

Results of Competition: UKRI Ideas to Address COVID-19: Innovate UK Article 25 Sept 2020

Competition Code: 2008_UKRI_IDEAS_COVID19_OPEN_ART25

Total available funding is £120m

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
FOOTFALLS AND HEARTBEATS (UK) LIMITED	mRR - mask for Respiratory Rate	£167,434	£117,204
Manufacturing Technology Centre		£74,057	£74,057
University of Derby		£13,567	£13,567
University of Nottingham		£77,489	£77,489

Note: you can see all Innovate UK-funded projects here: <https://www.gov.uk/government/publications/innovate-uk-funded-projects>

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Project description - provided by applicants

NHS England (22/09/2020) confirmed more than 136,000 COVID-19 positive patients have been cared for in hospitals across England, and most have been able to recover and leave hospital . However, COVID-19 has produced a case load of patients released into community settings experiencing significant and prolonged morbidity . Forecasts predict that 45% of COVID-19 patients will need short-term 24 hour nursing care or long-term support at home after hospital discharge (NHS Hospital Discharge Service Requirement, March 2020). Approximately 30% of previous SARS-CoV global survivors experienced persistent physiological impairments and abnormal radiology consistent with fibrotic lung disease (NHS England 05/08/2020, ref. 001559). Therefore, there is a need for providing ongoing health support that rehabilitates patients post-COVID-19 to better physical (respiratory) and mental health (NHS guidance).

Traditional rehabilitation in a frequent face-to-face manner during the pandemic is not desirable under control of transmission measures. Facemasks are now commonplace for infection control and this has created an opportunity to develop new technology to monitor clinically relevant vital signs. We propose an innovative textile facemask that integrates a low cost optical fibre sensor connected to a small wearable opto-electronic unit. This is integrated into the mask in a way that will monitor respiration rate and can help to support post-COVID-19 rehabilitation. The assembled multidisciplinary team is experienced in developing monitoring technology, mask manufacture and respiratory clinical trials and are well placed to deliver this project.

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OWEN MUMFORD LIMITED	Innovation of a UK designed and manufactured self-test Covid-19 In Vitro Diagnostic Device to provide a long-term pandemic solution for the UK	£516,088	£129,022

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Project description - provided by applicants

The UK Healthcare system faces an enormous challenge to facilitate the administration of a population-wide immunisation programme against COVID-19. The widespread nature of the process of vaccination has meant that, until now, there has never been a pharmaco-economic justification that could bear the additional costs of vaccination using a self-administration device compared to a simple vial and needle syringe approach. The advent of the COVID-19 pandemic however, has brought about significant changes to our ways of working and social interaction that has impacted upon the way in which healthcare needs to be administered. Owen Mumford Ltd (OM) are working on the development of a Rapid Immunisation Delivery System (RIDS) to allow individuals to conduct self-immunisation in the comfort, safety and convenience of their own home. This approach would (i) significantly reduce the burden on the health services by removing the need for the practitioners and facilities to administer the injections; (ii) reduce the risk of viral exposure for the individual, particularly important for the at-risk population; (iii) offer additional time-saving cost benefit to the individual by removing the need to visit to a clinic. Moreover, the system offers itself as a platform for the potential to develop a broader UK vaccination strategy to enable individuals to self-inject other vaccines safely and with convenience. OM is a UK company with a global reach and has a long heritage and world class expertise in the design, manufacture and commercialisation of self-injection devices and diagnostics for various medical conditions. This proposal would allow OM to develop a simple to use, lateral-flow immunoassay (LFIA) diagnostic device suitable for home use, specific for antibodies to SARS-CoV-2 in human blood. Our vision is that the diagnostic would form the basis of a much broader Rapid Immunisation Delivery System (RIDS) in which an individual would (1) self-administer the vaccine using an autoinjector, (2) subsequently confirm the presence of antibodies by use of the home diagnostic test kit and (3) using device connectivity a digital confirmation would be created to validate vaccine delivery and antibody test outcome to provide the basis of an electronic certification of immunisation. This capability could be far-reaching and may provide a solution to multiple social and business challenges, such as attending events with mass gatherings or air travel, in order to help the UK return to some level of normality.

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VAMSTAR LIMITED	AI-powered real-time healthcare supplier profile and COVID-19 supply risk matrix	£219,148	£153,404
University of Sheffield		£96,591	£96,591

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Project description - provided by applicants

As we navigate through the COVID-19 pandemic, the impact on global healthcare supply chains continues to mount, leading to widespread systematic uncertainty. For hospitals and health systems such as the NHS, with stretched out resources, the pandemic demand shock and the overall supply shortages represents a monumental challenge that needs real-time risk-adjusted solutions. This means efficient supplier sourcing, supplier selection, and continuous supplier-risk assessment are the most critical tasks for any healthcare buyer, such as hospitals/trusts/clinics.

Within the NHS and other healthcare buyers, the majority of this budget is spent on tier-1 large suppliers with remaining being spent on tier-2 and tier-3 suppliers (medium to low spend). It is this over-reliance on a small set of tier-1 suppliers that exposes the NHS to high risks, as these suppliers are also present in other countries and do business at the same time with other hospitals while managing their limited time-bound aggregate capacity or ability-to-supply.

Moreover, to conduct supplier scanning exercise, the NHS and other buyers follow a manual and outdated process that only surfaces a fraction of global suppliers. This is the primary reason that a concurrent spike in demand due to COVID-19 from within and across the healthcare systems, that led to a total collapse of the global supply chain, leading to heavy shortages for PPE, protective gear, equipment, and pharmaceuticals.

To better prepare the NHS and other healthcare buyers for the emerging COVID-19 wave and to prevent widespread shortages, Vamstar will leverage cutting-edge big data, deep learning and artificial Intelligence to create a real-time healthcare supplier profile and product/service level supplier forecasts, powered by the COVID-19 risk-based framework developed in an earlier research grant. This will help the NHS to maintain an ongoing view of the supply-side dynamics and will provide mission critical visibility into the evolving state of the supply chain on a continuous basis, not just focusing on existing bottlenecks, but also identifying future potential challenges. The project will develop products that can already be used by the NHS during the project lifecycle, but also those that can generalise beyond the project and benefit the wider range of healthcare providers in the longer term.

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TRUST ELEVATE LTD.	Protecting Children and their Data Online: RegTech in Covid-19	£397,252	£278,076

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Project description - provided by applicants

TrustElevate is a technology solution which aims to solve challenges to the protection of children online and make the internet a safer place for kids. We are the first company globally to make it possible to verify a parent-child relationship, age-check children and obtain parental consent. In checking children's ages, we want to make sure that businesses can deliver age-appropriate content and services to children, who can, in turn, be safe and secure in the knowledge that they're learning, playing and growing in online environments tailored to suit them. Parents, too, can be assured that their kids are protected online. Our parental relationship and consent verification also enables robust digital parenting, so parents can grant, deny and even pause their child's access to online services.

The verification processes which facilitate these outcomes are done by conducting privacy-preserving checks against authoritative data sources. TrustElevate doesn't store the information being checked and uses tokens to share this information with platforms, apps and websites so they don't get to store it either. This way, we build trust between parents, children and the online businesses they engage with! Not only that, but in enabling companies' secure processing of children's data, TrustElevate enables them to comply with regulatory requirements, building trust between government and companies as well as parents and kids. Our solution is working to make the internet a safer environment for children, building trust between everyone involved and facilitating a more robust digital ecosystem and economy.

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TEAMSOS LIMITED	TeamSOS - supporting schools to respond to COVID-19 and ensure continued education	£399,921	£179,964

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Project description - provided by applicants

Schools are key to the wider economy - according to Chancellor of the Exchequer Rishi Sunak school closures over the COVID-19 lockdown period have in their own right been as disastrous for the UK's economy as the impact of the global financial crisis of 2008\.

By improving the speed and efficacy of schools' responses to suspected and diagnosed COVID-19 infections, it will be possible to reduce the number of staff and pupils who are required to self-isolate. Many schools are currently sending entire year group bubbles home, resulting in large numbers of parents being unable to work as normal due to the need for childcare and support for home learning.

We propose to create an integrated emergency response app which will result in a step change in schools' ability to respond to COVID-19, emergencies and other situations. We will evidence and quantify the impact of the TeamSOS app in trials with a leading Multi-Academy Trust.

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IF VEHICLES LTD	COVID19 AUTONOMOUS DELIVERY VEHICLES (C19-ADV)	£93,417	£65,392
University of Lincoln		£86,132	£86,132

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Project description - provided by applicants

Vulnerable people including elderly and ill people must shield during Covid-19. The Mayor of Mablethorpe has identified this town as at especially high risk due to its demography as a retirement location and its current construction of a dedicated geriatric medical campus which will concentrate elderly people and their carers living and working on site. To reduce human contacts with shielding people in Mablethorpe's current social housing and care streets and its future medical campus, and possible infections during delivery of medicines and goods, this project will set up an autonomous vehicle for last mile delivery to their doors. Autonomous, electric, last-mile delivery vehicles promise to improve the rapid and low cost movement of standard-sized packages between shops, homes, restaurants, public transport and car park nodes. If Vehicles Ltd currently designs and manufacturers similar vehicles for manual rather than automated control, but in this project will convert them to autonomous vehicles with the help of Robotics experts from the University of Lincoln. Rather they rely on advanced artificial intelligence, we will install simple tried and tested radio localisation devices in the environment, which provide immediate ground truth locations, usually used for testing against research AI methods. An important aspect of the project will investigate the safety, legal and security practicalities for using these autonomous electric vehicles in Mablethorpe in the time frame of the pandemic and our team includes experienced local and national government consultants and the support of Mablethorpe Council to ensure this.

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