

SFC's innovation strategy (COVID-19)

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- This paper invites RKEC to be bold and ambitious in providing its advice to SFC's Board on its strategy for innovation and ensuring our colleges and universities are motivated, inspired and supported to play a key role in Scotland's successful, sustainable and equitable recovery from the economic and social effects of COVID-19.
- Whilst the Scottish Government's invitation to SFC to review its further and higher education support sets some specific context for SFC, RKEC should feel free to comment on the wider context in addition to offering specific commentary on SFC's role.

Recommendations

RKEC is invited to:

- Note that SFC will soon conduct a review of further and higher education support and that RKEC will be engaged in this work.
- Provide advice and guidance on SFC's strategy for innovation in the context of the review of further and higher education support and wider.

Financial implications

- There are no direct financial implications associated with this paper.

SFC's innovation strategy (COVID-19)

Purpose

1. The Scottish Government has invited SFC to "...review how best it can fulfil its mission of securing coherent provision by post-16 education bodies, and the undertaking of research in these changing times."¹ This paper invites RKEC to be bold and ambitious in providing its advice to SFC's Board on its strategy for innovation and ensuring our colleges and universities are motivated, inspired and supported to play a key role in Scotland's successful, sustainable and equitable recovery from the economic and social effects of COVID-19.
2. Whilst the Scottish Government's invitation to SFC to review its further and higher education support sets some specific context for SFC, RKEC should feel free to comment on the wider context in addition to offering specific commentary on SFC's role.

Background

3. In his letter of 3 June 2020 the Minister for Further Education, Higher Education and Science invited SFC to 'review how best it can fulfil its mission of securing coherent provision by post-16 education bodies, and the undertaking of research in these changing times².' It is important to note that the letter encourages SFC to build on the Muscatelli report³ and the Cumberford-Little report⁴. RKEC is reminded that our analysis of both reports has been high-level to date.
4. This follows evidence provided to the Scottish Government's Education Committee on 15 May 2020 by SFC CEO, Karen Watt. In our evidence to the Committee we stated, 'The only certainty we have right now is that Scotland's society and economy will face a slow recovery. We believe the skills, education, research and innovation that universities and colleges deliver will be an essential part of a successful, sustainable and equitable recovery.', and 'The retention, in Scotland, of a broad research capacity that means that Scotland can anticipate and respond to the big challenges that face us beyond the current crisis, e.g. the climate emergency' and 'the need for business creation, adaptation and growth through innovation, opportunities for trade and export.'⁵
5. In this context, there is an expectation that SFC will share early considerations

¹ See paper RKEC/20/05, Agenda item 3

² <https://www.gov.scot/news/review-of-further-and-higher-education-support/>

³ https://www.gla.ac.uk/media/Media_700300_smx.pdf

⁴ <https://view.pagetiger.com/inlhij/1>

⁵ <https://www.parliament.scot/parliamentarybusiness/CurrentCommittees/115268.aspx>

with the Minister in an update by the end of August 2020. This is a tight timeline but offers an exciting opportunity to think in bold ways that could transform the sector and how it is funded.

6. The main focus of this paper is innovation but RKEC should recognise that this is an often broad term. Thinking of the review and for the purpose of this conversation it might be helpful to consider the application of new knowledge in its widest sense. RKEC could then consider the role of our universities, colleges and funded assets in utilising this knowledge to support Scotland's recovery from COVID-19 in the short, medium and long term and to consider how the sector might need to adapt and reposition to meet the challenges of recovery.
7. The Scottish Government formed the Advisory Group on Economic Recovery, chaired by Benny Higgins, to provide expert advice on Scotland's economic recovery once the immediate emergency, created by COVID-19, has subsided.⁶ This is expected to publish initial recommendations in late June. SFC and the sector will have to consider how to support and respond to these recommendations. We have an excellent knowledge base, strong innovation assets that are responsive to Scotland's needs, an embedded culture of collaboration built on outcome focussed action and the ability to pull the sector together quickly to discuss ways of working. The effective utilisation of these positives will be critical in the longer-term response to this crisis.
8. UKRI are continuing to support 'levelling-up' activity as they move to reach the OECD average of 2.4% for R&D investment in a 'balanced' way across the UK. They have recently published an environmental sustainability strategy outlining a path to net-zero by 2040 and continue to pivot funding towards COVID-19 responses. Given the scale and importance of this funding it will be critical for SFC and the wider sector to seek to influence the direction of this funding and to leverage it into Scotland.

Response to date

9. We have seen our colleges, universities and innovation assets pivot their activities to meet the challenges presented by COVID-19 – prompting our CEO to say publically that she has "...never felt prouder to work with our colleges and universities"⁷. Examples of this include:
 - Innovation Centres adjusting quickly to meet the needs of their sectors and support government. DHI are at the centre of the delivery of the digital products that will underpin the national Track, Trace, Isolate, Support (TTIS) national approach to COVID-19 management, PMS-IC have provided their lab

⁶ <https://www.gov.scot/groups/advisory-group-on-economic-recovery/>

⁷ <http://www.sfc.ac.uk/news/blogs/Blog-79549.aspx>

space and seconded staff into the Lighthouse Lab testing facility in Glasgow, CSIC created the i-con: COVID-19 support platform for the built environment sector,⁸ and The Data Lab recently supported 4 successful applications to Innovate UK for COVID-19 response funding;

- The Converge Challenge has seen record participation in their most recent application round, with an increase of 17% in submissions during the pandemic;
- Interface has compiled an extensive, though not exhaustive, list of contributions by universities and colleges towards the COVID-19 response. This is provided in Annex A;
- The Forth Valley College Innovation Project Digital Skills Transforming Care Course will launch on the 16 June 2020 in direct response to COVID-19 and lockdown. It will support healthcare with an online course which integrates digital skills into the training of care staff across the Forth Valley area to meet the demands of a changing sector and an emerging ‘new normal.’⁹

SFC’s current strategy for innovation

10. It is useful to remind RKEC of SFC’s current stated strategy for innovation and our funding policy and areas of influence. SFC’s strategic framework states, under objective 2, that we will ‘invest in excellent research and innovation that adds to current knowledge, delivers economic and societal value, enhances Scotland’s international reputation and attractiveness, and makes the world around us prosperous, healthier and more sustainable.’
11. In addition our strategic framework is aligned to the Scottish Government National Performance Framework (NPF)¹⁰. This is a set of national outcomes supported by indicators of progress against these outcomes.
12. We currently invest in a number of interventions to support innovation activity. These include the University Innovation Fund; Interface: the knowledge connection for business; Innovation Centres; Innovation Voucher scheme; College Innovation Fund; Company Creation and Scale-up initiatives; Shorter-term pump priming/leverage investments such as EIT Digital (Scotland), Cancer Innovation Challenge; Knowledge Transfer Partnerships etc.
13. Our Innovation Centre programme is framed as bringing ‘the expertise and capabilities of Scotland’s universities, research pools, colleges and businesses, to address industry demand led opportunities that support growth of the

⁸ <https://www.cs-ic.org/innovationcentre/innovation-support/i-con-covid-19-support/>

⁹ <http://www.sfc.ac.uk/news/blogs/Blog-80854.aspx>

¹⁰ <https://nationalperformance.gov.scot/>

Scottish economy. Innovation Centres support transformational opportunities for industry and work collaboratively to develop Scotland as a world-leading entrepreneurial and innovative nation.’ We have been discussing the future strategy for the programme with our partners and have sought guidance from RKEC at the appropriate points. We now need to reframe this thinking in the wider context of the SFC review and RKEC’s views on this will be important.

14. We engage with UKRI to ensure that they are taking a four nations approach to their funding. This has been effective to some extent with an expected announcement of successful Scottish projects in Wave 1 of the Strength in Places Fund.
15. The University Innovation Fund (UIF) is an investment in university capacity for innovation/knowledge exchange. As reported to RKEC in April 2020, the planned consultation as part of the RKEC-led review on changes to the UIF model has been paused. UIF was introduced properly in 2017/18 before SFC published its current strategic framework. The review, therefore, had a core purpose to ensure alignment. The much wider review SFC is about to embark on is expected to lead to an updated strategic framework. We, with RKEC’s support, will need to consider carefully how we resume the review of UIF in this wider context¹¹.
16. This portfolio can be built upon. The examples given earlier in the paper on the response our colleges and universities to COVID-19 have been possible, in part, because we invest the way we do. We are not, therefore, at a standing start. The UIF, for example, has encouraged a collaborative ethos across our universities and a greater focus on economic and social outcomes from KE. We also, however, should be prepared to scrutinise and test this portfolio.

Successful, sustainable, and equitable recovery and future

17. The following sections are intended to provide evidence to support RKEC’s discussion. They focus on some of the key themes and challenges facing our economy, society and environment. We will not have captured everything. We may not have the context right in all areas. RKEC is encouraged to discuss and challenge what is set out here and to direct SFC to other relevant evidence.

Economic

18. Whilst the health crisis of COVID-19 is the immediate challenge we face the economic crisis that has resulted will also create lasting damage. Updated economic modelling suggests a longer recovery phase is increasingly likely given the loss of productive capacity and the change in market conditions for many

¹¹ RKEC is also reminded that the UK KE Concordat (<https://www.keconcordat.ac.uk/>) and HESA-led review of HE-BCI (both relevant to UIF) continue but at different pace due to COVID-19

sectors of the economy¹². This indicates a more gradual recovery rather than the desired 'V' shaped sharper recovery. In the 'Gradual Recovery' scenario, the slower rebound in demand causes the short-term downturn to be more protracted, and more importantly the greater degree of scarring means economic output does not recovery to pre-crisis levels until the start of 2023.

19. According to the Scottish Government's Monthly Economic Brief: June 2020¹³, Scotland's claimant count (Job Seekers Allowance and Universal Credit) increased by 67% to 186,000 over the month to April, signalling that incomes are falling and unemployment is rising. At a UK level, the claimant count increased by 69% to 2.1 million over the month to April. It is unclear yet what level of unemployment will be seen as a result of this crisis. Some businesses which are currently furloughing employees may not re-open as we move to recovery. Between 4 May and 17 May, 19% of businesses reported that they had temporarily closed (UK: 18%) and 81% reported they were continuing to trade.
20. Specific sectors face huge challenges including, but not limited to, construction, tourism, hospitality, the creative industries and the associated supply chains. Whilst gradual easing will provide some 'bounce back' for certain sectors, others will face a prolonged downturn in demand, where restrictions on international travel and social distancing remain in force.
21. The tertiary sector will also face a downturn in demand from international students and some business and funding partners. As we look at the wider funding review this may require us to sharpen focus on key priorities and deprioritise other activity.
22. All of this places Scotland and the UK in a fragile economic position. The UK has committed to ending the Brexit transition period in December 2020 and is currently negotiating the terms of a trade deal with the EU. If these negotiations fail, or agree a deal that is suboptimal to the current trade arrangements with the, EU then the UK could potentially compound one economic crisis with another.

Societal

23. The health impact of COVID-19 has disproportionately affected the vulnerable and the low-paid. Prominence of the virus and associated death toll in communities appears to correlate to the most deprived areas in Scotland, as identified in the Scottish Index of Multiple Deprivation,¹⁴ and the recent Public Health England report has highlighted that BAME individuals are at greater risk

¹² <https://www.gov.scot/publications/monthly-economic-brief-2/>

¹³ <https://www.gov.scot/publications/monthly-economic-brief-2/>

¹⁴ <https://simd.scot/#/simd2020/BTTTTT/9/-4.0000/55.9000/>

of dying from COVID-19¹⁵.

24. The mental health toll of both extended isolation and coping with bereavement could create a further health crisis in Scotland. This is in addition to the ongoing reality of living with COVID-19, how this affects everyday aspects of life and relationships. In addition, as we understand the impact of this virus better, it is becoming clear that a number of people are developing longer-term health conditions which will have to be managed.
25. In employment terms, the crisis has most affected young people, with one third of 18-24 year olds furloughed, directly lost their job or had hours cut¹⁶. Scotland has one of the world's highest percentages of graduates per capita and yet a substantial proportion of graduates are under-employed. These combine to create a deeply concerning situation for the young workforce with a broader trend that we could see a lost-generation with persistent unemployment, underemployment and poor job-security for workers. This will have dramatic effect on the wider economy with young people struggling to save for homes, lower disposable income and purchasing power.
26. In Scotland poverty remains high. Some decreases have been seen in the last 20 years and yet we still see approximately one in five adults in poverty and nearly one in four children in poverty¹⁷. This is lower than both England and Wales but is still at an unacceptable level. In the UK, the Trussell Trust highlighted an 81% increase in food bank parcel requirement in March 2020 and a 122% increase in food parcels for children during the COVID-19 pandemic. This is on top of an already dramatic rise in food banks in the last decade with approximately 2% of all UK household having accessed a food bank¹⁸.

Climate

27. The global lockdown has led to significant drop in carbon emissions reaching a peak drop of 26%¹⁹. However, even at peak level we have still retained 74% of emissions and this is increasing as global lockdowns begin to ease. This highlights much larger structural challenges in moving towards net-zero.
28. At the same time we have seen a further collapse in the oil price, currently sitting at \$38 a barrel (as at 12 June 2020). This has a significant impact on potential tax revenue in Scotland and compounds the challenges in the North-

¹⁵

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/890258/disparities_review.pdf

¹⁶ <https://www.resolutionfoundation.org/publications/young-workers-in-the-coronavirus-crisis/>

¹⁷ <https://www.jrf.org.uk/report/poverty-scotland-2019>

¹⁸ <https://www.stateofhunger.org/wp-content/uploads/2019/11/State-of-Hunger-Report-November2019-Digital.pdf>

¹⁹ <https://www.nature.com/articles/s41558-020-0797-x>

East which has already faced a collapse in oil prices. Faced with a longer term global oversupply it is unlikely that we will see the oil price recover and the low-price will likely prevent many companies from moving as quickly towards low-carbon solutions. SFC has begun to act with the merger of OGIC in OGTC. This investment of £3M, in partnership with Scottish Government and Scottish Enterprise, will support academic involvement in projects focussing on net-zero solutions.

29. Social distancing has also emphasised that streets need to be able to provide space to pedestrians and this has highlighted the disproportionate amount of urban space allocated to cars. As many parts of the country look at re-imagining how streets function, there are considerable opportunities to create innovative transport solutions and, through national innovation infrastructure such as National Manufacturing Institute for Scotland (NMIS) and Michelin Scotland Innovation Parc (MSIP), a potential route to maximise, and include our colleges and universities in, the production of solutions.
30. The challenge of this wider context is articulating what the civic role of universities, colleges and SFC are in doing something about this, how we should best deploy our assets to meet these challenges and what we should target. In NESTA's *Is Scotland Getting Innovation Right*²⁰ report they highlight 'the Scottish public want to see investment and support for new ideas which address longer-term social issues and prioritise universal public good for the largest number of people, even if there is not necessarily any economic benefit.'

Ensuring policy alignment

31. Much of the information in this paper is not new. It has been brought into accelerated focus by the global pandemic and the realisation that this could be a significant moment of change.
32. We have already made early steps in responding to the climate emergency²¹ and we are committed to supporting the new Scottish Government targets of reducing carbon emissions to net-zero by 2045. The updated climate action plan which would set this out in more detail has been delayed due to COVID-19 as has COP 26 which will now be held in Glasgow in November 2021.
33. The Scottish National Investment Bank is still due to become operational in the second half of 2020²². It has proposed a mission-led²³ approach to investment

²⁰ <https://media.nesta.org.uk/documents/NESJ7903-Scot-Summary-Findings-FINAL.pdf>

²¹ <http://www.sfc.ac.uk/news/2020/news-79259.aspx>

²² <https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2019/05/a-national-investment-bank-for-scotland-factsheet/documents/a-national-investment-bank-for-scotland-information/a-national-investment-bank-for-scotland-information/govscot%3Adocument/SNIB%2Bfactsheet.pdf>

and the First Minister announced in the most recent Programme for Government that the bank's primary mission would be to support Scotland's transition to a net-zero carbon economy.

34. The mission based approach has also been adopted by the upcoming European Horizon programme and in the UK Industrial Strategy Challenge Fund. Much of this is built on the premise of reshaping markets and utilising public investment to channel growth towards different sectors and technologies that can support the fulfilment of stated missions.
35. A recent report authored by Richard Jones and NESTA²⁴ highlighted a 'missing' £4 billion from UK regional innovation spend, based on matching London's current public sector funding. The paper highlights that Scotland already has a high level of public investment in R&D but a persistently low level of private sector investment. The challenge for Scotland, as seen by this paper, is ensuring that public investment is being prioritised effectively to unlock more private investment.
36. In 2018 Scotland, Iceland and New Zealand established a network of Wellbeing Economy Governments, committing the nation to the values of a wellbeing economy. This reflected the desire to move away from existing measure of GDP as the determinant of success and move to new indicators based on wellbeing²⁵. Wales became the fourth government to officially join this movement in May 2020.
37. Recognising all of this, our innovation assets and investments are aligned to broader outcomes such as increased collaboration or in the case of Innovation Centres are focussed around industry-demand led responses. Are these still appropriate approaches to innovation or does the sector risk being left behind in mission-based approaches? Missions are often 'top-down' ambitions but the responses are often through co-creation and collaboration. What is the role of the sector in shaping Scotland's missions and then in achieving them?

Points for discussion

38. This paper provides the committee with a brief overview of various issues; each could be a paper in their own right and yet they are inter-dependent, particularly in the case of a just transition to a low carbon economy. The

²³ From NESTA: "The European Commission defines it, in uncharacteristically succinct terms, as 'an approach to policymaking which means setting defined goals, with specific targets and working to achieve them in a set time'. In her report on the topic for the Commission, Mariana Mazzucato (perhaps the biggest champion of missions) defines them as 'systemic public policies that draw on frontier knowledge to attain specific goals or "big science deployed to meet big problems"'. The classic example is the moonshot – a concerted, cross-sector effort mobilising large resources with a clear goal in mind." <https://www.nesta.org.uk/>

²⁴ https://media.nesta.org.uk/documents/The_Missing_4_Billion_Making_RD_work_for_the_whole_UK_v4.pdf

²⁵ See First Minister Ted Talk - Why governments should prioritize well-being <https://www.youtube.com/watch?v=gJzSWacrKko>

committee is invited to consider the detail of this paper and may wish to discuss aspects of the following prompts and questions:

- We need to be able to clearly articulate the importance of innovation and the key role of our colleges and universities in driving Scotland's recovery and future.
- What are the key opportunities and challenges brought by COVID-19 and how should these shape our thinking?
- What should guide our criteria on deciding what is good, irrelevant, missing etc. from our current strategy and portfolio of funding policy and areas of influence? The next steps for the UIF and Innovation Centres are significant issues requiring RKEC's view.
- How should we be influencing others – e.g. working with SG and others to ensure UKRI understands Scotland's challenges (Strength in Places is a good example) – recognising that a key role is to support our institutions to be part of a bigger UK and global innovation landscape.
- Where else should we be looking for thought leadership in our approach? Do we look externally, at other countries or, ideally, from within our academic community?

Risk assessment

39. RKEC is invited to highlight any risks associated with this paper. RKEC's discussions will be used as inputs to SFC's review of further and higher education support. The risk assessment for this work will be owned by SFC's Board.

Equality and diversity assessment

40. RKEC is invited to highlight any equality and diversity issues associated with this paper. RKEC's discussions will be used as inputs to SFC's review of further and higher education support. The equality and diversity assessment required for the review will be owned by SFC's Board.

Recommendations

41. RKEC is invited to:

- Note that SFC will soon conduct a review of further and higher education support and that RKEC will be engaged in this work.
- Provide advice and guidance on SFC's strategy for innovation in the context of the review of further and higher education support and wider.

Financial implications

42. There are no direct financial implications associated with this paper.

Publication

43. This paper will be published on SFC's website.

Further information

44. Contact: Robin Lee, Senior Policy Officer: rlee@sfc.ac.uk or Keith McDonald, Assistant Director: kmcdonald@sfc.ac.uk.

Annex A

Scottish University Response to COVID-19

This document prepared by Interface provides a short summary of some of the ways in which Scottish Universities are providing support for COVID-19.

This is not meant to be an exhaustive list but rather an indication of some of the activities underway.

Provision of vital COVID-19 testing:

- **The University of Glasgow** is hosting a major COVID-19 testing centre at their Clinical Innovation Zone at the Queen Elizabeth University Hospital campus. The **Lighthouse Lab** in Glasgow, officially opened on 22 April and is made possible by collaboration and support from Scottish and UK Governments, NHS, industry partners and with the help of over 500 staff volunteers²⁶. This was established in three weeks and now processes thousands of tests a day.
- The **University of Edinburgh** Institute of Genetics and Molecular Medicine has been running 1,000 COVID-19 tests a day within its laboratories, in support of NHSS services.
- The **University of Dundee** has helped establish Scotland's central COVID-19 testing facility in support of the national response to the coronavirus pandemic. The centre, based at the **University of Glasgow**, was announced by the UK Government as part of a series of measures to increase testing and response to the spread of COVID-19 across the UK. It will be opened in collaboration with the Scottish Government and industry experts from BioAscent Discovery Ltd and Dundee's Drug Discovery Unit (DDU).
- The **University of Dundee** has donated its two KingFisher Flex robots which are vital to the national diagnostic testing programme. It has been reported in the media that these machines are currently like "gold dust". On special request from Number 10 Downing Street, the Royal Navy turned up at Dundee's School of Life Sciences to transport them to Milton Keynes to be part of the national COVID-19 Diagnostic Centre.
- A drive-through coronavirus testing facility is to open at the **Perth College UHI** as part of the UK Government's UK-wide drive to increase testing for thousands more NHS and other key workers.
- Prof Linda Scobie from the Department of Biological and Biomedical Sciences at **Glasgow Caledonian University** has loaned her equipment for the extraction of material to test for SARS-CoV2 to NHS Dumfries and Galloway; Dr Claire Crossan, Research Fellow in Biomedical & Biological Sciences, at **Glasgow Caledonian University** is located there to provide training and to assist with testing in the meantime.
- An extra 1000 COVID-19 tests are being carried out every day in the North East of Scotland thanks to a partnership between the **University of Aberdeen** and NHS Grampian. The NHS Scotland Genetics Consortium Laboratory, based in the University of Aberdeen Medical School, has been boosted by the loan of equipment from the University and associated companies and research institutes. The partnership will provide significant additional testing capacity and contingency to the existing NHS Grampian Virology department service.

²⁶ https://www.gla.ac.uk/news/headline_714460_en.html

Provision of vital medical equipment -from ventilators to visors:

Ventilators

- A ventilator normally used within the Simulation and Clinical Skills Centre at **Edinburgh Napier**'s Sighthill campus has been transferred to the intensive care ward at the Royal Infirmary of Edinburgh to help cope with increasing demand as a result of the pandemic.
- The **University of Aberdeen**'s space team have used skills needed to develop life support systems for crewed space missions to build a ventilator called the ATMO-Vent (Atmospheric Mixture Optimization Ventilator) to help treat the most severe cases of coronavirus. Using certified and low-cost components which are commercially available for common use on Earth, the scientists believe the device - known as ATMO-Vent (Atmospheric Mixture Optimization Ventilator) - is quicker to build, more cost-effective and more user-friendly than any other model currently in development.

Visors and face masks and Scrubs

- **Edinburgh Napier University** has started producing specially designed visors to give health workers the protection they need when treating COVID-19 patients.
- **Heriot-Watt University** have begun production of protective face shields using their specialist equipment at the Edinburgh campus this week with the aid of 3D printers and highly-specialist industrial laser cutting machines. This is being led at Heriot-Watt University by academic and technical staff that include Dr Steven Hammer, Nathan Oo, Dr Theo Lim and Dr Michael Crichton. The team has already received a number of requests from hospitals, care homes and GP surgeries for Personal Protective Equipment (PPE) and are working with health authorities to reach those most in urgent need. The team can even use the technology to manufacture components for ventilators if required.
- Colleagues in the School of Computing, Engineering and Physical Sciences are using **University of the West of Scotland's** cutting-edge 3D printer to produce PPE in the form of protective visors for the NHS. The University has also provided simulation equipment for training purposes to NHS Greater Glasgow and Clyde in the form of venepuncture arms. The prosthetic arms, which are used by students to train in cannulation or IV insertion, will be used by key workers at a number of NHS facilities.
- A group of **University of Edinburgh** students and alumni has turned over their entire business – the 3D printing of prosthetic limbs – to join the efforts being undertaken across the UK to manufacture personal protective equipment (PPE) for NHS frontline staff.
- The **University of Stirling** has gifted two 3D printers – and loaned another two – to a local school that is using the devices to create personal protective equipment (PPE) for healthcare workers.
- The **University of Stirling** are set to test a prototype facemask that could help prevent further spread of the virus in a new study launched just days after the UK and Scottish Governments indicated there may be benefits in wearing face coverings.
- Former students of the **University of St Andrews** in China have donated 11,000 face masks to the University to help protect Scottish health workers on the COVID-19 frontline.
- Engineers from the **University of Glasgow** have repurposed an injection moulding machine, usually used to support research projects, to produce safety visors.
- Research from the **University of Edinburgh** has found wearing a face covering can reduce the forward distance of an exhaled breath by more than 90 per cent. Surgical masks and the

tested handmade masks were found to limit the forward flow of a breath out but also generate far-reaching leakage jets to the side, behind, above and below.

- **City of Glasgow College** staff are producing hundreds of frames for safety visors each day as part of a new PPE campaign supported by a number of high profile Scottish organisations and stars such as Robert Carlyle.
- The **University of Dundee** has provided supplies of PPE equipment to Dundee City Council for use by front line public health, social and community care workers across the city. Facemasks, gloves and other equipment was gathered from across the University to be used by council staff who are working across the community to deliver vital services through the coronavirus crisis, providing care, support and comfort to vulnerable people across Dundee and Tayside. NHS Tayside is working with local industry, the **University of Dundee** and community volunteers to also produce thousands of additional sets of scrubs for frontline staff.

Clinical services

- The **University of the West of Scotland's** former Deputy Principal, Professor Paul Martin CBE, played a leading role in creating Scotland's largest temporary hospital to help fight coronavirus. His role involved advising and informing both the clinical shape of the hospital's services and translating this into an integrated workforce model, looking at staff numbers and skills, training and deployment. The University has also made a donation of 33 hospital beds from their own nursing and midwifery facilities to the new NHS Louisa Jordan hospital.
- Pioneering virtual emergency eye consultations using technology co-developed by the **University of Strathclyde** are being rolled out in parts of Scotland in response to COVID-19.
- A critical need given the sudden development of the COVID pandemic has been the ability to rapidly set up and approve important clinical trials. The **University of Dundee** have been successful in doing this thanks to the effective collaboration between the University of Dundee and NHS Tayside, in particular Tayside Medical Science Centre (TASC), Clinical Trials Pharmacy, Clinical Research Centre (CRC) and the clinical research nurse service. These clinical trials have now been set up and are underway in Tayside.
- Researchers from the **University of Dundee's** School of Medicine are partnering with global biopharmaceutical company Insmid Incorporated to conduct trials of brensocatib (formerly known as INS1007), a drug being developed to treat lung inflammation, in COVID-19 patients.

Supply chain and manufacture

- NMIS @ **University of Strathclyde** is supporting the work of the Scottish Government and NHS procurement in the development of **flexible supply chain solutions** during this time of unprecedented supply and demand challenges for the NHS.

Research in Universities – from clinical trials to expert scientific advice

- The **University of Glasgow's** Centre for Virus Research (CVR) is at the heart of COVID-19 research in the UK. The Centre has been named as one of 13 key centres in a pan-UK alliance of scientists collaborating on a range of research areas related to the new coronavirus.
- The **University of Glasgow's** CVR has also been announced as playing a key role in new COVID-19 scientific project, led by the **University of Edinburgh** which has received £4.9m of

rapid response government funding to tackle the coronavirus pandemic. The project seeks to increase our understanding of COVID-19 and its impact on the body.

- The **Universities of Edinburgh and Glasgow** have proved pivotal members of the Genomics UK Consortium of top scientists, for instance, and their leading-edge labs have been used to sequence the genome of the virus isolated from Scottish patients.
- **University of Aberdeen** has undertaken a major study of symptomless carriers and infection rates.
- A drug commonly used to treat patients suffering from strokes could be repurposed to treat patients with Covid-19, according to researchers at the **University of Aberdeen**. They suggest an aerosol version of a clot-busting drug called tissue plasminogen activator (tPA) could be a 'pragmatic' way to tackle lung injury complications caused by the virus.
- The **University of Aberdeen** has been awarded funding for six rapid research projects from the Scottish Government to tackle the Covid-19 pandemic. Aberdeen academics will examine the impact of the pandemic on healthcare workers and also explore the impact of social distancing, particularly upon the elderly, and consider strategies going forward to help mitigate the effects of loneliness, reduced physical activity and management of disease, as well as protecting physical and mental health.
- The **University of Dundee** is leading a major new clinical trial of a drug it is hoped may help to prevent the worst symptoms of COVID-19. The [MRC Protein Phosphorylation and Ubiquitylation Unit](#) (MRC-PPU) at Dundee have identified 38 separate proteins produced by SARS-CoV-2 –the virus that causes COVID-19 – that produce an immune response in the body. Over the next four months, the Dundee team will manufacture these components of the virus in order to generate antibodies against them. The University's Protein Portal allows UK scientists to access protein reagents for critical research relating to SARS-CoV-2. Protein reagents are provided free of charge by a consortium of leading protein production laboratories, in an Open Science initiative led by Wellcome and UKRI.
- A major new study has been launched to understand how the COVID-19 lockdown has impacted gambling behaviour, including among potentially 'high risk' groups. Led in partnership by the **University of Stirling** and **University of Glasgow**, the project will consider the effect of the pandemic restrictions on young adults and sports bettors – and analyse the promotion and marketing of gambling products during the lockdown.
- Scientists at the **University of Glasgow** have teamed up with illustrators at the Glasgow School of Art to create one of the first and most detailed 3D models of the virus behind the COVID-19 pandemic.
- Annabel Slater, a freelance scientific illustrator and Art School graduate, created the images in collaboration with the University of Glasgow's Centre for Virus Research (CVR) and the GSA's School of Simulation and Visualisation.
- The **University of Dundee** has been one of the first UK cancer centres to join a new network focused on quickly understanding and sharing the best approach to care for cancer patients with COVID-19.
- Scientists at the **University of Dundee** and the EMBL's European Bioinformatics Institute (EMBL-EBI) have published online some of the largest and highest resolution images yet recorded of the SARS-CoV-2 virus, the cause of the Covid-19 pandemic.
- An analysis of SARS-CoV-2 pandemic data from more than 70 countries, carried out by researchers at the **University of Dundee**, shows that a return to pre-lockdown levels of activity in society will be almost impossible without a vaccine. The **Universities of Glasgow**

and Dundee have been awarded £225,000 to rapidly screen for potential COVID-19 treatments.

- SARS-CoV-2, the virus that causes COVID-19, works by infecting the respiratory system. If it gets into the lungs, it causes an immune reaction, which can lead to pneumonia and even death. At the **University of Dundee**, we have identified 28 proteins created by SARS-CoV-2 that produce an immune response in the body. These proteins are vital research tools for developing diagnostics and in helping to understand how the virus infects and attacks us. Researchers at the University are to test new diagnostic technologies they hope may tackle the dual risks posed by Covid-19 and antimicrobial resistance.
- Research initiatives at the **University of Dundee's** School of Life Sciences and School of Medicine will help identify those most vulnerable to severe symptoms of coronavirus and establish what happens to those recovering from the illness. The two projects have received money as part of a £5 million round of funding announced by the Scottish Government to further our understanding of Covid-19, screen potential treatments, and support clinical trials.
- The **Open University** has partnered with UKRI accredited Independent Research Organisation, The Young Foundation to launch a landmark new project to capture the social impact of coronavirus on individuals and communities across the UK. Delivered on the OU's citizen science platform, nQuire the project aims to understand how this generation-defining moment impacts the future of community life and wellbeing.
- **Glasgow Caledonian University** had members from the Data Science Research group of Professor Gordon Morison (School of Computing, Engineering & Built Environment) took part in the *Corona Hack*. This was a week-long hackathon where multi-disciplinary teams from all over the UK competed to attempted to try and contribute their data skills to help to combat COVID-19 using publicly available data. During the course of this week they used their data science and software development skills to develop a prototype visualisation tool which can be combined with AI models to display Covid-19 classification and severity based on X-ray and patient meta data.
- A new expert group providing additional scientific analysis of the impact of COVID-19 in Scotland is chaired by the **University of Edinburgh's** Professor Andrew Morris. The COVID-19 Advisory Group was announced by the First Minister on 25 March 2020 and will provide the Scottish Government with scientific advice to further strengthen modelling informing national and local decisions in Scotland during the pandemic. Professor Morris will be supported by vice chair, Professor David Crossman, Dean of Medicine at the **University of St Andrews**.
- A team of scientists at **Glasgow Caledonian University** (GCU) have launched a nationwide study to investigate the impact coronavirus measures are having on Scotland's mental health. The results of the survey will help to inform healthcare practitioners to develop interventions to support people through quarantine and lockdown, and it will also be used in evidence to policymakers and government as to the effect of some of those measures on the psychological wellbeing of the public and how we can address any negative impact from the COVID-19 measures.
- Claudia Estcourt from **Glasgow Caledonian University** is Clinical Professor of HIV and Sexual Health here at GCU and recently also took up the post as joint Clinical Lead of NHS Greater Glasgow & Clyde Sexual Health Services at the Sandyford Clinic. During the Covid-19 crisis, Professor Estcourt has made several important contributions, such as in published advice for ensuring access to Pre-Exposure Prophylaxis for people at high risk of HIV:

- <https://www.hiv.scot/pages/faqs/category/prep-coronavirus>
- Prof Jacqui Reilly, from **Glasgow Caledonian University** is co-Lead of the Centre for Living 'Safeguarding Health through Infection Prevention' (SHIP) Research Group, is also Nurse Director at NHS National Services Scotland and Executive Lead for Quality Healthcare Associated Infection. Prof Reilly is intensively involved in NHS and Scottish Government planning in response to the current Covid-19 pandemic and will bring SHIP group research findings to bear in her thinking and leadership at this time, particularly in relation to handwashing technique and public and professional behaviour change in relation to infection prevention.
- Led by Professor Sebastien Chastin, leading physical activity researchers, respiratory experts, and sport and exercise psychologists at **Glasgow Caledonian University** have launched the world's largest study to find out for certain if physical activity can boost COVID-19 immunity.
- Professor John McKendrick from **Glasgow Caledonian University** outlines the definition of poverty and examines its prevalence in Scotland before looking at how the coronavirus pandemic has affected the poorest and the most vulnerable in our society and Professor McKendrick has also been assisting the Poverty and Inequality Commission to administer a survey to community organisations that are providing emergency food aid across Scotland during the pandemic.
- Researchers at the **University of the Highlands and Islands** are leading a new project which will use digital technologies to help NHS Highland staff cope with the impacts of COVID-19.
- Scottish Government (through Chief Scientists' office has funded **55 rapid research projects**²⁷ at 15 Scottish universities and institutions to support global efforts to combat COVID-19 and understand its wider effects. The studies focus on interventions to prevent transmission, new diagnostics, disease surveillance as well as studies aimed to support the mental health of frontline NHS workers and understand the impact lockdown will have on the wider population's mental health.
 - Projects from following universities and research institutions have been awarded funding:
 - University of Aberdeen: six projects, £972,870;
 - University of Dundee: two projects, £487,710;
 - University of Edinburgh: eight projects, £603,500;
 - Glasgow Caledonian University: three projects, £136,290;
 - University of Glasgow: nine projects, £1,025,458;
 - Institute of Occupational Medicine: one project, £206,300;
 - Edinburgh Napier University: three projects, £166,826;
 - Queen Margaret University: two projects, £92,424;
 - Robert Gordon University: one project, £55,789;
 - University of St Andrews: three projects, £132,719;
 - University of Strathclyde: four projects, £355,096;
 - Scotland's Rural College: one project, £36,118;
 - University of Stirling: ten projects, £480,707;
 - University of the Highlands and Islands: one project, £44,581;
 - University of the West of Scotland: one project, £128,882.

Sanitisation & prevention of the spread of COVID-19

²⁷ <https://www.gov.scot/news/rapid-coronavirus-research/>
<https://www.cso.scot.nhs.uk/rapid-research-in-covid-19-programme/>

- The **University of Edinburgh** has been working closely with their commercialisation service, Edinburgh Innovations, which is streamlining its usual procedures for work between academic researchers and industry to allow joint research to begin without delay. Joint projects already under way include:
 - Helping scale up disinfectant production
 - Finding a new way to chemically bond antimicrobial agents to fibrous materials
 - Developing a rapid point-of-care test for Covid-19
 - Researching the use of the sewage system to monitor Covid-19 infection rates
 - Improving social distancing among teenagers
 - Developing a citizen science app to record social effects of Covid-19
- Academics from the **University of the West of Scotland (UWS)** have played a key role in the production of innovative thin film-based chips to go into non-contact thermometers to support front line staff and prevent the spread of COVID-19.
- Tech experts from **The Open University** have developed the world's first digital application to certify COVID-19 immunity test results. Researchers from the Open University's Knowledge Media Institute have created a prototype mobile phone app that enables instant verification of tamper-proof coronavirus test results and vaccination certificates.

Examples of Joint Research with businesses

- **Elasmogen & University of Aberdeen** - The University of Aberdeen and Aberdeen-based biologics company, Elasmogen Limited in collaboration with other partners are working to develop 'pregnancy style' tests for Covid-19 which could give a result within half an hour. The project is part of the University's portfolio of projects funded within a £5million rapid response research scheme funded by the Scottish Government which aims to harness Scottish expertise to fight the virus <https://www.abdn.ac.uk/news/13983/>
- The **University of Aberdeen** continues to support **Novabiotics** who have announced the rapid repurposing of Nylexa for the 'hidden killer' underlying Covid-19: secondary bacterial lung infections. Nylexa 'supercharges' antibiotics, boosting their efficacy against difficult to treat and even drug resistant bacteria.
- **Censo Biotechnologies**, a specialist biotech company, has joined the COVID-19 Volunteer Testing Network, offering free coronavirus testing for GPs and other front-line health care professionals who are at significant risk both personally and as potential super-spreaders to the vulnerable community from Monday 4th May 2020 <https://www.censobio.com/news>
- **tensARC & University of West of Scotland's** School of Health and Life Sciences are validating the efficacy of a new alternative to surgical mask, the *Face Gaiter* in preventing transmission of the virus at the University's microbiology facilities <https://interface-online.org.uk/news/speedy-turnaround-tensarc-fight-against-covid-19>
- A new anti-viral drug developed by **Pneumagen**, a **University of St Andrews** spin out company, has had positive results in laboratory tests against Covid-19.
- **Exscientia**, a spinoff company from the **University of Dundee** that is now based in Oxford science park, said it had gained access to a large collection of existing drugs held by the Scripps research institute in California and funded by the Bill and Melinda Gates Foundation. It will screen them in partnership with [Diamond Light Source near Oxford, which works like a giant microscope](#) and generates bright light that allows scientists to study viruses.

Provision of Medical Students & Training to support NHS

Universities worked rapidly with the GMC, Royal College of Nurses and others to accelerate hundreds of nursing students, and hundreds more medics and paramedics through their final months of their degree to join the NHS and boost capacity.

- The **University of Aberdeen** has brought forward the graduation date of final year medical students who have completed the necessary academic requirements so that they can be available to respond to the needs of the NHS.
- **Glasgow Caledonian University**'s cohort of student nurses will be offered paid work with the NHS to ensure their degree is completed and allow them to contribute to the fight against Covid-19.
- Nearly 1,000 undergraduate and post-graduate students' nurses and student midwives from **Edinburgh Napier University** are in the process of being or already are assigned to hospitals and care homes across NHS Lothian and NHS Borders
- Healthcare students at **Queen Margaret University** have joined the Health Care Professions Councils (HCPC) emergency register to help ease pressure on the NHS and social care amid the ongoing pandemic. The students responded to calls from the Scottish Government for extra support during the crisis and as a result, Nursing, Physiotherapy, Occupational Therapy, Therapeutic Radiography, Diagnostic Radiography, Speech & Language Therapy, Dietetics and Podiatry students are now working in NHS and social care settings.
- **Glasgow Caledonian University**'s paramedic students have joined the Scottish Ambulance Service in the fight against the COVID-19 pandemic. Over 500 nursing students are also joining the NHS frontline to help the health service deal with the coronavirus pandemic.
- Around 1,200 of the **University of the West of Scotland** nursing, midwifery and applied biomedical science students have joined the NHS frontline in the fight against coronavirus.
- Graduation for the medical students at the **University of Dundee** usually comes in June. This year the crisis caused by the coronavirus has prompted an early graduation so that early registration can be made with the General Medical Council and the graduates can join the NHS workforce immediately, as needed.

Provision of Training to support NHS

- **Robert Gordon University (RGU)** is working closely with NHS Grampian to deliver a rolling programme of training which will equip hundreds key NHS staff with critical skills to support the battle against COVID-19 in the North East.
- An innovative COVID-19 training solution for healthcare professionals – based on gaming technology – has been developed through a collaboration involving the **University of the West of Scotland, Edinburgh Napier University** and NHS Education for Scotland (NES). The training software can be used anytime, anywhere by healthcare professionals. Based on computer games technology, the online training program will better-equip staff with the skills and knowledge required to assess and treat COVID-19 patients, and will be updated and developed as new information is supplied
- **Forth Valley College** have been creating a digital skills induction programme for health and social care workers. Funded under the Scottish Funding Council's College Innovation Fund the recent pandemic has accelerated the engagement with the stakeholders at Stirling and Clackmannanshire Health and Social Care partnership.
- **University of Stirling** are improving the prehospital identification and management of people presenting to the ambulance service with COVID-19 symptoms as well as researching the ambulance call-outs for psychiatric emergencies during the COVID-19 pandemic.

- Another research area the **University of Stirling** is focusing on is Protecting the safety and wellbeing of Vulnerable Children and Young People in Scotland during the COVID-19 pandemic.
- The **University of Aberdeen** Suttie Centre is being used to re-brief retired NHS workers who are returning to work, and to train medical students in scenarios they may be asked to assist with. The University has also turned their car parks on the hospital campus over to NHS staff and patients and their clinical academics have turned to working with the NHS full time.
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Supporting other public-sector front-line responses

- Five **Edinburgh Napier University** students are ready to support Police Scotland in its COVID-19 response after becoming the first individuals to qualify in the country as Special Constables through a new on-campus training programme.
- Following the closure of campuses to prevent the spread of COVID-19, colleges across the **University of the Highlands and Islands (UHI)** partnership are supporting local food banks by donating unused produce from their canteens.
- The **University of the West of Scotland** has also recently provided facilities at its Paisley campus for the British Transport Police's West Scotland division, enabling them to undertake essential training exercises.
- Three **University of Stirling** projects will play a key role in safeguarding carers and support workers during the COVID-19 pandemic – and assessing the impact the experience has on them including developing an app to will help to reduce the risk of infection among a vulnerable group – informal carers of people with life-limiting conditions. With the other two projects looking at the resilience and mental health of carers and support workers with vulnerable groups during the pandemic.
- The **University of Stirling** also has two other projects in place to help homelessness in the current situation one creating managed alcohol programmes: Implementation of a novel intervention to help prevent infection (COVID-19) for people experiencing alcohol dependency and homelessness and the second focuses on stress and mental health challenges experienced by third sector homelessness services workers during the COVID-19 pandemic in Scotland.
- Benjamin Butterworth, from **Glasgow Caledonian University** PhD researcher in Psychology and member of the Centre for Living's Substance Use and Misuse Research Group, has been working as coordinator for Glasgow Mutual Aid in G42 8 and G42 0, a catchment area of 15,000 people. Benjamin is responsible for leading a team of 50 volunteers in responding to requests for help these areas. The main requests are for sourcing food parcels and supporting food banks, in addition to delivering groceries, collecting prescriptions, and offering emotional support calls.
- A free **Open University** course, [How to Teach Online: Providing Continuity for Students](#) has launched to help teachers and instructors move learning online during the pandemic. While [FutureLearn Schools](#) gives students aged 13+ free, upgraded access to over a hundred relevant short courses
- Neil Campbell who is studying at the **University of Dundee** founded RockSolid now distributes around 200 lunches per day to local people and families, with the larder serving nearly 100 households. The group also delivers food parcels to those isolated, vulnerable, or unable to leave their home, continuing to support those most in need in the local area. As well as this **Dundee University** Students' Association and the University's own Student Services team have been working together over the past two weeks to help vulnerable

students and their families get through lockdown by providing emergency care packs. All of the emergency care packs are being packaged by a small group of staff and volunteers and supplied by the campus Premier shop, which opened especially to help with the effort.

Keeping culture and creativity alive & keeping the public motivated.

Scotland's specialist institutions are supporting their communities of artists and performers but also adapted their programmes of events to make them accessible to the public in spite of lockdown

- The **Glasgow School of Art** has launched a new online platform that allows members of its Creative Network to share thoughts, tips and questions on how the creative community can help respond to crisis situations.
- The **Royal Conservatoire of Scotland** is used to welcoming audiences into its five professional performance venues to showcase the best in music, dance and drama has developed a new online creative initiative which showcases work from its students, staff and alumni
- To lift spirits and share a very important message, the **University of the West of Scotland's** second year BSc adult nursing student, Eilidh Houston, who came up with the fantastic idea of a virtual brass band. Formed of her fellow NHS colleagues, the band performed the classic I'm Gonna Be (500 Miles) by The Proclaimers, asking people to stay home while they walk the extra mile.
- The **University of the West of Scotland's** Alzheimer Scotland Centre for Policy and Practice, together with Alzheimer Scotland, have produced a series of video podcasts containing helpful advice for those affected by dementia during the coronavirus pandemic.
- The **Open University** is also helping those staying at home with its Open Learn platform. Enrolments have more than doubled since the end of March, reaching a milestone 75 million visitors.
- **University of Aberdeen** Specialist in sound art and sound mapping, Professor Pete Stollery is capturing sound changes in our environment as a result of the Covid-19 lockdown. The project, which is seeking the help of the public to preserve and reflect on this unique period in time, has received recordings from all over the world and can be enjoyed online.
- As part of the Data-Driven Innovation (DDI) Programme response to the current COVID-19 pandemic, the DDI initiative has allocated up to £100,000 to be released as small grants to enable staff and students at the **University of Edinburgh** to practically apply data-driven innovation ideas in support of communities, services and businesses in the Edinburgh and South-East Scotland Region.
- The **University of Edinburgh** is working with the Edinburgh Tourism Action Group to assist local businesses in their efforts to recover from the impact of COVID-19. They will analyse data to support targeted marketing once lockdown measures are gradually lifted. This project which is supported by the University's Data-driven Innovation initiative, is a chance to recover tourism responsibly, with local consent, and in line with Edinburgh's ambition to lessen its environmental impact.
- The **University of Stirling** are doing research into both the COVID-19 social distancing effects on social engagement, loneliness, wellbeing and physical activity in Scottish older adults, and an exploration of potential ameliorating strategies and protecting the safety and wellbeing of Vulnerable Children and Young People in Scotland during the COVID-19 pandemic.
- Professor Dawn Skelton, from **Glasgow Caledonian University** later-life training guru and Professor of Ageing, is helping older people cope in the coronavirus crisis and improve their

lives with new live online movement sessions. **Glasgow Caledonian University** psychology researcher Dr Christopher Hand has been providing evidence-based advice around sustaining positive mental health and wellbeing during social distancing and self-isolation interventions, maintaining anxiety levels within healthy boundaries, and the behaviour of the public in relation to adapting to working from home, 'panic buying', and maintaining healthy social networks.

- The **Open University** has several projects on the go to help with the nation's mental health in this time. The Time to Think have developed a [free course](#) on coping in isolation. The **Open University** has partnered with the BBC to co-produce a digital series to support maintaining good mental health during the pandemic lockdown. New content – featuring clips and illustrations – will be released daily to mark **Mental Health Awareness Week** (18-24 May), covering topics from toxic productivity to relationship tips. And new continuing professional development (CPD) course has been jointly developed by The Open University and the British Association for Counselling and Psychotherapy as a response to the coronavirus (COVID-19) pandemic. The aim of the course is to offer a primer on working online as a counsellor or psychotherapist at a time when face-to-face therapy is neither possible nor safe.
- People who have been furloughed or made redundant in Scotland are being encouraged to develop their skills with the help of a brand new online resource. Skills Development Scotland, in collaboration with the **Open University** has introduced a learning portal in response to the Covid-19 pandemic to connect people with thousands of free-to-access online learning materials.
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- **Policy and Practice**
- Dr Olga Biosca and Professor Cam Donaldson from **Glasgow Caledonian University** were joint signatories in a letter to the Chancellor of the Exchequer, coordinated by Responsible Finance, calling for support for financial support for vulnerable families. Research by GCU's Yunus Centre was quoted in the letter.
- Professor Patrick Ring (GSBS) has co-authored a research paper, published in the *Journal of Risk Research* with colleagues from Cass Business School, in London, Nottingham University, and Vlerick Business School in Belgium. The paper, which received extensive coverage in local and national press, claims that the UK government made key failings in its strategic preparations for COVID-19. Mistakes left stockpiles short of vital supplies and capacity for personal protective equipment (PPE), ventilators and testing, and piled pressure on the NHS. They argue the UK Government failed to act on systemic weaknesses highlighted through emergency exercises and should hand over future planning for health emergencies to an independent body.

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