



Innovation districts and their contribution in the fight against COVID-19

The spread of COVID-19, a highly contagious coronavirus that has infected over 100,000 people globally, has undeniably altered our lives on a day-to-day basis. Health organizations, governments, companies, and others continue to analyze the spread of the disease in real time, weighing the risks, and, in response, updating their policies on how best to control its containment and move swiftly into community mitigation.

COVID-19 reminds us that the science necessary to solve this latest challenge, and other global problems, increasingly doesn't happen in isolation but through a network of small geographies of innovation—areas of advanced research, rapid prototyping, and commercialization. Since the outbreak in China, innovation geographies have been leveraging their assets to better understand and find solutions to COVID-19. Their assets include pools of highly trained academic researchers; essential innovation infrastructure, such as laboratories with specific biosafety standards; the advanced technologies and Big Data needed for modeling; and a network of peers, both local and global that help us better understand the complexities of COVID-19.

COVID-19 also reminds us that innovation geographies require intentional action and continuous investment in order to deliver accelerated market solutions to health and environmental crises.

Connections to innovation districts to understand more

In light of the current global health crisis, our connection to a specific subset of innovation geographies—known as innovation districts—prompted us to ask the leaders of such districts to what extent their research institutions, R&D labs, companies, and other actors are advancing research on COVID-19, including the development of a vaccine.

In early March, The Global Institute on Innovation Districts sent a letter to approximately 75 districts and other geographies of innovation, reaching out only to places with a focus in life sciences. We targeted the broad sector of life sciences (rather than districts specializing in epidemiology, immunology, and/or infectious diseases) in an effort to include all research specializations that have been tapped to address COVID-19.

Of the nearly 20 responses that we received, seven innovation districts shared their current and deepening engagement on COVID-19. The seven districts are:

- The Melbourne Innovation District (Melbourne, Australia)
- The Milan Innovation District (Milan, Italy)
- The Cortex Innovation Community (St. Louis, United States)
- The Hagastaden Innovation District (Stockholm, Sweden)
- The Pittsburgh Innovation District (Pittsburgh, United States)
- Copenhagen Science City (Copenhagen, Denmark)
- The Knowledge Quarter and St Mary's Hospital Campus (London, UK)

Other districts that submitted responses include the Galway Innovation District (Ireland) and the Be'er Sheva Innovation District (Israel), which shared how the coronavirus has accelerated ongoing research under way by start-ups. As this article was being uploaded for distribution, we have since learned of other work underway in places such as the Cleveland Health-Tech Corridor.

Described below are highlights of the information shared by the seven innovation districts.

The Melbourne Innovation District, which includes the Melbourne Biomedical Precinct, is recognized for its high concentration of major universities, hospitals, medical research institutes, and industry. A global leader in immunology and the study of study infectious diseases, this district played an instrumental role in the early stages of the outbreak, which helped advance our collective understanding of COVID-19. The Peter Doherty Institute for Infection and Immunity,

an institute established through a partnership between the Royal Melbourne Hospital and the University of Melbourne, has played a leading role to date:

- Scientists from the Royal Melbourne Hospital's [Victorian Infectious Diseases Reference Laboratory](#) at the Doherty Institute were the first outside of China to grow COVID-19 in the laboratory. At the end of January, the Doherty Institute was first to share it with public health laboratories nationally and globally.
- In early March, the [Ma Foundation](#) awarded the Doherty Institute AU\$3.2 million (US\$2.15 million) to expedite the creation of a vaccine against COVID-19. Funding will be directed toward three areas: (1) research to develop an active vaccine platform, which is "a process of stimulating the body to produce antibodies through administration of a vaccine"; (2) research to develop a passive vaccine platform, which is "the direct transfer of antibodies to a non-immune individual, providing temporary protection"; and (3) research to "determine vaccine efficacy, safety and readiness for phase one human trials."

The Milan Innovation District (MIND) will include cutting-edge research in life sciences, advanced technologies, and health/nutrition. Led by Arexpo and Lendlease, MIND is in advanced stages of transforming Italy's EXPO site into a hotbed of innovation. The district's anchors, which include the Statale University of Milan, the Human Technopole, and the Galeazzi Hospital, are currently advancing joint research activities. Teams of researchers in this area of northern Italy are using their particularly challenging circumstances to inform their work:

- Researchers from the Statale University's Department of Biomedical and Clinical Sciences and Sacco Hospital [completed the isolation of three COVID-19 coronavirus strains](#) currently circulating in the Codogno area (a town close to Milan where the first outbreak was registered). The team is now analyzing additional genomes to better understand when the virus entered the country and how it spreads.
- The University of Milan Statale has established a special fund to sponsor research projects that could provide rapid results to help address the current emergency
- The Italian member of the World Health Organization and chair of The Human Technopole Scientific Board is driving efforts to increase access to reliable and centralized data sources to inform public policies. This includes the recognition of key variables, such as demographics, given that senior citizens and chronic patients are disproportionately affected by COVID-19.
- Researchers at the Galeazzi Hospital are working with policymakers and industry on developing an early technology assessment to speed up "horizon scanning" of newly proposed in vitro diagnostics, medical devices, and vaccines in an effort to better diagnose, monitor, and treat COVID-19.

The Cortex Innovation Community in St. Louis is a robust innovation community underpinned by a strong constellation of life science research institutions, including Washington University, [Saint Louis University](#), and Barnes-Jewish Hospital. Saint Louis University is one of the nine Vaccine Treatment Evaluation Units (VTEUs) in the United States. Established by the National Institute of Allergy and Infectious Diseases, the VTEU network conducts clinical trials of vaccines and treatments for infectious diseases and has played a key role in developing new and improved vaccines for over four decades. Experts in St. Louis shared that the VTEU network is involved in a multi-site COVID-19 treatment trial and that work has accelerated in St. Louis over the past week. Other advancements specifically within this district include:

- The testing of several vaccine candidates: two viral vectored (VSV and adenosine) approaches and one recombinant spike protein.
- Research to isolate neutralizing antibodies to the virus, allowing antibodies to be scaled up for production.
- Research under way to develop diagnostic assays, using animal (mouse) models of the disease to obtain data on the basic biology of the virus.
- Efforts on the part of the spatial health arm of the [Geospatial Institute](#) to better predict and prepare areas and populations with the highest need. The associate director of GeoSLU (Geospatial Institute at Saint Louis University) emphasized the need for additional support to develop and implement research that will inform public health practice and response beyond the CDC's plan to fund the already supported centers.

The Hagastaden Innovation District in Stockholm, Sweden, is a growing area of innovative and international research anchored by three universities (the Karolinska Institutet, KTH Royal Institute of Technology, and Stockholm University) and by Karolinska University Hospital. It is also home to 120 life science and health tech companies. Their work on COVID-19 to date is as follows:

- In early March, the [Karolinska Institutet](#) was awarded three of the 17 EU-funded projects to research the virus. These projects aim to find a vaccine, immunotherapies, and neutralizing antibodies against COVID-19.

The Pittsburgh Innovation District is a fast-growing innovation district with a constellation of strong research institutions—Carnegie Mellon University, the University of Pittsburgh, and UPMC, which is the largest academic medical system in the country. The University of Pittsburgh School of Medicine's Center for Vaccine Research is leading the research on COVID-19:

- The [Center for Vaccine Research](#) received a sample of COVID-19 within the last two to three weeks. Their research will occur in one of the 12 federally designated Regional Biocontainment Laboratories in the country. Specific research efforts will include the development of disease models, which will be used to develop a vaccine.

Copenhagen Science City is an innovation district in the heart of the Danish capital that is anchored by the **University of Copenhagen, University Hospital Rigshospitalet, and University College Copenhagen**. **Work to date on the COVID-19 is as follows:**

- The [University of Copenhagen](#)—in collaboration with the University of Tübingen, Leiden University Medical Center, Wageningen University, and two companies—is in the process of developing a vaccine against COVID-19. A vaccine technology previously developed by this group will be used as the platform for developing a COVID-19 vaccine. In early March, the consortium received a grant of 2.7 million euros (US\$3.06 million) from the European Union.

The Knowledge Quarter and St Mary's Hospital Campus in London are nationally recognized as powerhouses of innovation, boasting a research specialization in emerging infectious diseases. In the Knowledge Quarter, the concentration of leading research institutions include Imperial College, The London School of Hygiene & Tropical Medicine, University College London, The Royal Veterinary College, and the Francis Crick Institute. The St Mary's Hospital Campus includes Imperial College MRC and the Abdul Latif Jameel Institute for Disease and Emergency Analytics (J-IDEA). Their work on COVID-19 includes:

- Research on COVID-19 is being led by the Imperial College's [MRC Centre for Global Infectious Disease Analysis](#). MRC research includes the severity of three strata of the virus and the transmissibility of the virus.
- Researchers at [St Mary's Hospital campus](#) in the process of developing a vaccine for COVID-19.
- The [Center for Mathematical Modelling and Infectious Diseases](#) at the London School of Hygiene & Tropical Medicine has undertaken research to better understand the severity of COVID-19, its current patterns of transmission, control measures, and early outbreak dynamics.

While this article provides only a sample of the research under way to address COVID-19, it affirms the importance of concentrated research efforts to solve highly complex challenges. It is heartening, frankly, to learn of the hard work and dedication of research institutions and other actors within innovation districts, and their responses also prompted key observations on our global approach to addressing COVID-19:

- **Many of the efforts to combat COVID-19 require a collaborative approach to research.** As highlighted by microbiologist and virologist Prof. Carlo Federico Perno, director of the Niguarda Laboratory of Analysis in Italy, “swift collaboration between researchers and clinicians from different institutions, locally and globally, has never been more important, both to understand and to contain the spread of this highly contagious virus.”

- **“Broader support is needed.”** Several respondents expressed the need for even greater funding support than what is already planned, and some acknowledged that support must also be quickly extended to data-driven organizations and start-ups that have an important role to play.

Undeniably, COVID-19 has given us a new imperative for greater financial support of intensified R&D, including data-rich actors leading geospatial analysis, Big Data, and AI. Innovation districts and other geographies of innovation have an important role to play.

Look no further than your own community to understand how important this is.



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