

<sup>59</sup> In the last five years, this financing to the UN and WHO has risen by 9% and 11% respectively, and importantly the US has become less important relative to China and Germany.

<sup>60</sup> Annual reports and financial statements of foundations

## Resilience Indicators Scorecard: Major Nations Ill-Prepared for Global Pandemic

	US	China	India	Germany	France	UK	Italy	Japan
<b>Resilience Factor 1: Population and Demographic Risk</b>								
At Risk Population	Red	Red	Red	Red	Red	Red	Red	Red
Risk of Spread	Red	Orange	Red	Orange	Red	Orange	Orange	Red
Poverty/Inequality	Orange	Red	Red	Green	Green	Green	Orange	Orange
Communication and Information	Red	Orange	Red	Orange	Orange	Orange	Red	Green
<b>Resilience Factor 2: Healthcare and Social Protection</b>								
Critical Care Capacity	Orange	Orange	Red	Green	Orange	Red	Orange	Orange
Virus Testing	Red	White	Red	Green	Red	Red	White	Red
Social Protection for Job Loss	Orange	Orange	Red	Green	Green	Orange	Orange	Orange
Healthcare Access and Quality	Green	Orange	Red	Green	Green	Green	Green	Green
<b>Resilience Factor 3: Economic Strength Against Macro Shocks</b>								
Economic Growth	Orange	Green	Green	Red	Red	Red	Red	Red
Unemployment Rate	Green	Green	Red	Green	Red	Green	Red	Green
Informal Employment	Orange	Red	Red	Green	Green	Green	Orange	Orange
Corp/Household Indebtedness	Orange	Red	Green	Green	Red	Red	Green	Orange
Structural Risk	Orange	Orange	Orange	Red	Red	Red	Red	Red
<b>Resilience Factor 4: Policy Capacity for Economic Stimulus</b>								
Monetary Policy	Red	Red	Red	Red	Red	Red	Red	Red
Ability to Introduce Stimulus	Orange	Orange	Orange	Green	Orange	Orange	Red	Red

A number of key conclusions can be drawn from the resilience scorecard above:

- 1. The World Is Critically Ill-Prepared for Covid-19, Creating Major Risks to Human Life and Severe Damage to Major Economies.** While there are large gaps between the levels of resilience of individual countries, all major countries lack preparedness to deal with a pandemic on the scale of Covid-19, along multiple fronts.
- 2. The US is Severely Exposed Due to Systemic Shortcomings and Structural Factors.** Large segments of the US population are critically exposed due to a lack of adequate long-term healthcare cover for its mass population and in particular its elderly, its poor and also its unhealthy affluent population. For America's healthcare system to cope with the pandemic, it will need to rapidly stem the infection rate. Current data coming out of the US is not promising in this regard, and America risks seeing total fatalities commensurate with a much poorer country.
- 3. US Economic Stability Rests on its Ability to Increase Money Supply (and Co-opt its Banking System, Subject to the Markets Playing Along).** Given its near zero interest rates, a high fiscal deficit and indebtedness at the level of the Global Financial Crisis, the US will likely need to rely on effectively printing money in a heroic fashion to shore up its economy. Separately, given that this crisis, unlike the Global Financial Crisis, did not originate in the banking sector, the country's financial system remains fundamentally strong for the time being. Therefore, US banks still have the capacity to safeguard themselves and, should they choose to, their customers from defaults and thereby be an important force in stabilising the economy, provided that capital markets remain stable enough to support the financial stability of the corporate sector.

4. **The UK and Italy Share Similar Exposures to their Populations and their Economies.** Italy and the UK lag well behind major European neighbours across key resilience metrics. For Italy this is tragically borne out by the scale and scope of the pandemic there, setting an example for the likely spread of the virus in other countries, particularly the UK, with similar systemic challenges and policies that have delayed taking timely and decisive action.
5. **India is the Most Exposed from this Crisis on Multiple Fronts, Reflecting its Development Stage.** India has announced quite a radical strategy and now, if for whatever reason, it and its people fail to implement a radical, timely and effective set of measures to protect themselves from being infected, it stands to have the highest challenges given its poorer population, healthcare and social security net and its economic and stimulus capacity.
6. **Germany Has the Strongest Profile in Terms of its Population, Healthcare, Economy and Policy Flexibility.** Germany has the strongest resilience profile across both risk and preparedness, which has played out in its favourable mortality rates and slowing infection growth relative to other European peers (e.g. France and the UK) which have enacted similar containment measures on similar timelines.
7. **China's Overall Resilience is one of the Strongest and Stands to Emerge in a Relatively Superior Position from this Crisis.** If China has indeed overcome the worst of the Covid-19 crisis and can now send its people back to work, it is in the best position to progress its economy while the rest of the world struggles through the devastating impact of the virus and although there are no beneficiaries, its position relative to other large countries may be much stronger.
8. **The Ability of Countries to Compensate For One Another's Shortfalls is Limited but Not Absent.** A number of critical factors are fixed: population, demographics, poverty levels, and the historical absence of healthcare and social security. In addition, countries cannot easily transfer healthcare assets to their neighbours, and most appear to critically need all of their capacity in any case. Financial resources may be transferable and China, Japan and Europe, as a whole, have the capacity or reserves to potentially help India, and others that may need assistance.
9. **Global Institutions Have a Critical Task in Ensuring Lessons are Passed on and Additional Crises do Not Undermine the Efforts of Currently Afflicted Countries.** 'Solving' the coronavirus outbreak in any one country does not solve the pandemic since the epicentre spreads from region to region and less developed countries struggle to contain Covid-19, thereby creating the risk of further economic and viral contagion. Developed countries will need to work closely with global institutions to help manage the crisis globally and to tangibly support vulnerable countries to beat the virus and its implications. The capital and know how is present to do so.
10. **Capacity for Leadership in the Crisis Exists.** The resilience scores demonstrate critical gaps and strengths but do not cover the significant intangible assets that are transferable, including the vast body of knowledge on medical illnesses, of managing crises, most recently, from the Global Financial Crisis, 9/11, multiple wars from the last century too, of international institutions and their on-the-ground peace and aid experience and the strong legacy of allied post-war leadership.

There are a number of important matters that affect how the country, cross-country and international picture of resilience may be interpreted and indeed how the outcome may be altered.

**Development Stage and Investment.** The current level of resilience across major countries is low relative to the breadth of the pandemic and the waves in which it is spreading across the world. Leaders have either not invested to create or continued to invest to maintain the healthcare, social, economic infrastructure at national or international levels. This is sometimes due to the stage of development of a country, as in the case of India and China, but for others with the resources, this is often the result of a lack of investment.

**Leadership is perhaps the key variable and determinant given most other matters are fixed.** This crisis has also exposed the importance of the nature and quality of a country's leadership as an additional factor driving resilience. It is

perhaps relevant that the leaders of Germany and China are engineers and physicists who embraced the facts of the case early and acted decisively. This crisis clearly requires embracing facts, and this has not proven to be the case among leaders who have followed the National Populist movements as a route to power. Countries that took rapid and evidence-based action have been far more successful in tackling the crisis, while those lagging, like the US and UK, now require many more resources to achieve what may end up being far less.

**Tactical Innovation in Compensating for Deficits.** The ability to quickly adapt existing facilities and technologies can compensate for important deficits, as China did in rapidly constructing hospitals and the UK is doing too, or the US and others are doing in co-opting private sector manufacturers to produce ventilators.

**Fundamental Innovation as a 'Circuit Breaker'.** Innovation in finding a vaccine and fast tracking it through testing and approvals may also compensate for the lack of "hard" resilience. In this case, most reliable sources estimate that this is unlikely before mid to third quarter of 2020 at the earliest<sup>61</sup> and if so, it may be only relevant to later waves of the virus, if that happens. Of course, if all drug testing and safety rules are broken a vaccine could arrive much sooner.

**Accountability Matters, Human Lives are at Stake.** It will be tempting for politicians to make a virtue of their ability to compensate for their lack of resilience and untimely or poor decisions, but the loss of life resulting from these failings is testament to the disparity between countries, the choices generations of leaders have made and their need to compensate in the midst of a crisis is a necessity in recognition of the neglect rather than a virtue.

### National and Global Implications

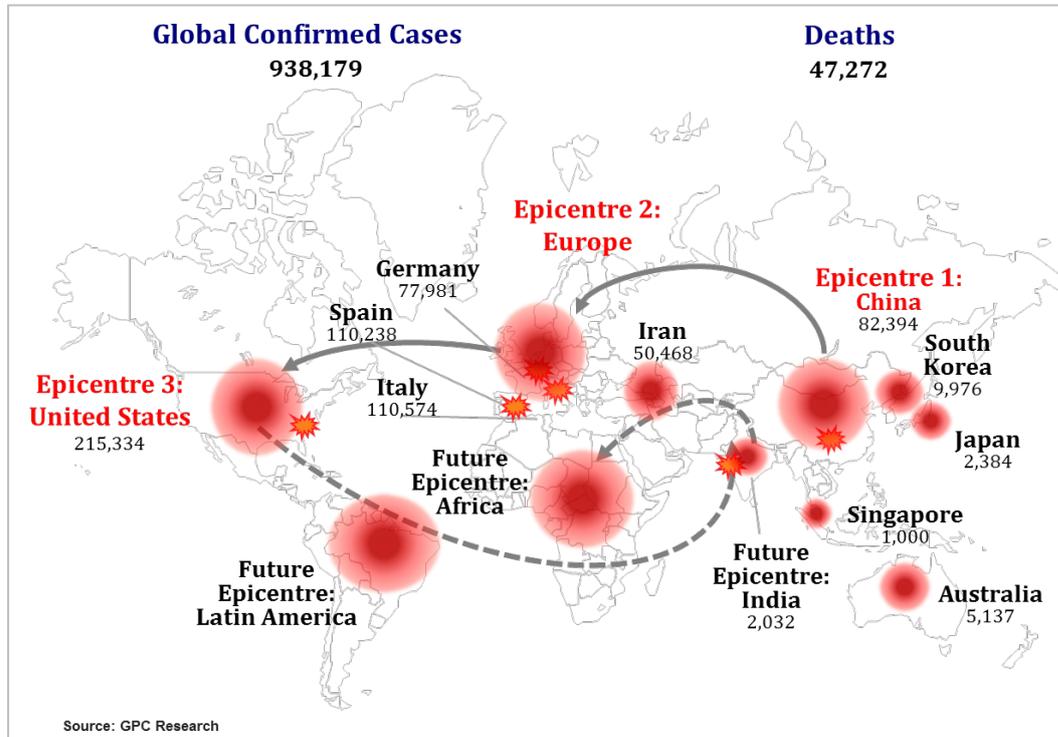
In an unprecedented global shock, the West has not been able to lead the world. The East has taken the unprecedented step of showing the West how to respond to a major global crisis. China, as an autocracy, was widely expected to be able to grip its country and discipline the spread. However, the Eastern democracies have led the way in translating that into the actions required in their democracies, implementing radical government-led actions supported by the private sector and civil society in the very early stages of the virus' growth, without compromising their democratic character.

The early actions of these countries significantly altered the trajectory of the virus. Lockdowns and social distancing, combined with widespread testing helped them to isolate clusters and bring down the rate of infection while augmenting healthcare system capacity and other interventions to isolate the most vulnerable citizens (the elderly and those with pre-existing conditions) helped to reduce the mortality rate. For the slower responding Western countries, in the absence of a vaccine or a proven cure, the response strategies of China and East Asian countries appear to be the most effective way to contain the public health impact of the virus.

The epicentre of the spread of the virus has moved in waves from China to the rest of East Asia to Europe and now to the US and Canada and, if undeterred through a treatment breakthrough, on to India, Latin America and Africa.

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<sup>61</sup> Sources: Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases; Michael Osterholm, Director of the Center for Infectious Disease Research and Policy; Peter Hotez M.D. Ph. D, Dean for National School of Tropical Medicine

Shifting Epicentres of the Coronavirus Pandemic<sup>62</sup>**Conclusion: A Time for Leadership and Unity in the Face of a Deadly Global Crisis**

The world is ill-prepared for a global pandemic. The lack of tangible resilience leaves large populations at risk in developed and developing countries. The divisions and lack of geopolitical cohesion embedded in the last five years of National Populism has weakened the ability of the world to respond together. So, it remains to be seen whether those differences can be put aside at this time to re-unite the world, rather than just countries, to fight a common enemy.

Two important things are clear. Firstly, a global crisis requires the world to play at their global best as a team recognising its interdependence. As countries around the world shut borders, close down transportation infrastructure and the geographic scale of people's daily lives contracts to the super-local, it is important to remember that the pandemic is a global one, with global reach and global implications. The coronavirus recognises no borders or walls or political affiliations (not to say poor leaders should not be held to account or replaced), and the domino-like progression of the virus from country to country shows that world is in the same boat in facing the crisis.

Secondly, the solutions to the crisis needs to be delivered locally recognising the individual, the family and the community. It is clear that a war-time approach is needed. Most major countries which are now locked down are coming to realise that their 'crisis management'-level strategies will be insufficient to turn the tide. Instead they will likely need to adopt mass-mobilisation-level strategies last seen in Europe and the US during the second World War, co-opting public goods, private industry, citizens and civil society in a coordinated effort to dam the spread of Covid-19, treat the sick and manage the fall-out that the virus and the responses to it will incur. Without these measures, the world may well pull

<sup>62</sup> As of April 2<sup>nd</sup>, 2020, Source: Johns Hopkins University

through the current crisis but will leave itself open to and ill-prepared for a second wave of a virus that it failed to full eradicate, with potentially further catastrophic human and economic consequences.

There are “winners” in a crisis too. Some countries, China in particular, some industries, digital commerce, and some traders (given the market volatility) may appear to be winners. It is uncertain whether these are sustainable wins. Following difficult times, as one sees after wars are won and lost, at some point, blame is laid and scores are settled. It is unclear how this will play out following this crisis.

Looking ahead with hope, the question has to be asked of whether the world will be a better place? Of the myriad of lessons and changes that will come out of the pandemic, one can expect that political, economic and social norms are being shaken and will offer new (and hopefully better) ways to shape the world. It will also offer insights into the success and failure of countries, politics and political leaders as well as the global system itself. A future Sign of the Times will look at this essential topic.

Already it is clear that the global system is shaken. The East has led the world in the absence of leadership from the US and the West at large. The world shutdown has shown how capital, globalisation, trade, consumerism, government and community can operate differently if required. It has exposed the weaknesses in transparency and nationalism in a much hoped for Chinese model for developing countries as well as the weaknesses in National Populism of the US model in denying the reality of a deadly virus that knew no borders and that money nor markets could stop. It has already showed the widespread heroism of ordinary people the world over especially in hospitals and communities is greater than the initial fear that gripped them. This crisis is demonstrating that countries need to work together in the face of such challenges; global coordination, collaboration and sharing are essential to solving and defeating global issues. This will prove to be true for poverty, climate change, the role of women in the world, wars and illiteracy, education and many more important of the big challenges facing the planet. The lessons of this still unfolding crisis will no doubt inform how people look anew at the other crises facing the world.

**Crisis creates a fight, flight or freeze in people, and national leaders have been no different from other individuals in this. Clearly, leaders that do not fight for the right things, avoid the issue at hand until it is too late or cannot decide quickly, cost lives. The opportunity to rise above the competitive self-centred instinct of me-first or me-only can be overcome one-by-one across the world; a fundamental challenge of values. In this difficult time, may you find the resilience to persevere and help others.**

### Best wishes

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#### Note on resilience tables and analysis

1. Resilience is a combination of ‘hard’ and ‘soft’ measures. This analysis focuses primarily on the hard measures.
  2. The relationship between resilience factors is addressed in the commentary rather than explicitly.
  3. Exogenous factors may have not been considered that may have an impact on the virus, rather than the resilience, e.g. generally, common colds and many influenza viruses subside with the weather. This virus has shown resilience to the weather in its appearance across countries with extreme temperatures to date.
  4. The categories and the measures have been chosen based on indications of recent experiences of this virus and historic experiences of previous crises and events such as 9/11 and the Global Financial Crisis. This is not an exhaustive list.
  5. Published sources have been utilised wherever possible for the data in the metrics, as footnoted.
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