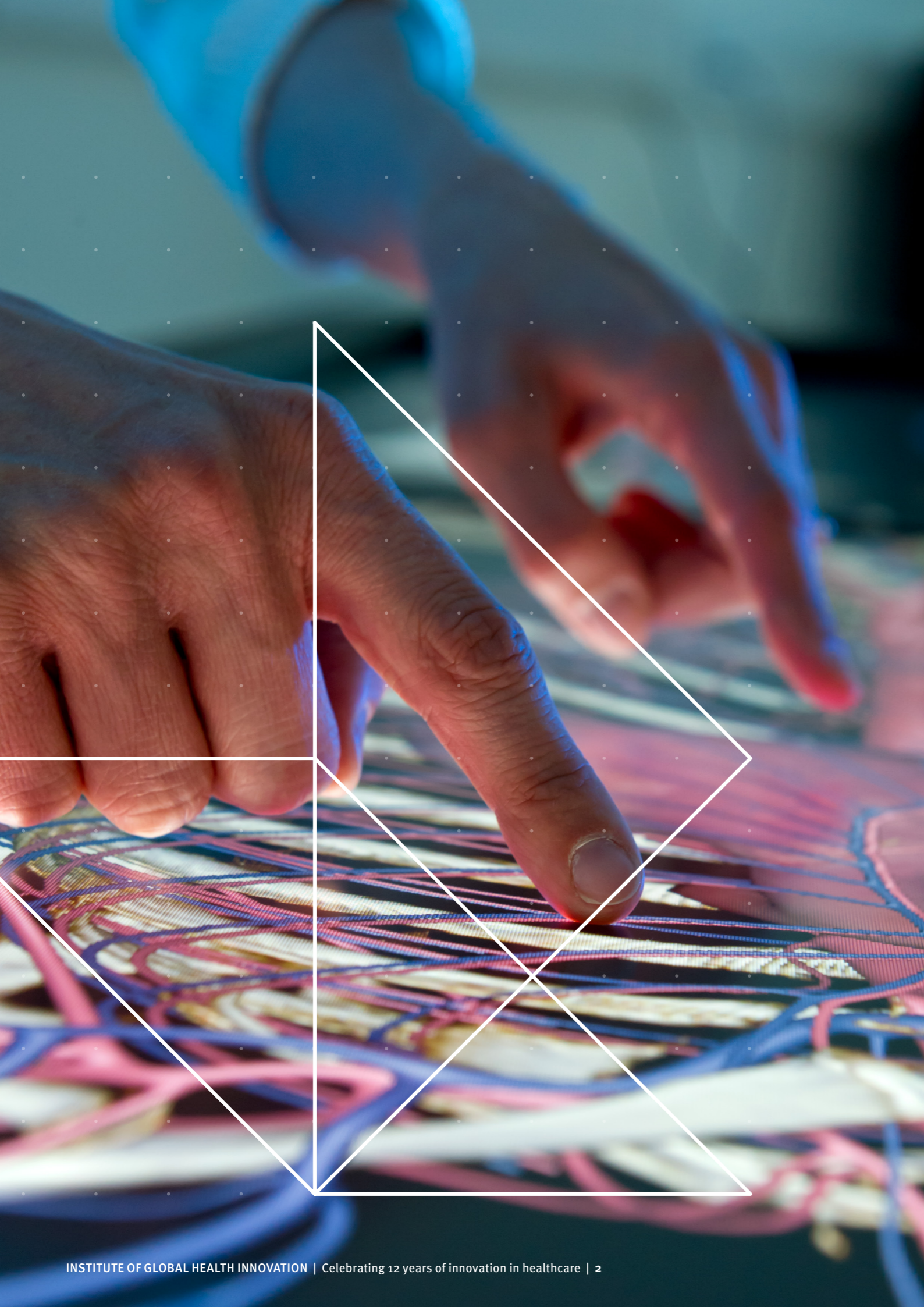


Imperial College
London

Celebrating 12 years of
innovation in healthcare

**INSTITUTE OF
GLOBAL HEALTH
INNOVATION**





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Foreword

The Institute of Global Health Innovation (IGHI) is a collection of remarkably gifted clinicians, scientists, designers, engineers, policy makers, developers, patient and public involvement specialists and more. This fusion of skills and backgrounds allows the Institute to solve the healthcare problems of the present and the future.

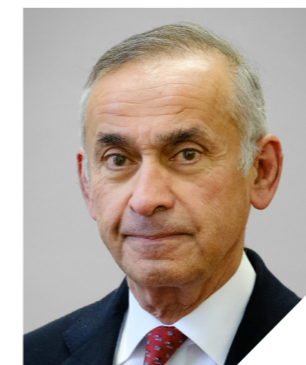
IGHI has always sought to identify opportunities before they become obvious to others. That is why we were the first research organisation to focus on patient safety. The first to focus on the fusion of engineering and surgery. The first to realise the potential of design in healthcare. The first to introduce qualifications for policy makers.

IGHI has also been quick to respond to opportunities that emerge. Opportunities such as the need for Digital Education in the NHS heralded by the Wachter

review, which led to the NHS Digital Academy. Possibilities such as the necessity of community prevalence testing for COVID-19, which led to the REACT study. Potential such as the application of artificial intelligence for screening, leading to a mammography study with Google Health.

COVID-19 meant that what would have been a report on our first decade has become a review of our achievements of our first dozen years. We are confident that over whatever time period – the rest of the 2020s or the next twelve years – IGHl will continue to be at the forefront of healthcare innovation. Leading the way, with work on antimicrobial resistance, climate change and mental health and food security.

It is our privilege to be leading IGHl as it makes a difference both now and into the future.



Ara Darzi

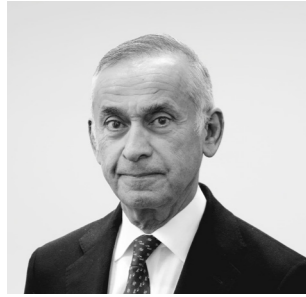
Co-Director
Institute of Global
Health Innovation



David Nabarro

Co-Director
Institute of Global
Health Innovation

Our Centre Directors



Professor the Lord Ara Darzi

Director, Patient Safety and Translational Research Centre;

Director, Centre for Health Policy;

Co-Director, Hamlyn Centre;

Co-Director, Helix Centre.



Professor Ferdinando Rodriguez y Baena

Co-Director, Hamlyn Centre.



Professor Kath Maitland

Director, Centre of African Research and Engagement.



Dr Paul Thompson

Co-Director, Helix Centre.

Introduction

Who we are



The Institute of Global Health Innovation is one of Imperial College London's global challenge institutes. Our mission is to transform health for all through evidence-based innovation.

We are a team of pioneering people who bring a wide range of expertise from data science and artificial intelligence to clinical research, health policy and patient safety. Through our research, teaching and outreach we are tackling some of the greatest global health challenges facing the world today, including infections, cancer and child health.

What we do



We are working towards a future where healthcare is better, safer and more equitable across the globe. Our approach is to discover, develop and implement innovations, leading to sustainable improvements in health and care.

To realise our vision, we:

- Design and disseminate high-impact global healthcare innovations to improve the quality and safety of care
- Deliver world-class educational programmes to establish the next generation of leaders in healthcare
- Translate cutting-edge research to drive real change in areas in need of transformation
- Put people at the heart of everything we do, involving patients, the public and healthcare professionals in every stage of our work

How we work



At the IGHI, we work across all stages of innovation, from laboratory bench to patient bedside and beyond. Our structure is flexible, giving us the ability to adapt our focus to those areas where we feel we can make an impact.

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.

- Centre for Health Policy – working on development, uptake and diffusion of innovative, evidence-based health policy globally
- Hamlyn Centre for Robotic Surgery – developing safe, effective and accessible imaging, sensing and robotic technologies to shape the future of healthcare
- Helix – transforming healthcare using human-centred design to create high-impact, equitable solutions that improve health and healthcare for all.
- Patient Safety Translational Research Centre – working to improve patient safety and the quality of healthcare services
- Centre of African Research and Engagement (ICCARE) – Based in Kenya, conducting research on issues such as blood transfusions and malnutrition

IGHI Publications



46

WORLD INNOVATION SUMMIT FOR HEALTHCARE (WISH) OR WISH-RELATED REPORTS THAT IGHl WERE INVOLVED IN FROM 2013-2022



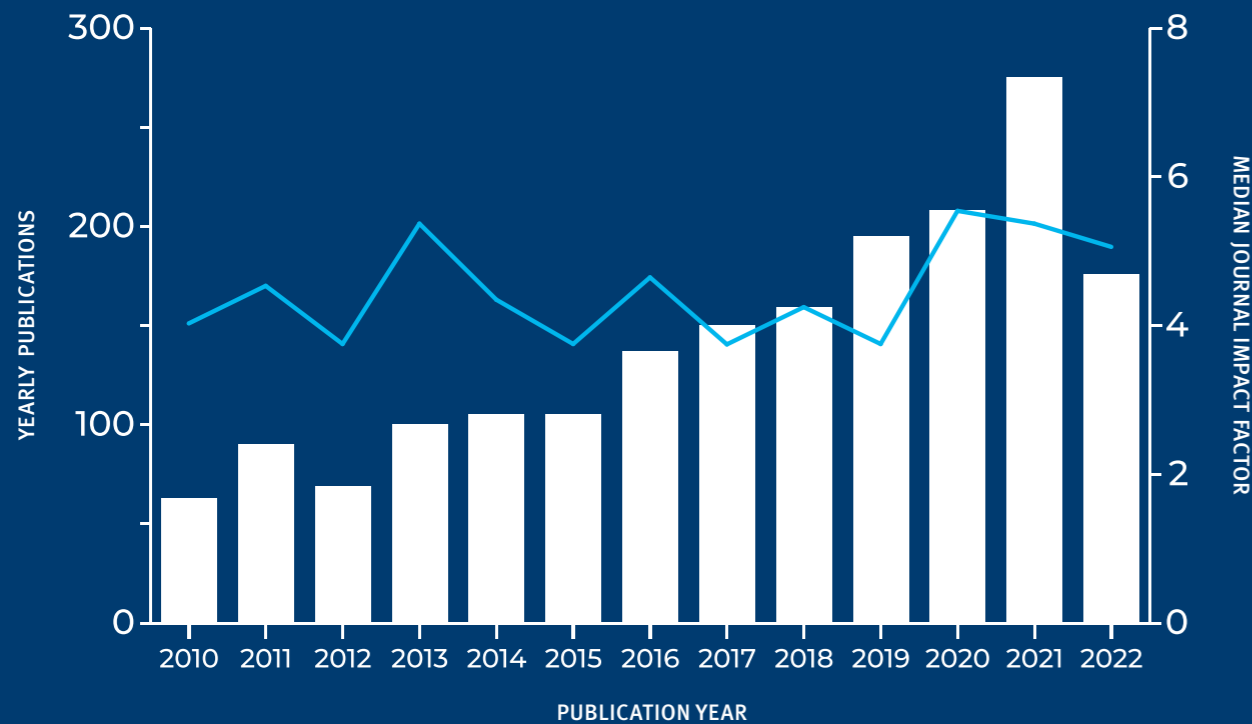
1,832 ACADEMIC PAPERS PUBLISHED 2010-2022¹



THE NUMBER OF PUBLICATIONS PER YEAR HAS INCREASED FROM 63 IN 2010 TO 275 IN 2021, AND THE MEDIAN JOURNAL IMPACT FACTOR HAS INCREASED FROM 4.03 TO 5.37 (SEE GRAPH)

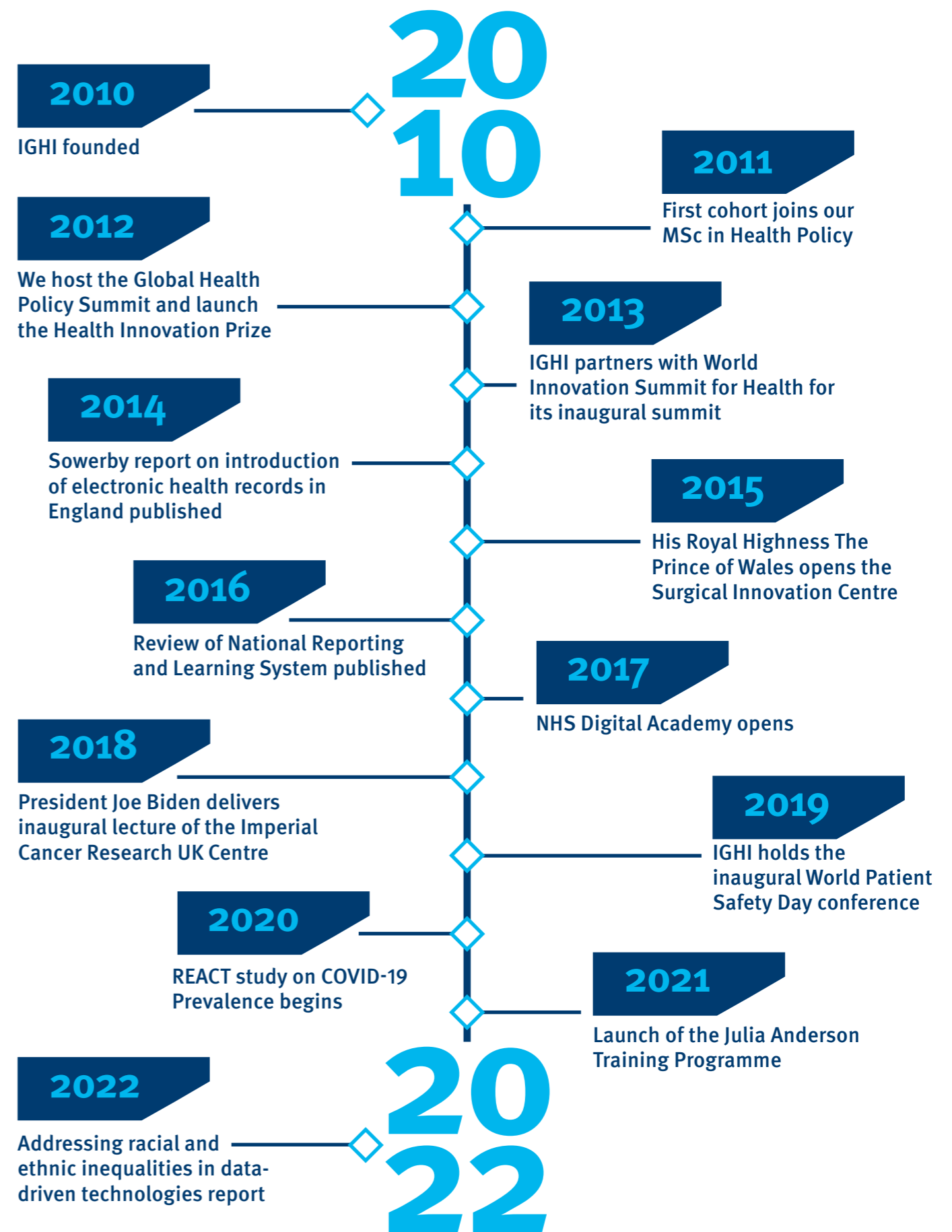
12

MAJOR POLICY DOCUMENTS PUBLISHED

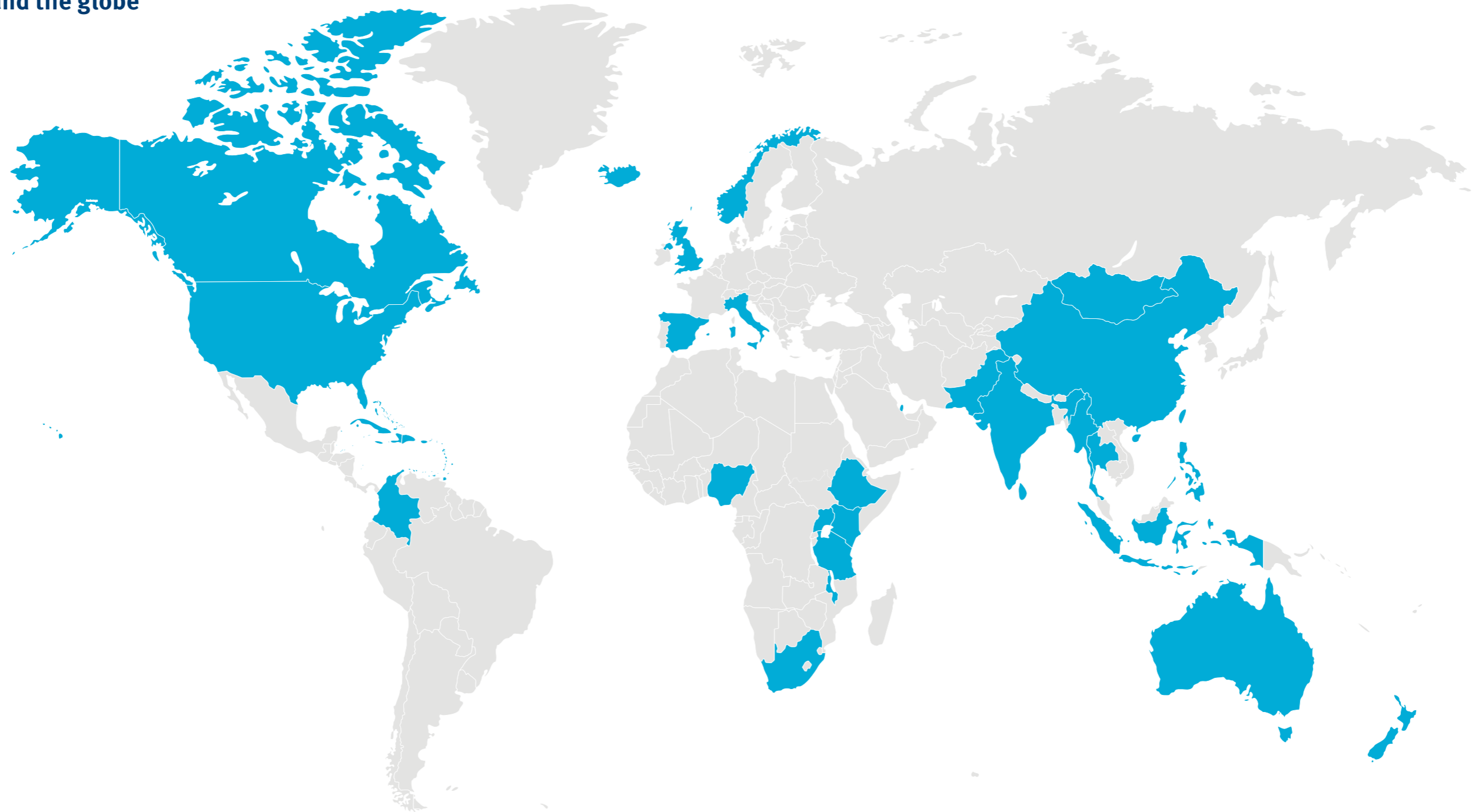


¹ This is based on publications which note an author was part of IGHl and/or publications where Professor Darzi is a co-author.

Our history



Our work around the globe



We partnered with the **Qatar** Foundation on the World Innovation Summit for Health ([see p.15](#)).

Our researchers have modified a regular hardware drill for use in **Malawi** where standard orthopaedic drills are unaffordable ([see p.12](#)).

In **Uganda** and **Malawi**, the TRACT trial has shown how children's lives could be saved by optimal use of blood transfusion to treat severe anaemia ([see p.10](#)).

Our collaboration with **US** researchers and DeepMind has resulted in AI to help breast cancer screening ([see p.9](#)).

The Centre for Health Policy developed [Essentials of Cybersecurity in Healthcare Organizations \(ECHO\) framework](#) which outlines key areas for organisations to consider as they scale up and maintain robust cybersecurity. The team is now conducting an international feasibility study on an informational resource designed for healthcare organisations based on the framework. This study is taking place in hospitals in countries including **Ethiopia, Iceland, Nigeria, Norway, Sri Lanka, Tanzania** and **Thailand**.

We have supported upgrading Yangon General Hospital in **Myanmar**.

With partners in **India, Pakistan, Mongolia** and **Kenya**, we are part of the Global Patient Safety Collaborative working to reduce the risk of avoidable harm and improve the safety of health systems ([see p.17](#)).

We are part of the Leading Health Systems Network dedicated to improving health care delivery by efficient use of resources, including partners in countries such as **New Zealand, Australia, Colombia, South Africa, Spain, China** and **Canada** ([see p.17](#)).

Work on Children's Palliative Care has been international, but there has been particularly close collaboration with hospices in **Italy** and **Indonesia** ([see p.17](#)).

Our Climate Cares initiative focuses on building resilience to the mental health impacts of climate change including work with colleagues in the **Philippines** and several parts of the **Caribbean** ([see p.20](#)).

Clinical decision-making

We have worked with our partners to create the information, technology and tools to support clinical decision-making and ensure patients get the best possible treatment and care.

Our collaboration with DeepMind to support busy doctors

The smartphone app Hark was developed by a team of IGHI researchers led by Professor Ara Darzi and Dr Dominic King. The app was designed to provide up-to-date clinical information at the bedside, improve communication and teamwork amongst clinical staff, and better organise and prioritise tasks.

In 2016, the team joined with London based artificial intelligence company DeepMind to develop the technology further and scale it across the NHS.

This partnership led to the development of Streams, a new clinical support app that provides clinical information, and results viewing and alerting to doctors and nurses on their smartphone. The app was deployed at a number of NHS Trusts with an aim to help clinical staff to identify and respond to deteriorating patients more quickly.



Helping patients get the treatment that is right for them

In partnership with the Royal Pharmaceutical Society, IGHI researchers have developed RxConnect, a translation engine between electronic prescribing systems and sources of information on medicines, to give doctors, nurses and pharmacists the most current information and guidance on the medicines they are prescribing.

There are vast amounts of data on how different medicines should best be used for different patients being treated for different conditions, but this information is typically not available in one place and is often not machine-readable, meaning it is unusable for computerised systems.

RxConnect integrates a range of data including patient and drug manufacturers' information, national formulary content and hospital protocols. It makes that information available to clinicians to ensure that a patient receives the right drug, at the right dose, for the right reason at the right time.

The team won funding from an NIHR Invention for Innovation award and, since 2020, development has been led by Helix Centre spin-out company Dosium.



Streams App in use

An intelligent knife to improve cancer surgery

Surgeons have been using electrosurgical knives for more than a century. This technique burns through tissue making a clean cut and limiting blood loss. It also produces tiny amounts of smoke.

Realising that this smoke would be a rich source of biological information, Professor Zoltan Takats developed the iKnife. The iKnife combines an electrosurgical knife with a mass spectrometer, an analytical instrument used to identify what chemicals are present in a sample.

Different types of tissue produce different combinations of chemicals as they burn, so this smoke can reveal information about the state of the tissue being cut. For example, with funding from the IGHI, Professor Takats has been developing the iKnife to improve the accuracy of cancer surgery, helping surgeons distinguish between cancer cells and normal cells to remove as much of the tumour as possible in one operation.

Helping clinicians, patients and families make difficult decisions

Researchers from IGHI's Helix Centre have collaborated with more than 30 clinical organisations to redesign the way in which difficult conversations about life-sustaining treatments are conducted and recorded.

Nearly half of all deaths in the UK occur in hospitals. Discussing death in a hospital can be incredibly difficult, especially following an emergency admission. 'Do not resuscitate' forms are particularly fraught with problems, with clinicians, patients and families agreeing that these forms often create confusion and distress around what treatments will be used in an emergency.

The Recommended Summary Plan for Emergency Care and Treatment, also known as ReSPECT, is a form and process for conducting and recording difficult and life-sustaining treatments. It was launched in 2016 and is widely used across the NHS.

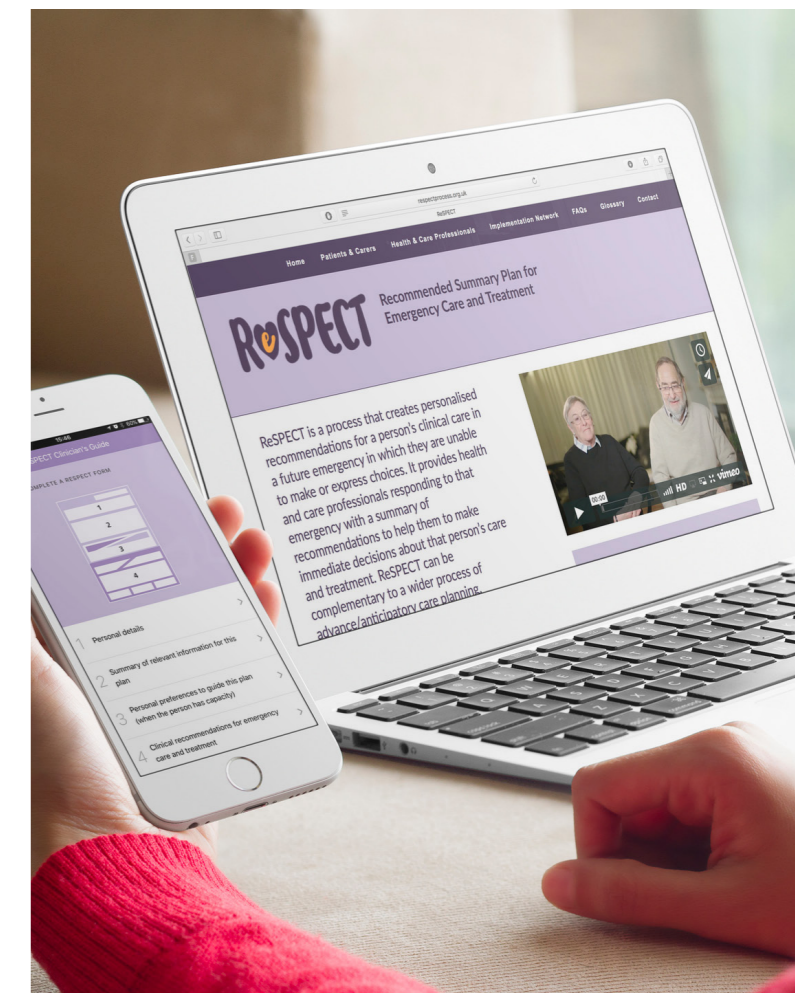
Using artificial intelligence to help spot breast cancer

An international team, including researchers from Google Health and the IGHI, have created a computer algorithm that can spot signs of breast cancer on mammograms.

Mammography is used to screen for the earliest signs of breast cancer when treatment is more likely to be effective. However, each mammogram needs to be examined by two experts, meaning breast screening programmes can be expensive and time consuming.

Research has shown that the new artificial intelligence (AI) was able to correctly identify cancers from the X-ray images with a similar accuracy to two expert radiologists.

The team say that AI tools like this could assist clinical decision-making in the future as well as alleviating the pressure on healthcare systems internationally by supporting the workload of clinical reviewers and freeing up their time for other patient supporting activities.



Translating research into real-world benefit

From cancer to COVID-19, we have translated promising medical research into improved clinical practice and better health for patients.

Case study: The REACT study



“As a new disease, COVID-19 presented enormous challenges to governments as to who was getting infected, how, when and where. The REal-time Assessment of Community Transmission (REACT) team came together in response to this national emergency, and within a few weeks we had designed a programme to provide independent, timely and authoritative analyses of the epidemic in England.

This required a huge amount of organisation and mobilisation. The highly qualified personnel at IGHI who could be switched immediately to work on the REACT programme were critical to its success.

This research acted as an early warning system, including detecting new COVID variants. It enabled us to quantify the uneven impact of the virus according to time, person and place. Our findings revealed the complexity of symptoms associated with this infection, and their changing nature and persistence. As the vaccination programme began, we could track its impact and effectiveness against infection, and by following up REACT participants, we can assess the effects of long COVID.

The REACT programme directly influenced the UK government’s response to the COVID-19 pandemic, for example informing the timing of the second national lockdown, limits on social contacts and school closures.”

– Professor Paul Elliott, REACT study

 **3,418,788**
PARTICIPANTS IN THE
REACT STUDY

Making the most of a precious resource

Blood banks can save lives, but they often face shortages. This is a particular issue in sub-Saharan Africa, where children often die waiting for a transfusion.

The ‘Transfusion and treatment of severe anaemia in African children’ (TRACT) trial began in 2013. By 2019, the study had shown that giving larger volumes of blood transfusions than current WHO guidelines could halve the number of deaths.

More recently, the study has revealed that children who received ‘packed blood cells’ – a more costly, processed form of blood – recovered more slowly and needed more extra transfusions than those who received cheaper whole-blood transfusions.



Recommendations for improved patient safety

With over 10 million incident reports, the National Reporting and Learning System (NRLS) database has been the most widely used mechanism for incident reporting within the NHS.

A review of the NRLS by the IGHI’s Patient Safety Translational Research Centre and the Centre for Health Policy showed how this database could be built upon to support a culture of transparency, minimise avoidable harm and better protect patients and informed the development of the NRLS’s successor system.



Robotic surgery for precision cancer treatment

Researchers at the IGHI’s Hamlyn Centre have developed a surgical robotic tool called Micro-IGEs. The tool has been designed to improve patient outcomes by enabling very precise removal of cancers with minimal damage to the rest of the body, for example removing a tumour that has formed close to the rectum.

Thanks to successful research in the lab, the team has now won approval from the Medicines and Healthcare products Regulatory Agency to carry out the first trials of the technology in patients.

Working with our partner NHS Trust

The IGHI is partly based at St Mary’s Hospital, part of Imperial College Healthcare NHS Trust. We work closely with our Trust colleagues, helping to keep patients at the heart of our work. This includes the NHS Digital Academy ([see p.18](#)) and the Patient Safety Translational Research Centre. We are also working with the Trust as part of the UK Networked Data Lab, aiming to learn from health and care data collected across northwest London.



Case study: Patient Safety Translational Research Centre

“The NIHR Imperial Patient Safety Translational Research Centre was a founding part of the IGHI. Since then, our researchers have identified important patterns in avoidable harm, such as the influence of weekend versus weekday hospital admissions and procedures, and more recently, the socioeconomic and ethnic inequalities in NHS hospital admissions during the COVID-19 pandemic. Other studies have focused on reducing prescribing errors among hospital in-patients and involving patients more in their own safety.

Our researchers have led many examples of innovative patient and public involvement in their research. For example, inviting lay partners to assist with observations and data collection on hospital wards and contribute to analysis of these data, and working with young people to co-produce interventions for mental health difficulties.

Being part of the IGHI means being part of a wider collaborative network of inspiring innovators, researchers, designers and policy experts, both nationally and internationally. Being able to collaborate with experts who bring such a wide range of expertise strengthens our research and makes it more relevant to policy and practice.”

– Professor Bryony Dean Franklin, PSTRC

Driving forward innovation

We have advanced technical innovations in the fields of robotics, imaging and sensing to solve challenging problems in healthcare.

From sensors and snakes to drills and diets

Outputs from the IGHI have seen the launch of a range of innovative tools and techniques over the last 12 years.

A sensor developed by the Hamlyn Centre in partnership with Sensixa won the Bluetooth Innovation World Cup in 2010. e-AR (ear-worn activity recognition) captures information such as the balance and body posture of the wearer.

The i2 Snake robot aims to improve endoscopic surgery by focussing on ergonomics and intuitive

control. It could allow surgeons to perform more complex procedures while reducing patient trauma and recovery time.

Researchers from the Centre for Health Policy have been applying reverse innovation in Malawi where standard orthopaedic drills are unaffordable. They have modified a regular hardware drill and put it inside a sterilised bag to carry out surgery.

Hamlyn Centre scientists are using a form of artificial intelligence known as deep neural networks to accurately assess dietary intake. Funded by the Gates Foundation, the project works by counting bites and recognising consumed food from videos.

Case Study: Hamlyn Centre Highlights



“In the decade since its launch, the Hamlyn Centre has grown to become a flagship centre of excellence in healthcare technology. Focusing on technological innovation, but with a strong emphasis on clinical translation and direct patient benefits with global impacts, the Centre is at the forefront of research in imaging, sensing and robotics for addressing global health challenges.

Key research highlights include our £6m Engineering and Physical Sciences Research Council ‘Micro-Robotics for Surgery’ grant which is developing sophisticated micro-instruments integrated with imaging, sensing, and robotic assistance; The FAIR-SPACE Hub, a UK national centre of research excellence in space robotics and AI which aims to solve the technical barriers faced by the global space sector; and our Wellcome Trust Institutional Translational Partnership Award.

Our flagship Hamlyn Symposium brings researchers, clinicians and engineers together under one roof and is a must-attend event within the field of surgical robotics. The symposium has grown to attract 500 delegates and now includes CPD accredited workshops from the Royal College of Surgeons.

Being part of the wider IGHI ecosystem enables our strong engineering and science membership to leverage the very best clinicians, policy makers, medical students, and academics to solve the most challenging problems affecting healthcare provision in the short and longer term.”

– **Ferdinando Rodriguez y Baena**, Co-Director of the Hamlyn Centre

Developing a digital sepsis alert system

Sepsis, or blood poisoning, accounts for an estimated 46,000 deaths in the UK each year. If diagnosed early it can be treated effectively with antibiotics but early diagnosis is difficult as symptoms are similar to other illnesses such as flu.

In 2016, IGHI scientists developed a digital sepsis alert system that monitors a range of changes in patients such as temperature, heart rate and glucose levels, and alerts doctors and nurses if they exceed safe parameters.

The introduction of the system at Imperial College Healthcare NHS Trust was associated with lower odds of death, shorter hospital stays and increased odds of receiving timely antibiotics.



Creating a smart operating room

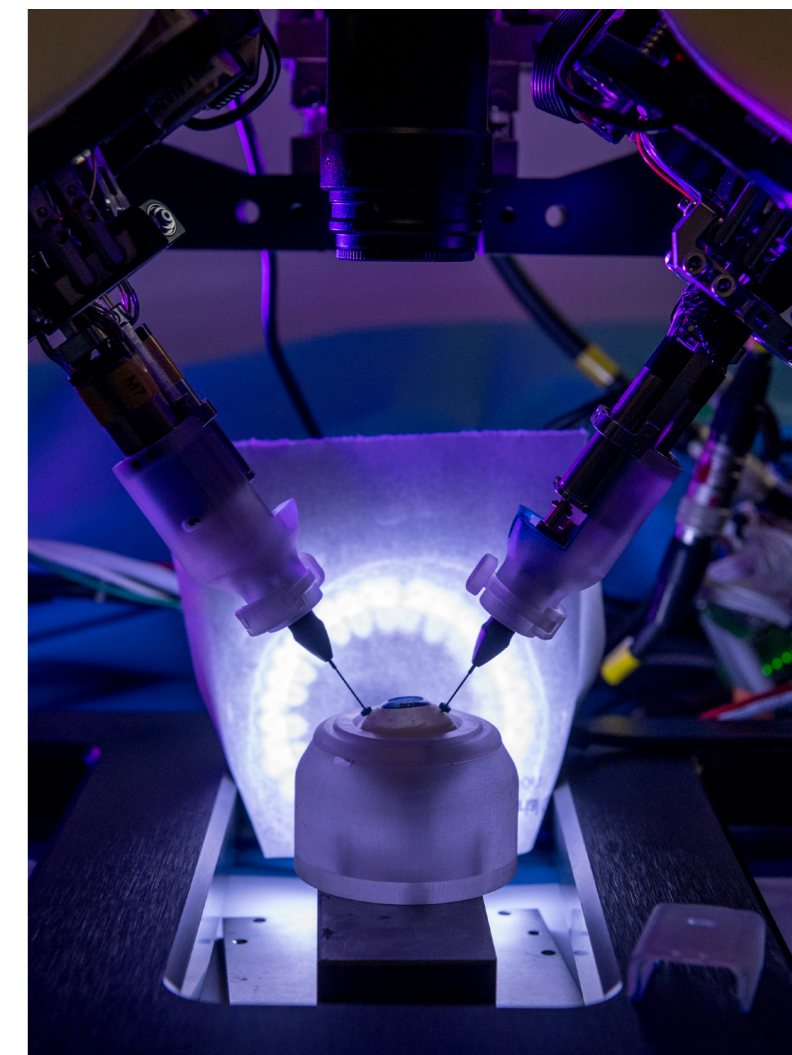
Robots in surgery offer so much more than the ability to mirror a surgeon’s hand movements, but there are many legal, ethical and technical challenges to overcome before they can replace surgeons. Dr George Mylonas from the IGHI’s Hamlyn Centre is leading a study that aims to develop a smart operating room environment. Powered by trustable, human-understanding artificial intelligence and able to continually adapt and learn the best way to optimise safety, efficacy, teamwork, economy, and clinical outcomes, this concept is called MAESTRO.

MAESTRO brings together the expertise of top researchers in the areas of robotics, sensing, artificial intelligence, human factors, health policies and patient safety, and is designed to have a significant societal, economic and technological impact.

The UK Robotics and Autonomous Systems (UK-RAS) Network

The Engineering and Physical Sciences Research Council’s UK Robotics and Autonomous Systems Network was established in 2015 with the mission to provide academic leadership, to expand collaboration with industry and to integrate and coordinate activities at 34 partner institutions across the UK. The Hamlyn Centre is a member and one of the founding partners of the UK-RAS Network.

Since its foundation, the Network has grown significantly and has helped transform the research landscape, bringing cohesion to the research base, enhancing capital facilities across the country, and supporting education programmes and public engagement activities at all levels. Key activities include the UK Robotics Week and the annual postgraduate and early career UK-RAS Conference, as well as the School Robot Competition and the UK-RAS white paper series.



Influencing policy and practice

We have engaged with UK and global decision makers to influence policy and practice, to change behaviours and to improve healthcare worldwide.

Case Study: The Change Lab



“A huge number of healthcare outcomes are dependent on human behaviour. From how the public engages with healthcare to the behaviour of clinicians in hospital, all of these things are amenable to behaviour change interventions.

The Change Lab is a collaboration between the IGHI, Imperial College Healthcare NHS Trust and Behavioural Insights. We work very closely with the Trust’s strategy team to understand their priority areas for potential behaviour change and how we can support those issues with evidence-based information.

Our work on improving the rate of cervical screening in west London is one such example. Trialling the use of different text message content with 14,000 women, we saw a five per cent increase in screening rates where patients received a text message from their GP; a result which was later replicated across London by Jo Ruwende at Public Health England.

Our next studies include reducing misdiagnoses in breast cancer and improving the rate of barcode medication scanning on nursing drug rounds to reduce administration error.

Working with the IGHI provides access to an eclectic mix of academic, clinical and design staff who all have very varied backgrounds and networks, but who are linked by a common goal. The connections and integration in the healthcare system that the IGHI offers gives us the opportunity to make real change on the ground, in real time.”

– Sarah Huf, Director of the Change Lab

All Parliamentary Group on Global Health

The IGHI is a sponsor of the [All-Party Parliamentary Group on Global Health \(APPG\)](#), which is concerned with issues that affect the health of us all globally – from education and staffing to mental health and global partnerships. It also takes a keen interest in the UK’s role in health globally and the continuing development of the UK as a global centre for health and health science. The APPG publishes reports on topics of interest and holds regular public meetings.



Dame Sally Davies, WISH 2016

World Innovation Summit for Health (WISH)

The IGHI is a partner of the World Innovation Summit for Health (WISH), a global community dedicated to sharing evidence-based ideas and practices in global healthcare. Professor Ara Darzi is their Executive Chair.

WISH focuses on some of the most pressing challenges facing governments, health systems and populations alike. It brings together health innovators and reformers from around the world to exchange ideas, learn from international experience, and collaborate in developing new solutions.

WISH aims to influence global health policy and has produced more than 40 evidence-based reports since its inception in 2013, each chaired by a leading expert and supported by a team drawn from academia, research, industry and policy. These reports are disseminated to leaders across the world.

Recent reports co-written by the IGHI include Cyber Security and Healthcare Systems and Climate Change and Health.



Queen's Tower lit up in Orange for World Patient Safety Day

Informing decision makers and influencing change

The IGHI publishes a range of ‘white papers’ that give policy makers an overview of the research landscape in any particular area with a list of recommendations.

In 2017 we evaluated the impact of private providers on health and health systems in a white paper in collaboration with British International Investment.

In 2020 we collaborated with the Institute for Security Science and Technology to publish a paper on improving cyber security including key insights for the UK health and care sector.

2020 also saw the publication of our white paper on NHS data and how we can maximise its impact on the health and wealth of the UK. We proposed a single overarching framework to guide the proper use of the UK’s health data assets.

In 2021 we published an update to the landmark 2015 white paper on the Future of Surgical Robotics.

Creating a global change in children’s palliative care

Hospices that provide palliative care for children and their families face many unique challenges. A new policy report from the IGHI sets out an optimistic vision of what a world-class provider of children’s palliative care (CPC) could look like in the future. It proposes nine key features to improve access and quality over time, drawing on best practice from 50 CPC service leaders in 27 countries, as well as insights from other healthcare sectors.

The report also marks the launch of the Global Treehouse Foundation, a brand-new organisation dedicated to promoting and sharing innovation in CPC. It grows out of a major research programme led by the IGHI, looking into the state of CPC globally, current innovations and the potential for future innovation. IGHI’s work on children’s palliative care is kindly supported by Fondazione Isabella Seràgnoli.

Strengthening capacity

We are educating the healthcare leaders of the future. We have pursued digital change and expanded our reach to share resources and strengthen capacity at a local, national and global level.



Case Study: NHS Digital Academy

“The NHS Digital Academy delivers the world leading programme in health system leadership for digital health. Commissioned by NHS Health Education England, in partnership with NHS Transformation Directorate, it is a commitment to develop and invest in the digital change leaders of the future.

The Academy is delivered by a partnership of the IGHI, the Usher Institute at the University of Edinburgh, Health Data Research UK and Imperial College Healthcare NHS Trust.

By working in partnership with the IGHI we can access a global network of unparalleled expertise, creating a relevant and stimulating curriculum for our NHS leaders.

More than 500 participants have undertaken the flagship PGDip Digital Health Leadership programme, including NHS England System CIO Sonia Patel. The Academy is now a required or desirable qualification for most advertised CIO and CCIO roles in the NHS.

The Academy provides the capability for the NHS to digitise care and use data to provide more efficient and effective care. Our ethos is patient-centric design for the healthcare of the future, and we design specific sections of the curriculum to equip participants with these skills.

The health care professionals we catalyse today are tomorrow’s leaders, working at executive level to progress digitisation of the health care system. The IGHI has led this programme to create the NHS workforce of the future. This next generation of healthcare is informed by data and knowledge and augmented by technology, and puts the UK health system ahead globally in digital health leadership creation.”

– Rachel Dunscombe, IGHI Visiting Professor



Global Patient Safety Collaborative

In 2019 the IGHI was chosen as a partner for the Global Patient Safety Collaborative (GPSC), an alliance between the WHO and the UK Government.

The initiative aims to bring patient safety to the top of the global health agenda, with a specific focus on low- and middle-income countries, by training the next generation of leaders in patient safety. It also pushes for greater coordination between countries by promoting uptake of effective solutions for safer care.

Through innovative programmes of education and research, IGHI staff are working with the GPSC to train and develop leaders in the field of patient safety. New leaders will then be equipped with the knowledge and skills to train others in healthcare systems around the world.

Leading Health Systems Network

Based at the IGHI and in partnership with the World Innovation Summit for Health, the Leading Health Systems Network (LHSN) is a network of healthcare leaders and organisations dedicated to improving health care delivery by using resources in the most effective and efficient way.

This expanding network has grown a global community of like-minded peers who value the cross-fertilization of evidence and best practices. Members share their ideas and strategies to improve healthcare and overcome challenges in their field, hoping to improve the quality of care in health systems at a global, national and local level.

Alongside producing evidence-based reports designed to influence policy, the LHSN promotes learning and knowledge sharing through its webinar series. It also offers evidence-based tools to help make healthcare safer, such as a hospital checklist for antimicrobial stewardship and an ‘Essentials of Cybersecurity for Healthcare Organisations’ framework.

Developing the next leaders in healthcare

Over the last 12 years, the IGHI has developed a suite of educational programmes that feature teaching from world class experts and aim to develop the healthcare leaders of the future. These include an MSc in Patient Safety, MSc in Health Policy, MSc in Healthcare and Design and MRes in Medical Robotics and Image Guided Intervention.

The IGHI partners with experts from other institutions to deliver its courses. The programmes attract professionals together with a range of partners tailored to each programme. They attract professionals working in healthcare or allied with healthcare systems, including Max Denning who completed his MSc in Patient Safety in 2010. He explains: “The faculty came from a range of academic disciplines and taught varied techniques to think about and solve difficult problems. This variety resulted in great class discussions and learning opportunities, especially during group projects. The course supported my goal of combining my clinical, academic and business interests to improve access to high quality, safe healthcare.”

Degree Type	Numbers Awarded
MRes	174
MSc	446
PGDip	230
PGCert	32

Table: IGHI Postgraduate qualifications awarded 2010/11 to 2020/21



568
POSTGRADUATE STUDENTS
(INCLUDING PHDS) AT IGHI IN
ACADEMIC YEAR 22/23

Engaging with a global audience

From the public and our patients to high profile visitors and speakers, we have involved the wider world in our work and pursued equality, diversity and inclusion throughout.

Bringing patients into research development

The IGHI involves patients and their families in research at every opportunity.

We are a partner of the Networked Data Lab (NDL), a pioneering network of analysts who use linked data, open analytics, and public and patient involvement to tackle the most pressing challenges in health and social care.

An IGHI project aims to increase engagement with hearing tests, and treatment for hearing loss, through the medium of bird songs. “Hearing Birdsong” is trialling a non-threatening hearing test, using familiar sounds played in a safe public space.

The IGHI’s collaboration with the digital charity Mental Health Innovations (MHI) hopes to provide insights into mental health in the UK and develop new ways to meet individuals’ needs. ‘Shout,’ MHI’s 24/7 digital crisis text line service was launched at the IGHI in 2019.

OnTrack Stroke Rehabilitation is a digital tool developed by our Helix Centre to support self-management amongst stroke survivors at home. The platform includes a smartwatch app with tailored coaching to help people own their rehabilitation journey.

Celebrating our work and inspiring the public

The IGHI is committed to engaging with the public.

For example, the annual Imperial Festival showcases research for the public through workshops, talks and demonstrations. Over the last 12 years the IGHI’s offering has introduced visitors to the next generation of artificial intelligence in the robot zone and let them try their hand at surgery.

In 2012, the redesign of the emergency ambulance by the Hamlyn Centre and the Royal College of Art won the transport award at the Designs of the Year awards. Staff worked alongside paramedics and patients and offered clinical expertise to redesign the interior of the standard emergency ambulance.

In 2018 we ran a free public exhibition giving visitors the chance to consider the issues with sharing healthcare data. The immersive Can of Worms event used storytelling and playful discovery to spark informed conversations.

Our research zine (a magazine-style publication), called Future Minds, is an online series showcasing IGHI research about young people and their mental health. The zine is co-produced with young people with mental health difficulties.



Opening our doors to high profile guests

The IGHI attracts high profile visitors and speakers from across the globe.

In 2015, His Royal Highness The Prince of Wales formally opened the Surgical Innovation Centre. Prince William visited the College’s Data Science Institute in 2017, where IGHI research was presented in the Data Observatory – the largest facility of its kind in Europe – to show the impact of his mental health campaign Heads Together.

In 2018, President Joe Biden delivered the inaugural lecture of the Imperial Cancer Research UK Centre, calling for scientists around the world to collaborate in new ways to create a cancer research and care system that the public deserves.

In 2019 the IGHI held the inaugural World Patient Safety Day conference. Hosted in collaboration with the Department of Health and Social Care and the WHO, the event aims to galvanise thought-leaders, policy-makers and the public to take urgently-needed steps to improve the safety of care for all.

In 2022 we hosted ex-prime minister Tony Blair for a talk on the challenges facing Britain and the bold action needed to tackle them.



Case Study: The Julia Anderson Training Programme

The Julia Anderson Training Programme offers paid work experience to people who have no, or limited, prior work experience at a university or organisation related to health, science, technology or business management.

Trainees work at the IGHI in a range of areas, from health policy to data analytics, enabling them to develop workplace skills and knowledge that will kick-start their career. The programme won the 2022 President’s team award for Excellence in Culture and Community.

One Big Data Analytics Unit Trainee was among the first cohort to complete the programme in 2022. They said: “The programme gave me an insight into working in a professional environment. There were so many opportunities to learn through contact with different staff members. At school I felt like research projects weren’t contributing to anything, but in this placement, you’re helping projects for a reason.

“It also gave me a chance to explore my options while also looking at other careers. I created a network of professionals who I can still contact if I need advice or help in the future. I like to think of it as a stepping stone to whatever my career is going to be.”



Looking to the future

What does the next twelve years hold for the IGHI? Our remit has always been to break traditional research silos to tackle some of the greatest global health challenges facing the world today. We will continue to push boundaries in healthcare robotics, patient safety and healthcare design.

But the pace of change has never been greater in global health innovation and new opportunities and healthcare challenges are always arising. These are some of the key research areas that the IGHI will focus on in the years ahead.

Climate Change and Health

The World Health Organisation has identified climate change as the greatest threat to human health. IGHI has run a successful programme, Climate Cares, looking at the mental health impacts of climate change for a number of years. This led to the first ever session on mental health and climate change at the annual UN Climate Change Conference (COP26) in Glasgow. At COP27 in Egypt, IGHI were prominent in discussions on mental health and climate change, with WHO highlighting our work.

IGHI is building on this success by establishing, with the Grantham Institute, a Centre on Health and Wellbeing in the Climate Emergency. This Centre will be the focus of climate change and health research at Imperial. It will continue to highlight the necessity of considering the mental health response to climate change. It will also look at education for NHS on responses to climate change and will work closely in partnership with Imperial College Healthcare NHS Trust.



Preemptive Medicine

The concept of preemptive medicine – using data to intervene before a disease has occurred – can be seen as a personalised approach to public health. For example, by using genetic and physiological data to identify that an individual has a propensity towards Type 2 Diabetes, we can then devise interventions that seek to prevent Diabetes ever occurring.

But preemptive medicine raises lots of interesting questions around how such initiatives could be funded, how can we ensure that it doesn't increase health inequalities, and how do we decide which diseases are most amenable to being prevented by this approach? IGHI plans to address these concerns and set out our recommendations for preemptive medicine in a new policy paper.



100 Years on from Penicillin

In 2028 it will be 100 years since Sir Alexander Fleming discovered mould growing on a petri dish in his laboratory at St Mary's Hospital. This led to Penicillin and other antibiotics that transformed medicine in the twentieth century. Now, in the twenty-first century, we risk losing the benefits of antibiotics as more and more bacteria become resistant to their impact.

We urgently need action in research, education and policy to ensure antibiotics remain effective. In the years ahead, the IGHI will be working with partners, including Imperial College Healthcare NHS Trust, to preserve Fleming's legacy.

Conclusion

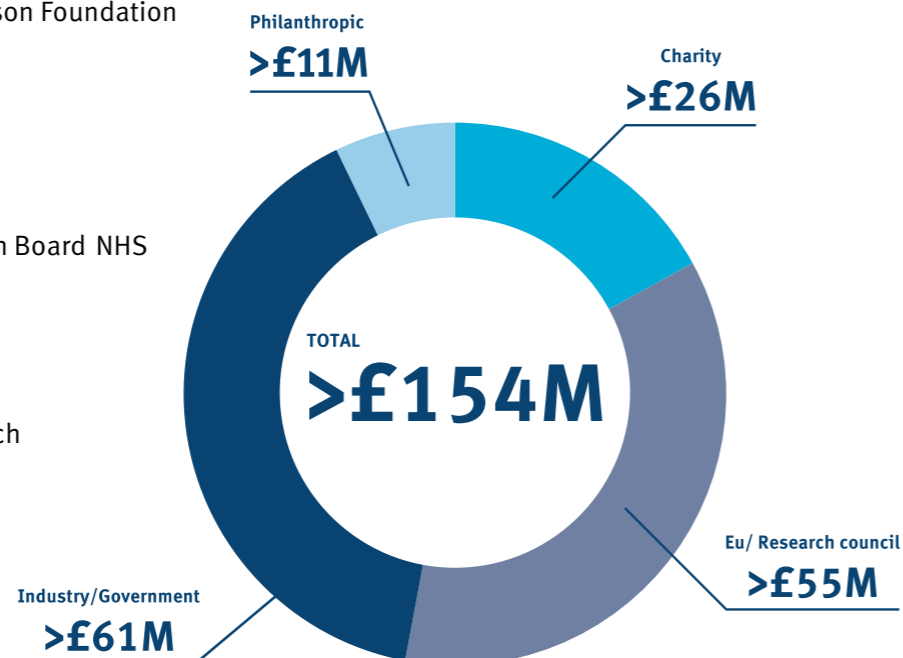
These are three examples of emerging programmes of work that we would expect to feature heavily in an IGHI anniversary report of 2030 or 2034. We know areas such as end of life care and artificial intelligence will continue to be of vital importance. Other issues, just as happened with COVID-19, will also emerge as new challenges and opportunities. The skills and experience within the IGHI means that we will be well placed to respond.

Thank you for the support

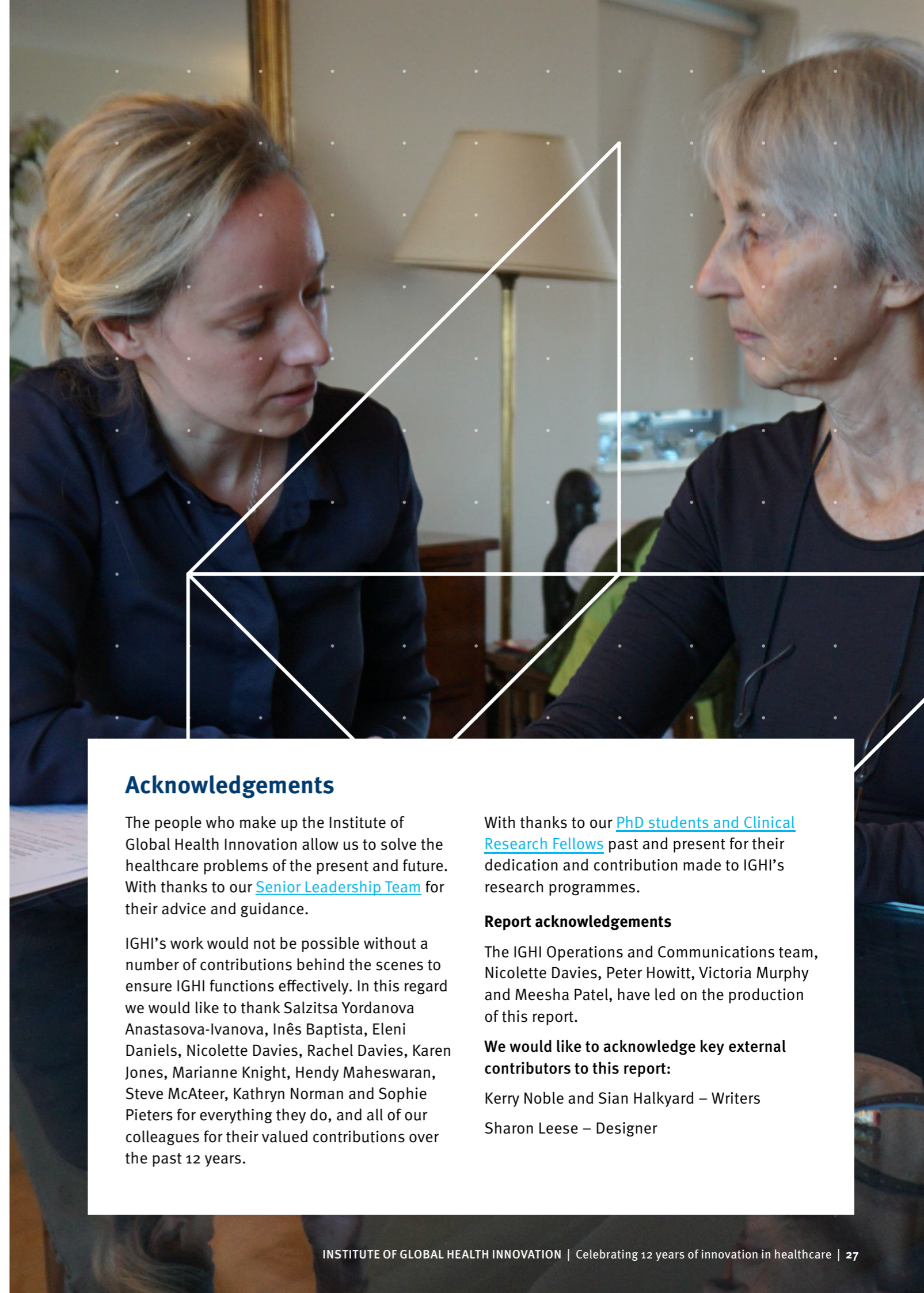
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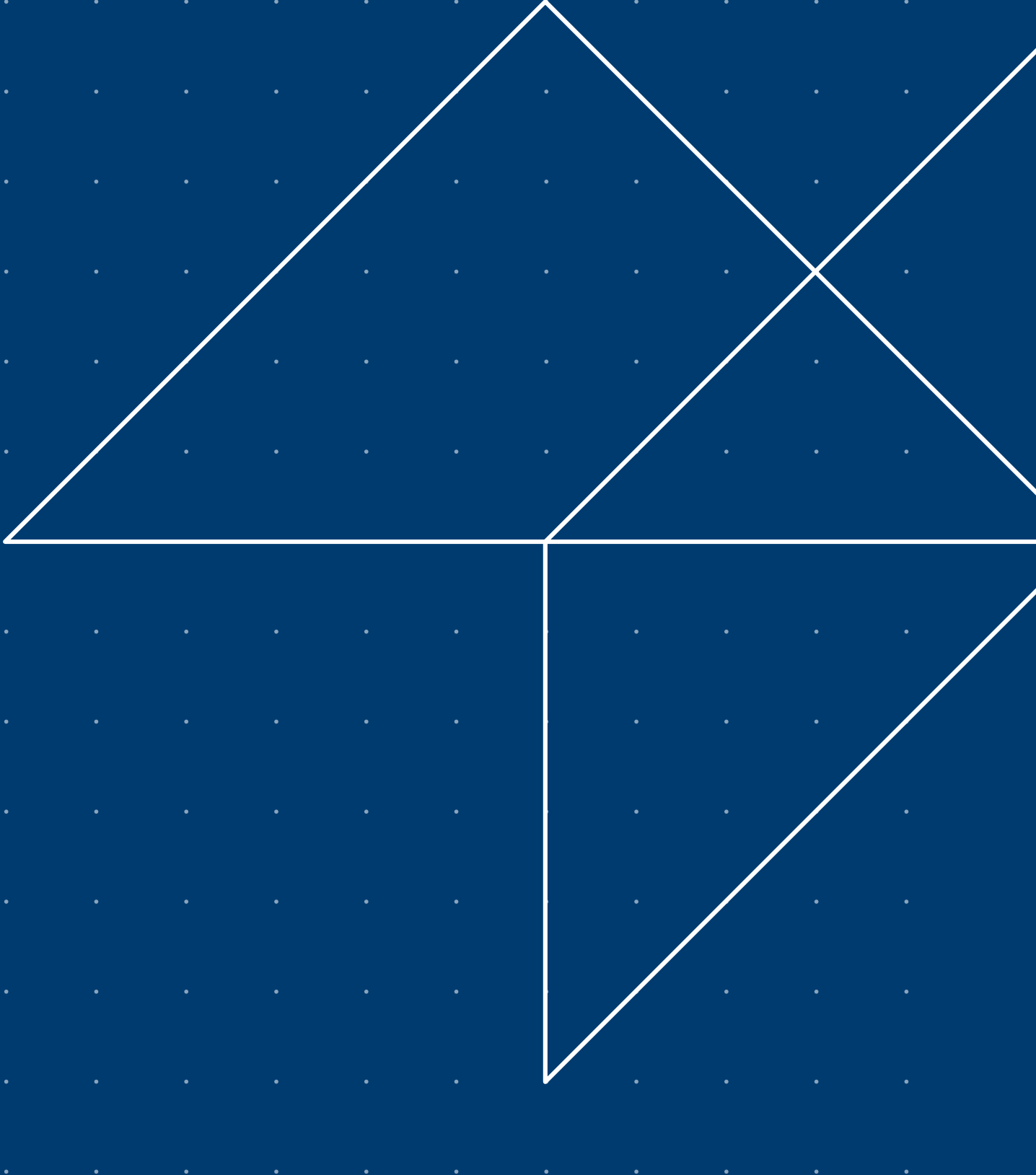
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