Imperial College
London

Institute of
Global Health Innovation

Improving global healthcare through evidence-based innovation

Prospectus
DESIGNING AND DISTRIBUTING HIGH IMPACT GLOBAL HEALTHCARE INNOVATIONS TO REDUCE HEALTH INEQUALITIES WORLDWIDE

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INSTITUTE LEADERSHIP

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Centre Director: Centre for Health Policy, Hamlyn Centre for Robotic Surgery, HELIX Centre for Design in Healthcare

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Professor of Paediatric Infection & Immunity
Centre Director: Centre of International Child Health

Professor Majid Ezzati
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Professor of Global Environmental Health
Centre Director: The Imperial College Wellcome Trust Centre for Global Health Research

Professor Kathryn Maitland
Professor of Tropical Paediatric Infectious Diseases
Centre Director: Centre for African Research and Engagement

Professor Elias Mossialos
Co-Director of the Centre for Health Policy and Head of the Health Economics Group
Institute of Global Health Innovation

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Led by Professor Darzi since 2010, the Institute of Global Health Innovation (IGHI) comprises a multidisciplinary team of over 160 clinicians, engineers, scientists, psychologists, policy analysts, data specialists, healthcare managers, economists, industrial designers and entrepreneurs all focused on the co-creation and diffusion of healthcare innovation to tackle some of the most pressing global challenges facing people today.

Housed within the Faculty of Medicine, the Institute is well placed to leverage the College’s wealth of multidisciplinary talent to innovate across science, technology, design and policy. By doing so, the Institute aims to develop cutting-edge solutions to the challenges faced by healthcare systems and to elicit transformational improvement in the quality and equity of patient care and population health and wellbeing.

Looking ahead, the Institute aims to continue to attract a strong cohort of students and scholars across its educational and academic programmes and to advance a broadening research agenda, which will encompass new and impactful interdisciplinary centres of excellence.

By leveraging its position at the forefront of policy research, the Institute both receives and disseminates leading-edge research and translational practice, which enhances its reputation and contributes to its high-impact status.

“MY GREAT, GREAT, GREAT GRANDFATHER PRINCE ALBERT WOULD HAVE BEEN THRILLED AT THIS LEVEL OF COLLABORATION.”

HRH The Prince of Wales

HRH The Prince of Wales visiting The Hamlyn Centre for Robotic Surgery
The Institute has evolved considerably since its conception in 2009 by Professor Peter Piot and its original focus on the traditional disease silos of global health.

Today, the Institute prides itself on a very different ethos and excels in the exploration and promotion of the entire innovation lifecycle within healthcare, from the identification of key global health challenges to the generation of solutions and their subsequent translation into realisable and widely adopted best practice. The Institute’s dynamic structure supports the creation and evolution of research that is focused within distinct, but widely partnered centres of excellence.

Aligned with the College’s strategic aims, the Institute focuses on the delivery of high quality and internationally pertinent research organised around seven centres of excellence. These centres are tightly woven within the clinical setting and together form a value-adding and supportive framework for fostering research expertise, translating cutting-edge research and establishing a recognised brand, which readily informs and influences the highest levels of industrial, academic and public sector stakeholders.

Utilising these strengths, the Institute is able to support innovation in healthcare along the entire innovation pathway of translational research; from scientific discovery, to first-evaluation in humans, to supporting the establishment of evidence-based best practice and finally, to the diffusion of best practice on a population and international level.

Through evidence-based policy formation and the collective insight of a global network of experts and peers, brought together through the World Innovation Summit for Health (WISH), the Institute is able to expand the impact of its research and better realise its founding vision.

“IT IS HIGH TIME THAT WE PUT MORE OF OUR ENERGIES INTO INNOVATION. THIS IS NOT JUST ON THE SUPPLY SIDE OF HEALTHCARE, BUT IN POTENTIALLY COST-SAVING DEMAND-SIDE INNOVATIONS.”

Simon Stevens
Chief Executive
NHS England
ALIGNED WITH THE COLLEGE’S STRATEGIC AIMS, THE INSTITUTE FOCUSES ON THE DELIVERY OF HIGH QUALITY AND INTERNATIONALLY PERTINENT RESEARCH ORGANISED AROUND SEVEN CENTRES OF EXCELLENCE.
The Institute’s seven centres work in an advisory and supportive role with a number of respected academic and clinical groups including:

- Imperial Cancer Research UK (CRUK)
- Imperial NIHR Biomedical Research Centre
- The national network of Academic Health Science Centres
IGHI CONSISTS OF SEVEN CENTRES OF EXCELLENCE, UNDER THE GOVERNANCE OF AN INTERNATIONAL ADVISORY BOARD CONSISTING OF SOME OF THE WORLD’S FOREMOST HEALTHCARE SPECIALISTS.

**New purpose-built facility for IGHI**

Currently spread across several sites and growing year on year, the seven centres of excellence and the support framework that currently constitute IGHI will be soon be brought together under one roof.

This new purpose-built facility will ensure researchers, clinicians and academics have the necessary resources to face the major health challenges of the 21st century. As well as new centres for child health, African healthcare and medical economics, the new Institute will provide state-of-the-art facilities that will allow for further expansion, flexible research and improved teaching space.

The establishment of this new building dedicated to IGHI will focus and reinforce its position as an independent, authoritative arbiter in healthcare policy and innovation. This in turn will ensure IGHI remains at the forefront in bridging and fostering effective relationships between governments, industry and healthcare systems worldwide.
An International Advisory Board has been established to support the wider network and outreach of the Institute and to provide an on-going mechanism for evaluative assessment and strategic guidance.

The Institute draws on the expertise of an esteemed network of high profile clinicians, researchers and honorary academics from across industry and health policy. This has created an outstanding international forum of specialists who take a proactive role in furthering the Institute's goals and ambitions.

IGHI International Advisory Board members

- Dr Richard Horton (Chair), Editor in Chief, The Lancet
- Dr Devi Shetty, Chairman of Narayana Hrudayalaya, Bangalore, India
- Sir Andrew Witty, Chief Executive Officer, GSK
- John Dineen, Former CEO, GE Healthcare
- Dr Mark McClellan, Senior Fellow and Director of the Health Care Innovation and Value Initiative at the Brookings Institution, USA. Director of the Robert J Margolis Center for Health Policy and the Margolis Professor of Business, Medicine and Health Policy at Duke University, USA
- Dr Hanan Al-Kuwari, Managing Director of Hamad Medical Corporation, Qatar
- Dr Philip Campbell, Editor-in-Chief, Nature
- Professor Chen Zhu, Professor of Medicine, Shanghai Jiao Tong University, China and former Minister for Health, China
- Professor Gavin Screaton, Dean of the Faculty of Medicine, Imperial College London
The Institute has developed an esteemed national and international profile and diffuses its broad portfolio of research interests through policy events and outreach initiatives that bolster a strong network both internally, within Imperial College, and far afield.

The Institute's Policy Seminar Series and Annual Lecture provide an opportunity for Imperial academics to engage with leaders in the field of global health. Previous guests include Dr Julio Frenk, President of the University of Miami and former Secretary of Health of Mexico; Madam Zuma, First Lady of South Africa; Stephen O’Brien MP, former Parliamentary Under-Secretary of State for International Development; Dr Noubar Afeyan, inventor, entrepreneur and founder and Managing Partner of Flagship Ventures; and Dr Edna Adan Ismail, nurse, midwife, UN diplomat, French Legion of Honour recipient and former foreign minister of Somaliland.

The Institute has experienced a growing media profile each year since 2010 as evidenced by increasing social and traditional media references, including tweets, followers and measured press activity in over 30 countries worldwide. The Institute's website and social media channels provide a platform for global health colleagues at Imperial College to raise awareness of their research activity and communicate key messages to a broad and receptive audience.
GLOBAL REACH

Working with the very best medical institutions and healthcare policy makers, IGHI has close links with a powerful global network of experts and peers. Foremost amongst these groups is WISH, the World Innovation Summit for Health.

Under the auspices of WISH, a network of the world’s most influential health policy makers come together to analyse, debate and form policy on major global health issues.

IGHI has taken a leading role in reforming and supporting national and international health initiatives across the globe. These include partnerships in Burma, Africa, South America and the Far East. IGHI, in collaboration with WISH, has also established the Leading Health Systems Network (LHSN), a group of healthcare leaders and organisations dedicated to improving healthcare through international collaboration.

IGHI academics and clinicians work closely with leading institutions, including the World Bank, The World Economic Forum (WEF) and other including the World Bank, The World

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WORLD INNOVATION SUMMIT FOR HEALTH (WISH)

WISH aims to provide the ideal environment for intellectual interchanges of ideas and to benefit from our shared experiences.”

HH Sheikha Moza bint Nasser

On 10 and 11 December 2013, Qatar Foundation for Education, Science and Community Development launched the inaugural WISH at the Qatar National Convention Centre.

A distinguished audience of decision-makers and influencers from across the world convened to discuss practical, lasting and innovative solutions to global healthcare challenges. This high-profile event, which was the successor to 2012’s Global Health Policy Summit in London, brought together heads of state, ministers, senior government officials, academics and influential business leaders.

The mission of WISH is closely aligned to the vision of Her Highness Sheikha Moza bint Nasser, Chairperson of Qatar Foundation, and represents her ongoing commitment to raising the standards of healthcare nationally and internationally.

Her Highness Sheikha Moza bint Nasser announced WISH during 2012’s Global Health Policy Summit in London’s Guildhall, which was jointly organised by Qatar Foundation and Imperial College London’s Institute of Global Health Innovation.

During Her Highness’ address, she urged delegates to invest their efforts into coordinating and improving prevention and treatment of diseases by exchanging ideas, collaborating and learning from global experiences.

Through WISH, Qatar Foundation aims to create tangible and long-lasting solutions in healthcare advocacy, policy, research and delivery. In keeping with this objective, the project is designed to build a network of health experts and to facilitate an interdisciplinary approach, as well as best practices that can transform healthcare policies and systems globally.

WISH is about action. The Summit looks at ideas which are evidence-based, scalable, and sustainable – often ideas which have already been implemented somewhere in the world – and works out how to implement them far more widely.

The Summit is based on the concept that radical innovation is needed to meet the world’s health challenges, and that this requires more collaboration between those bodies and individuals that are in a position to make a difference. I hope that in time this annual event will become the Davos of healthcare.”
WISH 2015 was attended by 23 health ministers, and a total of 50 countries were represented by a ministerial delegation. Delegates from over 93 countries attended the two-day event in Doha to discuss key global health policy issues and hear keynote addresses by Dr Devi Shetty, Narayana Health, and Don Berwick, Institute for Healthcare Improvement.

Evidence-based policy reports presented at the summit have since been translated into articles which have been published in Health Affairs and presented in other global fora such as the APAC forum, Auckland, and the International Patient Safety Congress led by Apollo Hospitals, Bangalore. Policy reports from both WISH 2013 and 2015 can be accessed via www.wish-qatar.org/

**Key policy reports from WISH 2015**

- Communicating complex health messages
- Delivering affordable cancer care
- Dementia
- Diabetes
- Mental health and wellbeing in children
- Patient safety
- Universal health coverage

**Miklós Szócska**
Minister of State for Health at the Ministry of National Resources of the Republic of Hungary

“It is my conviction that WISH has opened up new horizons of thought as regards to the application of technology and healthcare.”

Left: Dr Devi Shetty
OUR RESEARCH CENTRES

BRINGING TRANSLATIONAL RESEARCH ALONGSIDE POLICY AND A STRONG INTERNATIONAL PROFILE RESULTS IN AN INSTITUTE THAT IS VERY MUCH GREATER THAN THE SUM OF ITS PARTS. THAT IGHI CAN DISCOVER, CREATE, IDENTIFY, TEST, SPREAD AND PROMOTE INNOVATION ACROSS THE REALMS OF TECHNOLOGY, BUSINESS MODELS AND SERVICES ADDS VALUE TO PATIENTS AND HEALTHCARE SYSTEMS ABOVE AND BEYOND THE TRADITIONAL METRICS OF IMPACT.
IGHI draws upon the unique interdisciplinary strengths of Imperial College London across all of its faculties: Medicine, Engineering, Natural Sciences and Business to achieve its strategic aims.

The Institute provides a powerful engine to support the incubation and transformation of research groups into world-leading centres of excellence by first accruing a critical mass of academic brilliance, aligned objectives, funding and resources.

As a coordinating force, the Institute supports these centres to promote collaboration and access a diverse and rich network of internal and external partners from academia, industry, government and the charitable sector. The seven core centres of IGHI are:

**The Hamlyn Centre for Robotic Surgery**

**The Centre for Health Policy**

**The HELIX Centre for Design in Healthcare**

**The Centre for Digestive and Gut Health**

**The Centre of African Research and Engagement (ICCARE)**
Facilitating the interactions of research groups active in this area across faculties within Imperial and national and international partners. Director: Kathryn Maitland. Est. 2015.

**The Centre for International Child Health**
Hosting multi-disciplinary global health research directed at the health and well-being of children worldwide, and providing a forum of resources and connections for scientists, clinicians and allied professionals working in child health. Director: Beate Kampmann. Est. 2015.

**The Imperial College Wellcome Trust Centre for Global Health Research**
Initiating and fostering research that improves health, and reduces inequalities in health and healthcare, through generation and deployment of knowledge that can lead to more effective and equitable prevention and treatment of illness and to promoting positive health over the life course. Director: Professor Majid Ezzati. Est. 2013.
This internationally recognised centre of surgeons, engineers and computer scientists was founded on the principles of collaborative and multidisciplinary practice. By simultaneously advancing technology in response to an evolving clinical landscape, the group aims to reduce the physical and psychological traumas of surgery through minimal access and minimally invasive techniques.

From the advancement of basic research and development, to the construction and testing of robust prototypes in the laboratory, and finally to first-in-human trials on patients in the operating theatre, the Hamlyn Centre exemplifies the tripartite aims of the Academic Health Science Centre model.

By bridging the innovation and translational science pathway the Centre has fostered considerable commercial success, including 20 unique patents, and a far-reaching international network of industrial and academic partners.

The Hamlyn Centre boasts a team of over 60 staff, over 35 of whom are PhD students, focused across three broad and interconnected themes.

### Key partners
- Boston Scientific
- Covidien
- GE Healthcare
- Hansen Medical
- Harvard Medical School
- Intel
- Intuitive Surgical
- John Hopkins University
- Karl Storz Ltd
- McLaren
- Mauna Kea Technologies
- Medtronic
- Technical University Munich, Germany
- University of Tokyo, Japan
- University of Washington

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www.imperial.ac.uk/hamlyn-centre/
Institute of Global Health Innovation

THE CENTRE IS AT THE FOREFRONT IN THE DEVELOPMENT AND INTEGRATION OF ROBOTICS INTO MEDICINE AND PATIENT CARE. ADVANCED ROBOTIC TECHNOLOGIES HAVE THE POTENTIAL TO TRANSFORM CONVENTIONAL KEY-HOLE SURGERY AS WELL AS DEVELOPING NEW APPROACHES TO INTEGRATED SENSING AND IMAGING FOR CANCER SURGERY AND TREATMENT.

Pervasive Sensing
With the aim to provide safe, effective and accessible technologies for both developed and developing countries, our researchers have advanced the field of miniature and wireless body sensor networks. These technologies can monitor physiological, physical and biochemical parameters in a multitude of environments and generate a wealth of valuable biometric data without restricting or modifying patient behaviour.

These networks and sensors will be essential for assessing the future health needs of patients and will provide a powerful tool to support the development of personalised and precise medical interventions and practices to support an ageing population. 'eAR', a low-power miniaturised ear-worn activity recognition sensor for wellbeing, personal training and professional sports was spun out as a commercial entity in 2008. The technology won the Bluetooth Innovation World Cup in 2010.

Biomedical Imaging and Photonics
Through the development and translation of optical imaging and spectroscopy instrumentation, for in-situ and in-vivo tissue characterisation, we aim to advance real-time diagnostics as well as to push the boundaries of medical image computing and image-guided interventions that harness MR, CT and ultrasound modalities.

The Centre has developed image augmentation technology and a novel guidance platform for improving intra-operative decision making, which is now in clinical use at St Mary’s Hospital and the OLV Clinic in Aalst, Belgium.

Biomedical Robotics
This theme is dedicated to the development of robotic technologies to transform conventional minimally invasive surgery, as well as optimising and empowering robotic technologies with greater intelligence and precision. Within this theme we are developing miniature ‘microbots’ with integrated sensing and imaging to provide a vector for targeted therapies and treatments within humans, as well as designing new assistive robots for both clinical and community settings. A novel solution to the limitations of rigid endoscopy, the flexible iSnake® won the prestigious 2011 IEEE International Conference Award for Robotics and Automation in Shanghai, China.

Academic output
Highlighted publications
- Spectrally encoded fiber-based structured lighting probe for intraoperative 3D imaging, Journal: Biomedical Optics Express, Impact: 3.176, Citations: 8

> 5 editorials
> 80 journal articles
> 15 reviews
> 100 conferences
The Centre for Health Policy’s vision is to catalyse the development, uptake and diffusion of innovative, evidence-based health policies around the world. It harnesses international events and forums to raise the profile of key healthcare challenges and to amplify the impact of the Institute’s diverse research outputs.

The Centre’s work is focused on health policy development, the diffusion of innovation, patient safety, e-health and informatics (including Big Data), health economics, pharmaceutical policy, and quality outcome metrics. Current major programmes include:

**Patient Safety**

- **NIHR Imperial Patient Safety Translational Research Centre (PSTRC)**
  
The PSTRC is one of only two centres of excellence in the UK for patient safety and it is funded by a grant from the NIHR. The Institute has a pedigree in patient safety science from its central role in the development of the surgical safety checklist, and works closely with the Patient Safety and Translational Research Centre (PSTRC) to share expertise, talent and resources.

- **National Reporting and Learning Systems (NRLS)**
  
  NHS England has commissioned the Centre to deliver a research and development programme exploring the role of incident reporting within patient safety. The ultimate aim is to better understand and specify the role of incident reporting within the broader patient safety landscape. It is also to improve the processes, incentives and shared learning around incident reporting and the NRLS. Ultimately, our research aspires to help build a greater focus on patient safety and improved clinical outcomes within the NHS.

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**Academic output Highlighted publications**

- A Key To Slower Health Spending Growth Worldwide Will Be Unlocking Innovation To Reduce The Labor-Intensity Of Care, Journal: Health Affairs, Impact: 4.641, Citations: 10

> 10 editorials  
> 100 journal articles  
> 30 reviews  
> 10 conferences

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www.imperial.ac.uk/centre-for-health-policy
Health Economics

Led by Professor Elias Mossialos, the Health Economics Group works closely with all of the Centre’s teams, harnessing global expertise to measure the economic impact of various international policies and interventions in healthcare. The group uses mixed methods, both quantitative and qualitative, to derive evidence that policy makers can use to drive quality improvement and efficiency across health systems, hospitals and community care. A large part of the research from the group is applied; as such, collaboration with clinicians and hospital administrators is an important feature of their work.

The group also leads three of the four core modules on the MSc in Health Policy at Imperial College: health systems and policy, health economics for health policy, and financing healthcare.

- **MINDSPACE**

  IGHI was central to the development of the MINDSPACE framework, which has transformed the UK government’s approach to behaviour change in public policy. Utilising this experience, the Centre is now working with Qatar University to tackle childhood obesity, and Imperial College Healthcare NHS Trust to improve patient medication adherence and hand-hygiene compliance.

E-Health and Big Data

- **Sowerby Commission**

  The Sowerby e-health forum is a research and development programme that explores how the use of electronic health records, healthcare data and health informatics policy can transform the way the NHS delivers safe and effective patient-centred care. The forum looks at the potential for primary and secondary care data integration to improve service delivery, healthcare research and population health in this country. The forum is made possible by the Peter Sowerby Foundation.

- **Big Data and Analytical Unit (BDAU)**

  The BDAU brings together experts from the fields of computer science, artificial intelligence, statistics, epidemiology and informatics, to create a data-driven evidence base for healthcare policy. The multi-disciplinary team conducts complex and innovative analyses and develops new analytical methods to gain insight from large datasets.

Frugal and Reverse Innovation

The Centre is conducting research into Frugal and Reverse Innovation, identifying innovations from low- and middle-income countries that may offer potential value for high-income country health systems. Commissioned by the US Commonwealth Fund, researchers presented two innovations from Brazil and Singapore at a high-level policy symposium in Washington DC in December 2015 examining the potential for adoption of these innovations in that context.

Safer Care Accelerator programme

The Safer Care Accelerator brings together healthcare leaders and organisations to exchange insights, experiences and data around patient safety. Network activity comprises a series of webinars, case studies, surveys and insight reports and will culminate with a final report synthesising our findings.

End-of-Life

The End-of-Life Care Forum is a hub for all end-of-life care work performed within IGHI’s Centres of Excellence. Our work encompasses areas such as health policy, patient safety, design and economics, developing evidence to improve end-of-life care around the globe. The Forum’s projects focus on improving access to essential medicines in low- and middle-income countries, evaluating the cost, usage and impact of advance care planning, and using design principles to improve the safety and experience of patients in hospices and hospitals.

“If we do not share data in the way that is necessary, not only are we breaching the rights and obligations of the patients, we’re breaching the rights and obligations of the clinicians. It is unsafe.”

Dr David Stables, Peter Sowerby Foundation Trustee
LEADING HEALTH SYSTEMS NETWORK

Based at Imperial College and in partnership with the World Innovation Summit for Health (WISH), LHSN is a collaborative network of healthcare leaders and organisations dedicated to improving health care delivery by effectively and efficiently using available resources.

Our network brings together the best ideas, models of care and strategies to drive sustained improvement, and connects health care leaders to a like-minded community of peers that share the same goals and challenges.

IF YOU WANT TO CHANGE SYSTEMS, YOU HAVE TO CHANGE PEOPLE’S PERSPECTIVES AND REKINDLE THAT YEARNING FOR LEARNING AND INNOVATION. THAT IS WHAT INVOLVEMENT WITH LHSN DOES.
The HELIX Centre is an exploration into how design can transform health when it’s placed on the front line of the medical world – an acute general hospital in Europe’s busiest city.

HELIX was launched in Autumn 2013 and is a collaboration between the Institute and the Royal College of Art (RCA). Working in partnership with the NHS and high profile industrial and academic partners, the HELIX team design human-centred healthcare solutions directed at some of the most pressing challenges facing healthcare.

The Centre builds upon a strong foundation of collaboration with the RCA and a proven model of bringing together product and service designers and clinical staff. The ‘Redesign the London Ambulance’ project won the UK Design award in 2012 for successfully reworking the antiquated ambulance model to provide a more functionally sound and ergonomical environment that harnessed innovation in diagnostics and digital networking to support safer practice and better communication.

Real medical breakthroughs occur when people-centred design and scientific rigour collide.

www.helixcentre.com/
HELIX is unique in embedding a design team directly in a healthcare setting working to translate research into scalable innovation. Opened in 2015 by HRH the Prince of Wales, the HELIX studio sits directly opposite the A&E department at St Mary's Hospital. It gives the process of innovation a physical focus within the healthcare setting, and the architecture, which is a welcome contrast to the clinical spaces around it, gives designers, clinicians and patients a space to think freely and collaborate.

The impact of HELIX is measured by the rigorous validation of its innovations as well as the economic and commercial success of its outputs. HELIX aims to generate IP and build sustainable businesses. This new model of translational research sees business development resource and skills embedded in the Centre to promote the commercialisation process, and this novel expertise, within the research setting, is expected to positively enhance the wider Institute and promote a culture of commercially attractive and focused research.

Floot
The HELIX team has developed a digital platform to help children manage their asthma by providing a simple, fun way to take control of their lung health. Children can attempt challenges, such as making a dragon breathe fire, by blowing a simple whistle that comes with Floot. The microphone in the smartphone listens to the pitch of the whistle and records a peak flow reading. Floot can also be used to map attacks and their triggers, providing a comprehensive view of lung health to allow children and their doctors to actively manage asthma to avoid complications.

Zilli: a card game for active kids
HELIX has explored ways to promote physical activity through informal, low-cost, sociable and fun ways to children. Zilli is designed for kids between 9 and 13, a time where there is a lot of change in their lives. We have created a card game, Zilli, where participants set each other physical challenges to be acted out in a light-hearted and amusing manner. The card game is competitive, but not in the traditional sense of established sports; it combines physical activity with wit, imagination and humour. Zilli appeals to groups of children and families alike and offers an alternative form of ad-hoc exercise with broad appeal.

Caremap: Improving cancer patient experience
HELIX has designed a solution to help cancer patients understand their individual care pathway, who their clinical team are, where the key locations of their care are, and what third party services (such as charity support) are available to them. The simplest element is a printed card brochure that acts as a discussion tool between clinician and patient. This can also be used as a web or app based portal, establishing a digital connection between the patient and clinical teams.
Under the leadership of Professor Jeremy Nicholson, the Centre for Digestive and Gut Health (CDGH) is a partnership between CSM, Hepatology and IGHI and bridges other departments and faculties, including St Mark’s.

The Centre brings together expertise in microbiology, gastrointestinal surgery, gastroenterology, hepatology, nutrition and computational and systems medicine.

The Centre is based in the QEOM building on the St Mary’s Hospital Campus and comprises multiple senior investigators in many disciplines. All aspects of liver and GI disease are covered within the Centre. There is considerable expertise in genomics, proteomics, metabonomics, microbiomics and immunology.

The centre aims to bring together like minded scientists and clinicians who recognize that the human microbiome is an exciting new frontier in human biology. In recent years we have begun to realise that the collection of microbes which live in and on us are not just passengers, but key components in the day to day functioning and development of mammalian systems.

We now understand that human beings have co-evolved a requirement for the microbiome and that we may not be able to function properly when we alter it, either intentionally or unintentionally. The microbiome has been linked to a significant set of health parameters and also disease states, such as colorectal cancer (CRC), inflammatory bowel disease (IBD), liver inflammation, cardiovascular disease (CVD) and behavioural disorders such as autism.

At the centre we are at the forefront of developing integrated models of the microbiome-host interactions with a strong aim of translating these into clinical practice.

www1.imperial.ac.uk/centrefordigestiveandguthealth/
THE CURRENT PANDEMIC OF OBESITY IS A SIGNIFICANT AND GROWING HEALTHCARE ISSUE. THE CENTRE FOR DIGESTIVE AND GUT HEALTH IS AT THE FOREFRONT IN DEVELOPING TOOLS AND INTERVENTIONS TO EXPLORE THE COMPLEX ROLE OF THE GUT MICROBIOME IN OBESITY.

The CDGH is recognised as one of the foremost institutions working in digestive and colorectal disease. Its international standing is reflected in both the quality and number of academic papers published, as well as the Centre's high profile representation at the major international meetings.

The CDGH employs over 30 staff working across basic science, metabonomics, physics and engineering, focused on the clinical application of their research.

One of the most high profile developments was the iKnife. This technology offers the prospect of real-time cancer diagnosis during operative procedures by harnessing mass spectroscopy to detect cancerous by-products through the heated vapours released during incision. The publication of the iKnife paper was reportedly the most media attention Imperial College has observed for a recent scientific discovery.

The group is commercially focused and has filed over six patents and propagated four associated commercial spinout companies.

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**MRes in the Microbiome in Health and Disease**

The educational course is designed to provide multidisciplinary training in microbiology, nutrition, hepatology and microbial signaling. The students will gain knowledge and experience in various systems biology approaches to understand the functionality of the gut microbiome and develop new targets for disease prevention and treatment.

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**Academic output**

**Highlighted publications**

- **Title:** Host-Gut Microbiota Metabolic Interactions, Journal: Science, Impact: 31.027, Citations: 752
- **Title:** Gut microbiome-host interactions in health and disease, Journal: Genome Medicine, Impact: 3.91, Citations: 187
- **Title:** Metabolic surgery profoundly influences gut microbial-host metabolic cross-talk, Journal: Gut, Impact: 10.732, Citations: 192

- > 100 journal articles
- > 10 reviews
- > 10 conferences
Imperial College has a wealth of scientists and engineers working across Africa in a diverse range of health and environmental research programmes, yet there is no single resource on the Imperial College website that captures this diversity or scope of our work.

The formation of a 'virtual' Africa Centre within IGHI aims to provide a portal that assembles our research, education and policy engagement and synthesizes this information under recognizable and logical themes within this resource.

IGHI will hold regular forums to highlight key challenges being addressed by our work in Africa. The forums will focus upon particular health or environmental challenges to encourage dialogue between researchers with different backgrounds, a north-south and south-south exchange, cross-fertilisation of ideas and translational research. Imperial College Centre for African Research and Engagement (ICCARE) would therefore facilitate the development of interdisciplinary partnership, drawing on the wide range of facilities, skills and expertise within Imperial College.

The ICCARE website aims to provide a portal via newsfeeds for our partners to publicise their latest research outputs or awards for rapid dissemination, discussion and uptake of new ideas and findings. The website's interactive page will act as an importance source and catalyst in the pathway to impact of our research outputs with respect to policy and practice.

www.imperial.ac.uk/global-health-innovation/our-research/our-research-centres/centre-of-african-research-and-engagement-iccare/
The Centre for International Child Health (CICH) conducts, hosts and facilitates multi-disciplinary research with a focus on international child health.

Led by clinical academics with an international track record in paediatrics, it is a hub for activities and partners in multi-disciplinary research, all aimed at improving the health of children throughout the globe.

It facilitates the interactions of cross-faculty research groups committed to global child health at Imperial College, and has built a network of international partners.

We provide a platform of educational resources and connections for clinician-scientists and allied professionals in order to train the next generation of leaders and professionals in all aspects of international child health.

The CICH has created cross-faculty partnerships between medicine, engineering, nutrition and education, and brings together their diverse expertise and connections to give a unified voice to child health at Imperial College within its many international activities.

Positioned within IGHI, the CICH has access to the world leading expertise based in IGHI-associated centres and can focus such resources towards addressing key questions in international child health.

Members and partners of the CICH are valuable resources for external organisations to advise on needs, interventions and strategies that can make a difference to the health of children in a given setting.

The centre has created partnerships with international researchers and sites, who share our vision of joint working for child health. These partnerships facilitate exchanges of ideas, staff and students across continents and settings.

The health of children worldwide is intimately linked to their environment. We need to make sure that we can address their needs through cutting-edge multi-disciplinary research and policies that are fit for purpose.
The Imperial College Wellcome Trust Centre for Global Health Research is one of the five UK-wide centres funded by the Wellcome Trust to enhance global health research.

The centre aims to initiate and foster research that improves health, and reduces inequalities in health and healthcare, through the generation and deployment of knowledge that can lead to more effective and equitable prevention and treatment of illness, and to promoting positive health over the life course.

Our vision is to be truly global, to learn from successful experiences throughout the world, and to serve the disadvantaged people and communities everywhere – in remote rural areas as well as deprived English inner cities.

Since its establishment in 2013, the centre has taken major steps to leverage Imperial’s strengths in science, engineering, medicine, public health, data analytics and business towards cutting-edge global health research. It encourages interdisciplinary and cross-faculty initiatives, and organises events and supports activities that will catalyse and enhance them.

The centre also has a strong focus towards identifying rising young researchers and supporting their career development. It also plays a major role in expanding Imperial’s training in global health topics.

The centre works with partner institutions throughout the world on collaborative research and coordinated training, and emphasises strengthening research excellence in low- and middle-income countries. We and our partners have research activities on every continent, and in every area of global health.

www.imperial.ac.uk/global-health-innovation/our-research/our-research-centres/wellcome-centre-for-global-health-research/
The Imperial College MSc in Health Policy is now widely recognised as the leading postgraduate qualification of its kind.

With the emphasis on practical management skills rather than theory, the course ensures students have the practical experience to make an immediate impact when returning to full-time employment.

A workplace-focused dissertation is a key part of the course.

All students are expected to spend time implementing health policy skills in the workplace.

The standard and quality of lecturers is second to none, consisting of respected experts from international health care systems, acting and ex-government ministers, and leading academics and senior managers from the NHS.

**Structure**
During the two years, students attend four two-week teaching sessions at Imperial College. They also complete an individual dissertation under the supervision of world class researchers.

The taught modules cover the following areas of health policy:
- Financing Healthcare
- Health and Society
- Health Economics for Health Policy
- Health Service Delivery
- Health Systems & Policy in Developing Countries
- Innovation in Healthcare
- Leadership in Healthcare / Ageing and Society
- Measuring and Improving Performance in Health Systems / Communicating Health Policy

In addition, students undertake a research dissertation during the second year of the MSc in an aspect of Health Policy that will advance the understanding of best practices.

**Career prospects**
Imperial College is one of the world’s leading research universities and works closely with employers and industry, including Industrial Advisory Panels, to design Master’s courses which provide graduates with technical knowledge, expertise, and transferable skills. Most Master’s courses offer an opportunity to carry out research projects in, or in collaboration with industry.

**Key benefits**
- A detailed theoretical and practical understanding of health policy from leading health policy academics and practitioners.
- Quantitative and qualitative research techniques to be able to carry out original study in health policy.
- The ability to critique existing and emerging health policy on the basis of evidence and knowledge.
- A comparative perspective on health policy which considers the challenges affecting different regions and countries as well as different potential responses to them.
- An international network of high-flying peers.
- Skills and knowledge for leading roles in the healthcare sector.
- A CV-enhancing Master’s qualification from a world leading university.
**MSc IN PATIENT SAFETY**

**Introduction**
This two-year part-time programme offers a sound theoretical background to the principles of patient safety and quality improvement in healthcare. It provides rigorous academic training, practical experience in safety and quality improvement, and an introduction to a range of relevant research methods.

**Programme structure**
The programme is made up of eight taught modules (normally four per year) of face-to-face teaching – each lasting a week. Seven modules are core (compulsory) and the eighth is selected from a choice of modules provided by other MSc programmes, e.g. Health Policy or Surgical Education.

In addition to the taught modules and associated assessments, students are required to conduct and write up a research project, and submit a reflective portfolio.

**Entry requirements**
Prospective students will be expected to hold a degree in medicine or as a minimum a Second Class in a healthcare-related subject, and have three years of experience working in healthcare. On top of these, Imperial College London has a set of minimum entry requirements that must be met to be considered for a place on the course.

**Is this programme for you?**
This Master's level programme is designed for healthcare professionals who have experience in their chosen field, such as surgeons, physicians, anaesthetists, nurses, pharmacists and those from other allied health professions. It is also relevant to those who have a position related to improving safety and/or quality of healthcare.

The main topics covered are an overview of the current healthcare system including: how we manage risk and use information; incident reporting, investigation and analysis; the impact of harm on patients and staff; quality improvement tools and techniques; and organisational aspects of safety and quality. In addition, a number of cross-cutting themes will be covered, including teamwork, the patient’s perspective, effective communication, and critical skills.

We welcome applicants from the UK and EU, and any students from outside the EU who have a visa to work and study in the UK.

**Career prospects**
The Quality and Safety in Healthcare Programme equips graduates to further their careers in healthcare and in particular to enhance the safety of their own clinical practice and to develop an understanding of processes involved in improving quality and safety. The programme can also be used to enhance or develop a position related to patient safety and/or quality improvement.

**Key benefits**
MSc Quality and Safety in Healthcare graduates are able to:
- Demonstrate an understanding of the essential theoretical and practical issues in patient safety and quality improvement
- Demonstrate an understanding of, and skills in, risk assessment, audit, incident investigation and analysis, and planning a quality improvement project
- Demonstrate skills in effective communication including report writing, academic writing and reflective practice
- Apply quantitative and qualitative research techniques to be able to carry out their own studies

By the end of the programme, students will have enhanced their understanding of quality and safety issues, have experience of using a range of tools and techniques applicable to their own discipline and healthcare in general, and have developed their research and statistics skills.
Introduction
The MSc in Healthcare and Design is an interdisciplinary programme that draws on the complementary knowledge and expertise of Imperial College London and the Royal College of Art (RCA).

The programme is offered part-time over two years with eight individual weeks of intensive teaching (four blocks of two weeks). The programme runs alongside an MRes programme awarded by the RCA. The Imperial MSc programme has been designed for clinicians and healthcare professionals, while the RCA programme is aimed at design professionals.

The two separate programmes build on the partnership between Imperial and the RCA, exemplified by the HELIX Centre, a design studio in St Mary’s Hospital bringing designers and clinicians together for the first time to solve healthcare challenges. A key objective of the HELIX Centre is to catalyse more innovative approaches to improving health and healthcare through human centred design.

The programme structure
Face-to-face teaching will take place in each module during one-week long intensive sessions when students will be exposed to world leading experts and facilities from both Imperial and the RCA, and will also have the opportunity to participate in a range of formative and summative individual and group activities. Combined with the face-to-face teaching, e-learning and blended learning modules will offer students the opportunity to advance their learning, achieve the specified learning outcomes and demonstrate their progress.

The majority of modules (six out of eight modules) are shared between the two programmes, with two introductory modules designed specifically for each cohort to introduce the principles of design and healthcare respectively.

The research project will be supervised by Imperial but with the option for students to have a second supervisor from the RCA. In addition students may choose to undertake this research project in their workplaces, and to manage this we may utilise ‘subject experts’ in workplaces to provide additional support to students.

Entry requirements
• Normally, a 2:1 UK Bachelor's Hons Degree or an overseas qualification of equivalent standard.
• Students will either have a clinical background or will have other healthcare experience. Students with design experience/qualifications will be directed towards the RCA’s MRes programme.
• As the programme is part-time, we would expect students to be employed and we will require a letter of permission from their employer.

Is this programme for you?
This programme has been specifically designed to suit professionals working in or allied to the healthcare system or those with experience of the healthcare space who wish to develop the skills to advance an entrepreneurial idea. The programme has been developed for part-time delivery, allowing you to attend without having to take a year out of your career. We also encourage you to complete your research in your own place of work (under Imperial's supervision), allowing you to embed the knowledge and skills you have learned into your own area of practice.

Key benefits
• You will be exposed to a world-class faculty who can provide knowledge based learning and encourage critical awareness of the current issues. You will be encouraged to translate this into your own professional practice.
• You will be taught a range of research techniques, alongside tools and frameworks that can be used in the field of design and innovation.
• You will be expected to develop your skills, including collaborative multi-disciplinary working, decision-making, continuing professional development and problem solving, amongst others transferable skills.
MRes IN MEDICAL ROBOTICS AND IMAGE-GUIDED INTERVENTION

By leveraging the unique research strength, state-of-the-art facilities and multidisciplinary environment of the Centre, this MRes course is designed for science/engineering graduates in traditional disciplines to enhance their career opportunities and progression in the following areas:

- Academic research and PhD
- Commercial research and development in medical robotics (the fastest growing sector in the robotics industry)
- Clinical translation of robotic technology, in both public and private sectors (clinical uptake of robotic surgery and image-guided intervention has been rapid, showing over 50% annual growth in recent years)
- Research or management career in the medical devices industry
- Careers in IP protection, safety, and regulatory organisations related to medical robotics and image-guided intervention

The course lasts for one year and consists of taught courses, a group research skills project, surgical skills training and a literature review leading to an extended project. Full details on this course are available at www.imperial.ac.uk/medicine/study/postgraduate/masters-programmes/mres-medical-robotics-and-image-guided-intervention/
In the Institute of Global Health Innovation, the PhD programme is committed to training the next generation and hosts its own PhD programme which aims to attract and train the global health innovators of the future. Since 2011 IGHI has awarded 16 studentships (including six overseas) focusing on innovation in healthcare through policy, science, technology and design.

The IGHI PhD programme is open to UK/EU and overseas students. The funding is for three years and covers both fees and living expenses. Research progress is assessed each year and continuing receipt of funds will depend on satisfactory academic progress.

A number of research topics are currently available to study across IGHI’s centres. Ideal candidates will have research interest in the following areas:

**Centre for Health Policy**
- Patient safety
- Global diffusion of healthcare innovation
- Advanced analytical techniques applied to healthcare
- Economic evaluation of health policies
- Global health policy and universal health coverage

**Hamlyn Centre for Robotic Surgery**
- Medical imaging and robotics
- Pervasion sensing (body sensor networks and surgical implants)
- Medical devices and design in healthcare

**HELIX Centre for Design in Healthcare**
- User-centred design
- Behavioural design
- mHealth
- Frugal innovation

**Centre for Digestive and Gut Health**
- Optimising nutritional strategies to achieve a healthy gut metabolism
- Phenotyping of malnutrition and monitoring responses to intervention
- Understanding mechanisms of diabetes resolution after Bariatric surgery
- Modelling gut-microbial-human metabolism in relation to disease aetiopathogenesis (for example, autism)
- Building chemically aware surgical devices for real-time operative diagnostics
- Mass spectrometric chemical tissue imaging

For further information: www.imperial.ac.uk/global-health-innovation/student-hub/phds-and-courses/phd/
INSTITUTE AFFILIATES

The institute is fortunate to harness partnerships with a broad network of Visiting Professors and affiliated leaders from across the international healthcare landscape. By working in collaboration, IGHI can make better-informed decisions and obtain a richer understanding of the issues facing global health today.

**Dr Faleh Mohamed Hussain Ali**  
Assistant Secretary General for Policy Affairs, Supreme Council of Health

**Dr Hanan al-Kuwari**  
Managing Director, Hamad Medical Corporation

**John Appleby**  
Chief Economist, Health Policy, The Kings Fund

**Professor Sir Sabaratnam Arulkumaran**  
Head of Obstetrics and Gynaecology, St George's University of London; President-Elect of the International Federation of Obstetrics and Gynaecology

**Robert Bell**  
Chief Executive, Royal Brompton and Harefield NHS Foundation Trust

**Dr David Bennett**  
Former Chairman and Chief Executive Officer, Monitor

**Dame Ruth Carnall**  
Former Chief Executive, NHS London; Strategic Advisor on Health to the Mayor of London

**Ian Dodge**  
Director, NHS Group, Department of Health

**Stephen Dorrell**  
Health Policy Consultant, KPMG

**Professor Len Fass**  
Former Director of Academic Relations, GE Healthcare

**Sir Robert Francis QC**  
Barrister, Serjeants’ Inn Chambers

**Professor Glenn Gibson**  
Head of Food Microbial Sciences Unit, University of Reading

**Peter Goldsborough**  
Senior Advisor, The Boston Consulting Group

**Professor Sian Griffiths**  
Board Member, Public Health England; Director, Centre for Global Health, Chinese University of Hong Kong

**Phil Hope**  
Former Minister for Care Services, Department of Health

**Sir Thomas Hughes-Hallett**  
Chair, Chelsea & Westminster Hospital NHS Foundation Trust

**Tim Kelsey**  
National Director for Patients and Information, NHS England

**Edward Kiely**  
Honorary Consultant Paediatric Surgeon, Great Ormond Street Hospital for Children

**Paul Levy**  
Corporate Advisor, Author, Speaker

**Professor Ric Marshall**  
Former Director of Pricing, Monitor

**Professor Stephen Matlin**  
Former Executive Director, Global Forum for Health Research

**Dr David Mitchell**  
Medical Director, Imperial College Healthcare NHS Trust

**Michel Mossessian**  
Architect, Mossessian Architecture

**Sir David Nicholson**  
Former Chief Executive, NHS England

**Baroness Lindsay Northover**  
Liberal Democrat Principal Parliamentary Spokesperson on International Development, UK Parliament

**Sir John Oldham**  
Former Quest for Quality and National Clinical Lead for Long Term Conditions

**Dr William Owen**  
Former CEO, Sidra Medical & Research Center

**Dr Santosh Rath**  
Honorary Professorial Fellow of Global Surgery, University of Oxford

**Dr Julia Riley**  
Consultant in Palliative Medicine, Royal Marsden and Royal Brompton Hospitals

**Professor Richard Satava**  
Professor, Department of Surgery, University of Washington

**Egbert Schillings**  
Chief Executive Officer of the World Innovation Summit for Health (WISH)

**Professor Jeffrey Shaw**  
Honorary Professor at Central Academy of Fine Art, Beijing; Dean of the School of Creative Media, City University of Hong Kong

**Dr Richard Smith**  
Director, UnitedHealth Chronic Disease Initiative; Former Editor of the British Medical Journal (BMJ)

**Dr Suzanne Suggs**  
Associate Professor, University of Lugano

**Dr Paul Thompson**  
Rector of the Royal College of Art; Former Director, National Design Museum, New York City
FROM PROFESSOR THE LORD DARZI OF DENHAM

“I understand the different sorts of challenges facing us in healthcare across the world. I think the solutions are there, and the Institute of Global Health Innovation will provide us with a platform to make that change happen and to have that impact globally.”
Visit our website: www.imperial.ac.uk/global-health-innovation/

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