

Imperial College
London

2020, Our year.
Our progress

INSTITUTE OF
GLOBAL HEALTH
INNOVATION

Foreword

As we adjust to the new normal in which we are living, we also long for the return of life pre-pandemic. But despite the dramatic and unsolicited upheaval, for research and innovation, there are lessons we can take away to bring positive, lasting change in what we do.

The COVID-19 crisis has shown that we can, and do, work better together. The coronavirus has broken borders but so has science. As a united front, the world has achieved more than we could have ever dreamed was achievable. And we are immensely proud of the part that our Institute and its pioneering people have been playing in this global effort – not just in response to COVID-19, but to help achieve a world with better health and care for all through evidence-based innovation.

We have been working to better understand, monitor and respond to the rapidly-evolving situation. With our partners across the College, Trust and Ipsos MORI, we launched the biggest and most comprehensive study of community self-testing for coronavirus, REACT. In doing so we are contributing to the evidence-base for public health policy and helping people to make informed decisions about their actions and behaviours. We have also been guiding international decision-making through our COVID behaviour tracker, which has been monitoring how populations across the world are behaving in response to the pandemic.

Our efforts to evaluate and establish remote surveillance for COVID-19 patients are also enabling safe monitoring at the individual level, while work to evaluate the use of mixed-reality headsets in wards is helping clinicians to deliver care from a safe distance.

While we are forced to stay further apart, it has never been more important to ensure that we continue to care for one another, and for ourselves. COVID-19 not only takes its toll on physical health

but mental health too. Which is why we are working to better understand the mental health burden of the pandemic and other crises, with a particular focus on young people who may feel the greatest uncertainty over their futures and that of the planet.

Although we don't know what the future will hold in the wake of COVID-19, what we do know is that it is only through continued collaborative efforts, such as those we outline in this report, that we can emerge stronger and more resilient, as individuals, communities and societies. It is through partnerships that we are able to continue to broaden our work so that we can remain agile and responsive to emerging needs, such as the complex interplay between climate change and health and the role of digital technologies in the delivery of care.

We hope that you can share our pride as we share with you our progress this year, marking our 10th anniversary, none of which would be possible without our people and our partners. Together, we have worked faster, achieved more, and reached further than ever before.

**Professor the Lord Ara Darzi
and Dr David Nabarro**

Co-Directors, Institute of Global Health Innovation



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About our Institute

We are a multidisciplinary team of pioneering people who break traditional research silos to tackle some of the greatest global health challenges facing the world today.

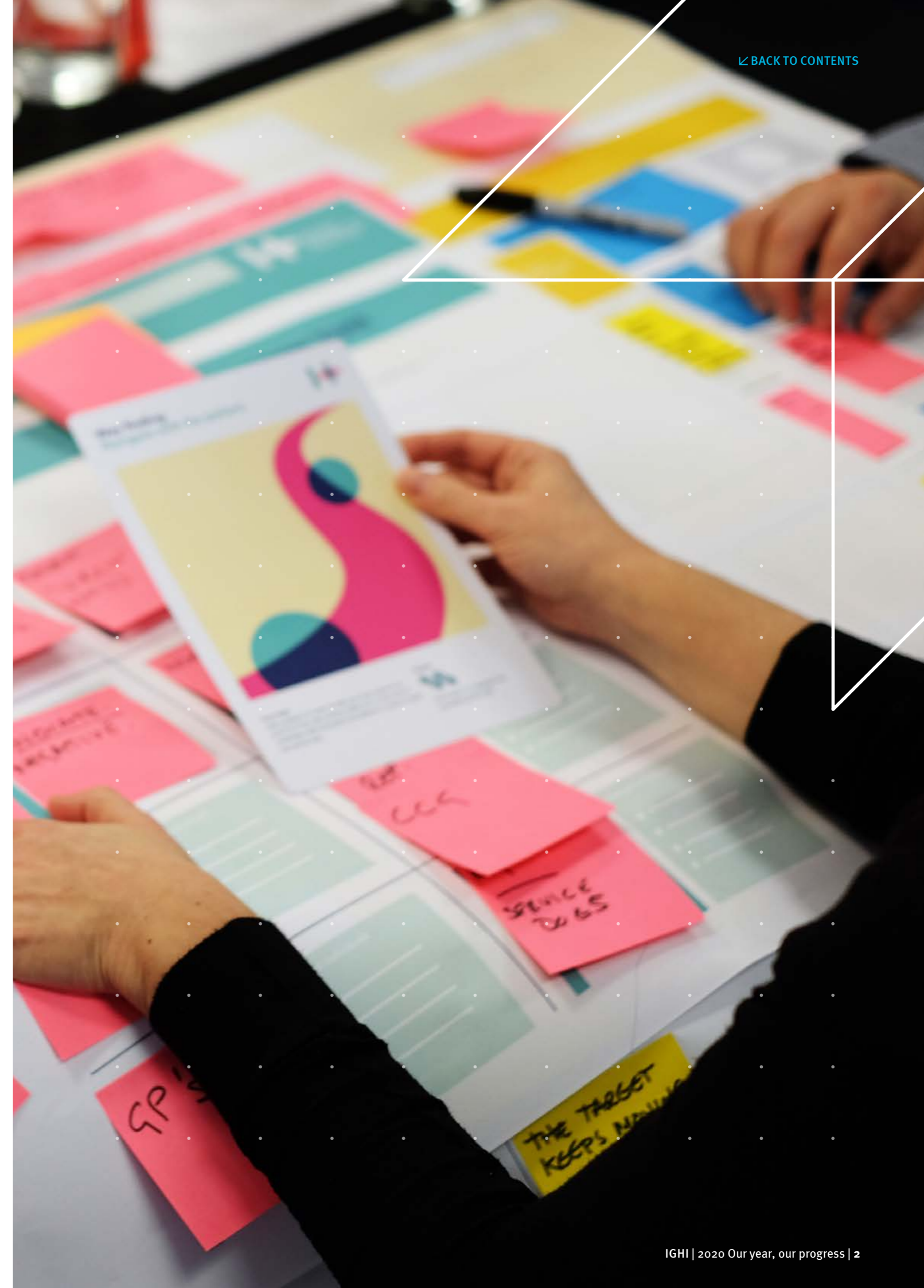
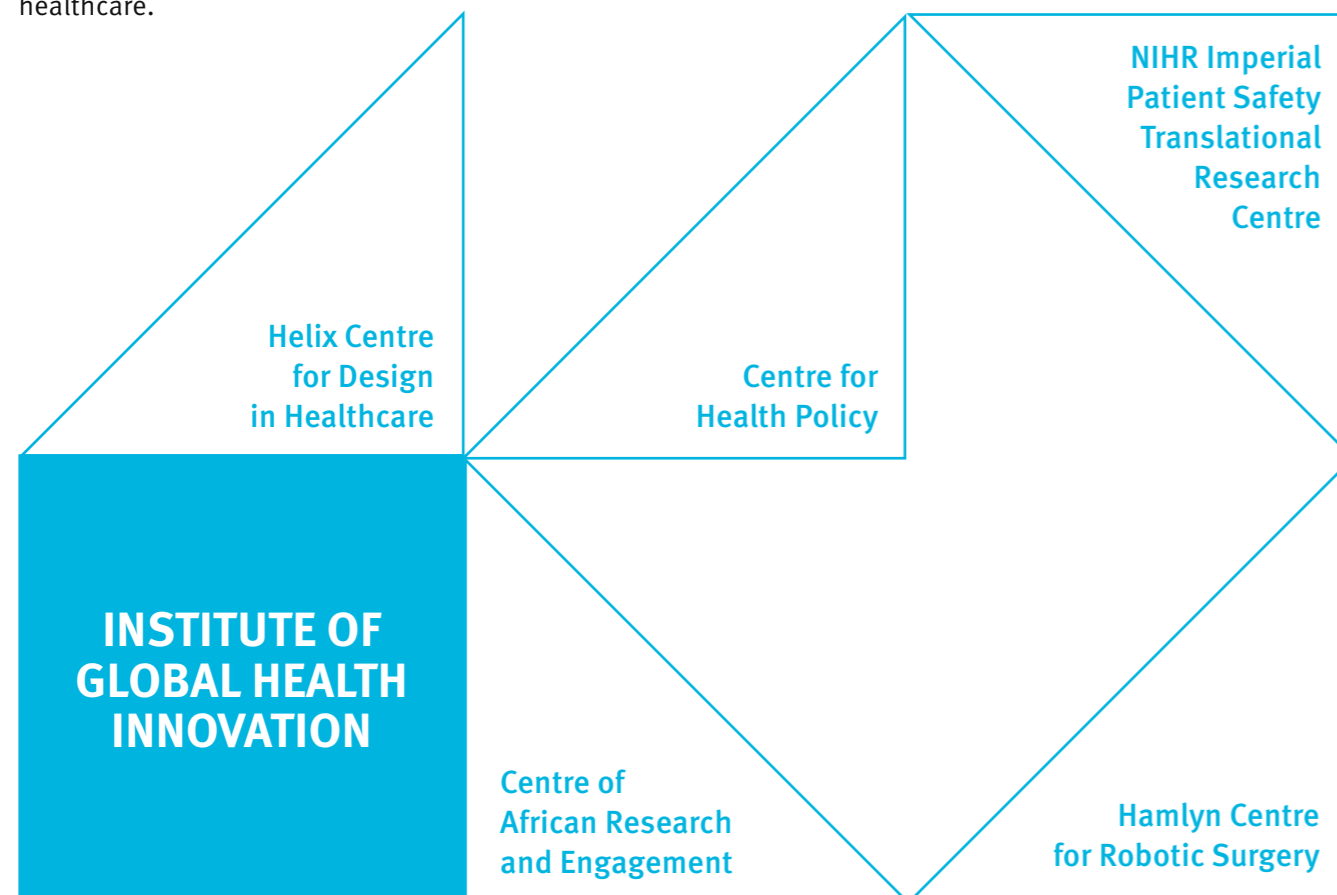
Our mission is to transform health for all through evidence-based innovation.

Our vision is to support the identification, development and widespread diffusion of healthcare innovation, and in doing so to sustainably reduce inequalities in global health for generations to come.

To realise our vision, we:

- design and diffuse high-impact global healthcare innovations.
- deliver world-class educational programmes.
- translate cutting-edge research.
- put people at the heart of everything we do.

Our work is made possible through our Centres of Excellence that innovate across medicine, policy, technology and design. Our Centres collaborate to share knowledge, skills and expertise so that we can solve bigger problems and accelerate progress in healthcare.



Responding to COVID-19 through innovation

IGHI has launched a number of national and global COVID-19 initiatives to help health systems and governments better respond to the ongoing crisis, focussing on building evidence, sharing knowledge, and promoting safety.

Global leadership in the response to COVID-19

Since early on in the pandemic, our co-director, Dr David Nabarro, has been playing a leading role in coordinating the global response to COVID-19.

Dr Nabarro is one of six public health experts appointed by the World Health Organization Director-General as Special Envoys on COVID-19. Together, the Envoys have been providing strategic advice and high-level political advocacy and engagement in different parts of the world, with Dr Nabarro's role focussing on Europe and North America.

With a range of actors including governments, businesses, local authorities and universities, the Envoys have been working to better understand the global situation, communicate evidence and advice, and unite nations in a collective effort to tackle the virus.

At the core of the role has been helping to shape and interpret the World Health Organization's guidance on COVID-19, accompanying people around the world so that they can make sense of the guidance, and reporting insights and activities to the Director-General.

One area that the Special Envoys have been focussing on is uncovering the broader societal consequences of the pandemic. In particular, the impact on poorer people in poorer circumstances,

for example those living in crowded homes or working in cramped conditions. In addition, the Envoys have been learning from the strategies adopted by different nations to identify which elements are key to effectively curbing the spread of the virus.

This work is enabling a better understanding of how to build defences for a more resilient society that can function even though the virus is present as a constant threat. Such capacities will be needed for the foreseeable future as – even when vaccines become available – it will take many months to ensure that they reach all those who wish to be vaccinated.

Open online briefings

Dr Nabarro has been growing an online international community to connect, exchange knowledge and develop ideas together during COVID-19. He organises [Open Online Briefings](#) twice a week. These interactive briefings are open to everyone, offering up to date information about the current situation and emerging issues.

“A culture of open sharing is important as societies make sense of, and respond to, novel threats. Given the enormous number of different actors dealing with the same issues across the world, there is a need for local and national leaders in different countries to analyse and share experiences. Cooperation, and not competition, is essential at this time.”

- Dr David Nabarro





REACT: tracking England's epidemic through home testing

Coronavirus testing has been an essential component of worldwide efforts to mitigate the effects of the pandemic. Doing so accurately and at scale offers critical information on the current burden of disease and how the virus has been spreading, revealing those most at risk and how the situation is evolving. This is vital to ensure that decision-making is based on robust, current evidence and that responses are targeted and appropriate.

These are the foundations of the REACT (REal Time Assessment of Community Transmission) programme, one of the biggest and most comprehensive studies of its kind, which we're helping to lead.

Led by a world-class team of Imperial scientists, clinicians and researchers, alongside colleagues at Imperial College Healthcare NHS Trust, Ipsos MORI and public partners, REACT is using community self-testing carried out at home to track the progress of England's epidemic.

The programme has two main arms that together are improving understanding of who, and where, infections are clustering in.

 <p>REACT 1 uses swab tests and laboratory PCR to look at how many people are currently infected with the virus. More than 150,000 randomly-selected people take part each month.</p>	 <p>REACT 2 is using antibody finger-prick tests carried out at a similar scale to indicate how many people have been infected and recovered and track antibodies at the population level over time.</p>
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Involving the public

Since May, more than 1.5 million people have already tested themselves at home as part of the study. Public involvement has also been vital in shaping the research from the outset.

The programme has carried out a [massive usability exercise](#) with more than 14,000 people to explore the feasibility of home testing at this scale, and to find out how easily people can use the tests at



home and read the result. A panel of public partners were also involved in informing the contents of the testing packs and the design of the easy to follow instructions, led by our Helix Centre. This work has helped to increase the likelihood that people will engage with the programme, with consistently high response rates, and be able to carry out the tests successfully, therefore offering meaningful results.

Finding the best test

Hundreds of antibody self-testing kits have been developed to enable community testing en masse, but there have been concerns over their accuracy and whether people can do the tests themselves without assistance from a healthcare professional.

REACT has therefore been analysing the performance of a number of different antibody finger-prick tests, called Lateral Flow Tests, to identify the most suitable kits for nation-wide seroprevalence studies. This has enabled the team to select the best test in terms of accuracy, availability for use at scale, and ease of use, with the flexibility to evaluate and consider new tests as they emerge.

Shaping policy

REACT has been commissioned by the Department of Health and Social Care. Its data and analyses form part of the evidence base that is guiding agile decision-making in response to the rapidly-changing situation in England. The speed and scale of testing have enabled the study to quickly detect rising rates of infections and hotspots, enabling timely public health responses from government.

The study has also been making all of its findings available to the public through regular reports and media engagement to help people stay informed and encourage safer behaviours among the public.



Meet the IGHI team:

- Ara Darzi**
- Gianluca Fontana
- Sutharsan Satkunarajah
- Lenny Naar
- Anna Lawrence-Jones
- Justine Alford

Operation Moonshot: Supporting mass population testing

Testing is widely acknowledged as the best weapon to tackle the coronavirus. The Government has pledged a moonshot programme to ramp up efforts and achieve population-wide mass testing by spring 2021, with the goal of carrying out as many as 10 million a day. Our co-director, Prof Darzi, chaired the Government's Moonshot Scientific Advisory Group. Together, this group advised on the validation, design and development of mass population testing across the country.



Building critical care capacity

Early on in England’s epidemic, large numbers of healthcare staff were redeployed to Intensive Care Units (ICUs) to help the NHS cope with the surge of COVID-19 patients, many of whom require mechanical ventilation. With an urgent need to increase care capacity, our researchers developed an online training tool that rapidly teaches doctors and nurses how to ventilate COVID-19 patients.

Created with our partners at Imperial College Healthcare NHS Trust and Fundamental VR, the training takes just 30 minutes and enables clinicians to manage patients under the direction of an intensive care consultant.

The training consists of a short how-to video that teaches the essentials of operating ventilators. Clinicians can use the tool on their smartphone at home or in real-time as they care for patients, enabling them to begin running ventilators

immediately under supervision. It can be accessed for free by any clinician across the world, regardless of health system or specialism.

Following initial launch across the Trust, the training has been rolled out both nationally and internationally. Working with Community Jameel to translate the tool, the training is now available in 6 languages: English, French, Spanish, Portuguese, Arabic and Hindi, helping more healthcare workers across the globe to access the training and build the capacity that’s vital to meet ongoing demands.



Meet the IGHI team:

Hutan Ashrafian
Rachel Davies
Barry Paraskeva

Working towards a safer future in the wake of COVID-19

The global coronavirus pandemic is arguably one of the greatest public health challenges of our time. It has required all people, societies, health systems and governments alike to act and respond to the pandemic.

To protect generations to come from experiencing another COVID-19, a global coalition focused on improving public health worldwide was forged in the wake of the crisis. The Trinity Challenge, which we are supporting, will work to prevent future health emergencies by providing £10 million of funding for innovations that could improve the world’s ability to identify, respond to and recover from pandemics and other global health threats.

Together, we will work towards a common goal of harnessing the power of data, technology and analytics to drive change and contribute to a world better protected from health emergencies.



“Through the Trinity Challenge, we can break boundaries that stifle innovation and set us along an urgently needed path of discovery and global collaboration towards a safer future for all.”

- Professor Ara Darzi, IGHI co-director

COVID data hub: a global survey to monitor changing behaviours and attitudes

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As lockdowns swept across Europe, in March 2020 we responded by convening world-leading experts in epidemiology, mental health, social science, behavioural science, health policy and economics to launch the largest COVID-19 health behaviour study of its kind, in partnership with YouGov.



In doing so, our aim has been to offer decision-makers a greater understanding of how their citizens are responding to the crisis, enabling them to tailor their public health strategies based on evidence.

With data from 29 countries donated by YouGov, our online survey tracks COVID-19-related health behaviours and attitudes such as social distancing, avoiding public transport, working outside the home and quality of life. These questions were asked on a weekly/bi-weekly basis in 29 countries between April and September 2020. The survey continues to be conducted across a subset of 15 countries.



Our key findings

Country variations:
Our data have revealed major differences in national behaviour. At the start of the survey period, for example, many Asian countries were already reporting high rates of face mask use. Western countries caught up soon, with the notable and continued exception of Nordic countries.

Age variations:
Younger and older people have shown contrasting adherence to government coronavirus measures. For example, older respondents reported more frequently avoiding crowded spaces and social gatherings, while simultaneously being less likely to engage in other preventive behaviours such as face mask use.

Gender variations:
This work has highlighted gender disparities in mental health, with women globally reporting higher anxiety and depression symptoms than men. We also found that, in contrast to previous trends, women are no longer happier on average than men.

Collaborators, research question contributors and key data users

We've worked with a range of partners to grow the reach and impact of our work. These include the World Health Organization, International Monetary Fund, UK Cabinet Office, Bank of England, Lancet COVID-19 Commission, UN Sustainable Development Solutions Network, World Happiness Report, and Oxford University Blavatnick School of Government.

Communicating our insights

To the public: we make all of our findings freely available via CovidDataHub.com, a publicly accessible visualisation hub co-developed and managed by our Big Data and Analytical Unit. This dashboard, updated weekly, has led to accelerated collaborations, data querying, and semi-automated data reporting.

To researchers: YouGov has made our raw datafiles available on GitHub, which researchers can access to incorporate the data into their own projects, leading to peer reviewed publications and contributions to a landmark report by the International Monetary Fund.

To policy-makers: Our reports, designed in partnership with Made by Many, are tailored specifically for a policy audience. These weekly reports focus on global and individual country trends in COVID-19 related behaviours. [All reports are made publicly accessible here.](#)

Meet the IGHI team:
Sarah P. Jones
Melanie Leis
 Roberto Fernandez Crespo
 Hutan Ashrafian
 Gianluca Fontana
 Natalie Melas-Kyriazi
 Noor Al-Zubaidy

Understanding the impact of COVID-19 on the use of digital technologies in primary care

The COVID-19 pandemic has abruptly changed the face of primary care. Face-to-face consultations rapidly shifted to “digital-first” solutions, such as telephone, video, or online services. We wanted to better understand the extent of these changes in primary care, the impact on clinical practice and lessons for the future.

As part of our inSIGHT project, in collaboration with the European General Practice Research Network, more than 1,500 GPs from 20 countries have shared their views on the adoption of digital-first models during COVID-19. While the majority believe that these technologies have had a positive impact in a number of ways, including reducing COVID-19 transmission and enabling patient monitoring, our results highlighted a range of concerns including uncertainty of identifying patients at risk of clinical deterioration. To address this, we’re working with the University of Oxford to develop and validate a primary care early warning score (RECAP – Remote COVID-19 Assessment in Primary Care). This aims to identify people with COVID-19 who could be at risk of severe disease, helping them receive the care they need sooner.

To facilitate sustainable adoption of digital technologies in primary care, it is vital to listen to the voices of patients, as healthcare’s most important stakeholder. That’s why we’re exploring patients’ perspectives using targeted public research supported by the Imperial COVID-19 Response Fund. We will survey members of the public in 10 countries about their use of these technologies, perceptions on impact in quality of care, and whether they have widened health inequities between different groups of patients.

This work will help to grow the evidence-base on the impact of these models, and offer a brief to policymakers who are working at the cutting-edge of integrating digital-first technologies into a post-COVID-19 healthcare environment across the world.



CW+ and Mile91/Ben Langdon



Meet the IGHI team:

- Ana Luisa Neves**
- Edmond Li
- Gianluca Fontana
- Saira Ghafur
- Jackie van Dael
- Clarissa Gardner

Community Makers: designing for dementia

Designers at our Helix Centre are working across Imperial’s UK Dementia Research Institute Care Research and Technology Centre to bring a human-centred approach to the team’s work. This collaborative project is developing a smart “Healthy Home” system, called Minder, to enable remote health monitoring for people with dementia and improve understanding of this common disease.

COVID-19 has made this work all the more urgent as people with dementia are some of the most vulnerable, isolated, and least able to adapt. We joined forces with the Alzheimer’s Society Innovation team and the Association of Dementia Studies at the University of Worcester to explore how technology could play a role in reducing isolation and maintaining support for people affected by dementia.

Through this collaboration we developed [Community Makers](#), a digital resource to help community groups set up local online networks to replace the face-to-face meetings that provided key support pre-COVID-19. This includes a knowledge exchange network that meets online monthly to share experiences and advice, and a library of creative ideas to inspire groups with different approaches to digital involvement.

To help us reach as many people as possible, we have a growing Slack workspace of community organisers representing groups from Scotland, Wales and England, rural and urban settings, and those focussing on minority ethnic populations. Groups within the network vary in size from supporting over 150 people with dementia to new groups just setting up. One example is Dementia Matters Here(forshire), established during the pandemic as a digital-first group on the back of our Community Makers collaboration.



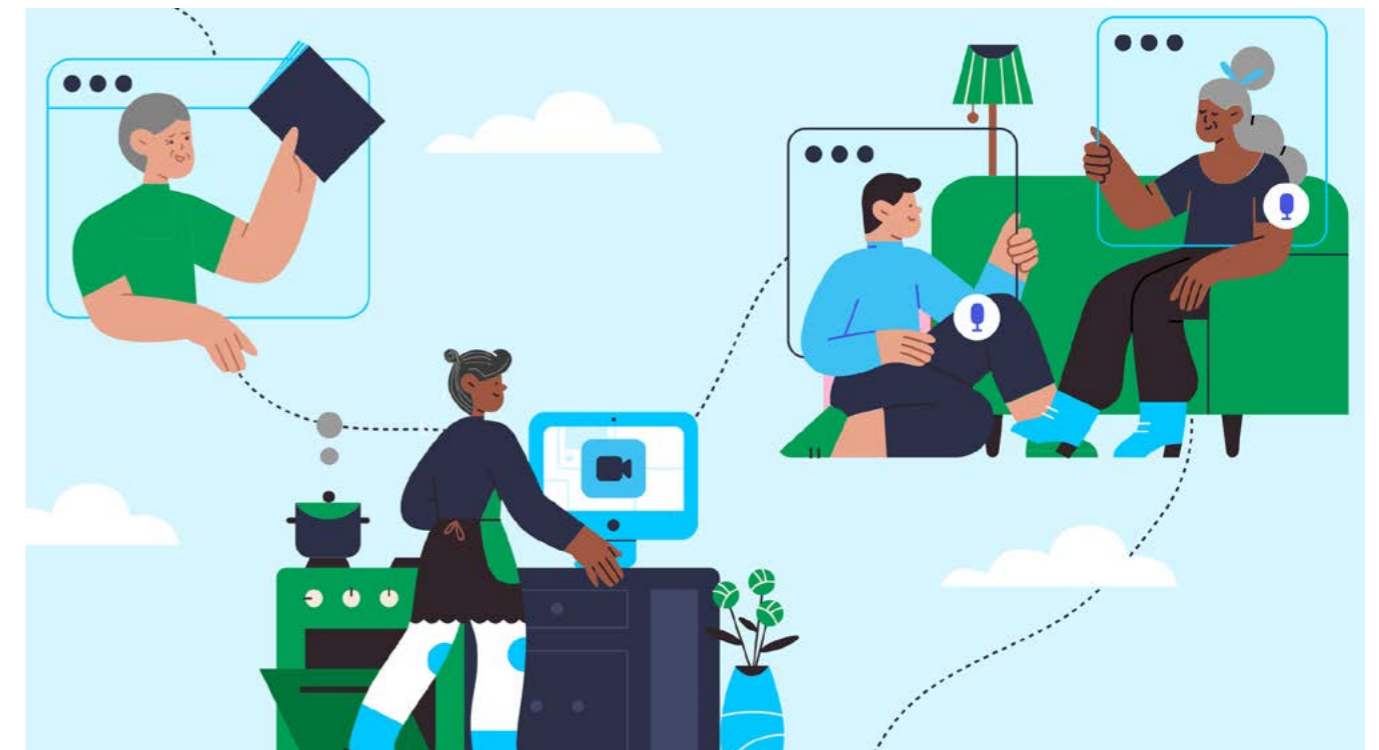
Meet the IGHI team:

UKDRI / Minder:

- Lenny Naar**
- Matthew Harrison
- Pip Batey
- Lauren Dowling

Community Makers:

- Matthew Harrison**
- Alice Blencowe
- Lenny Naar
- Lauren Dowling



Delivering care from a distance: evaluating remote monitoring

Oximetry at home

In response to national COVID-19 priorities, our NIHR Imperial Patient Safety Translational Research Centre (PSTRC) has been assessing the safety and effectiveness of home oximetry, which measures blood oxygen levels, as a community pathway for managing coronavirus patients.

With Imperial College NHS Healthcare Trust and NHS Digital, we have been evaluating a range of remote monitoring procedures implemented internationally during the first wave of the pandemic. Our analysis revealed facilitators of successful remote monitoring. These ranged from digital system integration and supportive policy environments to clinical partnerships. Importantly, the work also highlighted that patients with comorbidities, and those with lower oxygen saturations at onboarding, had a higher risk of hospitalisation and COVID-19-related mortality.

These findings contributed to NHS England/Improvement's decision to roll out COVID-19 home oximetry across England in early November 2020. We have since been commissioned to continue this work and improve understanding of the clinical effectiveness of home oximetry on a national scale. With NHS Digital and a consortium of partners including the Health Foundation, we are exploring whether this approach can improve outcomes and support patients to access the services they need. This work will reveal the effectiveness of remote oximetry and produce findings that will inform that direction of policy making for future waves of COVID-19 or similar conditions.

 **Meet the IGHI team:**
Kelsey Flott
 Jonathan Clarke
 Big Data and Analytical Unit

Wearable sensors

Wearable sensors can enable clinicians to monitor trends in vital signs continuously and remotely, which is important in the context of COVID-19. Our researchers have therefore been exploring whether such sensors could enable the delivery of healthcare outside of hospital facilities, for example in hotels and other facilities commissioned by the NHS, to help cope with the increased care demand from COVID-19.

We designed a pilot proof-of-concept trial in engineered hotels near London airports. People involved in the study were travellers with mild suspected COVID-19 symptoms requiring quarantine, or healthcare professionals with COVID-19 symptoms unable to isolate at home. We used the SensiumVitals™ patch, which measures temperature, heart and respiratory rates every two minutes, as a monitoring device for the duration of their stay. The data collected by the lightweight sensor is automatically analysed by a computer algorithm and can be seen by a medical team, alerting them when a person's health may be worsening and enabling swift intervention.

Our work has demonstrated the feasibility of using this rapidly implemented model of healthcare delivery, allowing clinicians to interpret signals of deterioration and respond successfully. This approach could also improve health worker safety by reducing exposure to the coronavirus, and limit the use of personal protective equipment (PPE).

 **Meet the IGHI team:**
Fahad Iqbal
 Meera Joshi
 Hutan Ashrafian



Working with and for young people with mental health difficulties


Lockdown has had a detrimental impact on young people's mental health, likely due to limited social contact with friends and family, forced routines and uncertainty about the future. We wanted to explore this further with young people and understand how they have been coping with these changes, and launched our [CCopeY](#) (COVID-19 Coping in Young People) study to do this.

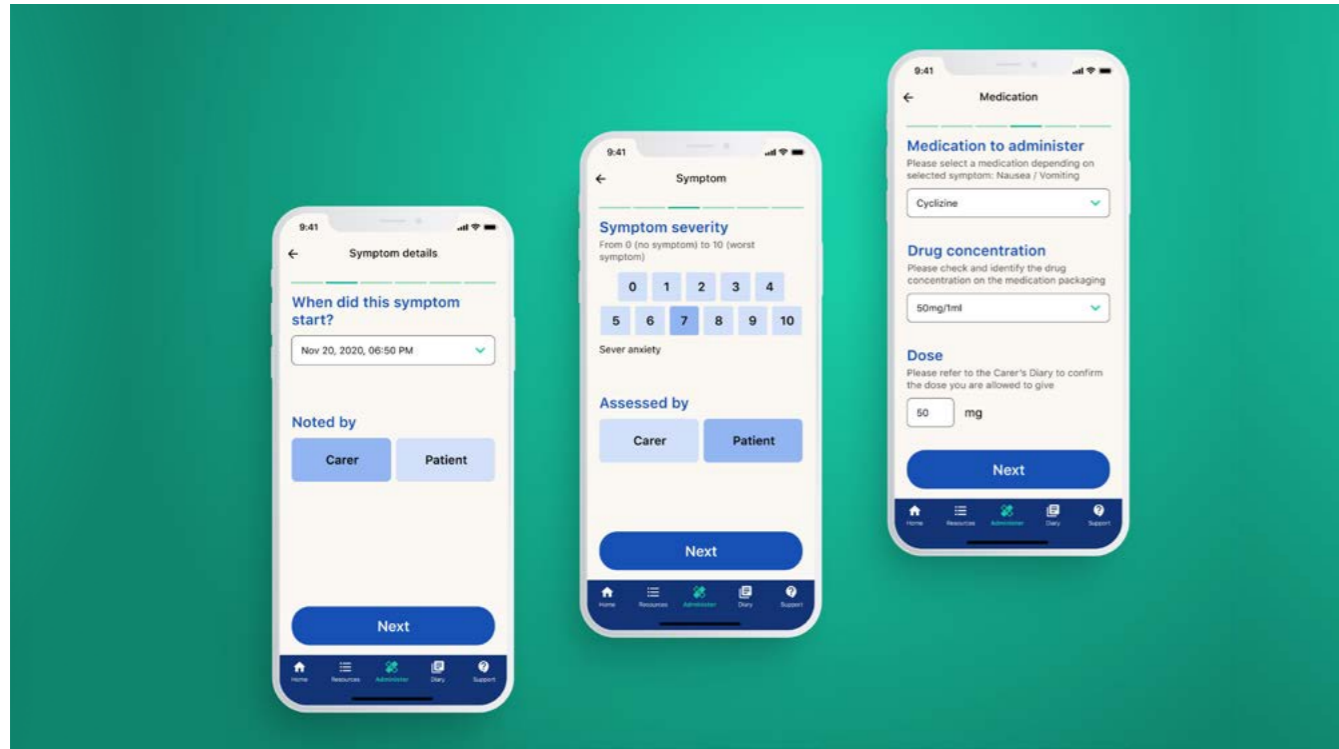
Through our repeated online survey and interviews, we're helping to paint a fuller picture of how the pandemic is affecting young people, from their mood to sleep patterns, and the strategies young people are using to cope. We worked together with young people with mental health difficulties across all stages of this co-produced research project, including young people carrying out interviews and analysing data.

We found that around a third of young people surveyed had poor mental health, which was worse than expected, and identified several factors that were linked with poor mental health, including self-blame and substance misuse. But through our interviews we were also able to identify a number of useful coping strategies that young people were using, including exercise and meditation/mindfulness. Importantly, we also identified barriers to accessing mental health care and possible ways to overcome them, such as digital peer support, which we will take forward as our research progresses.

These findings tie into two other projects. One of these, commissioned by Wellcome, has been examining the importance of social connection in digital mental health services for young people with depression and anxiety. Working together with a young people's advisory group, we found quality social connection in digital interventions plays an important role in improving outcomes, particularly for depression. Our findings have implications for future development of digital services, particularly during the COVID-19 pandemic, where support will be increasingly provided online.

The other project, Fightin Thru, is a collaboration with The Mind Map, Golden Gloves UK boxing gym and young men of colour from Toxteth, a deprived area in Liverpool. The aim of the project is to use boxing to raise awareness of mental health and appropriate support. The team is co-producing events on Instagram about mindfulness, exercise, diet, sleep and finances.

 **Meet the IGHI team:**
Lindsay Dewa
Paul Aylin
 Anna Lawrence-Jones
 Cat Kilkenny
 Lily Roberts
 Emma Lawrance
 Hutan Ashrafian



Supporting community-based palliative care during COVID-19

The majority of people who die every year would prefer to die at home, yet only about half achieve this. This is often due to not being able to manage symptoms and pain relief at the end of life. The 2019 [CARIAD](#) study found that lay-carers trained to carry out timely administration of as-needed medication for dying patients being cared for at home could dramatically reduce waiting times for these injections.

Building on this, we are now working with the CARIAD team, along with NHS hospice partners and carers, to develop a technology-driven support tool for carers. We aimed to increase the confidence levels of carers, improve the overall experience of managing symptoms and treatment in the home and unlock opportunities for robust data collection for quality improvement and improved patient safety.

Our solution, Palliate, seeks to improve the access and quality of training and support for carers to administer subcut medications in the home, to support patient preferences for a home death while also reducing pressure on community care teams. It does this by providing carers with digital information and support, via an app.

With the pandemic adding further pressure to already stretched health systems, the need to support care in the community has become ever more prominent. In response, we accelerated the development of Palliate. And with an urgent need to provide support during the crisis, we also rapidly deployed a website tool that incorporated the training materials and processes, which was used by NHS and hospice teams during the first peak of the epidemic. Through that we were able to swiftly validate the role of design and technology to support community palliative care, especially in a crisis, and our learnings are helping to improve Palliate as we continue its development.



Meet the IGHI team:

Ivor Williams
Imogen Eastwood
 Milo Hill
 Lily Hoskin
 Greta Castellana
 Cat Kilkenny

Medical robotics for contagious diseases

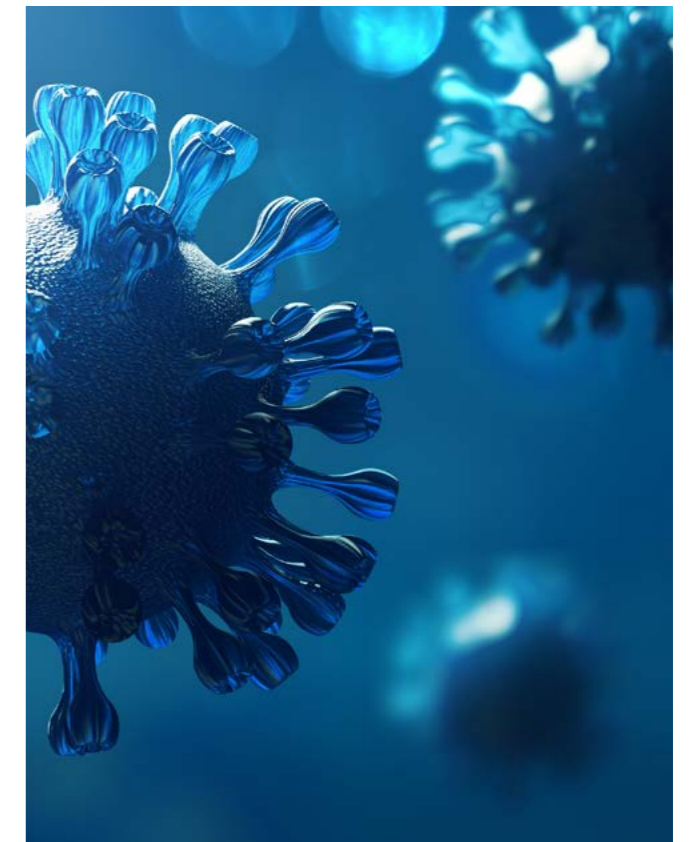
Robotics research and innovation communities have played a key role in the response to COVID-19. To spur innovation in this important sphere, the UK Robotics and Autonomous Systems (UK-RAS) Network, which our Hamlyn Centre is part of, launched a timely new international competition in a bid to accelerate relevant research and development for the global COVID-19 response.

The [Medical Robotics for Contagious Diseases Challenge 2020](#) aims to encourage researchers all across the world to bring forward ideas and innovations that could offer solutions for the pandemic and future health emergencies. This online competition, sponsored by Imperial, Wellcome and others, will be judged by an expert panel including our co-director, Prof Darzi, and will offer the winners £15,000 to progress their work.



Meet the IGHI team:

Marianne Knight
 UK-RAS Network



Exploring the use of data and digital to address the crisis

The COVID-19 pandemic has radically changed the environment in which health services are delivered. With the rapid shift to remote delivery, working and collaboration has come a rise in the use of digital platforms. Our collaboration with EY has been investigating the challenges that healthcare organisations face in implementing digital and data solutions.

We partnered with YouGov to commission a multi-country survey to test the views of health service providers on how they have used digital solutions to respond to the crisis and how they anticipate the crisis altering service delivery permanently for the future, complemented by a series of expert interviews. Our report is due in the new year, which

will be followed by a further report that will look at how successful organisations across the world have overcome the challenges to leverage data and analytics in the provision of health and social services. We hope that the insights will provide a view into how healthcare organisations are leveraging the power of data and digital solutions to improve the lives of the citizens they serve.



Meet the IGHI team:

Melanie Leis
 Didi Thompson
 Roberto Fernandez Crespo
 Lisa Gould

PanSurg, a global hub for safer surgical care during COVID-19



In recognition of the unparalleled challenges currently facing healthcare systems around the world from the COVID-19 pandemic, a team from IGHI and the Department of Surgery and Cancer created the [PanSurg collaborative](#).

Through a range of collaborative, research, data and engagement initiatives, PanSurg aims to enable the delivery of safe, effective surgery during the pandemic.

Risk prediction to aid surgical decision-making

With the strains imposed by the pandemic, patients requiring surgery will present to hospitals experiencing depleted resources, presenting admission and management challenges. There is therefore an urgent need for risk-prediction models to address this complex issue. PREDICT was created in response to this need.

PREDICT seeks to understand the excess death and illness in the surgical population directly caused by coronavirus infection, as well as through the collateral effects of surgical service disruptions caused by the pandemic. The initiative launched two parallel studies – an observational study and a service survey – to achieve this, which are collecting, analysing and interpreting global in-hospital data. 55 surgical teams from 24 countries globally contributed towards PREDICT, collectively entering data for 5,692 patients. These data are undergoing analysis by the PanSurg team and will be available next year.

Mixed reality for safety and education

PanSurg worked with Microsoft and the Imperial College Healthcare NHS Trust to introduce HoloLens mixed reality headsets in COVID-19 wards to support the provision of safe clinical care. The technology was trialled in a bid to reduce the number of staff who need to interact with patients, while maintaining the delivery of high-quality care.

This initiative demonstrated a [significant reduction](#) in staff exposure to COVID-19 and an 83% reduction in PPE use by clinical staff, or 3,100 fewer PPE items each week.

The team is continuing to explore the development of HoloLens for use during COVID-19 through a Defence and Security Accelerator grant. In addition, in collaboration with Imperial's School of Medicine, PanSurg delivered the world's first virtual Grand Round using the technology and is now working on a trans-Atlantic partnership with Michigan State University to deliver undergraduate medical teaching.

Knowledge exchange for the global surgical community

Education and sharing of experience was one of the core aims of PanSurg when it was established in March 2020 and continues to remain central to the collaborative's efforts. As part of this drive, PanSurg has hosted [23 webinars](#) to over 5,000 people. These have had a distinctly international flavour with hosts from Italy, Spain, Singapore, America and Africa.

Topics have been varied and include management of cancer services, crisis management, humanitarian challenges, mental health and medical education.

The webinar series culminated in an “Aftershock” report, investigating how we can optimise the delivery of healthcare during a pandemic to minimise the collateral damage to patients with other medical conditions. The team [published a White Paper](#) which summarised our findings.

Staff wellbeing and safety

The coronavirus pandemic has put healthcare staff under tremendous, sustained pressure. Early webinars in the PanSurg series recognised the potential for mental ill-health and burnout among staff due to stress, long working hours, job reassignment, lack of breaks and an extremely challenging working environment. Our SSAFE – [Staff and SAfety effects of Epidemics](#) – study investigated the impact of COVID-19 on the safety attitudes of healthcare professionals. Being female, non-white and working in nursing were identified as factors contributing to lower perceived safety in the hospital environment during COVID-19.

In recognition of these challenges, PanSurg paired frontline NHS workers with key figures to create podcasts exploring coping strategies in adversity. The podcasts, called Hidden Strengths, focus on issues such as endurance, emotional challenges, cooperation and team collaboration. The series sees the first British citizen to go into space, Helen Sharman, professional boxer and politician, Manny Pacquiao, and British journalist, Frank Gardner, in conversations with NHS workers talking through their own stories and experiences of adversity. [You can hear the podcasts here.](#)



Meet the IGHI team:

Guy Martin
Jasmine Winter-Beaty
Alasdair Scott
Sanjay Purkayastha
James Kinross
Jonathan Clarke
Ravi Aggarwal
Ola Markiewicz
Sam Mason
Viknesh Sounderajah
Seema Yalamanchili
Nikita Rathod

Themes:

- #digital health
- #data science
- #mental health
- #technology
- #education
- #design
- #policy
- #patient safety

Highlights from our work

We're working to better understand the problems facing global health and care and create innovative ways to address them. Our collaborative, people-centred, interdisciplinary approach also means that we are flexible to adapt to emerging health needs and respond to current issues.

The breadth of our work is one of our defining strengths. Our growing focus areas are digital health, data science, mental health, innovations in technology, education, design in healthcare, shaping health policy, and patient safety.

Explore highlights from our ongoing activities and find out how we're making a meaningful difference for patients, professionals and health systems alike.

Exploring the relationship between climate change and mental health



The climate and ecological crises are linked with a range of mental health impacts and will increase mental health needs while potentially disrupting health system capacity. To better understand and respond to this complex issue, particularly in young people who appear more vulnerable, we have launched a programme of work that is seeking to address this pressing challenge through generating evidence, developing interventions and guiding policy.

Climate cares

We have convened [an interdisciplinary partnership](#) of researchers, designers, policy-makers and educators working across Imperial and beyond to understand and support mental health in the current climate and ecological crises. Overseen by IGHI co-director Dr David Nabarro, our vision is for individuals, communities and healthcare systems to have the knowledge, tools, and resources to become resilient to the mental health impacts of climate change. We have hosted a seminar with global leaders, established an international Advisory Board, and carried out a number of public engagement and involvement activities.

Changing worlds

In partnership with a UK-wide Young Person's Advisory Group, our Changing Worlds programme is using a dual approach of a survey and guided journal to both understand and respond to the psychological and emotional needs of young people aged 16-24 as they navigate crises, including COVID-19 and climate change.

#mental health
#digital health
#policy

As well as a research tool, the guided journal also acts as an intervention to empower young people by providing them with a way to self reflect and discover their own sense of agency in order to act in an impactful, meaningful and healthy way. As a global issue, we have been working with our international collaborators to expand the programme; our UK survey has been adapted for use in the Philippines, India and USA to date.

Shaping policy

Working with Imperial's Grantham Institute – Climate Change and the Environment, we have produced a policy briefing paper summarising the current evidence base for the mental health impacts of climate change. We also make a series of recommendations that decision-makers can take to bring co-benefits for people and planet. This will be launched with a range of activities in early 2021.

“In our current system, healthy sustainable living is hard. It requires you to care a lot. Most people don't.”

“Society has always had huge problems to solve but now there is much despair; we have lost our hopes and dreams.”

- from members of the public at our engagement activities



Meet the IGHI team:

Emma Lawrance
Pip Batey
David Nabarro
Lily Roberts
Nikita Rathod
Justine Alford
James Diffey

#mental health
#data science
#digital health

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Improving understanding of mental health needs

Traditional services are struggling to meet growing mental health demands. In this context, the Shout 24/7 digital crisis text line is a vital service, while the data it captures also offers a unique opportunity to gain insight into the UK's mental health needs and the impact of Shout.

We're privileged to have partnered with Mental Health Innovations, the digital charity behind Shout, which has enabled collaborative development of a unique, anonymised dataset of nearly 500,000 conversations between a Shout texter and a Shout Volunteer. This provides a window into the issues faced by people across our nation, particularly young individuals, providing an invaluable evidence-base for service development to support mental health.

Our partners from the College's Centre for Mathematics of Precision Healthcare and Data Science Institute are developing and applying cutting-edge machine learning and natural language processing algorithms to the data. This has enabled us to successfully predict texters' suicidal ideation, and learn more about the people who use Shout and the impact of the service. Such insights will help Shout and the mental health sector respond to the large and rising mental distress faced by many, and we will work in partnership to do so.

To help Shout texters understand how we use their anonymised data to help others, and to ensure our research is tailored to their needs, we've run a number of public engagement and involvement events. These include online workshops with users of Shout and digital charity The Mix, helping to improve the information about data usage on the platforms.

The project is also working in partnership with Shout and the West London NHS Trust to develop a programme of work that will improve access and suitability of mental healthcare for young, underserved communities, particularly people of colour and those identifying as LGBTQ+. We will use Shout data and work alongside these young people to connect community and NHS care, ensuring people have access to the right help at the right time.



Meet the IGHI team:

Emma Lawrance

Cat Kilkenny

Lily Roberts

Anna Lawrence-Jones

Lindsay Dewa

Melanie Leis

Big Data and Analytical Unit

Gianluca Fontana

#digital health
#patient safety

Cyber security: building resilience in health systems

The number and severity of cyber-attacks against healthcare systems and hospitals has increased significantly, compromising the health information of millions of people. In response to this issue, we launched a programme of work on cyber security in healthcare with the College's Institute of Security Science and Technology.

Over the past year, this programme has become recognised as a leading academic player in this field. Following on from the publication of our White Paper, '[Improving Cyber Security in the NHS](#)', we have been working with national organisations including NHSX, NHS Digital, and the National Cyber Security Centre, and international partners. For example the Foreign, Commonwealth and Development Office and its country offices globally have adopted our cyber security update infographic designed for health and social care staff. And we have submitted a proposal to the World Bank to produce a White Paper on the state of global healthcare cyber security, with a focus on low- and middle-income countries.

Working with our [Leading Health Systems Network](#), we recently undertook a global survey of healthcare providers to explore cyber security in their countries and developed [a global readiness framework](#) for cyber security in healthcare. We are continuing to expand our work in this area, including an evaluation of how the pandemic has impacted healthcare cyber security, and the development of novel mathematical modelling that can be used to improve cyber resilience.



Meet the IGHI team:

Saira Ghafur

Niki O'Brien

Guy Martin

Emilia Grass

Mike Durkin

#data science
#policy

Maximising the value of the NHS data asset



The NHS owns long-term health data for the majority of the UK population and this unique asset is poised to be transformative for health, scientific and economic benefit. Our White Paper, '[NHS data: Maximising its impact on the health and wealth of the United Kingdom](#)', offers a framework to guide the proper use of the UK's health data assets and unlocking their vast potential. Launched in February 2019, this paper received considerable traction and publicity in mainstream media and, with 4,300 downloads to date, is the fourth most viewed report from Imperial College London in 2020.

We've also partnered with NHSX's new Centre for Improving Data Collaboration to provide NHS organisations with a clear framework and guidance for entering into value sharing agreements when licensing data. And our collaboration with Understanding Patient Data and the Health Foundation will generate a better understanding of the research needed to interrogate public data sharing attitudes throughout the COVID-19 pandemic.

Meet the IGHI team:

Saira Ghafur

Jack Halligan

Gianluca Fontana

Niki O'Brien

James O'Shaughnessy

#digital health

Evaluating digital health technologies

There is no universally accepted way to demonstrate the effectiveness of digital tools in healthcare. This remains a barrier to the uptake of new innovations. We're therefore working with collaborators and commercial companies to develop [novel approaches to generate evidence for digital products](#) as a critical step to proving their potential.

Decision support for cancer care

Using a simulation-based approach, we have [evaluated Roche's NAVIFY Tumor Board](#), a tool for facilitating cancer multidisciplinary team meetings, and NAVIFY Clinical Trial Match, an application to assist with screening and recruitment to cancer clinical trials. In 2021, we will expand the evaluation of the NAVIFY Clinical Trial Match and conduct a review of US practices for screening and recruitment to cancer clinical trials.

Remote care and risk prediction for diabetes

We're working to use data science and digital technologies to improve the management of diabetes. Our work includes the Type 2 Diabetes Exemplar Programme with AstraZeneca, which has designed a remote care service to help GPs identify patients at a high risk of developing health complications, and the "Risk Algorithms for Decision support and Adverse outcomes Reduction (RADAR)" project, which uses risk prediction tools powered by artificial intelligence to enable early intervention for people with diabetes. We will evaluate both of these solutions with a view to supporting their adoption across North West London.



Meet the IGHI team:
Jack Halligan
Clarissa Gardner
Saira Ghafur
Gianluca Fontana

#data science
#digital health

Big data to accelerate healthcare interventions

We're the lead academic partner in [Discover-NOW, the Health Data Research Hub for real-world evidence](#). The Discover-NOW Hub offers IGHI 'regulation ready' and GDPR compliant tools and technologies to support health research. These include a high-performance analytics environment and access to a consent-to-contact research register of over 7,000 people.

Through Discover-NOW, IGHI is collaborating with organisations from industry and the NHS such as AstraZeneca, Imperial College Health Partners, North West London Clinical Commissioning Groups, Huma and MyWay Digital Health. Projects with these collaborators aim to accelerate the development of new treatments, devices and apps, such as the Type 2 Diabetes Exemplar Programme. These research efforts are enabled by the Discover dataset - one of the largest linked and de-identified datasets in Europe. It links primary, acute, mental health, social and community care data from over 2.4 million people in North West London and scaling to 9 million people over time.



#data science
#policy

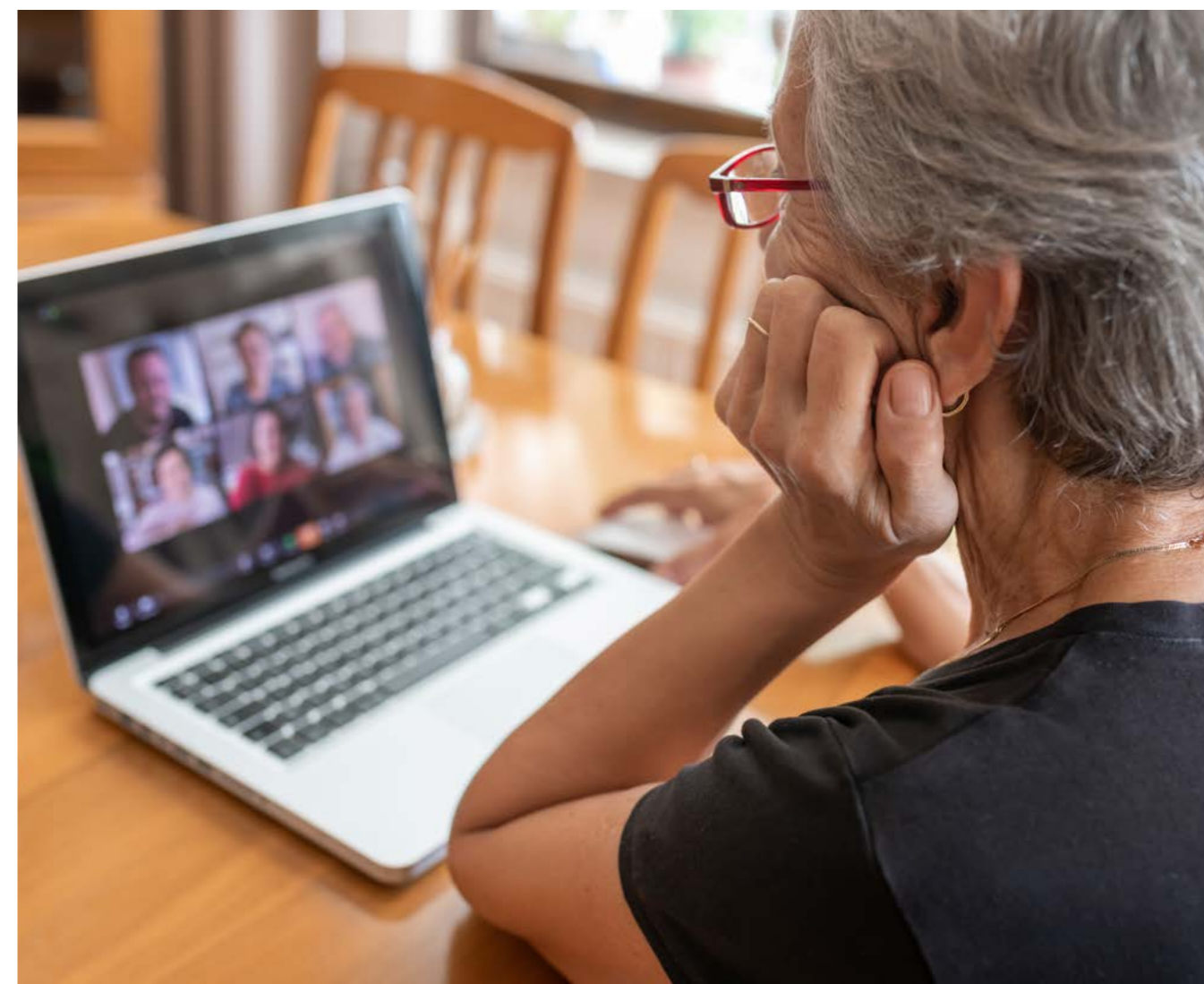
Involving community members in setting priorities for data analysis

IGHI, in partnership with Imperial College Health Partners and Imperial researchers, has been funded as one of five Network Data Labs across the UK. The aim is to use the Discover dataset to answer key research priorities for health and care since COVID-19, raised by local communities, and to translate the findings into policy and practice.

The first analysis is centred on people who have been shielding. Following a workshop with 50 community members from North West London, with a focus on seldom heard groups, we have identified a number of themes including access to care, digital exclusion and late diagnosis, and are now undertaking a prioritisation exercise.



Meet the IGHI team:
Melanie Leis
Anna Lawrence-Jones
Roberto Fernandez Crespo
Cat Kilkenny



#patient safety
#data science
#design
#policy

Making the systems and processes of healthcare safer

Our NIHR Imperial Patient Safety Translational Research Centre (PSTRC) is dedicated to making the systems and processes of healthcare safer and improving the quality of care. Despite the challenges presented by COVID-19, our Centre has made continued progress and new developments over the past year.

Feedback for quality improvement

By enabling learning from patient experiences, we're helping to deliver real translational impact in the NHS. Our digital platform using Natural Language Processing to analyse dynamic patient experience feedback was embedded within Imperial College Healthcare NHS Trust early in February 2020. Further funding has since supported the scaling up of the project, which is now supporting four further NHS trusts to use free-text patient experience feedback towards quality improvement.

We are also pioneering novel approaches to learning from patient complaints. Following a pilot study comparing the Healthcare Complaints Analysis Tool (HCAT), the evidence-based complaints analysis tool, with the current NHS policy guidelines at Imperial College Healthcare NHS Trust, HCAT has now been permanently implemented at the Trust. Subsequently, a national follow-up trial has been conducted at five trusts. As part of this research, we worked with IGHI's Helix Centre to develop an online community platform, ['Feedback First'](#), focused on improving the use of patient feedback across healthcare settings, which has formed part of a multi-trust trial.

Meet the IGHI team:
Erik Mayer
Mustafa Khanbai
Jackie Van Dael
Pip Batey
Lenny Naar
Kelsey Flott



Dosium: augmenting clinical decision making and reducing medication errors

Up-to-date medication prescribing data is vital for clinicians to make safe and informed decisions on the front line. Too often though, this data is fragmented and, most importantly, not machine-readable. This makes it unusable for computerised systems like clinical decision support.

Our team of clinicians, engineers and designers from our Helix Centre and PSTRC, working in partnership with the Royal Pharmaceutical Society, have spent tens of thousands of collective hours experiencing and understanding threats to medication safety first-hand. Through this research effort, the team identified a notable absence of modern digital tools to support clinicians through the medication administration process, which was found to be highly error-prone.

With funding and support from research grants, including a prestigious NIHR Invention for Innovation (i4i) award, the team has now developed one of the world's most advanced, real-time medication decision support systems, which puts doctors, nurses and pharmacists in direct contact with the most up-to-date and patient-specific medication guidance at all times. By integrating a range of data including patient and drug manufacturers' information, national formularies and hospital protocols, Dosium's Touchdose app ensures that the right patient receives the right drug, at the right dose, at the right time.

Text messages as behavioural interventions

Following the success of our trial of a text message-based intervention to reduce burnout in trainee anaesthetists, conducted in partnership with the Behavioural Insights Team, we are now establishing a trial of organisational-level interventions to reduce burnout in nursing staff, in close collaboration with Imperial College Healthcare NHS Trust.

With Public Health England, we are also exploring the potential of behavioural interventions to increase breast cancer screening attendance. Our study is evaluating the use of text messages and new message-based technologies in population screening

While maintaining research engagement with IGHI, the project successfully spun out from Imperial College London in October 2020, and is working closely with key national authorities, leading NHS Trusts and forward-thinking technology and clinical partners to deliver detailed decision support and world-class user experiences to the clinical front line.



Meet the IGHI team:
Nick Appelbaum
John Morrell
Carmen Rodriguez Gonzalvez
Marius Matei
Daniel Dickens
Philip Pratt
Calandra Feather
Bryony Dean Franklin
Matt Harrison
Lily Hoskin
Jonathan Clarke

programmes. Through a co-design process with the collaboration of designers, behavioural scientists, patients and clinicians, we aim to develop a video intervention that could help overcome common barriers identified through this programme.

Meet the IGHI team:
Gaby Judah
Amish Acharya
Alix Brazier

Innovating end-of-life care for children

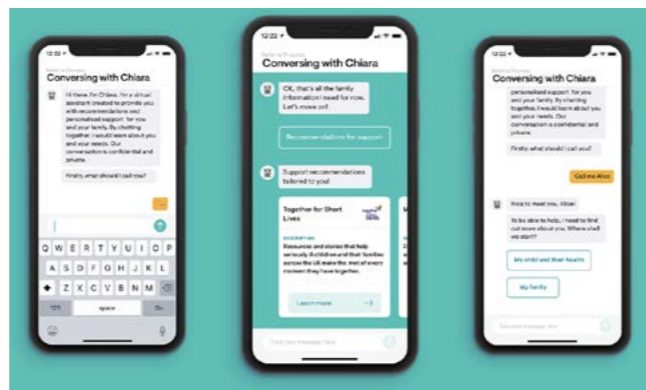
Since 2018, our work has been researching and designing innovative prototypes that help define the future of children’s hospice care, for a brand new children’s hospice being developed by Fondazione Seràgnoli near Bologna in Italy. The overall vision is to develop a new paradigm of children’s hospice – innovative from an architecture, user experience, clinical and managerial point of view – and of philanthropic entrepreneurship in this sector.

Our first prototype – the Connected Garden – recognised the significant importance that gardens hold as a place of refuge, play and relaxation. Through the development of interactive living plants, Connected Garden explored how to blend the principles of horticultural therapy practices we uncovered through research with meaningful uses of technology, to enable and support accessible use of a garden space for every visitor and patient of the hospice.

We also developed an AI-powered chatbot, Chiara, to help bring parents onboard to the hospice – providing them with personalised information they might need to get the right support from the right person, at the right time.

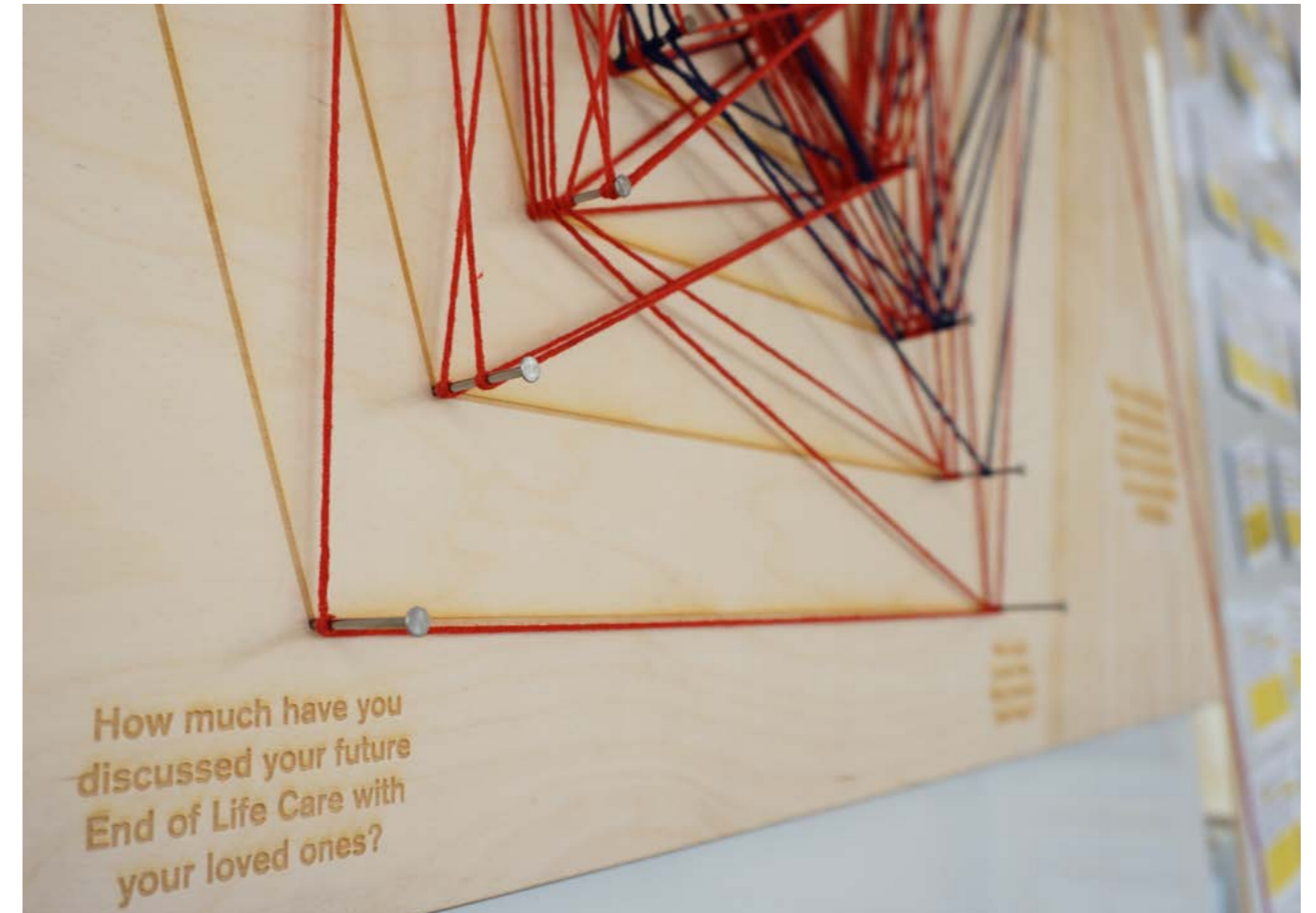
Another digital platform, Moments, was created for a parent’s most special memories. It is designed to capture everyday normal events and create a richer picture of a child’s life, to allow the family to relive the same moment from a different perspective. We co-developed this platform through remote workshops with parents of a child with a life-limiting condition.

Most recently, we have been using innovative technologies such as infrared facial recognition and augmented reality to transform how assistive play therapy can be better delivered to children with limited mobility, based on insights shared with us by parents of children with life-limiting conditions. The app was tested in a children’s hospice during the pandemic through collaboration with a play therapist.



Meet the IGHl team:

Ivor Williams
Greta Castellana
Milo Hill
Lily Hoskin
Brian Quan
Cat Kilkenny
Gianluca Fontana



Improving resource allocation for end-of-life care

Research has shown that many patients near the end of life receive high-intensity services without clear evidence of benefits and often at odds with their preferences, with the overwhelming majority of people wishing to remain at home. Yet costly hospital-based care could be avoided if patients were offered high quality care alternatives outside hospitals.

In partnership with the University of Edinburgh, the University of Lausanne and the Institute for Public Policy Research and public partners, we’re looking at ways to improve the efficiency of health and social care provision at the end of life, and the implications for patients and health systems. We want to find out whether greater efficiency in care resource allocation could enable access to higher-quality and more personalised care for patients.

Before conducting this qualitative study, we worked with four members of the public with lived experience of end-of-life care to incorporate their thoughts and opinions on our initial ideas and how best to frame our ideas in an appropriate way.

Our ongoing study is exploring how carers and their loved ones make decisions about end of life care, which is necessary to effectively support carers and patients at the end of life to ensure there is high quality care for all.



Meet the IGHl team:

Stephanie Archer
Cat Kilkenny
Ivor Williams

#education
#policy
#design
#patient safety
#digital health

Developing the next generation of healthcare leaders

We run several educational programmes which feature teaching from experts in the field and the flexibility to study part-time, accommodating professionals working in healthcare or allied with health systems.

COVID-19 presented the demanding challenge of rapidly transforming all our in-person programmes for online delivery, taken on by our education team. Modules for three of our MScs, Healthcare and Design, Health Policy and Patient Safety, have been delivered entirely online since spring 2020 with positive feedback. With the support of Bayer, a major programme of work has recently commenced to fully digitise the MSc in Patient Safety. We are also digitising the MSc in Health Policy and both programmes are due to launch in Autumn 2021. Our ambition is to develop fully online, two year, part-time MSc programmes which will be globally relevant, enabling our Institute to broaden its reach and impact.

Driving the information and technology transformation of our health system

The NHS Digital Academy is a virtual organisation set up to develop a new generation of excellent digital leaders who can drive the information and technology transformation of the NHS. Commissioned by the NHS, the Academy is delivered in partnership with the University of Edinburgh with strategic input from Harvard Medical School. Now in its third cohort, our aim is to create a workforce with the professionalism, capability and capacity to lead the NHS to a new digital future.

Our PGDip in Digital Health Leadership is the academic component underpinning the Academy. Now in its third cohort, we have 112 new participants from across the UK who joined us in September and are currently undertaking the PGDip entirely remotely.

We also offer an MSc in Digital Health Leadership. Now in its second cohort of 50 having doubled in growth since its inception, this course is

Our educational offerings

PGDip/MSc in Digital Health Leadership

Developing a new generation of excellent digital leaders.

MSc in Healthcare and Design

Helping professionals develop the skills needed to advance an entrepreneurial idea.

MSc in Health Policy

Equipping health sector professionals with the skills to improve the quality of health policy.

MSc in Patient Safety

Providing healthcare professionals a basis of the fundamentals of patient safety practices.

MRes in Medical Robotics and Image-Guided Intervention

Preparing new graduates for employment in medical robotics and surgical imaging.

demonstrating its value for career trajectory in digital health leadership in the NHS. This course involves students undertaking a ‘dissertation of practice’, the aim of which is to leverage organisation-specific challenges and issues. Two of these dissertations have contributed significantly to NHS digital policy: ‘A Blueprint for Digital First General Practice’, by John McCormick, and ‘An Implementation Strategy for Bring Your Own Device in the NHS’ by Rob Blagden.



Meet the IGHI team:

Health Policy:

Colin Bicknell
Erik Mayer
Melanie Perkins
Jason Lawson
Alex Carter
Lana Kovacevic
Gaby Judah
Søren Kristensen
Elias Mossialos
David Nabarro
Ana Luisa Neves
Jack Halligan
Saira Ghafur
Justine Alford
Jessica Prestt
Alisdair Smithies

Patient Safety:

Brendan Delaney
Kelsey Flott
Raleigh Mangsat
Owen Bray
Alex Carter
Olga Kostopoulou
Jack Halligan
Saira Ghafur
Jessica Prestt
Alisdair Smithies
Mike Durkin

Digital Health Leadership:

Lenny Naar
Gianluca Fontana
Alisdair Smithies
Jessica Prestt
Ruth Black
Amy Matrai
Merik Oztop
Lily Roberts
Pip Batey
Alice Blencowe
Brendan Delaney
Scott Payling

Design:

Daniel Leff
James Kinross
Jessica Prestt
Alisdair Smithies
Lenny Naar
Gaby Judah

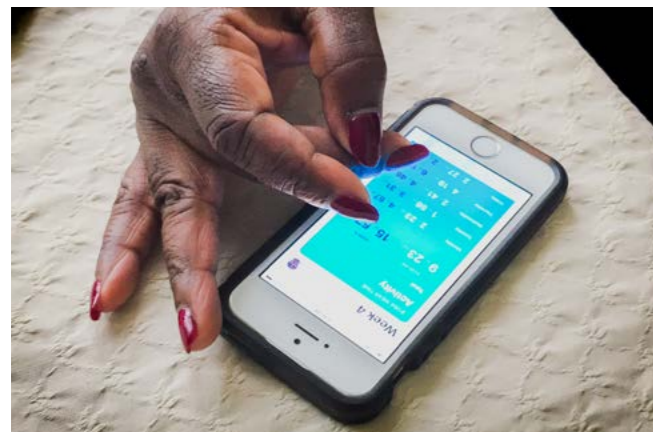
Health Innovation Prize: funding the next generation of global health innovators

We run an annual competition that awards budding student innovators a cash prize towards their idea that could improve global health. The competition is open to all UK-registered students. This year, our Health Innovation Prize was bigger than ever, awarding £10,000 to the winners at our virtual Dragon’s Den final event in April, where 6 teams battled it out in front of our panel of expert judges. Third Eye Intelligence, an AI-powered risk prediction tool for organ failure created by PhD students at our Hamlyn Centre, took home the prize.



Meet the IGHI team:

Nikita Rathod
Justine Alford
Nicolette Davies



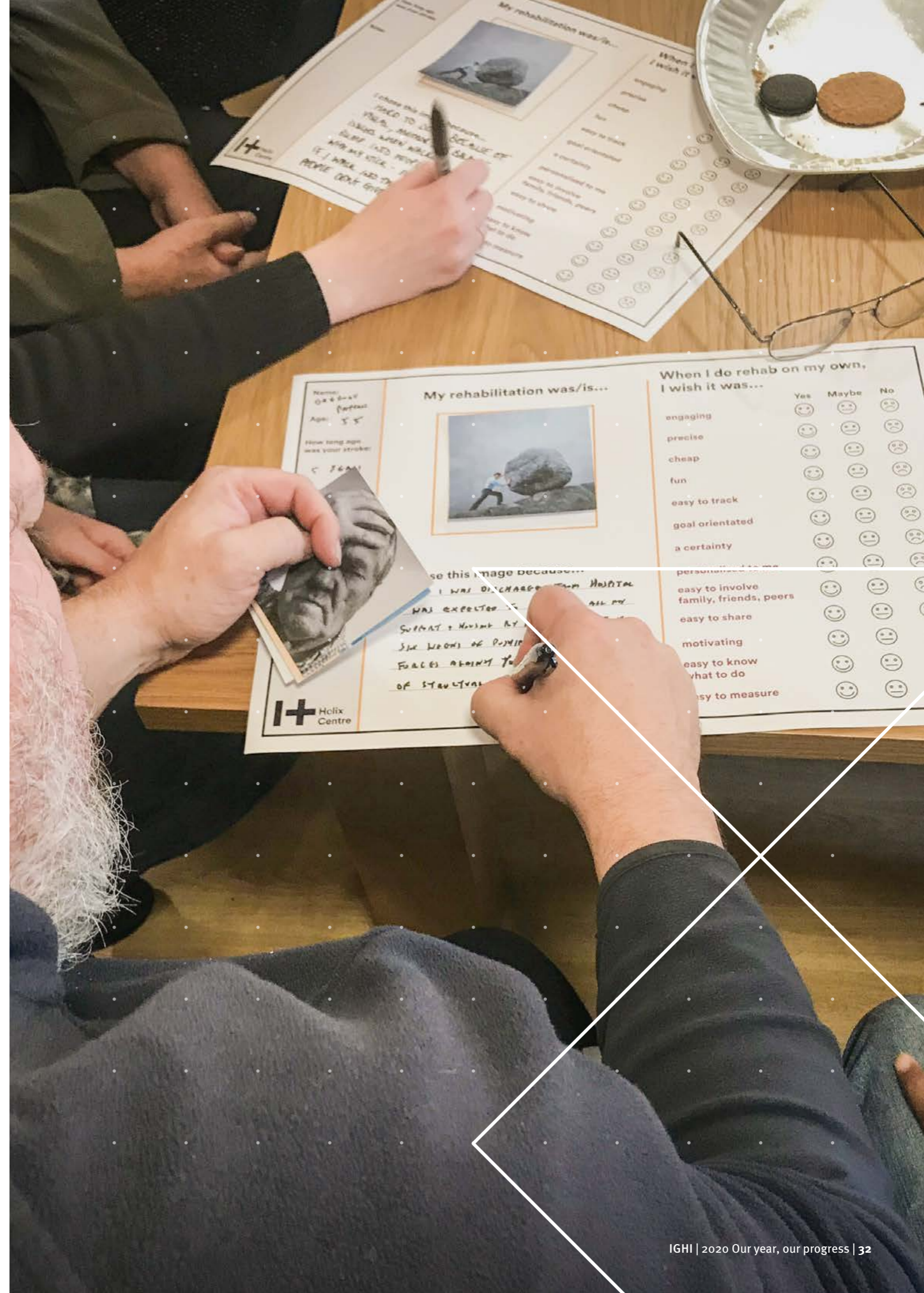
OnTrack: empowering stroke survivors in their own recovery

Stroke is a [leading cause](#) of disability worldwide. Among survivors, some 80% will experience difficulty in using their arms. Repetitive exercises can help stroke survivors regain the use of their arm. But many patients feel isolated upon leaving hospital to return home, and lose the motivation to carry out the intense programme of activity required.

In response to these issues, our Helix Centre has developed a digital app, called OnTrack Rehab, designed with stroke survivors to support stroke survivors through their recovery. The platform uses applications for both smartphones and smartwatches, and aims to facilitate arm rehabilitation through daily monitoring and tailored coaching, both online and face-to-face.

Early results found that people using OnTrack showed an average activity increase of 20%, translating to roughly an extra hour of arm activity per day. These promising results led to the launch of a feasibility trial with our partners at Charing Cross Hospital Stroke Unit and NeuroRehabilitation units.

Although the study paused due to COVID-19, the team has developed a viable approach to deliver the service fully remotely with potential wider applications. The study is ongoing but interim findings are encouraging, showing that almost 90% of participants engaged in daily activity recording. With OnTrack, there was an increase of 59% in arm activity over 12 weeks, equating to 2.2 extra hours of weekly activity. Full results are expected in spring 2021.



Meet the IGHI team:

Gianpaolo Fusari

Daniel Dickens

Ella Gibbs

Lily Hoskin

Anna Lawrence-Jones

Melanie Leis

Jack Halligan

Hutan Ashrafian

Clarissa Gardner

Saira Ghafur

Gaby Judah

Steve McAteer

Eleni Daniels

Joanne Sarao

Global engagement

World Patient Safety Day

In recognition of the World Health Organization's World Patient Safety Day, we hosted a virtual event in close collaboration with Imperial College Healthcare NHS Trust, under the theme 'Health Worker Safety: A Priority for Patient Safety'. The event presented an opportunity to learn from our colleagues at the frontline and explore some of the critical topics that drive healthcare worker and patient safety.

[Our event](#) featured a range of contributions from world experts in patient safety and healthcare quality, including National Director of Patient Safety at NHS Improvement, Dr Aidan Fowler, and former Secretary of State for Health and Social Care and current Chair of the Health and Social Care Select Committee, the Right Honourable Jeremy Hunt MP.

A highlight of the event was a compilation of video interviews we created with a patient and a number of front-line healthcare workers from the Trust, focusing predominantly on the experiences of minority ethnic staff including PPE and wellbeing.

In conjunction with and complementing our live event, the PSTRC team produced a commentary published in the Lancet. Entitled ['No patient safety](#)

[without health worker safety'](#), this outlined the key challenges of safeguarding both mental and physical wellbeing of health workers, the impact of environment and infrastructure on staff safety, and the role of government and healthcare organisations in supporting and protecting the health workforce to enable them to provide safe care for patients.

These activities have provided a significant and ongoing contribution to the conversations taking place globally around the crucial relationship between health worker and patient safety.



Meet the IGHI team:

Owen Bray

Kelsey Flott

Mike Durkin

Alex Shaw

Gianluca Fontana

Nikita Rathod

Niki O'Brien

Jessica Tingle



World Innovation Summit for Health

The World Innovation Summit for Health (WISH) is a global healthcare community dedicated to disseminating the best evidence-based ideas and practices. An initiative of Qatar Foundation, and Chaired by IGHI Co-Director, Professor Darzi, IGHI has partnered with WISH since 2013 to oversee the production of policy reports on the most pressing issues in healthcare, to be presented alongside keynote speeches from thought leaders at its bi-annual global Summit.

2020 has seen incredible change in how we live and work, reflected in the development of a virtual WISH this year. The event was a unique and innovative experience for over 7,500 registered delegates from over 180 countries, as the sessions ran via a fully immersive 3D platform across five days, under the banner 'One World, Our Health'.

The event featured more than 100 sessions and 300 speakers, including keynotes from World Health Organization Director-General Dr Tedros Adhanom, humanitarian Dr Tom Catena, actor and philanthropist Eva Longoria, and member of the White House coronavirus task force Dr Anthony Fauci. COVID-19 featured as a key theme, with a high-profile ministerial panel on COVID-19 held to discuss global efforts to tackle the outbreak, lessons learnt so far, and how policymakers, governments, and healthcare providers can better manage pandemic responses in the future.

Under the direction of world-renowned leaders in the field, IGHI supported the development of six health reports launched at WISH 2020 and aimed at influencing policy at a local, national and international level.

Meet the IGHI team:
 Nicolette Davies
 Niki O'Brien
 Saira Ghafur
 Emma Lawrance
 Steve McAteer
 Melanie Leis
 Justine Alford



Leading Health Systems Network (LHSN)

Hosted at IGHI, the LHSN is a collaborative network of healthcare leaders and organisations dedicated to improving healthcare delivery. The network connects healthcare leaders and organisations that value international sharing of evidence and best practice. LHSN supports data collection, collaboration and knowledge exchange among health institutions in ways that bring added value to healthcare systems at international, national and local levels.

Each year the LHSN focuses on one area related to healthcare and patient safety, with cyber security as 2020's chosen topic. As well as the development of the WISH report entitled: 'Safeguarding Our Health Systems: A Global Framework for Cybersecurity', IGHI hosted several cyber security webinars such as Systemic Design and Enterprise Architecture in healthcare, Balancing Cyber Security Outcomes with Clinical Outcomes During COVID-19 Pandemic Emergency Response, and Protecting Patient Information at Scale: COVID-19 data in South Africa.

In previous years the LHSN has produced reports for WISH on Antimicrobial stewardship, Safety in Maternity Services, and Patient Safety Information.

Meet the IGHI team:
 Niki O'Brien
 Saira Ghafur
 Dr Mike Durkin



The Global Patient Safety Collaborative

The Global Patient Safety Collaborative is a strategic partnership between the World Health Organization and Imperial College London that aims to enhance global action on patient safety. The GPSC works in three areas: leadership to promote safe culture and engage with patients and families; education and training to enhance health workers' skills; and research to build capacity and evidence for policy.

Among our achievements in our first year are the launch of a webinar series to provide an opportunity for knowledge sharing across the collaborative, and a policy brief we produced with the World Health Organization, titled 'Health Worker Safety and Patient Safety: Implications for Health Systems'. This brief focuses on the health system implications on health worker safety, considering threats to both their physical and mental health and the impact this has on the safety of care provided to patients.

The GPSC will drive impact in this sphere in two main ways. First by providing patient safety resources in a number of areas including the review of World Health Organization guidance and frameworks. Second, the in-country work will support capacity building for research, provide training and education opportunities and encourage safety culture through support for leadership development in patient safety. The aim for the future is to grow the collaborative so that it can offer direct support to further countries.



Meet the IGHI team:
 Alex Shaw
 Kelsey Flott
 Mike Durkin



Safety in fragile states

With COVID-19 severely impacting health systems globally, it is vital that policies, guidelines and checklists are in place to support healthcare workers through this challenging period, and that frontline staff and local leaders are supported to implement these initiatives. A research project we have launched aims to bridge the evidence gap around how best to support healthcare workers with the physical, psychological, behavioural and social repercussions of working at the frontline of a pandemic.

We are also further expanding our international work by exploring patient safety in fragile, conflict and vulnerable settings, such as humanitarian crises and natural disasters. With a current lack of research and knowledge base for decision-making in these contexts, the aim of this work is to begin to build the evidence to underpin the implementation of interventions to improve the safety of care provided in these settings.



Meet the IGHI team:
 Alex Shaw
 Niki O'Brien
 Kelsey Flott

Innovations in wearable technology and medical robotics

COVID-19 has thrown personal protective equipment into the spotlight. To explore the technology behind these items and the future of wearables, we launched a new collaborative webinar series, entitled 'From PPE to Spacesuits'.

As a four-part series, the webinars featured astronauts and space industry experts discussing insights on technical garments and the complexity of such technologies for health and wellbeing. The webinars addressed topical issues such as the design of better life support systems for patients by learning from spacesuit designs, and whether the design of PPE worn in surgical procedures could spark new ideas for the next generation of spacesuits. The series was hosted by our Hamlyn Centre, FAIR-SPACE and PanSurg.

A further virtual initiative launched this year by our Hamlyn Centre is the Winter School on Surgical Imaging and Vision. This week-long annual course focuses on both the technical and clinical aspects of surgical imaging and vision, an integral component of robotic surgery. Through invited lectures, workshops, and mini-projects, the purpose of the School is to help researchers familiarise themselves with the cutting edge research of this rapidly expanding field.



Meet the IGHI team:
 Stephanie Pau
 PanSurg
 Stamattia Giannarou
 Marianne Knight



Supporting diversity and inclusion

We're working to ensure greater inclusivity in our work, so that no voices are left unheard. We're also dedicated to building a more diverse Institute, because we know that diversity brings with it talent, creativity and innovative ideas. While we have recently launched initiatives in these important areas, we know that there is still much more for us to do to better support equality, diversity and inclusion.

Patient and public involvement and engagement

We strive to meaningfully and appropriately involve patients, carers and the public in what we do, working with a diverse range of people from different backgrounds to bring different experiences and insights. Throughout our report we have highlighted examples of how public members have influenced our work.

Our PSTRC has a Research Partners Group, made up of a diverse group of 11 public members, which reviews our projects and public involvement plans. Their contributions this year include reviewing the World Health Organization Global Patient Safety Action Plan and the NHS Improvement draft framework for involving patients in patient safety.

IGHI also collaborates with other Imperial colleagues to run the Young Person's Advisory Group, of over 50 young people aged 17-25 from London. This group has been involved in several projects this year, including REACT and CCopeY.

We have disseminated our work through blogs, podcasts and, in collaboration with Imperial's societal engagement team, through online versions of Imperial Lates and the Great Exhibition Road Festival, where artists created digital fantasies based on conversations with IGHl mental health researchers. We also published an [academic paper](#) about co-production with three young co-researchers as co-authors.

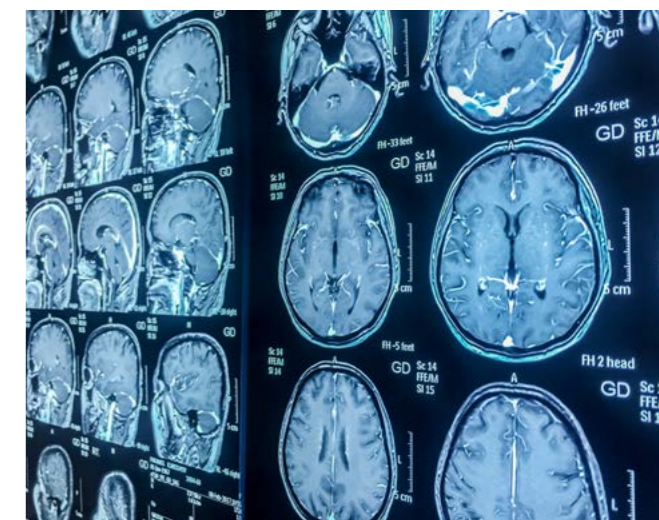


Meet the IGHl team:
Anna Lawrence-Jones
Cat Kilkenny
Lindsay Dewa

Widening the reach and impact of artificial intelligence

The use of artificial intelligence (AI) and machine learning is increasing in healthcare delivery. Yet there has been little research exploring how AI and data-driven technologies in health can be enabled and optimised with minority ethnic communities in mind.

As part of the data, health and wealth programme, IGHl is working with the Health Foundation on a project entitled 'Enabling AI and data-driven technologies in health for black and minority ethnic communities'. The scoping project aims to understand the opportunities and barriers to applying AI and data-driven technology to help improve the health of minority ethnic communities and key priorities for the future. We hope that the outputs of this project will help shape a new global research agenda for equitable and inclusive AI and machine learning in healthcare.



Meet the IGHl team:
Saira Ghafur
Niki O'Brien
Jackie van-dael
Jonny Clarke
Clarissa Gardner
James O'Shaughnessy

Raising awareness of hearing loss in underserved communities

Hearing Birdsong is an innovative project co-produced by a diverse steering group of IGHI staff, Imperial researchers, designers from Kennedy Woods, audiologists and community members with hearing loss. It is an installation of bird boxes playing birdsong to raise awareness of hearing loss in seldom heard groups, increase access to care and early diagnosis. Each familiar bird call matches the frequency bands of a traditional hearing test. Visitors not able to hear one of the birds could be experiencing hearing loss and are offered a hearing screen.

We worked with the Hackney Brocols to ensure the installations were accessible and attractive to older people and working class men. We held installations in a shopping centre unit and a cafe in Hackney.

Over 4 days we had 256 visitors and screened 40% with the HearCheck screener. Of the 122 visitors who filled out a feedback card, 73% were encouraged to get their hearing tested or would encourage others to do so and of those who gave ethnicity, 29% identified as part of non-white ethnic groups.



Meet the IGHI team:
Anna Lawrence-Jones
Cat Kilkenny
Owen Bray
Pip Batey
Alice Blencowe
Lisa Freise

IGHI internship programme

We are very fortunate to have a team of people from a variety of professional, cultural and educational backgrounds, working on projects that are internationally recognised and attract interest from highly talented individuals and institutions. However, alongside the College we have a drive to attract more diverse early-career talent, particularly those from underrepresented backgrounds in academia.

To address this, we are developing an internship programme, supported by College-wide equality, diversion and inclusion initiatives. Our aim is to provide work experience opportunities to early-career students from low socio-economic backgrounds and protected characteristics that are seldom seen in academia.

In the first year, we aim to welcome three individuals who will support existing projects at IGHI. Based on the successes and learning from the first round, we hope to increase the number of opportunities in subsequent years and expand this programme into a College-wide initiative which can attract diverse early-career talent across all areas of science, technology and medicine.

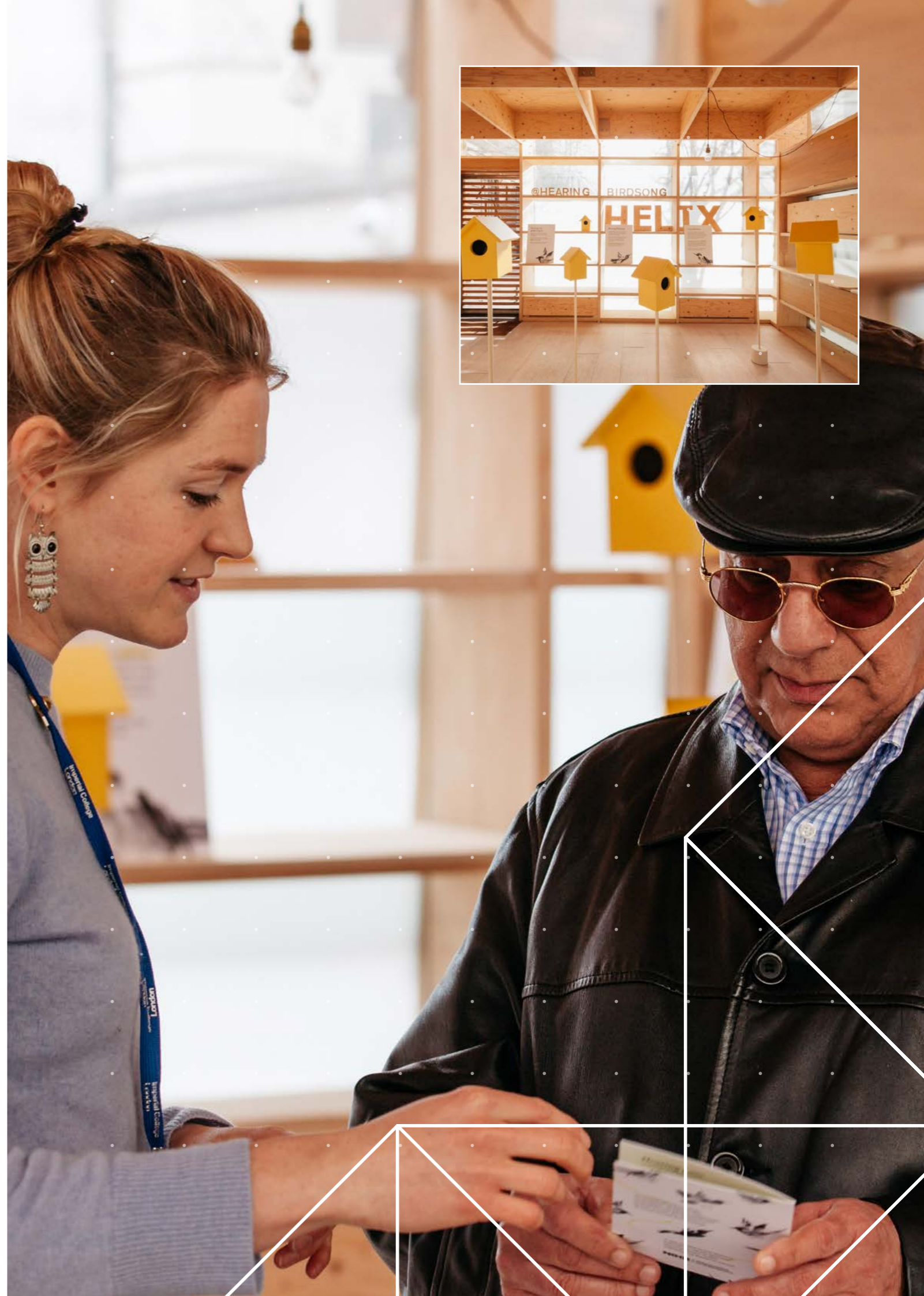
Designing better care for black mental health

Faced with intra- and inter-cultural stigma, and a lack of culturally appropriate mental health services, more mental healthcare solutions and services that are designed for the Black community, by the Black community, are needed. To address this need, we are working to co-design a mental healthcare self-management solution in partnership with the Oremi Centre, a mental health day service exclusively for Black and Arabic-speaking clients.

This year, IGHI staff also took part in a panel discussion entitled 'Better care for Black mental health' as part of the Imperial Lates online event. The engaging and open discussion focused on the solutions needed to address the nuanced mental healthcare challenges that affect the Black community.



Meet the IGHI team:
Clarissa Gardner
Nikita Rathod



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