

UCL dPHE Report 2018-2021

UCL dPHE is leading the development of cutting-edge digital innovations: strengthening global capacity, preparedness and response to public health emergencies!

In 2020, the dPHE team worked tirelessly on COVID-19 response – apart from winning multiple awards, the team spirit and mutual support was simply contagious!

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**Centre
Mission**



Welcome to the first UCL dPHE Report celebrating the achievements of the Centre since its establishments in November 2018. I am immensely proud of what my team has achieved in such a short time, and how it has risen to the COVID-19 challenge last year.

dPHE was born through my lifelong passion for improving public health and preparedness and response to emergencies through cutting edge technology. Breaking the disciplinary silos and bridging the gap between computer science, big data and public and global health, provided boundless opportunities to solve the global challenges our society is facing today.

dPHE success is cornered in the enthusiastic multidisciplinary team eager to learn and help each other, and through equitable collaboration with our international project partners across five continents. It is the joy of making impact on health of citizens in the poorest countries, such as Nepal, Nigeria, Brazil, Middle East and South Africa, through digital interventions and contributing to fighting epidemics and emergencies, that has been the team's passion and drive!

I was proud to see how the dPHE team have risen to the COVID-19 challenge and rapidly launched several new initiatives helping citizens in lockdown. It was thrilling to see formal recognition by winning prestigious awards and prizes in 2020, including the Computing Rising Stars 'Team of the Year 2020 Award', IT UK Awards and the second 'Innovator of the Year 2020' Award I received by Women in Tech Excellence for the COVID-19 My Activity Journal app.

Sharing our passion for digital global health through postgraduate teaching and students' supervision, dPHE events, public engagement initiatives, Frontiers in Digital Public Health journal, Conference for Digital Public Health and with those how read out Newsletter and follow us on social media, has been a flourishing strategy. Seeing students, interns and young researchers getting inspired to fight COVID-19 and help those in most disadvantaged parts of the world through technology innovation has been, in my view, the most important success of the Centre. Thank you all who have made the first two years of dPHE such a success and a lot of fun - I am looking forward to many more!

- Professor Patty Kostkova, UCL dPHE Director



As Director and head of UCL's newest department, the Institute of Risk and Disaster Reduction, I am very proud of the numerous achievements of the UCL IRDR Centre for Digital Public Health in Emergencies (dPHE) under the leadership of Professor Patty Kostkova and its strong contribution to the meteoric growth of the IRDR. Collaborating with WHO, UN, MSF and other internationally leading organisations, the award-winning dPHE is leading digital health interdisciplinary research and innovation which are transforming public health, clinical care and citizens' wellbeing in the UK, Africa, Brazil, Nepal and the Middle East.

The dPHE will play a leading role on a proposed new digital health master's programme which aims to inspire the next generation of students and practitioners, while bringing interdisciplinary collaboration across UCL and internationally through the annual Digital Public Health conference led by Patty. In 2020, dPHE gathered a number well-deserved awards and prizes for its pioneering research on the COVID-19 response.

- Professor Peter Sammonds, UCL Institute for Risk and Disaster Reduction (IRDR) Head of Department



Providing a welcoming space for multiple disciplines to come together, to share their individual approaches to problem solving and to begin talking the same language is essential if we are to successfully tackle the biggest of global challenges faced by public health today. The IRDR dPHE has rapidly grown as a strong and supportive community, not only connecting people through its series of conferences and events but also establishing itself as a leading Centre within digital public health research and training.

- Dr. Caroline Wood, Honorary Researcher and former UCL dPHE Manager



Digital public health, big data and mobile technologies have been underpinning public health advances for a long time, however, the COVID-19 pandemics made it unimaginable to see any transformation of public health and global response to emergencies without digital health innovation.

The UCL Centre for Digital Public Health in Emergencies, established in 2018 as a culmination of Prof Patty Kostkova's career passion for improving global health through bridging the gap between computer science and public health, was at the right place at the right time.

In only 2 years dPHE achieved international leadership in research and innovation across UCL, nationally and globally - working on five continents. Going from strength to strength, even turning the COVID-19 pandemics into an opportunity to improve wellbeing of citizens in lockdown through an innovative app. The UCL dPHE fully deserves the prestigious Computing Rising Stars Team of the Year 2020 Award!

- Professor David Lomas, UCL Vice-Provost (Health)



UCL Centre for Digital Public Health in Emergencies (dPHE) represents a cutting-edge cross-disciplinary digital research, innovation and training improving citizens' health and preparedness, and our capacity to respond to emergencies. dPHE is an excellent example of an initiative fulfilling the advocacy of UCL's spiritual founder, Jeremy Bentham, for "the greatest happiness for the greatest number".

The Centre is leading international cross-disciplinary teams investigating: a mobile gamified training app to combat the Zika virus in Brazil; increasing resilience and disaster preparedness in women in Nepal; and strengthening antibiotic stewardship using game-based training in Nigeria and the UK. Prof Kostkova's research includes one of the first studies exploring the potential of Twitter for early-warning of swine flu 2009 – paving the foundation for the big data and innovation challenges of COVID-19. The pandemic has brought digital public health to public and political attention, and the dPHE team received much deserved recognition: Team of the Year 2020 Award and Prof Kostkova was 'Innovator of the Year' two years in a row in 2019 and 2020.

I eagerly anticipate the public benefit that will arise from the dPHE's work in the years to come.

- Professor David Price, UCL Vice-Provost (Research)

Projects and where we work

UNITED KINGDOM

Adaptation of GADSA for UK settings: A mobile gamified antimicrobial stewardship decision support app for prescribing behaviour change

PASS: Collaborative project aiming to increase antibiotic stewardship through behaviour change

AFRICA

NRIC meets ICAN: Understanding information needs of infection control practitioners in Africa

NIGERIA

GADSA: A gamified antimicrobial stewardship decision support app for prescribing behaviour change

NEPAL

MANTRA: Increasing maternal and child health resilience before, during and after disasters using mobile technology in Nepal

MALAYSIA

SYMBIOTIC: Social-industrial symbiosis of Malaysia's bio-plastic wastes

AUSTRALIA AND EUROPE

Edugames4all: Educational games for children across Europe teaching antibiotic resistance and hand hygiene

MIDDLE EAST, WEST BANK

Data Sans Frontiers: Medi+board for mobile surveillance in medical emergencies

SOUTH AFRICA

DR-TB Genie: Mobile decision support for decentralised management of drug-resistant tuberculosis

WORLDWIDE

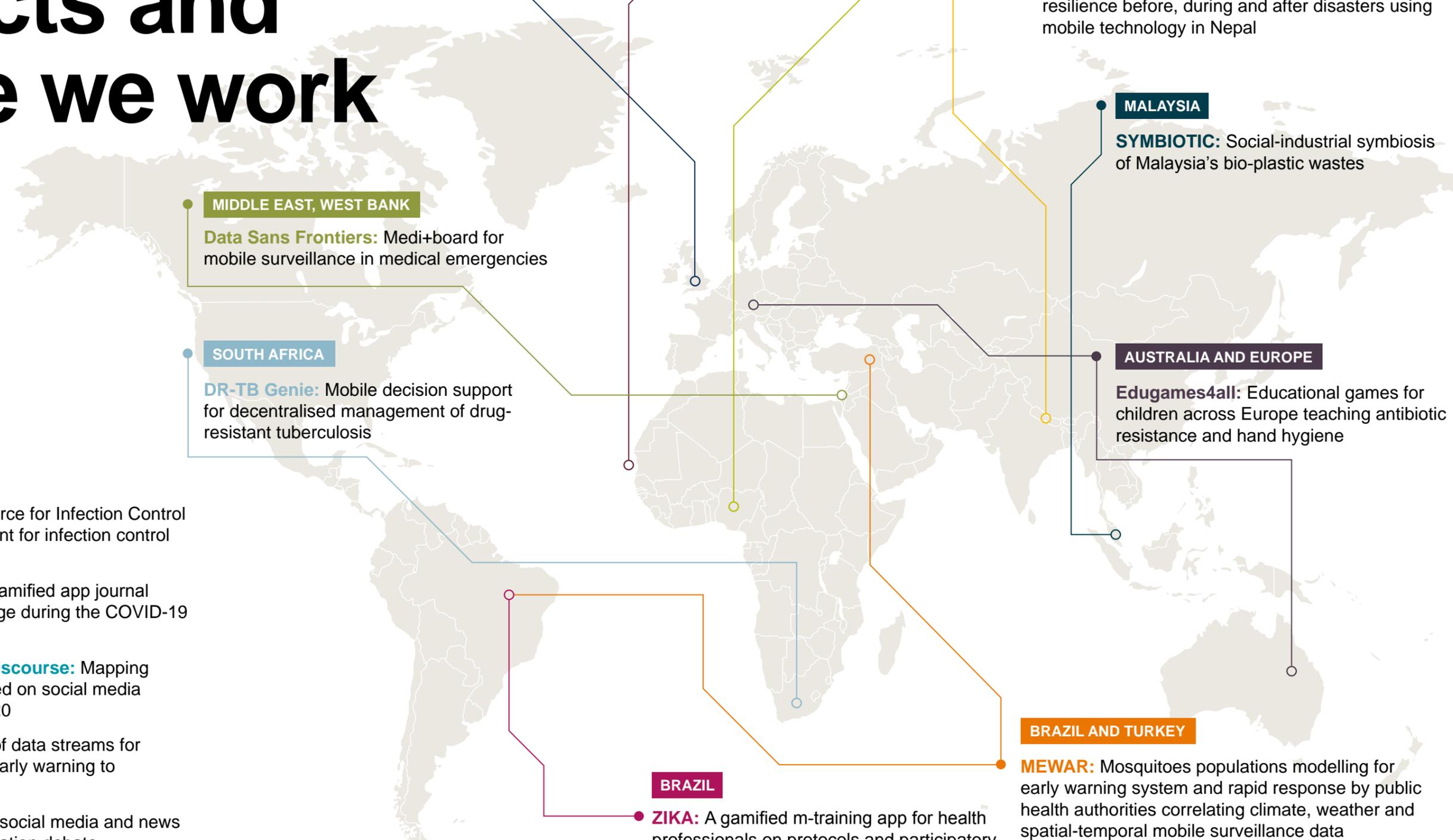
- **iNRIC:** International Resource for Infection Control providing single access point for infection control guidelines and information
- **#MyLockdownJournal:** Gamified app journal documenting lifestyle change during the COVID-19 pandemic in 2020
- **COVID-19 social media discourse:** Mapping trends and key terms shared on social media during the pandemic in 2020
- **Medi+Board:** Dashboard of data streams for modelling, prediction and early warning to outbreaks and epidemics
- **Medi+Vac:** Understanding social media and news coverage of the anti-vaccination debate

BRAZIL AND TURKEY

MEWAR: Mosquitoes populations modelling for early warning system and rapid response by public health authorities correlating climate, weather and spatial-temporal mobile surveillance data

BRAZIL

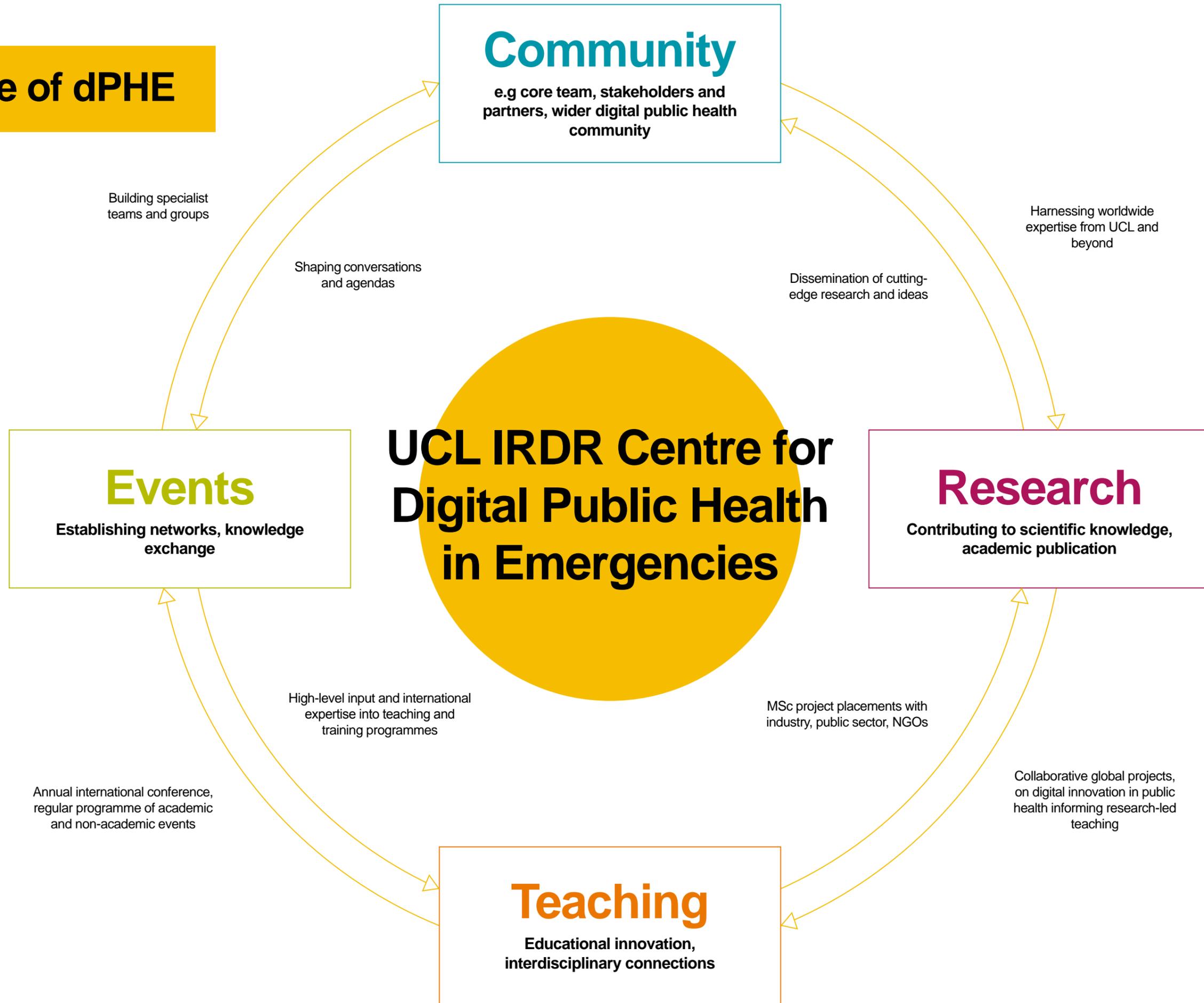
ZIKA: A gamified m-training app for health professionals on protocols and participatory surveillance associated with Zika virus



UCL Collaborations Partners



Structure of dPHE



In Numbers



8

Staff members

2

PhD Students

7

MSc Students

3

Volunteers

5

Interns

6

Consultants

3,174

 Followers on Twitter

510

 Followers on Facebook

481

 Followers on Instagram

1,524

 Subscribers to a monthly newsletter



12

Interdisciplinary events

22

Journal publications

representation on

5

UCL committees

22

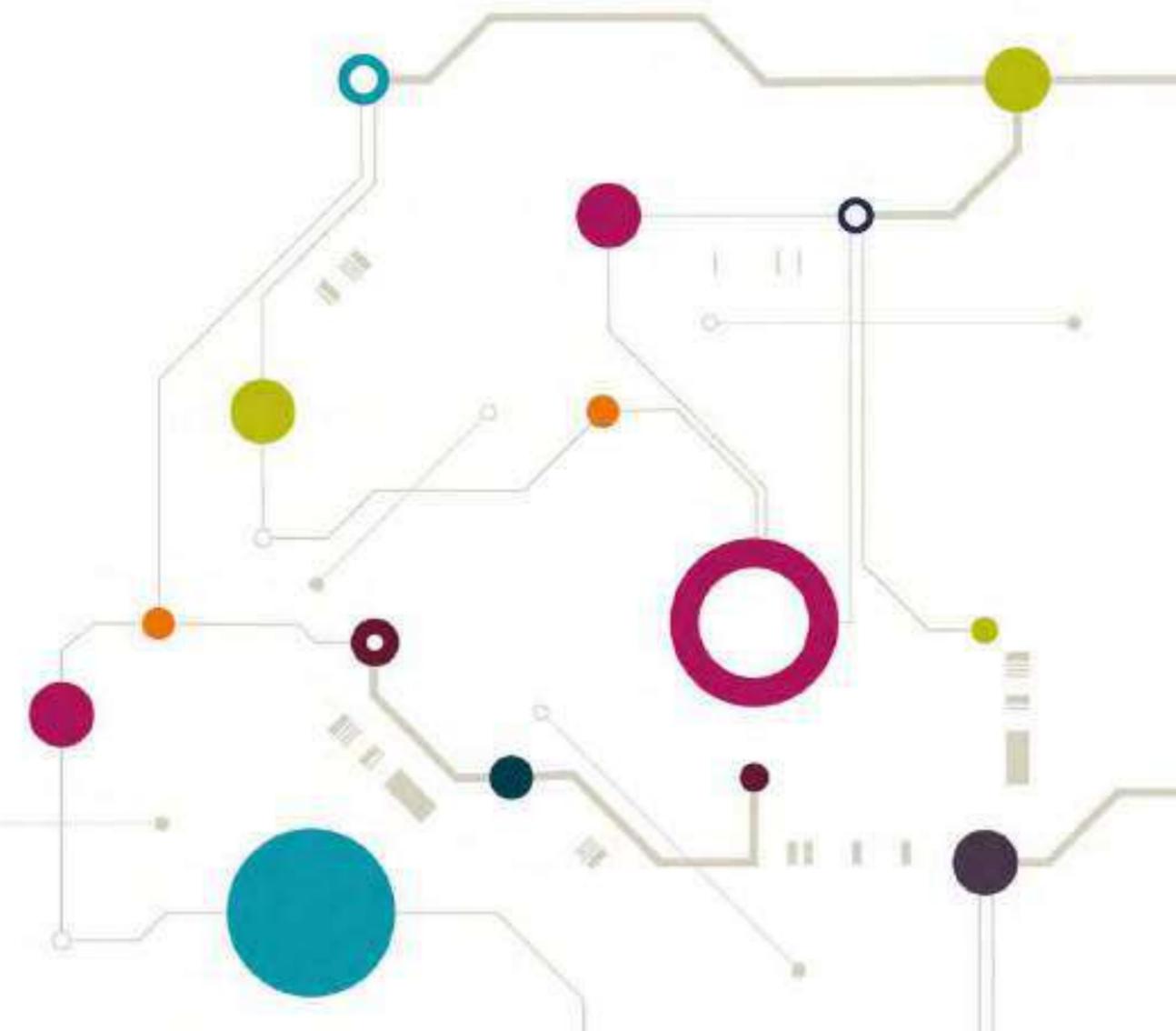
Invited talks

4

UCL press releases

3

External press releases





Research

○ ————— ●
2017 - ONGOING

ZIKA APP: IMPROVING EFFICIENCY OF SURVEILLANCE AND MONITORING FOR ZIKA VIRUS IN BRAZIL

Dengue epidemics have been considered major public health concerns since the middle of the last century. Due to climate change and increased air travel, two new arboviruses became endemic in the Americas: Chikungunya and the recent deadly outbreak of Zika.

In this project, we co-authored and developed a gamified mobile app to engage community health workers in new methods for mobile phone surveillance protocols using participatory mapping of *Aedes aegypti* foci, in order to supply geographical information to policy makers at municipality and regional and national levels. Secondly, using climatic and weather data we developed an early

warning now-casting model to predict the mosquito population.

Working with colleagues in Brazil, the dPHE team completed a systematic mapping exercise of the Campina Grande locality.

Project led by UCL IRDR dPHE with collaborators in Brazil from Universidade Federal de Pernambuco (UFPE) and Federal University of Campina Grande. Funded by the British Council Newton Fund and EPSRC Impact Accelerator Fund.

○ ————— ●
2020 - ONGOING

MEWAR: MODELLING MOSQUITO POPULATIONS FOR EARLY WARNING OF ZIKA VIRUS IN BRAZIL

As a result of the recent climate change, mosquito-borne diseases (like Zika, dengue) are becoming endemic not only in sub-tropical regions of Africa and Latin America, but in other parts of the world.

In this project, we combine public health, mobile technology and climate modelling to evaluate the impacts of environmental changes on water providing breeding habitats for mosquitoes in Northeast Brazil. Technological innovation will include the use of mobile

surveillance apps using gamification and citizen science co-developed with local stakeholders for reporting locations of water breeding points in Brazil.

Project led by UCL IRDR dPHE. Collaborators: Prof. Kate Jones (UCL CBER), Prof. Luiza Campos (UCL CEGE), Universidade Federal de Pernambuco (UFPE) and Federal University of Campina Grande, Bogazici University Turkey, and the World Health Organisation. Funded by Belmont Foundation.



2017 - 2019

GADSA: ENCOURAGING BETTER USE OF ANTIBIOTICS IN NIGERIA

Many deaths caused by infectious diseases in lower-income countries could be avoided through better infection prevention and control practices including appropriate prescribing of antibiotics. As high as 20-50% of antimicrobial use in Africa is thought to be inappropriate.

The GADSA (Gamified Antimicrobial Stewardship Decision Support App) project co-developed a mobile tool with prescribing professionals to encourage guideline-compliant prescribing. Integrating guidelines from WHO and Sanford, the GADSA app was piloted with 70+ surgeons across three hospitals in Nigeria and

demonstrated positive prescribing behaviour change.

Project led by UCL IRDR dPHE. Collaborators: Dr. Laura Shallcross (UCL Institute of Healthcare Informatics), Prof. Andrew Hayward (UCL Epidemiology and Public Health), College of Medicine at University of Lagos, Swinburne University of Technology Australia, London School of Hygiene and Tropical Medicine, and prescribing professionals from the Teaching Hospitals of Lagos University, Lagos State and Niger Delta. Funded by ESRC.



2020 - ONGOING

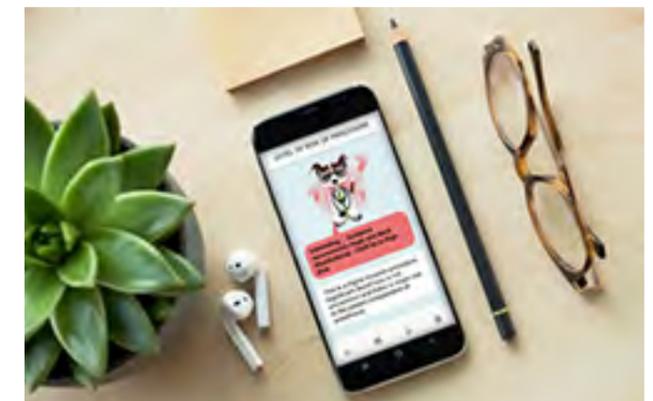
GADSA FOR NHS: GAMIFIED MOBILE APP TO ENCOURAGE BETTER ANTIBIOTIC PRESCRIBING IN THE UK

Antibiotics are the most widely prescribed antimicrobial agents to treat infection. Unlike other drugs, the more they are used, the less effective they become. Antimicrobial Resistance is a prominent worldwide threat limiting ability to treat common infection and disease.

This project builds on previous work in Nigeria for which we developed and successfully piloted a novel gamified mobile app for surgeons prescribing antibiotic prophylaxis (GADSA). Through this work, we aim to adapt the existing technology for use in the NHS setting and expand clinical coverage across the UK.

Project led by UCL IRDR dPHE. Collaborators: Prof.

Kate Jones (UCL CBER), UCL Hospital NHS Foundation Trust (UCLH). Funded by EPSRC IAA.



2017 - ONGOING

PASS: ENCOURAGING BETTER USE OF ANTIBIOTICS THROUGH CHANGING BEHAVIOUR

In order to slow down the development of antibiotic resistance, we need to reduce the number of antibiotic prescriptions. It sounds easy, but changing any behaviour is difficult, let alone a really complex behaviour like antibiotic prescribing. Complex issues like this require us to think differently about how we go about doing the research.

This large collaborative project aims to increase antibiotic prescribing stewardship through behaviour change, including surveillance of prescription levels in

primary care, secondary care and care homes, and the co-creation and development of targeted intervention bundles.

Project led by Prof. Andrew Hayward (UCL Department of Epidemiology and Public Health) and Dr. Laura Shallcross (UCL Institute of Healthcare Informatics) with collaborators across UCL, Royal College of Arts, University of Leicester and a network of healthcare professionals. Funded by ESRC.

2019 - ONGOING

DR-TB GENIE APP: HELPING DOCTORS TO MAKE INFORMED PRESCRIBING DECISIONS IN SOUTH AFRICA

Drug-resistant (DR) tuberculosis (TB) is the most costly and complex form of TB to manage. South Africa has the 3rd highest number of notified cases of DR-TB and high rates of HIV co-infection. New guidelines for DR-TB have increased the complexity of management which is a barrier to implementation of the decentralised model of care.

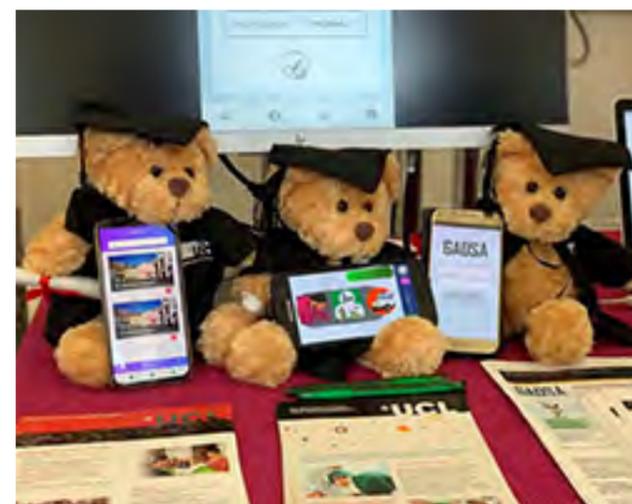
In this project we are developing and piloting a smartphone application that provides clinical decision-making support for inexperienced healthcare workers

managing drug-resistant TB in adults and children with or without HIV co-infection in decentralised in South Africa. We are establishing a network to support the wider evaluation and implementation across Africa and in other ODA countries.

Project led by Dr. Hanif Esmail (UCL Institute of Global Health). Collaborators: University of Witwatersrand, University of Stellenbosch and medical professionals working across the care system in South Africa. Funded by GCRF and the Royal College of Physicians.

2010 - ONGOING

EDUGAME4ALL: FUN AND INNOVATIVE GAMES TEACHING CHILDREN ABOUT BUGS AND GERMS



Educational games for children across Europe. Development and evaluation of two distinct education games for junior and senior children teaching hand and respiratory hygiene and antibiotic resistance launched in September 2009 with high acclaim. This was covered by press and media as a unique educational initiative for children.

Project led by UCL IRDR dPHE. Collaborators: Andreea Molnar (Swinburne University, Australia), Initially funded by the EC FP6 programme.



2006 - ONGOING

iNTRIC: PROVIDING A 'ONE-STOP SHOP' FOR INFECTION CONTROL PROFESSIONALS AND TRAINEES

The iNternational Resource for Infection Control (www.intric.org.uk) is a single access point to information and guidelines on infection and control for medical professionals and trainees requiring up-to-date evidence-based information in the infectious disease domain. In 2012, iNTRIC was successfully evaluated in terms of impact on clinical practice and has since served over a million users from 159 countries.

can significantly decrease mortality, improve health outcomes in city and rural settings and dramatically increase the capacity of health systems in low-to-middle-income-countries (LMIC).

Project led by UCL IRDR dPHE. Collaborators: Sue Wiseman (iNTRIC), Dr. Katerina Stavrianaki (UCL IRDR), Development originally funded by the UK Department of Health and Social Care and EPSRC IAA.

Improving Infection Prevention and Control (IPC) practice



2014 - 2016

iNTRIC MEETS ICAN: INFORMATION NEEDS OF INFECTION CONTROL PROFESSIONALS IN AFRICA

Improving infection prevention and control in Africa is key to increasing patient safety, lowering risk of outbreaks, hospital acquired infections and along with antibiotic stewardship, help drive down the high rate of antibiotic resistance across the continent. Ensuring that infection control professionals have access to the guidance they require for reference, training and at the point of care is vital.

needs assessment engaging 250+ African prescribing professionals. Results of this project informed the development of a section on the iNTRIC website with outreach to Africa.

Project led by UCL IRDR dPHE. Collaborators: Dr. Katerina Stavrianaki (UCL IRDR), ICAN University of Stellenbosch, South Africa and the College of Medicine, University of Lagos, Nigeria.

Through a collaboration with the Infection Control Africa Network (www.icanetwork.co.za), we led an information

2020 - ONGOING

MY ACTIVITY JOURNAL APP

In Spring 2020, governments around the world imposed lockdown regulations in order to slow the spread of COVID-19. Lockdown during the COVID-19 pandemic meant that people had to rapidly adapt their lifestyles to maintain a sense of normality. The benefits to health and wellbeing from keeping a journal are well-evidenced in the psychology literature.

In this project, we developed a gamified journaling, wellbeing and research app to help people keep a log of their activities during the pandemic and source inspiration for new activities from others. Designed in collaboration

with students from UCL Computer Science and experts in digital graphics, using information gathered by our 6000+ participant survey, the app effectively promotes moments of personal reflection as well as encouraging social interaction and connection. The app now has over 1000 users and goes hand-in-hand with a social media competition using #MyActivityJournal and #MyLockdownJournal which complements the app by sharing and inspiring positive messages, journal entries and activities.

Project led by UCL IRDR dPHE.

2020 - ONGOING

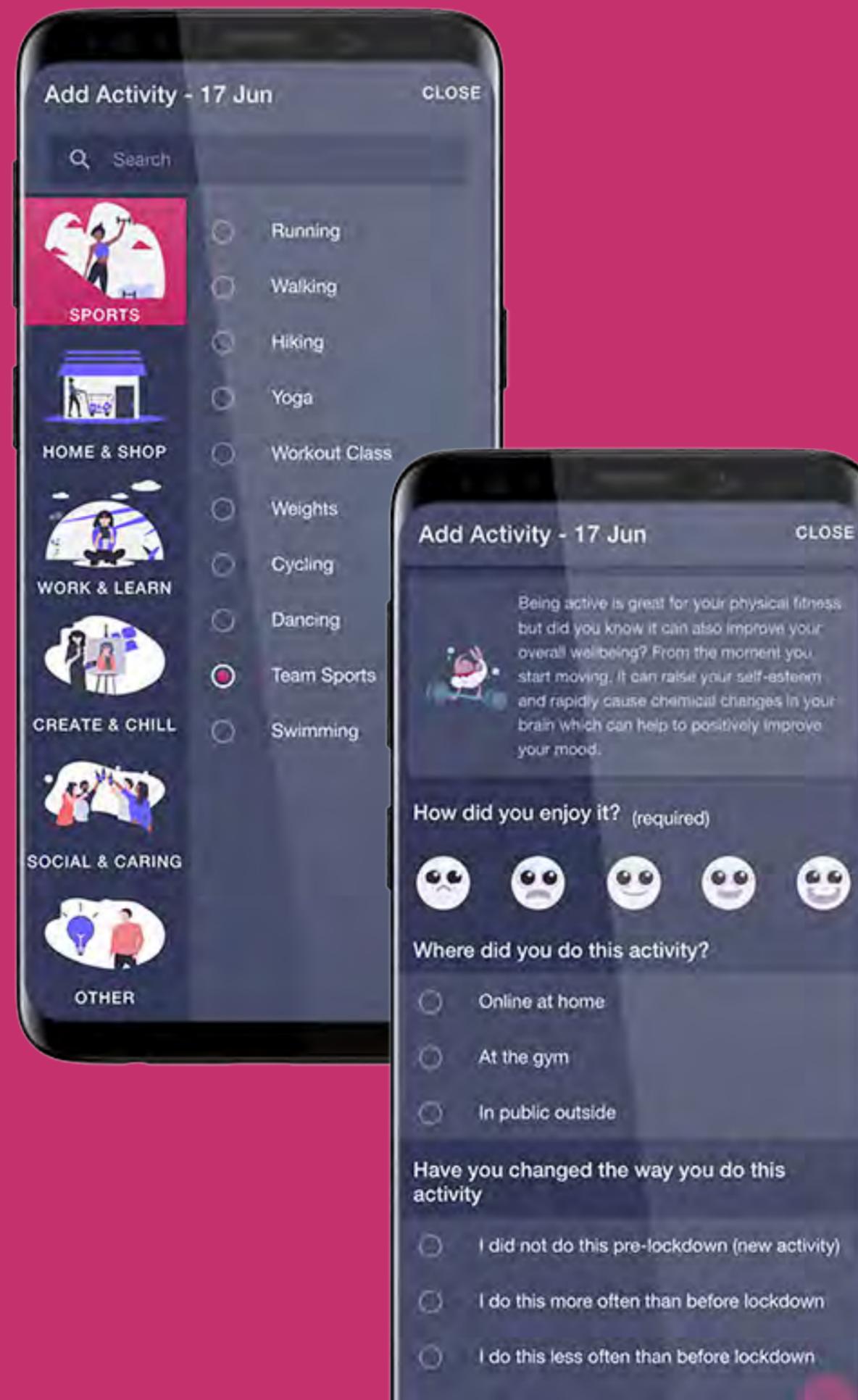
ZOOM OR NOT TO ZOOM: UNDERSTANDING LIFESTYLE CHANGE DURING LOCKDOWN FOR COVID-19

The lockdown regulations imposed around the world during the COVID-19 pandemic required large proportions of the global population to remain at home to slow the spread of the disease. People around the world found more and more innovative ways to keep active, to stay entertained and to connect with those important to them.

This project involved an online survey, now completed by over 6000 participants, that asked about the lifestyle activities that individuals engaged in during a typical week

prior to the lockdown compared with during and three months post-lockdown regulations being lifted. Survey data was analysed for trends in the types of activities undertaken, common adaptations and the changes in frequency. Qualitative follow up study will reveal the impact of lockdown and social distancing periods from gender perspective.

Project led by UCL IRDR dPHE.



2020 - ONGOING

COVID-19 ON TWITTER: CAPTURING SOCIAL MEDIA CONVERSATIONS DURING THE COVID-19 PANDEMIC

COVID-19 social media discourse: Mapping trends and key terms shared around the world on social media during the pandemic in 2020.

The COVID-19 pandemic saw an incredible rise in the amount of virtual connections being made through the use of technology. Looking more closely at the data collected on social media platforms, gives a unique snapshot of the themes and topics being discussed across the world.

This project assessed trending topics and key terms

in relation to the epidemic curve for COVID-19 across multiple counties. Working in collaboration with the WHO, colleagues from across the dPHE network and Master's degree students from UCL IRDR, searches of data drawn from social media platforms (e.g. Twitter) were analysed for keywords and terms across multiple different languages.

Project led by UCL IRDR dPHE. Collaborators from the [Universitat Pompeu Fabra](#), Barcelona, World Health Organisation.

2020 - ONGOING

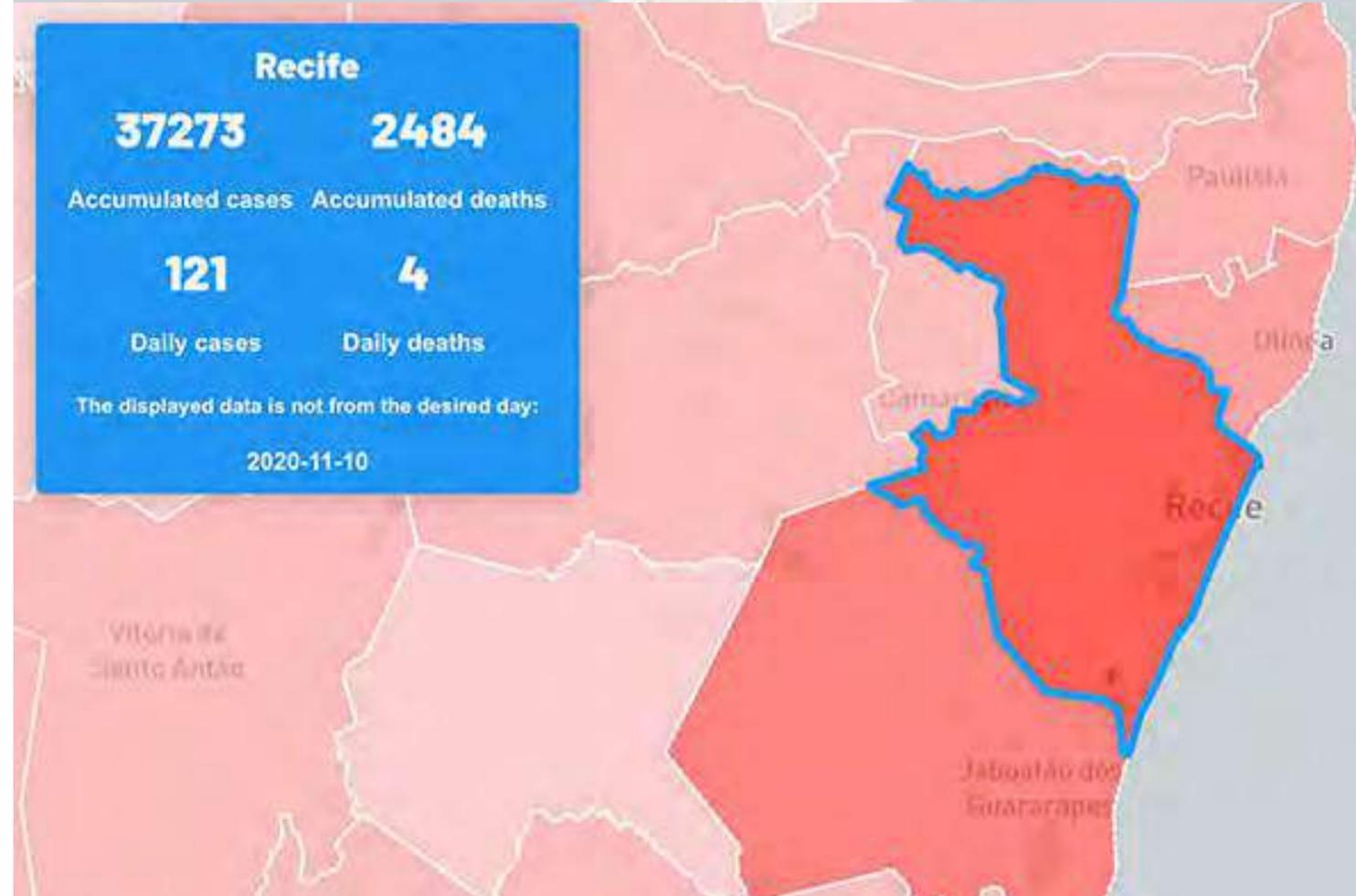
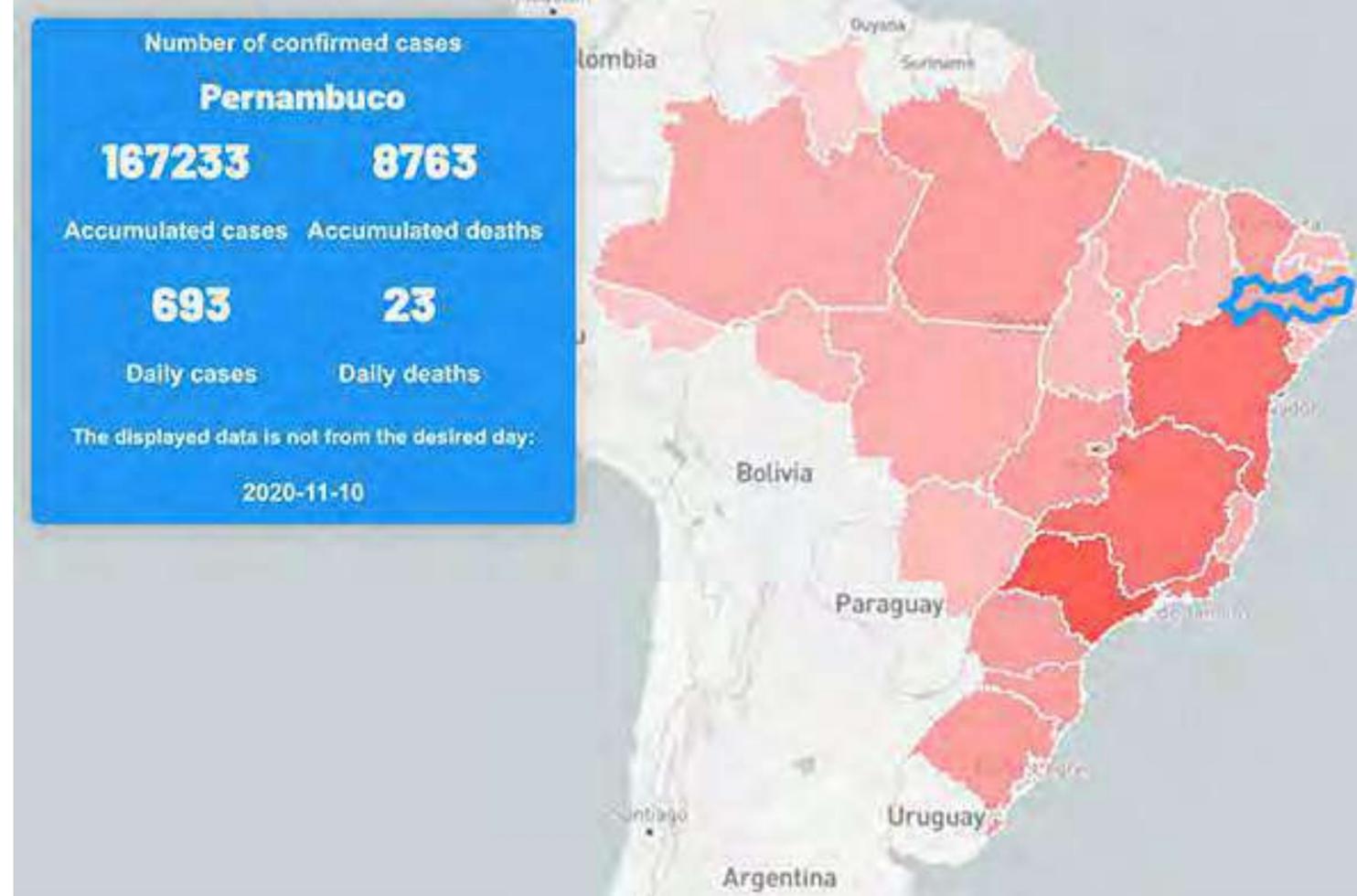
COVID SGIS AND IRRD-PE: MAPPING THE SPREAD OF THE COVID-19 PANDEMIC IN BRAZIL

COVID-19 systematic mapping: early warning and prediction of future pandemics in Pernambuco. The first confirmed case of COVID-19 in Brazil, was recorded on the 25th February 2020. Brazil was the epicenter of the pandemics in May and June 2020 - and the response was led by state governors.

Working with colleagues at the Universidade Federal de Pernambuco (UFPE), dPHE contributed to predicting models for the epidemics using artificial intelligence and

thermal drones through programmes COVID SGIS and IDDR-PE (Instituto para Reducao de Riscos e Desastres de Pernambuco)

Project led by Universidade Federal de Pernambuco (UFPE) - COVID SGIS and LIKA Institute in UFPE leading IRRD-PE initiative. Collaborators UCL IRDR dPHE



2020

SYMBIOTIC: REDUCING MALAYSIA'S PLASTIC WASTE THROUGH COMMUNITY INTERVENTION

Less than 25% of Malaysia's annual 42M tonnes of municipal solid waste (MSW) is recycled. The organic fraction represents a wasted 13.1TWh while 6.3M tonnes of plastic ends up in landfill annually.

The SYMBIOTIC project explores the social and industrial synergies in valorising Malaysia's organic and plastic waste streams with strong, complementary partners addressing Malaysia's waste and recycling challenges. It will investigate the integration of scalable, demonstration-ready technologies with community

engagement strategies to create a circular economy (CE) model that reduces poverty and social/gender inequality. The project's focus was on Sandakan, a poor coastal area with inadequate waste infrastructure and high levels of pollution.

Project led by UCL IRDR dPHE and LEAP Micro AD. Collaborators: University of West London, Future Alam Borneo, LAX Global Resource, Arkitek and community leaders and members from the region of Sandakan. Funded by Innovate UK Newton Ungku Omar Fund.



2015 - ONGOING

MEDI+BOARD AND DATA SANS FRONTIERS: MAKING SENSE OF BIG DATA FOR PREDICTING OUTBREAKS AND EPIDEMICS IN THE MIDDLE EAST

The aim of the Medi+Board initiative was to develop a dashboard to bringing together heterogeneous data streams for modelling, prediction, early warning and rapid response to outbreaks and epidemics. In collaboration with MSF, this project explored ways to increase knowledge exchange around data sharing for humanitarian emergencies in the Middle East.

Project lead by UCL IRDR dPHE. Collaborators: Prof Muki Hackey (UCL Extreme Citizens Science), Medicines Sans Frontiers, Palestine Red Crescent Society. Funded by EPSRC Knowledge Exchange



2015 - ONGOING

MEDI+VAC: EXPLORING THE ANTI-VACCINATION DEBATE THROUGH SOCIAL MEDIA



Social media platforms such as Twitter enable near real-time understandings of vaccine sentiment and information flows at scale. Building on the Medi+Board dashboard, the VAC Medi+board project developed a platform for identifying influential users spreading misinformation about vaccines and their outreach to Twitter followers through visualization of information diffusion through the network and assessment to inform policy makers.

Project lead by UCL IRDR dPHE. Collaborators: Heidi Larson (LSHTM).

2017

MANTRA: MAKING IMPACT ON HEALTH OF THE MOST VULNERABLE COMMUNITIES AND DISADVANTAGED WOMEN IN LOW-INCOME SETTINGS THROUGH MOBILE AND DIGITAL TECHNOLOGY



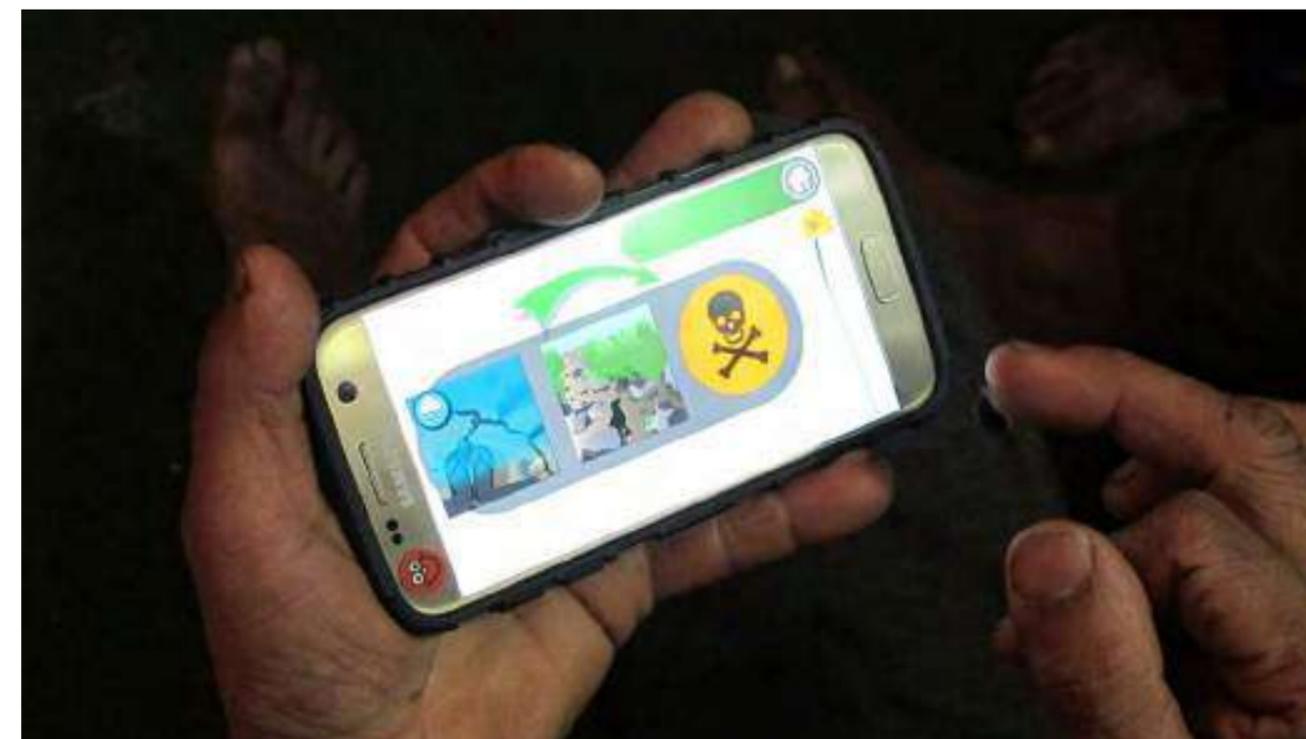
After the Nepalese earthquakes in April 2015, it became even more challenging for health workers in Nepal to provide support for women who needed it. As communication before, during and after earthquakes and landslides was a major difficulty, we aimed to provide educational content as learning through gaming. This can be beneficial for engagement and immersion.

The app was designed with 3 modules: maternal health, neonatal health and geo-hazards. It was particularly challenging to build a prototype app in just a few months, but this was achieved through solid team effort. We designed the app with: No text (for those unable to read); no voice; intuitive interaction with the phone because written help could not be included; a tutorial for Drag and Drop (for those unfamiliar with smart phones); and with

culturally appropriate graphic design.

The pilot app was tested among focus groups and local women and qualitative research was undertaken across two communities providing detailed insights on risk knowledge and understanding, health needs, and opportunities to strengthen readiness to respond to humanitarian emergencies.

Project lead by UCL IRDR. Collaborators: UCL IGH, ODI and HERD Nepal. Funded by The Natural Environment Research Council (NERC), the Arts & Humanities Research Council (AHRC) and the Economic & Social Research Council (ESRC) Global Challenge Research Fund (GCRF).





**Taught
programmes**

MODULE: DIGITAL HEALTH - EPIDEMICS AND EMERGENCIES IN THE ERA OF BIG DATA

Available to both undergraduate and postgraduate students at UCL, this module introduces the key concepts of digital public health. Students become familiar with the fundamental principles of public health, global health, disease surveillance, epidemic intelligence, emergencies, public health behaviour change interventions, and risk communication. Aimed at postgraduate students with a science degree or medical sciences degree, the module is of particular interest to those seeking further understanding of new technologies for public and global health, emergencies and big data challenges. To find out more and to apply: <https://bit.ly/3cAQopd>



MSC RISK AND DISASTER SCIENCE (DATA SCIENCE PATHWAY)

The importance of science in understanding disaster risks and the need for science-based strategies at local, national and international levels in the private, public, and third sectors is now widely recognised. The Data Science pathway of this science-led programme combines knowledge of risk and disaster reduction with statistical and computational skills and digital health in emergencies. To find out more and to apply: <https://bit.ly/3cAQopd>



• COMING SOON: MSC IN DIGITAL PUBLIC HEALTH IN EMERGENCIES

At present, there are few opportunities for the technical workforce responsible for creating the 'digital' (e.g. programmers, data scientists, statistical modellers) and the healthcare workforce tasked with deploying solutions into the 'real world' (e.g. healthcare professionals, public health and agency workers) to come together. The forthcoming MSc in Digital Public Health in Emergencies will establish a much-needed dedicated accredited training pathway for traditionally technology-based disciplines (e.g. computer science, data science) looking to work in public health, and for health disciplines (e.g. nursing, applied health) interested in the development and deployment of technologies for global health emergencies.

• COMING SOON: SUMMER SCHOOLS

Coming soon - We are currently preparing a dPHE Summer School curriculum which we anticipate will be available from Summer 2022. The structure of the course has been designed for those with a broad interest in the development, implementation and evaluation of digital technologies for public health in emergencies and with professional schedules in mind; easily digested, accessible and flexible. Our aim is to empower participants with the latest evidence-based research and case studies from real-life examples of where digital technologies have been developed and deployed in the field. Watch this space!



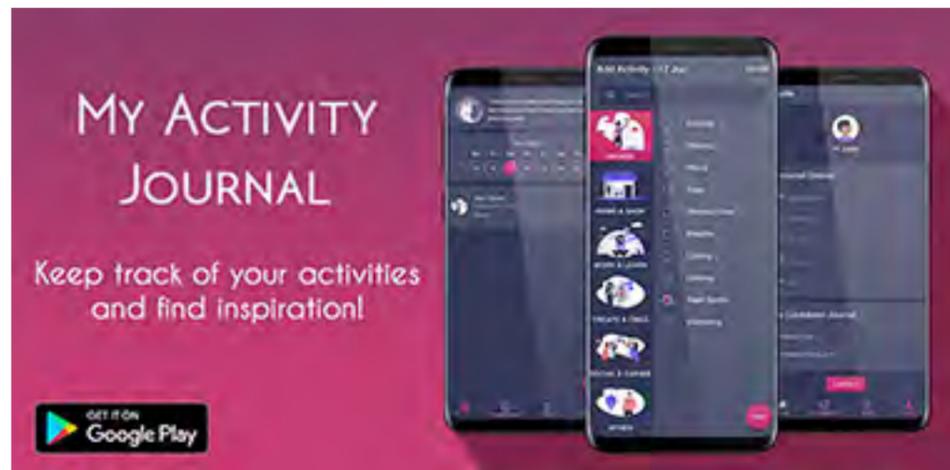


Impact

From improving the mental wellbeing of people in isolation during UK lockdowns to guiding the complex decision-making of doctors in South Africa, our innovative apps, programs and trainings are delivering cutting edge public health techniques around the world. The real-world impacts of our projects are sparking positive change across the field of digital public health and have been recognised by multiple awards in 2020.

MY ACTIVITY JOURNAL AND ZOOM OR NOT TO ZOOM PROJECT

Our journaling and wellbeing app has been downloaded by over 1000 UK and international citizens during the COVID-19 pandemic. Encouraging wellbeing activities and collecting data to inform public health policy, our app and complementary online survey, completed by over 6000 participants, provide structure, inspiration and understanding while the pandemic continues to disrupt people's lives in the UK and abroad.



GADSA PROJECT

This app was successfully evaluated in three hospital sites in Nigeria and is the first and only AMR app achieving behaviour change at the point of care! The app's huge potential has attracted attention from a number of international antimicrobial resistance societies, the NHS and industry, such as BioMerieux, and was 'Highly Commended' in the UK IT Industry Awards 'Healthcare Project of the Year 2020'. The team are working on partnerships to scale up GASDA across Africa and Europe.



MANTRA PROJECT

This project worked with Nepalese Field Community Health Volunteers, geological experts and local women and successfully developed and tested a pilot app. Findings were shared via exhibitions in the local rural area, Kathmandu, and London, as well as through Networking Workshops in Kathmandu. This project radically brought maternal and neonatal health knowledge to disadvantaged woman in a very deprived part of the world and was nominated for a Diversity Project of the Year (2017).



• ZIKA PROJECT

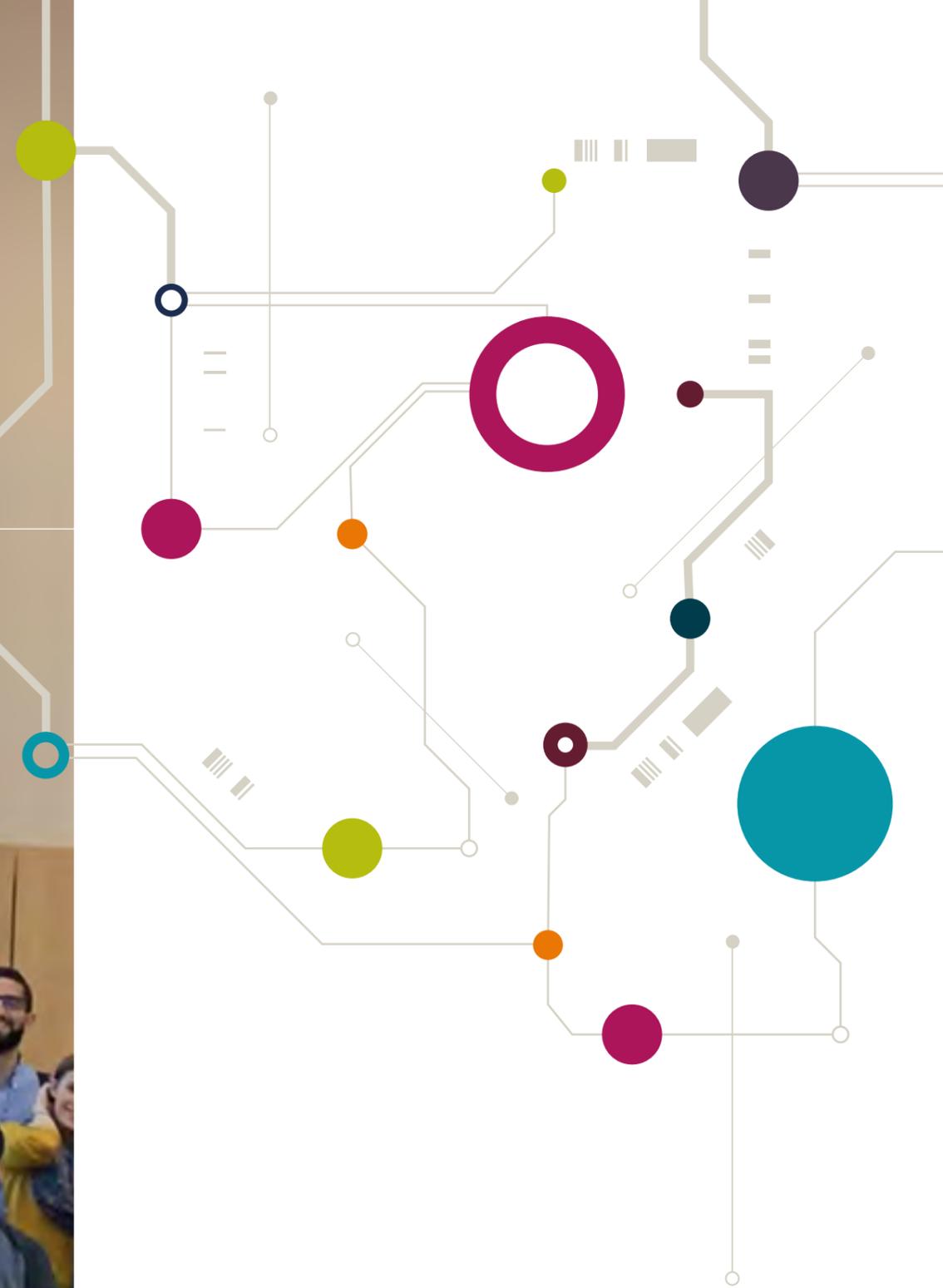
An innovative web- and mobile-phone application was developed to support the environmental health authorities in Brazil for early-warning against deadly mosquitoes that cause Zika and Dengue. Extensively tried and tested in focus groups, these tools will soon be used in everyday surveillance work. In collaboration with UCL's Centre for Analytics & Spatial Analysis (CASA) and the British Red Cross, we digitally mapped a site in Brazil in order to successfully understand residential areas' mosquito infestation levels for the first time. Due to the continued success and impact of this research, it was recently awarded additional funding to evaluate the impacts of broader climatic and environmental changes on breeding habitats for mosquito-borne arboviruses in Northeast Brazil.



• iNRIC PROJECT

Since its establishment in 2005, the iNRIC has developed into a comprehensive cross-platform digital intervention (website, tablet, mobile app) improving evidence at the point of care. The iNRIC has become a leader portal for healthcare evidence dissemination, delivering information to over a quarter of a million users from 159 different countries, having a positive impact on 53% of visits and ranking within the top-10 results in Google searches for infection-related terms. It has partnerships with WHO, International Federation of Infection Control (IFIC) and Infection Control African Network (ICAN) and has led to the award winning innovative GADSA app.





Events and Public Engagement

DPH ANNUAL CONFERENCE



Our annual flagship event is The International Digital Public Health Conference series ('DPH'); a world leading annual interdisciplinary event on research and innovation in digital health. In 2018, the DPH gained APHEA (Agency for Public Health Education Accreditation) Training and Educational Event accreditation lasting for 3 years and this showcases the measure of quality and international recognition for our work. For more information on the conference please visit www.acm-digitalhealth.org

In 2019, we partnered with the European Public Health Conference to deliver the 9th edition of the DPH conference. We welcomed more than 200 delegates

to a very sunny Marseille (France) with the audience coming from across healthcare, industry and policy. The programme kicked off with the Young Researchers Forum run in collaboration with ASPHER (Associate for Schools of Public Health in the European Region) and featured exciting plenary sessions on the ethical challenges facing AI and Big Data, challenges for upscaling technology and innovation across Europe and the role of social media in online anti-vaccination movements. Our programme also launched the European mHealth Knowledge and Innovations Hub – a bold new partnership for the future of mHealth in WHO European Region.



OUTREACH EVENTS

In the first week of June 2019, dPHE participated in the facilitation of an interdisciplinary workshop, the **Global Citizenship Programme Outbreak! 2019**, for under- and postgraduate students from UCL and beyond. The session focused on the importance of taking advantage of the digital world we live in, and opportunities of utilising reliable data from social media such as Google, Facebook, Twitter and many more, to use as a form of surveillance for accessing information regarding infectious disease outbreaks and the population's health in general.



In July 2019, we partnered with the **UCL Institute of Healthcare Engineering** to host the first **Global Healthcare Engineering Symposium** at UCL. The symposium was a way to bring together researchers in global health and healthcare technologies to share their experiences, opportunities and challenges. The day provided a springboard for our efforts to identify, support and strengthen the community at UCL around global healthcare technologies. [More info](#)

In October 2019, dPHE participated in the **UCL It's All Academic Festival** to give the public a glimpse into the world-changing research taking place within UCL's walls. Prof. Patty Kostkova gave an open talk on digital public health and the dPHE team gave members of the public live demos of the apps and mobile games we have developed through our research projects. [More info](#)



WORKSHOPS AND MASTER CLASSES

In June, as part of the **UCL IRDR Humanitarian Summit 2019**, we hosted a workshop on Infectious diseases and the role of digital public health. Participants were introduced to the key concepts of digital public health including basics of underlying knowledge management, semantic modelling, international disaster surveillance IT systems, early warning and response to disease outbreaks and emergencies, social media, serious games for public health interventions and big data challenges.



SKILLS BUILDING EVENTS

In November 2019, dPHE co-hosted an interactive session with **Missing Maps and the British Red Cross** as part of the DPH 2019 Conference in Marseille. Led by Dr. Katherine Roberts-Hill and supported by Mediciens Sans Frontiers, workshop participants contributed to a live opensource mapping project to help geolocate women as risk of female genital mutilation in Tanzania.



In January 2020, researchers from dPHE (Professor Patty Kostkova and Dr Anwar Musah), UCL Centre for Advanced Spatial Analysis (CASA) (Dr Sarah Wise) and expert mappers from the British Red Cross (Katherine Roberts-Hill and Jiumei Gao) organised the first **UCL-ZIKA Mapathon: Mapping of Residential Areas for Mosquito Surveillance in Campina Grande, Northeast Brazil**. Through crowd participation, the goal was to map out the entire residential areas of Campina Grande, Brazil. [More info](#)

PANEL DISCUSSIONS AND FORUMS

Masterclass in Public Health and Digital Disaster Response: Convened by IRDR dPHE Director Prof Patty Kostkova, this masterclass was a unique opportunity to learn how to manage a public health emergency and respond to nature and manmade disasters using social media and digital data. We were delighted to host Dr. Arnold Bosman (Medical consultant in public health and founder of 'Transmissible') and Prof Carlos Castillo (Universitat Pompeu Fabra, Barcelona)



In July 2019 as part of the UCL IRDR Annual Conference, we hosted: **In-conversation: on Drones for Health Emergencies: Friend or foe?** Prof. Patty Kostkova interviewed invited speaker Jorieke Vyncke (Coordinator of the Missing Maps activities from Mediciens Sans Frontiers) on the use of Unmanned Aerial Vehicles (UAVs) or drones in low-income and low resource settings for health emergencies.



KEYNOTES AND INVITED TALKS

JAN 2021 Invited Panellists: Promotive Digital Health and Well Being in the context of Covid Pandemic - Indian and Global Experience

NOV 2020 Global Symposium, UCL Institute for Healthcare Engineering, UK

NOV 2020 Scaling Digital learning in Global Health and Emergencies, Empower School of Health and University College London, International

OCT 2020 Keynote: International Students' Meeting on Public Health (ISMOPH) and World Federation of Public Health Associations (WFPHA)

NOV 2020 Keynote: 4th Symposium on Innovation in Biomedical Engineering - SABIO IV, Recife, Brazil.

OCT 2020 Keynote: Federal Institute of Pernambuco, Recife, Brazil. National Week of Science and Technology.

OCT 2020 Beyond Boundaries - October 2020, session 9 – [Cross-Border Translational Research Post-COVID](#).

AUGUST 2020 Laboratory of Immunopathology Keizo Asami (LIKA) Webinar, Recife, Brazil

JULY 2020 University of Liverpool, Women's Series.

NOV 2019 Keynote: The III National Conference on Primary Care, Rome, Italy

AUGUST 2019 Keynote: International Symposium on Diagnostics and Therapeutics (SINATER) 2019, Recife, Brazil

AUGUST 2019 University of Sao Paulo (UPS), Sao Paulo, Brazil

JULY 2019 United Nations Development Programme - expert consultant on a rights-based approach to digital technologies and data for health, New York.

NOV 2018 Invited speaker: Professional Certificate in Disaster Risk Reduction, International Centre for Parliamentary Studies (ICPS).

NOV 2018 Clinical Diagnostics and Antimicrobial Resistance: A Multidisciplinary Symposium, organized by International Diagnostics Centre and the AMR Centre at the London School of Hygiene and Tropical Medicine (LSHTM).

OCT 2018 Expert guest and invited speaker at the strategic workshop: 'The Governance of Data in a Digitally Transformed European Society' (the DigiTranScope project), Ispra, Italy.

SEPT 2018 London Conference on Natural Disasters and Child Vulnerability, British Academy, London, UK.

JUNE 2018 Keynote: World Congress on Medical Physics and Biomedical Engineering (Prague, Czech Republic, June 3-8th, 2018).

MARCH 2018 Keynote: 4th International Conference on Information and Communication Technologies for Ageing Well and e-Health, ICT4AWE 2018 (Funchal, Madeira, Portugal, 22-23th March 2018).

APRIL 2017 Closing Panel Session at the Biovision 2017.

OCT 2016 Grand Challenges annual Meeting, Bill and Melinda Gates foundation, London.

SEPT 2016 Pandemics and Infection Control - Meeting Tomorrow's Threats and Challenges Today, A Public Policy Exchange Symposium, London, UK.



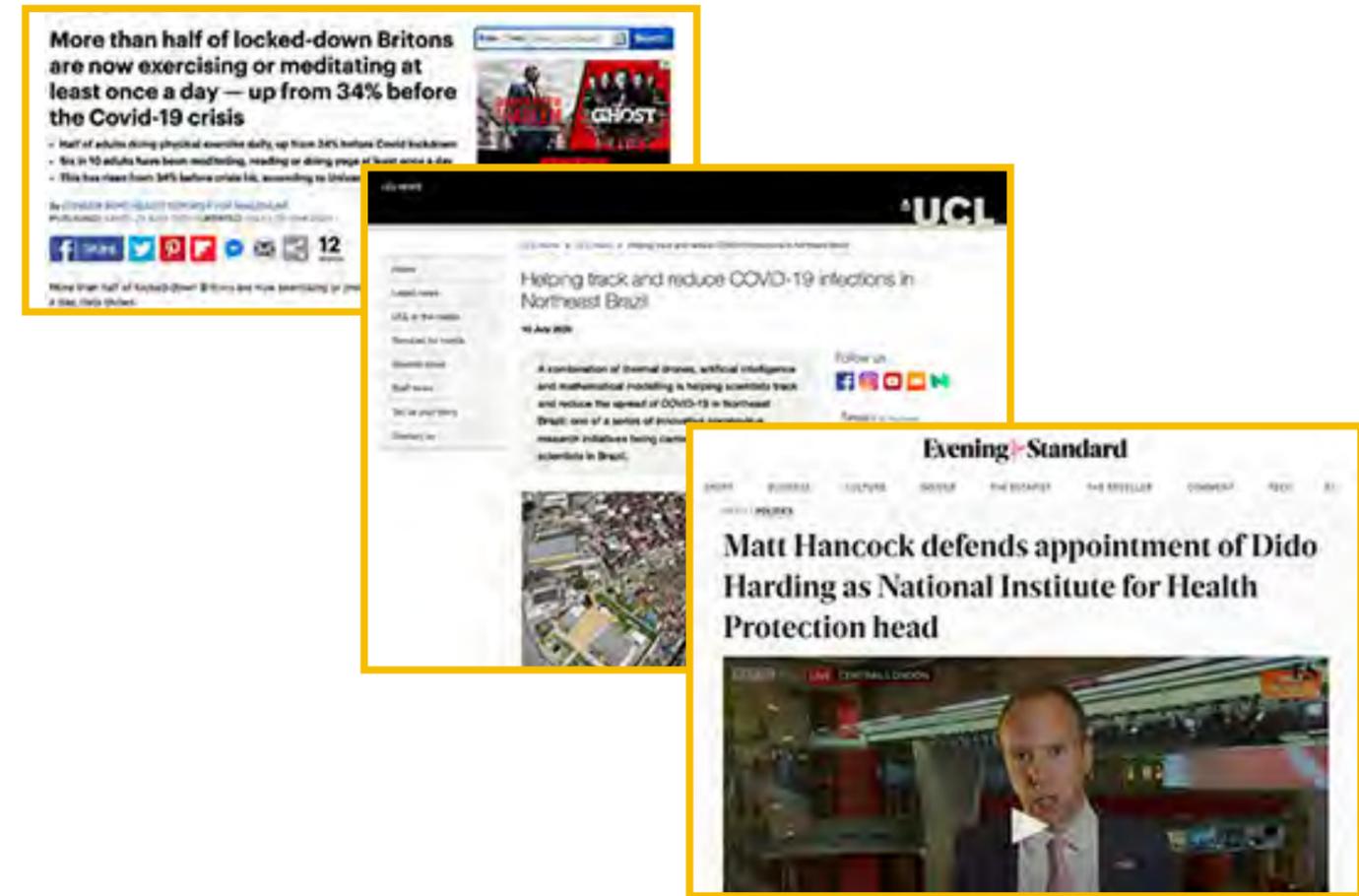
“ We were looking for a team coming together to solve a business challenge, clearly setting out their purpose, process and the end result. This entry was excellent, not just due to the subject matter, but also for the many examples of teamwork, shared vision and mission, the passion for delivery against the odds, and the amazing range of initiatives. Some excellent project descriptions demonstrate the range of skills that this team has, and despite what seems to be a high-pressure environment, the overall impression is a team that enjoys, and takes pride in what they do. ”

*Judges comment on Team of the Year award (Computing Rising Stars Awards):
John Leonard, Research Director at Computing/Delta, commended the team on their work*

Professor Patty Kostkova's tweets, quotes in the Evening Standard, covering the abolition of Public Health England (PHE) and the appointment of Dido Harding:

“ In 2013, the Tories restructured the world-class scientifically independent Health Protection Agency and created underfunded Public Health England while cutting public health operation at local level.

The decision to abolish PHE in the middle of the deadly Covid-19 pandemics without consultation while the UK Parliament is not sitting is scandalous. Setting up a new National Institute for Health Protection by a merge with dysfunctional private NHS Track and Trace operation under leadership of Dido Harding, who has no expertise in public health, seems yet another purely politically motivated move to shift blame for Government's failures over handing of the Covid-19 crisis. ”



RECENT MEDIA COVERAGE

My Lockdown Journal

- UCL Press: <https://www.ucl.ac.uk/news/2020/jun/how-are-our-behaviours-changing-lockdown>
- UCL MAPS: <https://www.ucl.ac.uk/mathematical-physical-sciences/news/2020/jun/how-are-our-behaviours-changing-lockdown>
- Daily Mail Online: <https://www.dailymail.co.uk/news/article-8455071/More-half-locked-Britons-exercising-day.html>
- The Future Leadership Institute - <https://fli.institute/2020/07/08/how-are-our-behaviours-changing-in-lockdown/>
- Business | Science - Coronaprofile: To Zoom or not to Zoom? (Profile of Patty on there with info on MLJ project)

Brazil - COVID19

- UCL Press: <https://www.ucl.ac.uk/news/2020/jul/helping-track-and-reduce-covid-19-infections-northeast-brazil>

- Youtube - Educational: <https://www.youtube.com/watch?v=eSQND-0dJOA>; Seminar: <https://www.youtube.com/watch?v=8OjX6vRI7O4>

Public Health England (PHE) commentary

- Science Media Centre: <https://www.sciencemediacentre.org/expert-reaction-to-speech-by-matt-hancock-on-the-future-of-public-health-and-the-launch-of-the-national-institute-for-health-protection-nihp/>
- Evening Standard: <https://www.standard.co.uk/news/politics/dido-harding-matt-hancock-national-institute-health-protection-a4528236.html>
- Research Professional News: <https://www.researchprofessionalnews.com/rr-news-uk-politics-2020-8-creation-of-new-health-body-like-rebuilding-a-ship-in-a-storm/>
- Politico: <https://www.politico.com/news/2020/08/23/britainhealth-boss-harding-cronyism-400227>



Awards

• WOMEN IN IT EXCELLENCE AWARDS

Professor Patty Kostkova won 'Innovator of the Year' at the Computing Women in IT Excellence Awards 2019 for leading the GADSA project and in 2020 for her role in the My Activity Journal project. She was previously shortlisted for the Woman of the Year and Team Leader of the Year in 2017 and 2018, and the team had also been nominated for the 2017: Diversity Project of the Year for their MANTRA project, at the same awards. The team featured in the following awards in 2020:

- Innovator of the Year (Winner November 2020) <https://womenintechexcellence.co.uk/womenintechexcellenceawards2020/en/page/2020-winners>
- Digital Leader of the Year (finalist November 2020)
- Graduate of the Year, Georgiana Birjovanu (finalist November 2020)



• DPH 2019 CONFERENCE NOMINATIONS AND PRIZES

- Runner-up Best Partnership: Dr. Caroline Wood on behalf of the GADSA project team
- Runner-up Best Data Driven Innovation: Georgiana Birjovanu on behalf of the ZIKA project team



• COMPUTING RISING STAR AWARD NOMINATIONS

- Won - Team of the Year 2020 – UCL Centre for dPHE
- Georgiana Birjovanu - Finalist - Rising Star Award (Large organisations)



• DPH 2018 INNOVATION PRIZES

- Nomination for Best Partnership: Prof. Patty Kostkova on behalf of the MANTRA project team



• UK IT INDUSTRY AWARDS

- 'Highly Commended' in the category of 'Healthcare project of year 2020' <https://www.ucl.ac.uk/risk-disaster-reduction/news/2020/nov/ucl-irdr-dphe-receives-uk-it-awards-commendation>



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Team



PATTY KOSTKOVA is Professor in Digital Health and the Director of UCL IRDR Centre for Digital Public Health in Emergencies. Prior to joining UCL, Patty was appointed ISI Foundation Fellow. She was a consultant at WHO, ECDC, Telefonica and Foundation Merieux. Patty served as the Advisory Board member at ECDC Knowledge Management Working Group and the NHS National Knowledge Service TB Pilot project.



SUSANNE LUEDTKE is a Senior Clinical Research Fellow at dPHE. Susanne is an infectious disease and internal medicine specialist working on the DR-TB Genie App project advising on clinical development of a digital mobile application for physicians in South Africa to help with treatment decisions for multi drug resistant Tuberculosis. She also works on the GADSA: 'Gamified Antimicrobial Stewardship Decision Support App' project.



AISHA ALDOSERY is a PhD student studying under the supervision of Prof. Patty Kostkova. Aisha's PhD explores the use of IoT (Internet of Things) devices to collect real-time global remote sensing data for mosquito surveillance and early warning systems for Zika virus prediction and rapid response.



KATERINA STAVRIANAKI is a lecturer in Risk Analysis jointly appointed between the IRDR and the Department of Statistical Science at UCL. Her research focuses on natural hazards using a statistical, geophysical and experimental approach and has collaborated with the dPHE since 2018. She has been involved in projects regarding Infection Control in Africa, analysis of the data on the project MANTRA and most recently in our COVID-19 projects.



ANWAR MUSAH is a postdoctoral researcher at dPHE. He is currently the lead researcher for a project developing app-based mosquito surveillance and early-warning tools for Zika virus. Anwar's interests include applied statistics and application of GIS to problems in Epidemiology and Social Sciences.



GEORGIANA BIRJOVANU is a software developer at dPHE. Before joining UCL, Georgiana interned as a Software Developer at Credit Suisse and Avanade, a Microsoft and Accenture tech consultancy company. She works on the technical development of dPHE mobile applications and software tools.



FATIMA MAHMOUD is an intern at dPHE. She is currently a medical student at UCL, and she has completed a Bachelor's degree in Global Health and Development. Her research interests focus around public health and humanitarian medicine. Working with dPHE, she is involved in their iNRIC project; an online database aimed at providing health professionals with up-to-date infection control evidence-based research and resources.



PHIL BAKER is a Research Assistant and Communications and Social Media Officer at dPHE. He is a recent IRDR MSc post-graduate working mainly on our current Covid-19 projects and is primarily interested in humanitarianism, public health and disaster risk reduction with a special attention on mental health in disasters.



BEN ISMAILI is an intern at dPHE. He is a second year computer science student looking to do something that would benefit the current COVID-19 situation whilst allowing him to gain valuable experience in app development! "It has been a pleasure so far to have had this internship opportunity and I am learning something new every day."



TIANYI WANG is an intern at dPHE going into his 3rd year of BSc Computer Science at UCL. He spends his time cycling and reading about Chinese literature and values his time coding as a software developer in dPHE as it's an opportunity to work with many interesting people while tackling problems in global health.



SUE WISEMAN is an Honorary Senior Research Fellow and Consultant at dPHE. She is the Infection Prevention and Control Content Manager for the iNRIC [website](#). At present her team is concentrating on COVID-19 advice both in healthcare and in the community, but have several exciting challenges ahead post-pandemic!



CAROLINE WOOD is an Honorary Researcher at dPHE. Her research interests focus on using theoretical frameworks from behavioural science to understand challenges and design solutions within the field of digital public health



CHARLIE COWAN is an intern at dPHE. He is a computer science student at UCL, currently working on the My Lockdown Journal app. He grew up and lives in Oxford. He enjoys cooking and cycling in his spare time and is involved with the musical theatre and live music societies at UCL.



MALWINA JABŁOŃSKA is an intern at dPHE and a 4th year Computer Games Art and Animation student at Glasgow Caledonian University. She is behind the 'fishy' graphic assets for dPHE's MyLockdownJournal app and is keen to get involved in community projects and see her art used for good causes!



ALEXANDRO RADIN graduated in Dentistry, Specialising in Public Health before doing a Sandwich Master's in Governance and Sustainability from ISAE - Brazil Business School and UCL. He specialises in epidemiology of infectious and tropical diseases related to environmental conditions and public policies and is now on the board of the SARS Prevention and Control Committee - CoV2 - Covid-19 in Araucaria City Hall - State of Paraná / Brazil.and resources.



BOGDAN-CHRISTIAN ANTON is a Software Developer (and co stand up comedian with Gigi Birjovanu) and former dPHE tech. He has interests in photography, holistic healthcare, everything to do with nature & flowers, great quality coffee, art and aesthetics in all its forms, self growth and self reflection, singing and quantum physics (both of which are at the early stages of WIP).



JUAN BELTRAN is a postdoctoral researcher. His main interest is the use of Big Data Analysis to understand fundamental questions in the ecology and evolution of tropical organisms and the use of mobile technology to empower people to fight and stop the spread of tropical diseases, in particular in the Americas.



ANDY BOSCOR is a Software Engineer specialising in Full-stack development, specifically in cross-platform Ionic (Angular and React based) apps, Unity games, and web apps. Research areas include UX principles applied in Security and Encryption, Gamification methods, Design principles and secure authentication systems for PHE mobile apps.



LAN LI is a PhD student at dPHE, IRDR. Her research topic is integrating behavioural theory into digital intervention to increase vaccine confidence. She is interested in social media data analysis, digital health and vaccination hesitancy studies.



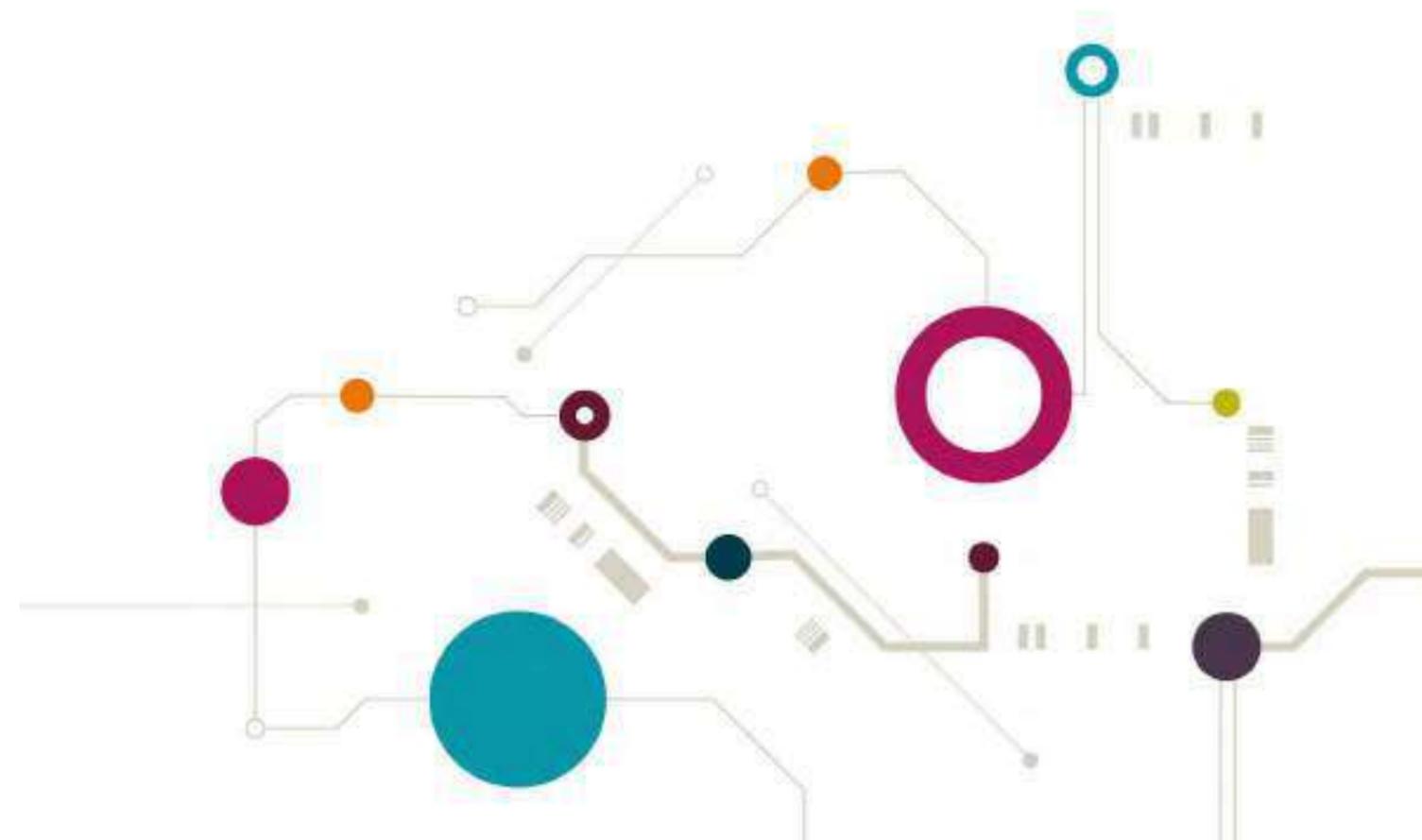
ADRIAN RUBIO-SOLIS is currently with the department of energy, CIDESI Mexico, working in the field of autonomous underwater vehicles and Machine Learning. His current research topics include Deep Bayesian Learning, multilayer neural networks design, time series prediction, online Extreme learning machines and the design of evolutionary computing algorithms for the solution of problems in Engineering and Medicine.



SONJA MUELLER is a researcher with the MANTRA project who travelled to Nepal to evaluate the MANTRA serious game and analyzed knowledge gain among users. Alongside her research at dPHE, Sonja is now a PhD candidate at University of Otago studying resilience to impacts of natural hazards.



RACHYA KAYASTHA is an Associate Scientist at Merck KGaA, USA. She was involved in MANTRA Project, a maternal health application working at UCL, Institute of Risk and Disaster Reduction. Her current focus is on Pre-Clinical Trials and researching Toxicity of Test Articles like COVID-19 drugs.





UCL dPHE ANNUAL REPORT ACRONYMS

AMR	Antimicrobial Resistance
APHEA	Agency for Public Health Education Accreditation
ASPHER	Associate for Schools of Public Health in the European Region
DPH	International Digital Public Health Conference (link to: www.acm-digitalhealth.org)
DR-TB	Drug Resistant - Tuberculosis
EPSRC IAA	Engineering and Physical Sciences Research Council - Impact Acceleration Accounts
ESRC	Economic and Social Research Council
GADSA	Gamified Antimicrobial Stewardship Decision Support App
GCRF	Global Challenges Research Fund
ICAN	Infection Control Africa Network
iNRIC	International Resource for Infection Control
LMIC	Low-to-Middle-Income-Country
LSHTM	London School of Hygiene & Tropical Medicine
MANTRA	Increasing maternal and child health resilience before, during and after disasters using mobile technology in Nepal
MEWAR	Mosquito population modelling for early warning system and rapid health authority response
MSW	Municipal Solid Waste
NHS	National Health Service
ODA	Official Development Assistance
PASS	Preserving Antibiotics through Safe Stewardship
SYMBIOTIC	Social-Industrial sYmbiosis of Malaysia's BIO-plasTIC wastes
UCL	University College London
UCL CBER	Centre for Biodiversity and Environment Research
UCL CEGE	Department of Civil, Environmental and Geomatic Engineering
UCL dPHE	UCL Centre for Digital Public Health in Emergencies (dPHE)
UCL GEO	Global Engagement Office
UCLH	University College London Hospitals NHS Foundation Trust
UCL IRDR	Institute for Risk and Disaster Reduction
UFPE	Universidade Federal de Pernambuco Brazil

