Dr Sally Leivesley from New Risk has given permission for DSF to circulate two important papers on unlocking Britain. Paper 1. We would welcome your comments.

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Reducing Lockdown for UK and other Countries using lessons from Wuhan Back to Work (under 40's) – Paper 1.

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Getting the UK Economy Back on Track NOW

Summary of Recommendations

A number of steps are possible through any structured industry-government partnership:

1. Bringing the under 40s back to work to push back the risk of global economic collapse. Symptomatic cases of persons aged 30-39 are reported in the only complete study available which is Wuhan China show that 0.2 of those symptomatic have the risk of fatality and that nearly all of these who have died are with underlying medical conditions that can be identified. The 0.2[i] of the symptomatic 30-39 year olds are not a population figure but represent an unknown proportion of the age group in the population who are not asymptomatic and who already have survived the virus. Italian data as of April 9, 2020 is showing a 0.15 of symptomatic cases in this age group are fatal. [ii] There is a rare exception with unexpected fatalities that remain unexplained by known medical condition. Bringing back the under40 year olds who are without relevant medical conditions is a policy for industry and governments to now consider.
2. Keeping the over-40s at home and working where possible until an immunity test releases them, a low risk vaccine is deployed or a medical solution
3. Once immunity certificates to coronavirus become available, it would be possible to release more people into the workplace.

4. Using lessons from the city of Wuhan's operation to re-open the economy and prevent cluster contagion break- outs, will provide fast options for business recovery and growth.
5. Government can lead with charismatic leadership that connects to people's thinking, apply greater use of defence forces in national command and logistics for services and bring science and technology to national policies with the cyber technology intelligence services and major corporations collecting data can provide.
6. Keeping the national medical response home-centric- where possible so that the strength of delivery of life preservation is early intervention into the home and maintenance of the patient in a known comfortable location where the body has best opportunity to fight the virus until moving into moderate or severe symptoms where complex interventions are required.
7. Restricting all traditional hospitals to the millions of non-Covid-19 ill patients while using dedicated staff and new built structures solely for moderate and severe virus cases. This is removing the risk of dual use hospital and staff facilities being major new virus clusters that feed the nation's sickness.
8. Agreeing Guidelines to forbid the mixing of staff under any circumstances between the two forms of hospital care and adopting an industry level of responsibility for life protection of the medical and other front line services likely to have high viral load exposures that will overcome even the healthy young person if personal protective equipment and procedures are not fully adopted and with adequate training and constant shift monitoring.
9. Using laboratory levels of personal protective equipment and procedures to keep all medical and other responders healthy and reduce otherwise unavoidable deaths of exposed committed heroes under high loads of virus exposure. This removes the practice of civilian level masks and protection being acceptable for the front line worker whether they are

medical, police, community health care givers, or others with close physical contact or work in high viral load environments.

10. Using business to deliver a novel counter contagion protection in their workplace and in transport and paying for this cost of new health protection in the workplace.
11. Keeping the over-60s and all ages of the medically unfit within their homes and isolated until virus treatment or vaccination arrives – time is unknown for this to be possible and with a potential fatality rate of symptomatic cases of 3.6% in 60-69 year are group; 8% in the 70-79 year age group and 14.8% in the over 80 year olds[iii], the retention of these groups in self-isolation is essential for them to achieve a normal life expectancy.

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[1] This paper is a pre-presentation draft April 6 Remote Meeting: **Novel Coronavirus: Catastrophic Risks, Mitigation and Resilience of Countries,**

World Federation of Scientists International Seminars on Planetary Emergencies Permanent Monitoring Panel - Mitigation of Catastrophic Risk and Megaterrorism.

Summary

A number of solutions to COVID-19 are described on the basis of catastrophic risk methodology where pathways between factors are traced to determine a binary outcome of either irrecoverable collapse or a mitigation of a catastrophic threat. Data is drawn from the Chinese city of Wuhan and medical articles to define which elements of the virus are vulnerable to intervention, the range of social measures that are open to governments and industry to avert a global economic catastrophe greater than the loss of life from the virus. The analysis that suggests under 40 year old's can go back to work presents planned steps industry might consider to get people back to work before any vaccine arrives and without access to a testing strategy which may require several tests per head of population during the course of a suspected illness and for population surveys.

The key to data is not predictive models but using large data on Covid-19 confirmed cases fused with social data from sources in a smart data set that gives risk weightings and mobilises people back into the workface. The city of Wuhan and the rest of China have demonstrated a pathway to return people to work in late March 2020 and China is open for business. The vulnerability of the virus was used in China's national strategy against COVID-19 to maximise medical treatment to reduce deaths and maximise social distancing behaviour. Mitigation by China was based on knowledge of the strength of the virus to infect populations and China's experience was that the virus moved throughout the country in 30 days.

Dynamic large data analysis is employed in China for innovative individual risk profiling resulting in colour coded 'health apps[iv]'; bio-security processes for

transport to work and in the workplace and active surveillance of all individuals to prevent clusters of virus reforming.The fight is taken to the virus rather than depending on a passive system of waiting for reports of symptoms or predictive models that use assumptions to calculate what is unknown.

Catastrophic risk assessments are a tool for policies to mitigate the catastrophic effects of a pandemic as these cover far wider observations from many disciplines.Covid-19 requires work on include social factors, industry operations, pathogenicity of the virus, and data gathered from observations across many fields.

The ultimate principle is that with catastrophic risks such as Covid-19 predictive models are a dangerous way to control uncertainty[v] and in contrast data that is observed and analysed such as is available from the Chinese city of Wuhan will provide options for solutions.Big Data, Cloud and smart city systems along with traditional face to face community data collection and risk measurement have combined to bring a virus under control and people back to work in China.

Steps for Industry in the UK and applicable to other countries

A partnership of industry and government is immediately required to bring back the under 40 workforce in multinational, SMEs and small traders as a circuit breaker for all industry sectors and a possible world morale changer.The UK economy will then be shielded against the virus if Britain can take up this challenge, despite months ahead of virus spikes moving across the country and continuing dangerous clusters occurring until vaccination gives real herd immunity.

This same pattern of escalating virus casualties is happening in Italy, the United States and other countries despite hopes that the crisis will go away and life can return to pre-virus times. It is the virus which is the enemy and weaknesses in this virus show after three months of world havoc that the under 40 year olds

who do not have an autoimmune medical condition are not dying.Industry can fight the virus threats to collapse global banking and trade by using the definite knowledge of the weaknesses in the virus to get back to work rather than the predictive and uncertain models currently driving government's into shut-down. There is daily depletion of industry's resources and capacity to re-start because of this policy.[vi]

The medical model is running all countries with predictions and shut-down's but only China's Wuhan city (similar in size to London) has achieved success in killing off the virus replication and largely limiting its movement beyond the Hubei province so that in April, 2020 China is open for business and world trade.Solutions based on the Wuhan operation[3] and data can be applied by business world- wide to bring a bio-secure working arrangement as China has done and to use the under 40 year olds to do the essential work while the 60 year olds remain home.

The Chinese Wuhan City operation is not being followed world-wide despite evidence strongly stated by WHO on Wuhan and China's wide success.At present it is up to individual hospitals world -wide to connect with the Chinese hospital web sites to arrange medical discussion if they want to have solutions.[vii] Governments are not acknowledging China's logistics miracles: in bio-secure transportation of goods; re-engineering of supply chains for protective personal equipment; and medical equipment; and national resource rationalising.This same desperate need for rationalisation across a country is currently being called for in New York State by the excellent planning of Governor Andrew Cuomo.[viii]

Note by Author on media and scientific data - CGTN, Chinese state broadcasting covered the Wuhan city response to COVID-19 from January – April and concurrently. From the inception of this coverage the visual material and development of the virus daily alongside the Wuhan and national city responses in news and documentary film was accessible in English and was watched at length daily and noted for the information on the nature of the virus and all aspects of social impact of the COVID-19 disease on Wuhan,

Hubei and the rest of China. The information and data wre independently assessed and observations were related to ongoing development of the virus in other countries including overwhelming outbreaks in countries such as Italy, Spain and the USA and the ongoing rises of cases in the UK and many other countries. The factors driving success of some countries, notably South Korea and Singapore were also available in detail in daily broadcasts. In parallel with the print and television media coverage, journals such as The Lancet, the New England Journal of Medicine and many other technical sources became available for analysis, especially because of open publication on line policies adopted by the journal editors which has assisted the scientific community.

The Chinese distributed effective highly capable medical teams into Wuhan as the hot spot and ran a national strategy and logistics local action operation.[i] The UK is calling up retired medical persons. [ii]

In the UK a bio-secure work arrangement would fight the death threat of the virus by ensuring that the workplace, the journey and home life for under 40 year olds re-starting work would be done when there was not contact with over 60 year olds in the home or autoimmune illness sufferers.The use of temperature testing, and symptoms reporting before daily entry into the workplace and a strong bio-secure hygiene for people and contact surfaces creates a long term work measure that would lead the way for the next two years or more. This is a reasonable time before vaccinations may become available based on lack of evidence of successful candidate vaccination tests to date.China has mastered all of this and is back in business with the virus killed off in replication while acknowledging it is lurking in the population and will cause clusters. This is a risk if the industry has failures in bio-security measures.The asymptomatic virus cases and days of shedding before symptoms make this virus a long term risk despite the ways populations will try to be protected.

A significant cluster of avoidable casualties in the UK that will emerge is that of the doctors, nurses and all workers in hospitals who are over the age of 60 and persons working on the front line who may have known autoimmune conditions.The rate of casualty growth in frontline medical and other support personnel will be two, three week and four weeks in escalation and in each

further week depending on a person's vulnerability and the layers of fully protected personal protective equipment being adequate.This means two or three layers in high viral load areas and in less exposed locations still using full body coverage by suits covering all exposed skin and with masks, goggles and gloves as a minimal requirement.

Based on the risk categories in populations and the experience that China has learned and applied over the months January to March 2020, there are many pathways to mitigation that will fit the limitations of culture and resources in the UK and elsewhere.

The vulnerability of the virus is that it doesn't threaten the under 40's. Using the weakness of the virus to defeat its effect on global economic stability is a counter intuitive solution. The under 40's are willing to work and will contribute strongly if given the opportunity to lead the nation out of trouble.

With the reality of pandemic looming large, we are simultaneously faced with an economic failure which may have even broader implications for life expectancy, social cohesion and international conflict.

Key financial centres, London, New York; Paris and Frankfurt are simultaneously facing significant population illness rates and corporate shut-downs that surpass the historic and established stress test assumptions of Central Bank scenarios. Cascading global failure is a scenario that can be mitigated if UK and other countries' business and health programmes follow China's and open up for business[iii]. With the recommendations for government and industry of a comprehensive reopening of business and industry contagion protection plan it is possible to maintain the backbone of global trade regardless of months ahead which will degrade production from the virus moving through nations.

Whilst President Trump desperately tries to contradict the medical model of

shutting down all but life critical economic activity, the Central Banks have not yet presented their concerted plans for shoring up global banking and corporations.[iv] Historic modelling scenarios have oft concentrated on individual nations, whereas a global pandemic of a novel coronavirus – without a current cure or vaccination solution- is an outlier catastrophe damaging every country's GDP and is outside the remit of those historically 'safe' crisis banking test scenarios.

President Trump reflects people's wishes when he says 'Its time. People want to get back to work, and 'large sections' of the country could return to work far sooner than others.[v] The solution is to use the under 40 age groups who have a demonstrated low risk of fatalities in fighting the virus. This is using a population cluster to come back to work rather than the President's wish for large areas of geography to be reinstated.

The risks to those under 40 are less serious damage to lungs from the form of viral pneumonia presented by Covid-19, many people will not show any symptoms, some will be mild and some will go through severely worrying fever and symptoms until they recover. With an expected 99.8% of this group not facing death there is no justification for keeping them incarcerated and industry shut down. The risks will be identified as much lower once the full population exposure is counted rather than symptomatic cases known in the country. Adopting a new contagion protection standard in business would filter known medical cases and bring those without household conditions that compromise the over 60's back to work.

The deployment of the under 40's is based on an analysis of a broad scope of factors and based a binary assessment of which decision pathways lead to economic to collapse or to recovery. The China case study shows success through applying big data sets, and minimal use of assumptions in old style predictive models. It is possible to use the Wuhan operation in place from January to April 2020 where local operations delivered a central strategy

enunciated by President Xi, the charismatic leader of China who urged each individual to follow a clear pathway to survive and to protect the nation. Data was fused from many sources of big data sets, human intelligence from community workers and logistics built on catastrophic response understanding delivered real time knowledge.

This approach contrasts to the modelling and predictive wavering outcomes forecast by politicians using 'science' to predict in lieu of data. There is an ultimate principle that can move the United Kingdom and other countries forward in the coronavirus crisis: use of assumptions, models and prediction is a dangerous way to control uncertainty.

Catastrophic risks posed to the UK and other countries by this novel coronavirus require novel approaches. Many novel solutions are possible for business and health services in contrast to the current shut down approach and overwhelming risk to medical services for the virus victims and millions of persons with other acute health care needs. It is possible to refer to the Wuhan operation and apply work-arounds that take into account the UK's cultural differences, comparative resource limitations and the UK's less complex data collection systems. Catastrophic risk management options are to fight the infectivity of the virus by new systems of rigorous protection of business and trade to reduce the load on the NHS by keeping medically unfit persons of all ages and those over 60 with likely co-morbid conditions working from home. With this incarceration being foreseeable beyond three months these persons may require support of a national income such as experimented with in Finland[vi] and which may apply well under COVID-19 conditions.

Delivery of an innovative return to work led by the under 40's requires charismatic national leadership, run concurrently with an energised national defence command structure to work on logistics and a national advanced cyber operation to give individuals valid risk weightings to avert fraudulent certificates of immunity and to deliver fast track strategies for business re-engineering of

supply chains. This would involve the Intelligence Services with the giant international cyber corporations to use, big data harvesting with fusion of local authority, community, police and medical reports. The objective is to have a disciplined, data informed strategic and logistical operations – including prioritising supply chains inside the UK and effecting international trade and procurement. The British Cabinet Office has an unusually well prepared structure and capability in its leadership to turn this around. The Civil Service can institute crisis managed deregulation for industry to fast track recovery and growth. An energised civil service adapting government to support industry would deliver a new image to the world.

In order to restart the economy, industry sectors could recall all persons under 40 years of age (except persons with specified vulnerable medical conditions[vii]) and with by referring to the Wuhan format of industry protection there is safe option to return to work. The workplace infection rate is manageable if truly (and not pretending to be) based on the Chinese model of sanitisation of routes, massively upgraded daily health surveillance on attending workforces and sanitary work conditions providing protective equipment and risk based separation. The fatality rates of persons aged 30-39 which has run at between 0.2 in China and 0.15 in Italy. [viii] The risk of this age group returning to work is mitigated by nominating those who are medically unfit to continue self-isolation. This approach could be used now and expanded in future subject to availability of certificates of coronavirus antibody proof of exposure. In six months' time such immunity proof may be universally available to get others, including some from higher age groups out of social isolation in the home. For persons aged 60 and above there remains a necessity of maintaining home work place or receive a social wage if they are unable to work or access a pension. This is the long wait for vaccination development and without anti-viral treatment options there is no way at present to bring this group into exposed social life.

Innovative opportunities to bring in a new world of economic performance are

rarely identified in the midst of global pandemics. It's a goal the UK and other countries with world financial capitals have the capability to deliver before the cupboard is laid bare of surplus capacity by dying demand and dislocated supply. Global companies are now in 30-180 day run-downs directed by governments and shedding performance each day ahead of the doom of mass casualties. The models of virus prediction are unstable, delivering wide variance in outcomes and fuelling uncertainty, such that businesses must not wait and must innovate so that business can resume without delay.

The tool that will keep business open and squash virus clusters in a ready for business workforce is early detection through the Wuhan workplace procedures and rigorous contact tracing of a newly infected person. This has been evidenced by South Korea and Singapore as well as China as a successful method for removing the infection growth. It requires a disciplined activity that is seen also in countries such as Germany who have combined pre-existing excellence in health care with strong laboratory infrastructure for contact tracing to minimise deaths. In China the response has applied the big data sets and capacity to watch public movements through mobile telephone data, public registrations on walking into transport and linkage with hospital data so that each citizen can receive a giving green, orange or red status on their mobile phone. This is a technological breakthrough China has fast applied with Cloud and 5G high speed capacity to maintain minimal infections in its opening up for internal business and world trade.

Bringing treatment to coronavirus patients with a distributed home-centric medical model and leaving hospitals separately to maintain general health care is a further option to consider. The infected person sheds virus strongly in the days before showing symptoms (with the highest infection time being the day symptoms appear[ix]) and the mean incubation period of the virus was 5.2 days.[x] Inevitably everyone in the home has a high risk of being infected by the time an individual can be diagnosed. While China had the disciplined social structures to run full separation of infected people and suspected infected

contacts through building quarantine centres and fever clinics and kept all but the most severe from the purpose built hospitals, this does not fit any capability in other countries right now, tomorrow or this week as the virus climbs in numbers.

In respect of the Recommendations of this study,- the home location is common to all countries however and by leaving an infected person and the other residents in this home using practical self-protection which is well described by the US Centers for Disease Control website[xi], the treatment can focus on early immediate care into that environment in the comfort and comforting awareness of known surroundings which is psychologically part of the body's immunity battle to heal from the virus onslaught. The enemy of the virus is the body's immunity and everything that keeps the person comfortable with support of family and community will fight the effects in the body. This leaves the hospitals to the multitude of the country's non-coronavirus patients. The home-centric care is based on delivering support and training to a potential army of volunteers (aged under 40) led by medical personnel to encourage survival in-situ which means simple oxygen treatment can be administered along with individual treatment focus for the coronavirus sufferer in the home.

The community nursing model has had a strong history in the United Kingdom and this brings together local health support and local authorities committed naturally to that community and with links to local resources and services. Coordination through the military national command structure capability would be an innovative solution to maximising health outcomes through fusion of data and intelligence gathering and energising local authorities to deliver local distributed services. The global corporations and national business initiatives already in operation for food supplies can also be targeted to expand to wider deliveries of coordinated essential medial requirements in the home. The 40-49 age group can be released more slowly with greater care as risk of existing health conditions is higher (0.4 case fatality rate[xii]) but with the advantage of low mortality risk still compared to the major

group under threat which is aged 60 and above as shown by the Wuhan medical data collected on more than 72,000 cases.

The mitigation of the novel coronavirus catastrophe by the health responses in the UK and possibly in other countries is a local distributed model of health care. This is simple and matches the demands of a novel virus that has no treatment other than natural immunity recovery by the patient. Home care delivers comfort, recovery and monitoring. The survival benefit is also increased by faster recognition of home patients changes in status in the one to three weeks of illness when breathing difficulties and other complications need direct medical monitoring, possibly with oxygen and other treatment in the home then removal to a dedicated institution for more complex oxygen and medical management and the final option of ventilator management. The focus of effort that brings the highest survival has to be the interventions early to reduce the chance of any individual moving out of their home with moderate or severe symptoms. At present the focus is on the terminal care of patients.

Dedicated purpose built hospital structures with dedicated staff are a solution for highly infectious severe cases requiring invasive treatment. At this level of severe Covid-19 treatment, there is exposure to all and there must be a high level of protection for medical and support workers. All protective equipment should be rated at a highly contagious laboratory level worker standard with quality assurance. The wearers of such equipment require training and testing.

Dedicated Covid-19 hospitals without adequate protection and monitoring are hotbeds of increased infectivity through mixing of air flow, materials and persons carrying infection. The comparative effectiveness of any treatment in mixed general hospitals with non-dedicated, contagion trained and fully protected staff (with three layers for invasive treatment procedures) is not achievable and sets up clusters of confined persons for much wider spread of the virus through staff, their families and non-virus patients. There is no safety

case for any staff working with severe Covi-19 cases to be released after their shifts back into the community and their home family life.[xiii] The pandemic phase requires these heroic responders to be accommodated close to the temporary hospitals dedicated to severe cases. [xiv]

There are add-ons where institutions such as prisons and care homes can be given special industry level standards of contagion management and smaller living quarters developed by creative architecture and engineering to reduce airflow contagion, food and services contact and build small independent communities for the months ahead with dedicated support workers. Removing infected prisoners without testing is not a solution and communities are exposed to sources of cluster growth.

And as for the lessons we can all learn from China, this is summarised by the WHO Assistant Director General, Bruce Aylward who announced that China had torn up the book and had moved 'to a science-and-risk-based approach, which was really tailored to allow it to use different containment approaches and measures, depending on the context, the capacity and really the nature of the coronavirus circulation.' [xv]

Traditional pandemic plans in China were replaced by real time data and connectivity of the systems of information that fused human information from community visitors, hospital resources, vital food to stabilise shut-in people, green transport routes for resources, twinning provinces to cities in Hubei for support and whole teams from hospitals outside the region to work on intensive care.[xvi] This real time 'ground truth' that every citizen in the crisis could understand delivered a collective belief in the national strategy. It pushed out of each fearful household a commitment to local delivery by each person in the crisis zone to give others a chance for survival against a virus that attacked the lungs, the blood and internal organs.

China has the only complete data set on a recovering population of the size of

Wuhan and Hubei province whereas all other countries are going through phases with various ambiguities and lags in the reported information.[xvii] It is common sense to immediately apply some of the principles and processes China applied to re-start industry, albeit with dislocated migrant workforces still returning, but with doors open to orders and delivery worldwide. An example is China's ambition to deliver new air cargo dedicated airports to match global demand. China is demonstrating confidence that subsequent break-out clusters cannot threaten its national economic revival.

Apart from being a bulwark to overwhelmed health systems worldwide and restarting general production, there are already signs from this three months endeavour by China of this appearing in the restructuring of China's daily living and production by fast tracked interconnected data across cities and industry and a miracle of granular tabulation of cooperative citizens through 5G and smart phones, work performance, recruitment and removal of intermediate institutions to achieve global market potential direct from manufacturer to client inside the country or abroad. China has the infrastructure for this through the massive belt and road initiative for product delivery and supply chain sourcing.

The gel for a new impetus in China's trade success is its response to the novel coronavirus and having scientific data inform the national leadership who stimulated local commitment on a wartime scale of actions. This success appeared (from observation of the CGTN China State media report) to come from a belief that every individual could deliver the national strategy to avoid death and support the nation. The result of this massive effort in Wuhan caused a fusion of behaviour and technology and analysis faster than any policy could hope to deliver in defeating the infectivity of the virus and maintaining life in severe cases that otherwise would have died.

China has succeeded with a catastrophic pandemic crisis response whilst all other countries have lost control primarily through failure to recognise and then apply the gold standard China was readily sharing each day from January

through to April 2020. Other countries have also demonstrated that they have not yet learned from the Wuhan operation how to motivate the population to voluntarily act in the way China more forcibly expected its citizens to do as a contribution to saving life and helping the nation.

So where does this leave the UK? In extremis, the UK has in past overwhelming crises shown initiative and put in place counter-intuitive operations that were not driven by the herd thinking of some academics or bureaucrats clinging to traditional solutions and models. The initiative to open Britain lies within the successful global companies and the backbone of economic success which is the small and medium business. It must galvanise its businesses and its citizens to disrupt the risk of global economic collapse which is the major world threat until governments unlock people and use business's capacity to deliver a Wuhan level of virus health protection at work and in travel to work.

The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

[1] https://www.epicentro.iss.it/en/coronavirus/sars-cov-2-analysis-of-deaths

[1] The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

[1] The "health code" service – run on the ubiquitous platforms Alipay and WeChat and developed for the Chinese government – give users colour-coded designations based on their health status and travel history, and a QR code that can be scanned by authorities … generally people given a green code are allowed to travel relatively freely. A yellow code indicates that the holder should be in home isolation, and a red code says the user is a confirmed Covid-19 patient and should be in quarantine.
https://www.theguardian.com/world/2020/apr/01/chinas-coronavirus-health-code-apps-raise-concerns-over-privacy

[1] Covid Risk was deemed moderate by scientists' – 'Scientists on a Public Health England Committee … met on February 21 and discussed the Covid-19 threat level … with no objections to holding the risk level at moderate despite alarming figures from China' The Times, 01 April, 2020 p. 1

Gamers drafted in to help model spread of virus- Yet for other scientists the big problem with Ferguson's model is they cannot tell how it works. It consists of several thousand lines of dense computer code, with no description of which bits of code do what…. ' For me … it's all in my head, completely undocumented'… The Times, 29 March 2020 p.7

[1] The consistency of age data across China and Italy is identified from the rates quoted in Chinese CDC study of 72,000 cases in Wuhan and data from Italy as of March 17 referred to by R.L.Garwin in personal correspondence.

[1] The primary mechanism for consultation with Chinese hospitals is provided in the Handbook released by China on line to assist hospitals with treatment and this handbook contains the web link contact process to arrange on line consultation groups so that the Chinese experience can be transferred to other countries.
https://tinyurl.com/Covid-19-Handbook

"Handbook of COVID-19 Prevention and Treatment Compiled According to Clinical Experience..
The First Affiliated Hospital, Zhejiang University School Medicine, Compiled According to Clinical Experience"
[1] https://www.youtube.com/watch?v=UXDimuOshS8 Gov. Cuomo to Trump Ventilator Claim, March 27, 2020

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[i] 'Over 40,000 medical workers were sent by other Chinese regions, army forces and central government agencies to aid Hubei Province.' Touching Moment | Medical teams return home with Wuhan in their hearts, CGTN, March 22, 20200, https://www.youtube.com/watch?v=24JmeTNEZf0
[ii] Coronavirus: 4,500 retired doctors and nurses sign up to battle COVID-19 pandemic, "The whole country needs the NHS right now and if you're a retired doctor or a retired nurse then your NHS needs you." https://news.sky.com/story/coronavirus-4-500-retired-doctors-and-nurses-sign-up-to-battle-Covid-19-pandemic-11961685

[iii] Wuhan authorities are set to lift travel restrictions on April 8 – but these can be availed only by those showing a 'green' health code. The city has also been warned to remain vigilant with residents being advised to stay indoors and practice preventative measures despite the scheduled ease on travel curbs. The reason is fears of a rebound or second wave of the outbreak due to 'internal and external risks' https://www.china-briefing.com/news/managing-china-business-during-coronavirus-outbreak-updates-advisory/
[iv] A timeline of central bank responses to the COVID-19 pandemic, indicates Central Banks following three forms of activity reducing interest, lending freely and encouraging extension of credit and these are not described as a concerted response but shown as various actions. https://www.piie.com/blogs/realtime-economic-issues-watch/timeline-central-bank-responses-Covid-19-pandemic

[v] https://www.theguardian.com/us-news/2020/mar/27/trump-coronavirus-back-to-work-column
https://www.wsj.com/articles/white-house-scrambles-to-develop-plan-to-speed-americans-return-to-work-11585171430

[vi] https://www.theguardian.com/world/2018/apr/23/finland-to-end-basic-income-trial-after-two-years

[vii] Cases with co-morbid conditions reported much higher fatality rates than those with no comorbidity of whom there were 0.9%. The co-morbid conditions were - 10.5% cardiovascular disease, 7.3% with diabetes, 6.3% chronic respiratory disease, 6% hypertension, 5.6% cancer. The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

[viii] The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

[ix] Xi He et. Al., Temporal dynamics in viral shedding and transmissibility of COVID-19 https://doi.org/10.1101/2020.03.15.20036707doi: medRxiv preprint

[x] Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia Qun Li et al, M.Med., Xuhua Guan, Ph.D., Peng Wu, Ph.D., Xiaoye Wang, M.P.H., Lei Zhou, https://www.nejm.org/doi/pdf/10.1056/NEJMoa2001316

[xi] https://www.cdc.gov/coronavirus/2019-ncov/community/home/index.html
https://www.cdc.gov/coronavirus/2019-ncov/community/home/checklist-household-ready.html
https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-prevent-spread.html#precautions
https://www.cdc.gov/coronavirus/2019-ncov/community/home/cleaning-disinfection.html

[xii] The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

[xiv]Rare look at medical staff in China's central city of Wuhan on front lines of the coronavirus fight https://www.youtube.com/watch?v=-KXtC8w8IDY CGTN March 13,2020

[xv] Bruce Aylward, Deputy Director General of WHO described China's approach – " it's fundamentally different to the way most people think about approaching a dangerous respiratory pathogen in the modern era.' 'China has taken one of the most ancient approaches for infectious disease control and rolled out probably the most ambitious.., agile and aggressive disease containment effort in history. China took old-fashioned measures, like the national approach to hand-washing, the mask-wearing, the social distancing, the universal temperature monitoring. But then very quickly, as it started to evolve, the response started to change. And it moved from this sort of one-size-fits-all approach to a science-and-risk-based approach, which was really tailored to allow it to use different containment approaches and measures, depending on the context, the capacity and really the nature of the coronavirus circulation.

https://www.who.int/docs/default-source/coronaviruse/transcripts/joint-mission-press-conference-script-english-final.pdf?sfvrsn=51c90b9e_2

[xvi] The innovation of systems using real time data and large data fused from many sources was presented daily by CGTN news and documentaries as the virus progressed and adaptations were made to meet evolving social requirements and treatment requirements of the victims in Hubei.

[xvii] The dataset such as the study of 72,000 cases in Hubei cannot be immediately replicated by other countries who are not at the stage of bringing the new cases to almost at a zero level. These cases are a guide to data on

the characteristics of the virus. The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

vided in the Handbook released by China on line to assist hospitals with treatment and this handbook contains the web link contact process to arrange on line consultation groups so that the Chinese experience can be transferred to other countries.
https://tinyurl.com/Covid-19-Handbook
"Handbook of COVID-19 Prevention and Treatment Compiled According to Clinical Experience..
The First Affiliated Hospital, Zhejiang University School Medicine, Compiled According to Clinical Experience"
[1] https://www.youtube.com/watch?v=UXDimuOshS8 Gov. Cuomo to Trump Ventilator Claim, March 27, 2020
[1] 'Over 40,000 medical workers were sent by other Chinese regions, army forces and central government agencies to aid Hubei Province.' Touching Moment | Medical teams return home with Wuhan in their hearts, CGTN, March 22, 20200, https://www.youtube.com/watch?v=24JmeTNEZf0
[1] Coronavirus: 4,500 retired doctors and nurses sign up to battle COVID-19 pandemic, "The whole country needs the NHS right now and if you're a retired doctor or a retired nurse then your NHS needs you."
https://news.sky.com/story/coronavirus-4-500-retired-doctors-and-nurses-sign-up-to-battle-Covid-19-pandemic-11961685

[1] Wuhan authorities are set to lift travel restrictions on April 8 – but these can be availed only by those showing a 'green' health code. The city has also been warned to remain vigilant with residents being advised to stay indoors and practice preventative measures despite the scheduled ease on travel curbs. The reason is fears of a rebound or second wave of the outbreak due to 'internal and external risks' https://www.china-briefing.com/news/managing-

china-business-during-coronavirus-outbreak-updates-advisory/

[1] A timeline of central bank responses to the COVID-19 pandemic, indicates Central Banks following three forms of activity reducing interest, lending freely and encouraging extension of credit and these are not described as a concerted response but shown as various actions. https://www.piie.com/blogs/realtime-economic-issues-watch/timeline-central-bank-responses-Covid-19-pandemic

[1] https://www.theguardian.com/us-news/2020/mar/27/trump-coronavirus-back-to-work-column
https://www.wsj.com/articles/white-house-scrambles-to-develop-plan-to-speed-americans-return-to-work-11585171430

[1] https://www.theguardian.com/world/2018/apr/23/finland-to-end-basic-income-trial-after-two-years

[1] Cases with co-morbid conditions reported much higher fatality rates than those with no comorbidity of whom there were 0.9%. The co-morbid conditions were - 10.5% cardiovascular disease, 7.3% with diabetes, 6.3% chronic respiratory disease, 6% hypertension, 5.6% cancer. The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

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[1] https://www.cdc.gov/coronavirus/2019-ncov/community/home/index.html

https://www.cdc.gov/coronavirus/2019-ncov/community/home/checklist-household-ready.html
https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-prevent-spread.html#precautions
https://www.cdc.gov/coronavirus/2019-ncov/community/home/cleaning-disinfection.html
[1] The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020 *The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team* 2020, 2(8): 113-122. http://weekly.chinacdc.cn/en/

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