



LONDON SCHOOL of HYGIENE & TROPICAL MEDICINE



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Annual Report 2016

Improving health worldwide



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London School of Hygiene & Tropical Medicine

Keppel Street, London WC1E 7HT, UK

From our partners



Baroness Valerie Amos
Director of SOAS
University of London
and former UN Under-
secretary General for
Humanitarian Affairs

“Throughout my career, I have been aware of many aspects of the London School of Hygiene & Tropical Medicine’s work in health and development in the UK and across the world. Since joining SOAS last year, I have seen how closely our two institutions work together in interdisciplinary areas, including agriculture, water and sanitation, development economics, sustainability, health systems and management. Much of this work takes place through the London International Development Centre. I was delighted to give the School’s annual Women in Health Lecture in May 2016 and look forward to our continued partnership and collaboration. LSHTM and SOAS are committed to finding solutions to some of the world’s toughest global challenges.”



Professor Michael Merson
Professor of Global Health
at Duke University, and
Chair of LSHTM’s Visiting
Committee

“A new global health landscape has emerged over the past decade, partly driven by globalisation and changes in funding. The Global Fund to Fight AIDS, Tuberculosis, and Malaria, bilateral aid from the United States and the United Kingdom, and the Bill & Melinda Gates Foundation have grown as vital channels of assistance. This picture is now changing as we see the emergence of greater ownership and financing of programmes by recipient countries. Universities are playing key roles, both in research and evaluation of health interventions and in educating and training the next generations of global health professionals.

The London School of Hygiene & Tropical Medicine has a long history of working collaboratively with partners around the world and in enrolling students from over 100 countries. The School is one of a handful of institutions that are setting the global health agenda, making important contributions across a range of disciplines and areas. The Times Higher Education University of the Year award for work in confronting the Ebola epidemic in West Africa is a very well-deserved honour.”



Professor Fred Binka
Coordinator of the
WHO Mekong Malaria
Elimination Project and
founding Vice-Chancellor,
University of Health and
Allied Sciences, Ghana

“Over the past three decades, the London School of Hygiene & Tropical Medicine has had excellent and productive collaborations with academic and public health institutions in Ghana, through participation in national health system reforms and evaluation of several large-scale public health interventions, ranging from Vitamin A supplements, to insecticide-treated bednets, vaccines and treatment of malaria in infants. Most recently, we have been working together on the rapid response to the Ebola outbreak in West Africa, trialling innovative vaccines. I am privileged to be associated with the School in research, training, policy work and mentoring for scientists and students across Africa.”



Nigel Edwards
Chief Executive,
The Nuffield Trust

“As someone involved in trying to shape health policy, the research undertaken at the London School of Hygiene & Tropical Medicine frequently informs my work. Much of this consists of helping policymakers and leaders in healthcare make better policy choices and improve implementation. I often find myself using its policy research on new models of care, commissioning, approaches to evaluation and lessons from other European systems.

The development of methods in evaluation is useful, but the combination of academic rigour and policy insight is particularly valuable as it offers useable answers to real life questions. Collaboration with the Policy Innovation Research Unit and the European Observatory at the School also provides insight and professional development for my staff.”

Foreword from our Chairman



Dame Marjorie Scardino
Chairman of Council

Dame Marjorie Scardino took up her appointment as Chairman of Council at the London School of Hygiene & Tropical Medicine in November 2015. She was previously Chief Executive Officer of Pearson PLC from 1997 to 2012, is on the boards of Twitter and IAG, and is a member of several charitable and advisory boards, including The Carter Center and The Royal College of Art.

It has been just over a year since I joined Council, and it’s certainly been a year of surprises and accomplishments around the world and around the School. In both places they have been big.

No matter what you believe in or are interested in, you are likely to be assessing how your work and your personal life and your job as a citizen (wherever you are) will be affected by political issues. The EU referendum in the UK and a contentious and surprising US election have shaken us up, and there may be more coming.

At the School we will face a challenging political, technological and funding environment, not to mention what opportunities or upheavals we might see in demographics or epidemiology. In the world of health we will face threats old and new. All that may seem unsettling, but these kinds of upheavals often bring with them a burst of energy and new ideas that rouses us from our apathy and raises us up to higher plains. That must be our hope, because these may be the times the world needs us most.

We’re ready for that, because the School has had its own up-and-down year: tragic deaths of much-cherished people; new additions to the administration who are already making their marks; and many achievements and awards from outside our walls. Certainly we’re all gratified to be the “University of the Year” and that Peter Piot and Nick Black are both receiving knighthoods in the new year.

We are laying plans for the next five years now and looking at the long game to be played out for 15 to 20 years. Our purpose doesn’t change, but we do know that, if we want to fulfil it, we have to have resources. In 2015/16 our income totalled about £168m, an increase of £21m over the previous year, thanks primarily to more research grants made up mostly of value-in-kind benefit. The development of our teaching programmes, especially the London-based courses and joint courses, remained stable.

This is a reasonable achievement at a time when the research budgets of some of our major sponsors are under pressure, and when competition is high.

But to increase the impact of our scientific research and a growing teaching programme, the School will need to invest significantly in its strategy for the next two decades. Without that long-term investment in people and ideas and facilities, the School may not have the capability or capacity to meet the challenges of global health - from educating health workers, to handling epidemics, to continuing to undertake ground-breaking research.

We are determined to bring our broad expertise to meet these challenges at global and local levels, to lead the agenda on infectious diseases and other public health issues, and to be outward-looking, engaged and entrepreneurial, working with partners worldwide. But our mission remains the same: To improve the public’s health all over the world through research, education and practice.

I look forward to this year. If you are working or studying in the School, I hope you will take an interest in what Council is doing - both in projects and in focus and attitude. If you are outside the School, I hope you will be inspired by what you read in this report and join us in this mission in any way you can. There are a lot of things we can’t predict, but we can surely promise that we will continue to do our part in addressing some of the world’s greatest health challenges.

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Our mission is to improve health and health equity in the UK and worldwide; working in partnership to achieve excellence in public and global health research, education and translation of knowledge into policy and practice.

Photo courtesy of Tapan Bhattacharyya.

Photo courtesy of Ah Young Lim.



Introduction – a year of challenge and change



Professor Baron Peter Piot
CMG FRCP FMedSci KCMG
Director

Professor Stephen Lawn was an exceptional researcher, colleague and friend who pioneered the diagnosis and treatment of tuberculosis in populations affected by HIV. Despite being himself diagnosed with a malignant brain tumour in 2014, he continued to work and teach until his death last September.

Steve dedicated his whole career to working in poor communities across sub-Saharan Africa, and was loved by colleagues and students for his passion, warmth, wisdom and humour. In line with the ethos of our School, he was a scientist who determinedly took knowledge into the real world to people in need. To continue his pioneering work, Steve's family, together with colleagues in London, Cape Town and around the world, have established a Memorial Fund to support an annual lecture on TB and a prize for an upcoming researcher working on TB and HIV.



Professor Steve Lawn.

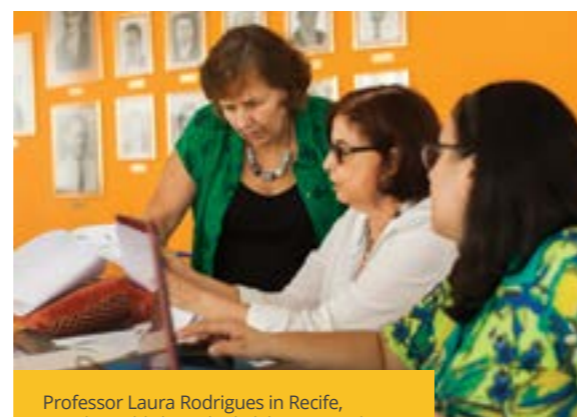
In 2016 we also mourned the tragic loss of our former Dean, Professor Harrison Spencer, who oversaw significant expansion of LSHTM between 1996 and 2000 and established some defining features including the Malaria Centre and our distance learning programme, which has now trained over 8,000 health professionals in more than 130 countries. Professor Spencer was a greatly respected world leader in public health, most recently as the President and CEO of the Association of Schools and Programs of Public Health in the USA. We will miss all these colleagues greatly, and our deepest sympathies and thoughts are with their families and many friends.

“ I am proud of our contributions to health worldwide, as a proactive, broad-minded and truly multidisciplinary community. ”

The world is changing rapidly, with political upheaval, the rise of populism, growing inequality, the continuing refugee crisis and humanitarian disasters. It is therefore more essential than ever that academic institutions play their role in society, and raise our voice about the values that have underpinned science and the foundations of universities since the Enlightenment.

There is also room for hope. A new Director-General of the World Health Organization in 2017 will provide leadership in confronting the ever more complex threats to health and wellbeing across the globe. We can also look forward to Antonio Guterres' term as the new Secretary-General of the UN, and John Nkengasong as the first head of the Africa Centers for Diseases Control and Prevention. Progress on tackling major epidemics continues, and earlier this year I attended the meeting in Montreal which saw the essential \$13 billion replenishment of the Global Fund to Fight AIDS, TB and Malaria. In another exciting milestone, a new Coalition for Epidemic Preparedness Innovations will become operational in 2017, seeking to develop vaccines against the pathogens that are most likely to cause future epidemics but for which there is no market incentive.

I am proud of our contributions to health worldwide, as a proactive, broad-minded and truly multidisciplinary community of staff, students, alumni and partners in the UK and overseas. This refusal to stand by in the face of need and injustice was reflected in our mobilisation during the Ebola epidemic in West Africa. This year, with the Zika epidemic, our School has been at the forefront of research, exploring the association between the virus and neurological conditions like microcephaly, and strengthening research capacity through our free online Zika course.



Professor Laura Rodrigues in Recife, Brazil, establishing the link between Zika virus and microcephaly. Photo courtesy Wellcome Images/Julio Bittencourt.

We are now partnering with Public Health England to run the UK Public Health Rapid Support Team, which will be deployed within 48 hours to respond to disease outbreaks anywhere in the world. In line with the UN's Declaration to act on antimicrobial resistance, our School has launched a new Centre on Antimicrobial Resistance. This will leverage our strengths across all research areas, from microbiology to anthropology, and adopt a uniquely global perspective on drug resistant infections.

We continue to play a major role in shaping global health policy and translating the results of our research into tangible impact. Colleagues took the lead on a *Lancet* series documenting progress towards improving global maternal health. LSHTM researchers have also provided the most rigorous, up-to-date evidence on newborn and child mortality and co-developed the new GATHER guidelines for accurate and transparent health estimates reporting.



Bill Gates visited the School in October.

In October, Bill Gates visited our School to learn more about our cutting-edge work and developments in vaccines, malaria, neonatal health and stillbirths. We also launched the new *Lancet* Commission on adolescent health and wellbeing, outlining urgent priorities to improve the health of the largest generation of adolescents and young people (1.8 billion) ever in human history.

Embracing new digital technologies continues to offer great potential, particularly in areas of severe health care deficits. Most recently, Andrew Bastawrous was honoured as one of the 2016 Rolex Awards Laureates for Peek, the innovative smartphone-based ophthalmic examination system helping prevent blindness in low-resource settings.

Here in the UK, our longstanding collaborative work and partnerships continue with Public Health England, NICE and other NHS and non-governmental bodies. This year, new guidance on alcohol consumption issued from the Department of Health was shaped by colleagues Mark

Petticrew and David Leon, warning that drinking any level of alcohol can raise the risk of cancers. Other notable findings from colleagues with potential policy implications included further evidence revealing the health benefits of walking and cycling to work; the national variation in awareness of the early symptoms of cancer; and findings by Liam Smeeth and colleagues that media coverage on statins led to a substantial reduction in their usage. Sir Andy Haines, Sari Kovats and other experts from our School were involved in July's UK Climate Change Risk Assessment Evidence Report, calling for urgent action to address the most pressing climate-related threats.

On 31 December, it was announced that Nick Black is to be knighted in the new year for his services to healthcare research. In a career spanning more than four decades, his work has directly influenced how the NHS evaluates its performance and in particular patient outcomes. He has played a crucial role in establishing health services research as a fully fledged academic area in the UK.

Chronic conditions including diabetes, cardiovascular disease, stroke, chronic lung disease, obesity, Alzheimer's and mental health problems pose increasing challenges. Our School has a central role to play in addressing these, building on the pioneering studies by the likes of Jerry Morris who first established the link between physical activity and cardiovascular disease over 50 years ago, and the seminal work of Geoffrey Rose on hypertension. Particularly through our Centre for Global NCDs, we continue this legacy through research into disease causation and risks to health and wellbeing, developing and evaluating new interventions, advising on implementation and, where needed, advocating for bold policy change.

Our Education programmes, including distance learning, continue to thrive, and while the long-term impacts of Brexit on student mobility remain to be seen, a record number of MSc students joined our School in October for the 2016/17 academic year.

For the first time our research income has exceeded £100 million, and overall revenue was over £160 million. Such continuing expansion will require that we invest in robust support services. Our leadership team has undergone some important changes as we welcomed Matt Lee as our new Chief Operating Officer, Lucinda Parr as Secretary, and Court Clayton as Director of Development and Alumni Relations. Under Dame Marjorie's leadership, the support of Council has been vital to our success over the year. Engaging with our whole community, we are now in the process of developing our next five-year strategy.

Finally, I extend warm congratulations to all our staff, students and alumni for their many achievements over the past year. Some of these are outlined in the following pages. Taking a long-term view, I believe that the golden age of public health and prevention is in sight and I am confident that we will continue to lead, inspire and push for change.



In September, Peter Piot was one of five global health leaders to receive the Bloomberg Hopkins 100 Award at a ceremony in New York. Photo courtesy of James Watts, Johns Hopkins Bloomberg School of Public Health.

2016: the year in review

January

■ New alcohol consumption guidance from the Department of Health, based on work by Mark Petticrew and David Leon, warned that drinking any level of alcohol raises the risk of a range of cancers.

■ A major *Lancet* research series led by Joy Lawn revealed the slow progress being made globally to end preventable stillbirths, highlighting the psychological, social and economic impacts, and identifying actions to improve progress.

February

■ Findings from a 15-year study found that a Hib child vaccination programme in Kenya was highly effective. Anthony Scott and colleagues showed that children were well protected from life-threatening infections caused by Hib bacteria, such as meningitis.

March

■ A study led by Ellen Flint found that adults who cycle or walk to work have lower body fat percentage and body mass index measures in mid-life compared to adults who commute via car.



■ Laura Rodrigues, Jimmy Whitworth, Taane Clark, Laith Yakob and other colleagues responding to the Zika outbreak received fast-track funding from the Medical Research Council, the Newton Fund and the Wellcome Trust for projects on Zika infection in pregnancy, mosquito control, and virus transmission and surveillance.

April

■ A study of men and women trafficked to the UK for sexual exploitation, domestic servitude and forced labour, found that many reported severe mental health problems.

■ The first published results from a major Ebola vaccine trial in humans indicated that a new two-part 'prime-boost' vaccine was safe and could help the immune system to combat the virus.



Photo courtesy of Tom Mooney.

■ A £1m trial, led by Liam Smeeth, was launched to investigate the potential side effects of statins, and examine whether muscle pain symptoms occurring during statin use are caused by the drug.



May

■ Baroness Valerie Amos gave the School's annual Women in Health Lecture – Why women are central to conflict resolution and humanitarianism.

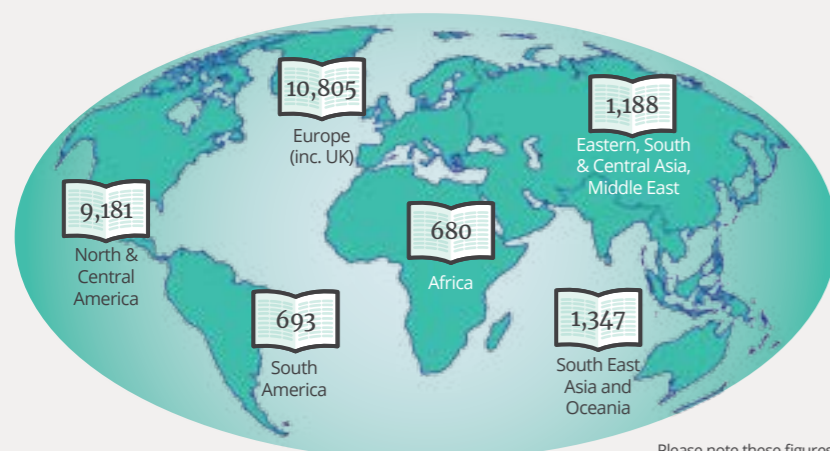
■ Rates of teenage pregnancy in England were shown to have halved since the implementation of the Government's Teenage Pregnancy Strategy in 1999. The research, led by Kaye Wellings, found the greatest effect was seen in areas of high deprivation, which received the most support.

June

■ Working with the Rugby Football Union, Neil Pearce launched a major study to examine the possible long-term effects of the game on brain health. Former England international rugby players are being recruited for the research to provide insights into the potential neurocognitive risks.

Global media coverage 2016

Total number of press articles mentioning our work - 23,994



Please note these figures do not include TV and radio broadcast coverage or social media.

Global Rankings

The School performs well in various global university league tables. In the US News Best Global Universities Ranking 2017, we are ranked sixth in the world (together with Oxford University) in the fields of social sciences and public health. In the 2016 CWTS Leiden Ranking, the School was ranked fifth in the world for research impact across all disciplines, based on the share of institutions' outputs within the top 1% of papers by citation in all areas of science and independent of size of output.

July

■ The UK Climate Change Risk Assessment Evidence Report outlined the impact that climate change is already having on the UK, and the urgent action required to address the risks. Sari Kovats was among the experts who contributed.

■ School researchers at the International AIDS Conference in Durban launched new research showing that mass imprisonment of drug users is driving global epidemics of HIV, hepatitis, and TB. A Global Burden of Disease analysis also found that rates of new HIV infections have increased in 74 countries over the past decade, raising significant challenges to ending the AIDS pandemic.

■ The School was ranked in the top 1% in the 2016 Center for World University Rankings, which measure the quality of education and training of students as well as the prestige of faculty members and the quality of research.

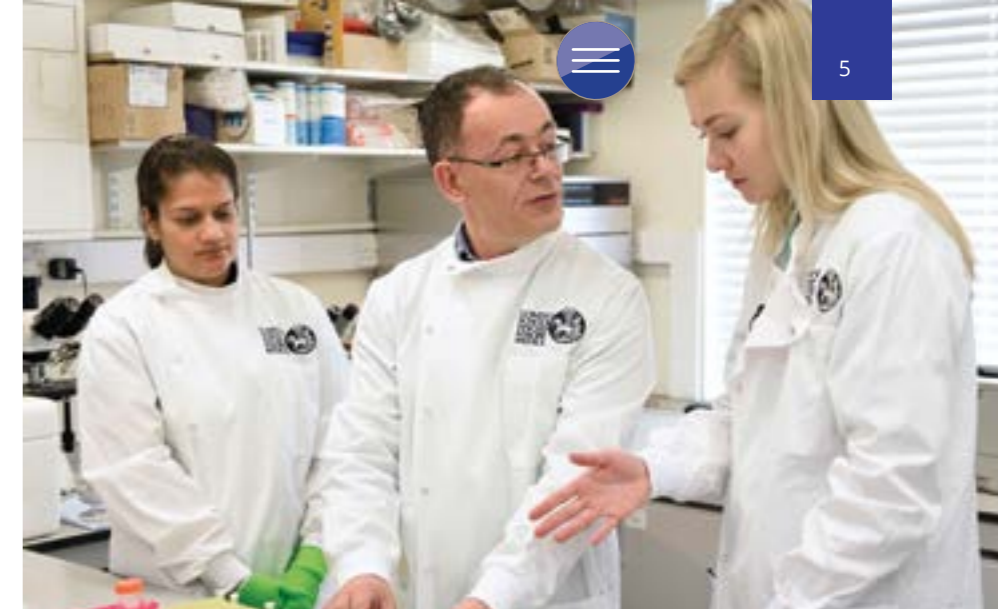
August

■ Findings from the National Survey of Sexual Attitudes and Lifestyles showed around one in 10 young men and one in eight young women in Britain who are sexually active have experienced a distressing sexual problem lasting at least three months in the past year.

September

■ The largest ever global survey of vaccine confidence mapped attitudes across 67 countries. The research, led by Heidi Larson, found that public confidence in vaccines varies widely between countries and regions.

■ Zika virus infection in pregnant women was proven to cause microcephaly in newborn babies, according to findings from the first case-control study carried out in Brazil by researchers including Laura Rodrigues.



Public Health Minister Nicola Blackwood (right) with Professor Martin Hibberd and Sonal Shah at the launch of the UK Public Health Rapid Support Team.

October

■ The state of the world's health was assessed in a new Global Burden of Disease study. The research found that life expectancy is rising, but seven in 10 deaths are now due to non-communicable diseases.

■ More than £2m of funding was awarded to School researchers from the European Union's Horizon 2020 Research and Innovation Programme, for vital new studies on Zika virus.

■ Bill Gates visited the School to meet with leading researchers in areas including malaria, neonatal health and vaccine development, as well as to hear presentations about some of our cutting-edge work.



John Edmunds and colleagues accepting the THE University of the Year award. Photo courtesy of Times Higher Education.

November

■ Minister for Public Health Nicola Blackwood launched the UK Public Health Rapid Support Team at the School, in partnership with Public Health England. The £20m initiative means the UK has a specialist team that can be deployed anywhere in the world within 48 hours to tackle disease outbreaks.

■ The School was awarded the prestigious Times Higher Education 'University of the Year' award for 2016. The School was the judges' unanimous choice for the award, given in recognition of its response to the Ebola epidemic in West Africa.



December

■ To coincide with World AIDS Day the World Health Organization (WHO) released new guidelines on HIV self-testing to improve access to and uptake of HIV diagnosis. The School's Self-Testing Africa (STAR) project is collaborating with WHO on large-scale implementation of HIV self-testing in Malawi, Zambia and Zimbabwe.

■ Teenagers and young adults could reduce the risk of developing near-sightedness by spending more time outdoors. Astrid Fletcher and colleagues revealed ultraviolet B light exposure was associated with a reduced risk of myopia.

In August, we hosted a reconstruction of the YMCA 'Shakespeare Hut' that stood on the Keppel Street site during World War I. The launch was attended by the New Zealand High Commissioner.



Research: meeting current global challenges



Professor Dame Anne Mills
DCMG CBE FMedSci FRS
Deputy Director and Provost

Over the past five years of our 2012-17 strategic cycle, both the world and our School have changed a great deal. The rate of growth in our research activity has exceeded expectations, with research income rising from around £70 million in 2011 to more than £110 million in 2016. This has brought great opportunities; for example, the expansion of programmes funded by the UK government, the European Union, the Bill & Melinda Gates Foundation and the Wellcome Trust, among others. Moreover, much of this funding has been for interdisciplinary and inter-sectoral research in areas including nutrition, agriculture, health impacts of environment and climate change and 'one health', focusing on animal and human systems.

In December, we welcomed the announcement of the UK Department for International Development (DFID) Bilateral and Multilateral Aid Reviews, which set out how DFID believes the UK can deliver the best results on the ground for the world's poorest people and address the global response to problems such as the migration crisis, cross-border conflict, climate change and disease pandemics. The UK government's sustained commitment to investing 0.7% of national income in international development has been exemplary. Priti Patel, the Secretary of State, also launched DFID's first ever research review in November, as part of a concerted cross-government effort to drive progress on tackling development issues through science and technology.

The reviews reaffirm a commitment to evidence-informed development aid interventions, and recognise that multidisciplinary research and education are key to advancing development. This includes research to improve health systems, services and delivery, and support capacity strengthening efforts in low and middle-income countries.

In November, many colleagues attended the Fourth Global Symposium on Health Systems Research in Vancouver, reflecting the extent to which this area

has developed in recent years. The range of health systems and policy research at the School encompasses work in the public sector, private sector, and from community to national and global levels. This diversity means that we are able to respond to evidence needs across settings, and enables conceptual and methodological innovation.

Addressing global challenges

We are now actively responding to funding opportunities available through the UK Government's £1.5 billion Global Challenges Research Fund (GCRF), to support cutting-edge research in developing countries. The focus of the GCRF is well-aligned with our strategic priorities, and three MRC Foundation Awards were awarded in December 2016.

We continue to engage with the Newton Fund; for example, Martin McKee and Dina Balabanova lead on a collaborative award entitled "Creating the building blocks for better treatment and control of non-communicable diseases among poor and vulnerable households in Malaysia and the Philippines". School staff have also been awarded Newton funding for collaborative research and exchanges with South Africa, India, the Philippines and Thailand.



Colleagues at the fourth Global Symposium on Health Systems Research. Photo courtesy of Neil Spicer.



Refugees and migrants at the border of Greece and Macedonia. Photo courtesy of UNHCR/Achilleas Zavallis. In 2016 we launched the Health in Humanitarian Crises Centre to focus on improving the health of refugees and people in conflict areas.

“The rate of growth in our research activity has exceeded expectations, with research income rising from around £70 million in 2011 to more than £110 million in 2016.”

Our work through the Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH) has also expanded. In June 2016, we hosted the first ever Agriculture, Nutrition and Health Academy Week in Addis Ababa. Looking ahead, we are becoming partners in the International Food Policy Research Institute's Agriculture for Nutrition and Health (A4NH) programme working on diseases in agricultural landscapes, with a focus on vector-borne disease, emerging zoonoses, and antimicrobial resistance.

From 2017, colleagues from the School will work with partners in the UK, India and South Africa on a new major project, Sustainable and Healthy Food Systems, to provide evidence for policymakers

to deliver healthy and sustainable food systems as part of the Wellcome Trust's 'Our Planet, Our Health' programme.

Following the UN's Declaration to act on antimicrobial resistance, steered by UK Chief Medical Officer Dame Sally Davies, and Lord O'Neill, our new Centre on Antimicrobial Resistance was launched by Dame Sally in December. The Centre is working across a broad range of disciplines, from microbiology to anthropology, with a uniquely global perspective on drug resistant infections.



Earlier this year, we also launched the Health in Humanitarian Crises Centre, which brings together researchers across the School to focus on improving the health of populations affected by humanitarian crises through research, teaching, consultancy, training and

dissemination of objective, evidence-based information to policymakers. In October, the Centre published an evidence review of research on health interventions in humanitarian crises, commissioned by ELRHA's Research for Health in Humanitarian Crises Programme (R2HC).

Fostering global partnerships

This year, we appointed a new Partnerships Officer to support strategic partnerships in Asia, Africa, Europe, and Latin America. We are developing a strategy for international engagement, that will feed into the School's new five-year strategy. We are also reviewing our many and varied partnerships in Africa to ensure they reflect the region's increasing scientific and socio-economic development.

In Asia, we strengthened links in India, China, Japan and South East Asia. For example, we worked closely with the National University of Singapore (NUS) and the National University Health System (NUHS), Singapore, to further develop our long-standing partnerships. We are now planning parallel appointments to enable the development of joint research addressing current public health challenges across the region.

Education: learning and teaching



Professor Della Freeth
Pro-Director (Learning and Teaching)

The School's vibrant research-led education programmes continued to thrive and develop in the 2015/16 academic year, with increased enrolment on London-based MSc and distance-learning programmes for 2016/17.

We have recently added online versions of successful London-based programmes to increase opportunities for more people to study these in the way that suits them best. These include MSc Demography and Health, opening up both distance learning and the blended learning routes, and our successful Continuing Professional Development course in Pharmacoepidemiology and Pharmacovigilance. Looking ahead, we are developing an executive programme for leaders in global health.

Naturally, we continually renew and enrich our established education programmes, updating component modules, creating new modules (for example see box below), and innovating within teaching and assessment. We have also undertaken in-depth reviews of two successful research degree programmes, the Doctor of Public Health (DrPH) for mid-career and aspiring leaders in public health, and our Capacity Strengthening Research Degree scheme for research degree students and supervisors at selected research sites in Africa and India.

Free online course on Zika

Responding rapidly to the need for freely accessible education for people responding to the challenges of Zika virus, we launched a new free online course (MOOC) 'Preventing the Zika Virus: Understanding and Controlling the Aedes Mosquito'. This is presented in English with support for Portuguese and Spanish speakers throughout the course, including video subtitles, transcripts, and translations of other key materials.

Student engagement

The School continues to benefit from engaged and talented students who contribute to the wider life of the School and to improving our education programmes. In particular, we appreciate the dedicated and insightful contributions we receive from a large number of student representatives at programme, faculty and School levels.



Gargie Ahmed, Melanie Almonte, Adrian Rabe and Shanise Owens – members of the Student Representative Council 2015/16.

Sustainability

During 2016 we considered the sustainability of our education programmes in a variety of ways. This included reviewing and continually improving the programmes we offer. We have also been considering environmental sustainability and we are pleased to have reduced the amount of paper and plastic that we use in London and ship to students elsewhere.

Water, sanitation and hygiene module launched

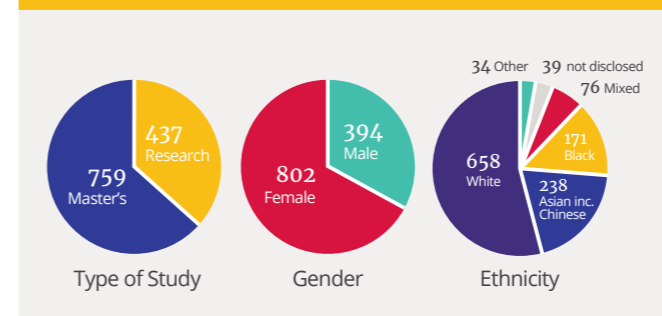
Every year, millions die from preventable diseases caused by inadequate sanitation. UN Sustainable Development Goal 6 is to achieve universal and equitable access to safe and affordable drinking water, sanitation and hygiene for all by 2030.

In October 2016, we launched a new module on water, sanitation and hygiene (WASH) within the Infectious Diseases distance learning programme. The aim of this module is to enable

students to understand the principles and practices that underlie WASH interventions in order to maximise health and social benefits and to empower students to contribute to the design and implementation of effective projects in low and middle-income countries. This module builds on the work of our colleague and Programme Director Jeroen Ensink, who before his tragic death last year (see page 24) was dedicated to improving water, sanitation and hygiene among the world's poorest people.

Latrine superstructure in rural Tanzania, photo courtesy of Belen Torondel.

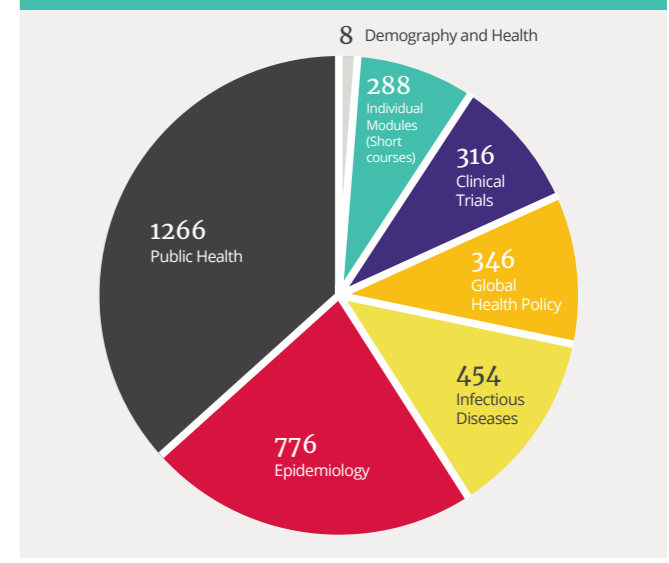
TOTAL LONDON-BASED STUDENTS 2016/17 1196



RESEARCH DEGREE STUDENTS BY FACULTY 2016/17 437

Epidemiology and Population Health	154
Infectious and Tropical Diseases	144
Public Health and Policy	139

DISTANCE LEARNING STUDENTS 2016/17 (Students enrolled at 31 Oct 2016) 3167



Student numbers by region of origin 2016/17



Continuous Professional Development (CPD) courses run in 2015/16 Total number of participants: 987

Adolescent Health in Low and Middle Income Countries	Infectious Disease Modelling
Advanced Course in Epidemiological Analysis	Intensive Course in Epidemiology and Medical Statistics
Advanced Stata: Programming and Other Techniques	Issues in Global Non-Communicable Diseases
Cancer Survival: Principles, Methods and Applications	Laboratory Diagnosis of Malaria
Causal Inference in Epidemiology	Laboratory Diagnosis of Parasites
Certificate in Pharmacoepidemiology & Pharmacovigilance	Methods for Addressing Selection Bias in Health Economic Evaluation
Clinical Trials	Model Fitting and Inference for Infectious Diseases Dynamics
Design and Analysis of Discrete Choice Experiments	Pathogen Genomics & Genomic Epidemiology of Infectious Disease
Professional Diploma in Tropical Medicine and Hygiene	Practical Pharmacoepidemiology
Professional Diploma in Tropical Nursing	Researching Gender-based Violence: Methods and Meaning
East African Diploma in Tropical Medicine and Hygiene	Statistical Analysis with Missing Data Using Multiple Imputation
Epidemiological Evaluation of Vaccines: Efficacy, Safety and Policy	Systematic Reviews and Meta-Analyses of Health Research
Factor Analysis & Structural Equation Modelling	

Knowledge exchange and innovation

Alongside research and education, we are working to translate the School's specialist knowledge into innovative products, services, contract research and consultancy. Our aim is to maximise the impact and benefit of research through expanding areas of application, exploiting our expertise and setting up responsible partnerships with industry and governments, for example in translational medicine and evaluation.

Arthropod control product testing – ARCTEC

As a world-leading independent test centre for consultancy, and the evaluation and development of arthropod vector and pest control technologies, ARCTEC provides clinical trials, as well as laboratory and field testing of products including insect repellents, head lice treatments, insecticides, insecticide-treated bed nets and other textiles and products for veterinary use. The team provides a high-quality scientific service to ensure that accurate data are used



James Logan, director of ARCTEC. Photo courtesy of Christian Sinibaldi.

to inform decisions about which products should be promoted for use, to protect people and animals against insects that transmit disease.

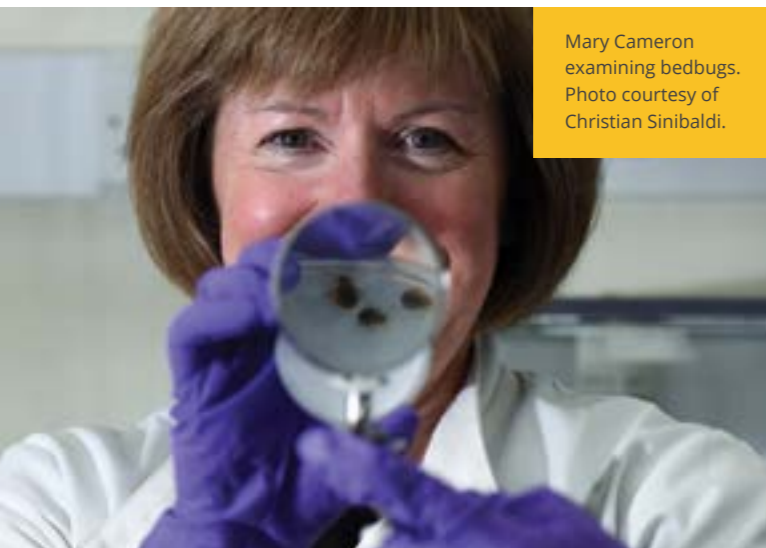
In 2016, ARCTEC expanded globally as a leading source of expertise, with rapid growth in the United States market. Our team now comprises 15 entomologists, clinical trial specialists and business staff. We also launched a new contract entomologist scheme and provided quality training through development of a highly successful open access online course on Zika vector control which attracted 15,000 participants. As part of a €12 million EU grant, 2017 will see ARCTEC connect the global vector control community and build a community of practice through the launch of its online, interactive forum and training network called The Global Vector Hub.

Vecotech – tackling insect-related public health problems

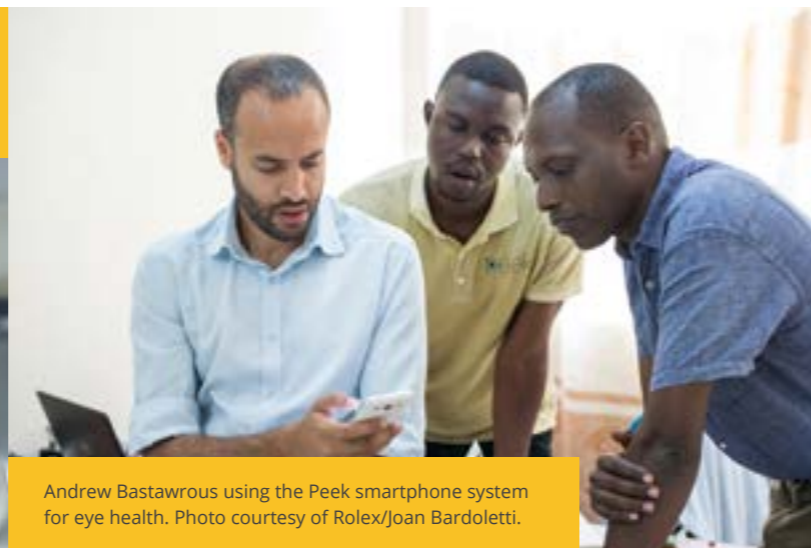
Vecotech Limited was established in 2016 as a spin-out company from the School to tackle some of the world's greatest insect-related public health problems. Its mission is to transform innovative academic scientific discoveries into products that address market needs and generate lasting social impact for communities around the world. In 2016, Vecotech raised more than £450k to continue extensive R&D activities to further develop its current pipeline of technologies, which include novel long-lasting repellents and lures, for a range of biting insects.

Glycoengineering for low-cost vaccines

Researchers in our Faculty of Infectious and Tropical Diseases are working at the forefront of basic glycosylation mechanisms in bacteria, and this is contributing to the development of glycoengineering, the cloning of recombinant glycoproteins in *E. coli*. The immediate impact of this technology is in the development of low cost glycoconjugate vaccines against *Streptococcus pneumoniae* and other bacteria. Funded by a £5 million strategic BBSRC grant, this technology has been applied to various animal pathogens. We have set up a new spin-out company ArcVax to further develop the technology for veterinary purposes.



Mary Cameron examining bedbugs. Photo courtesy of Christian Sinibaldi.



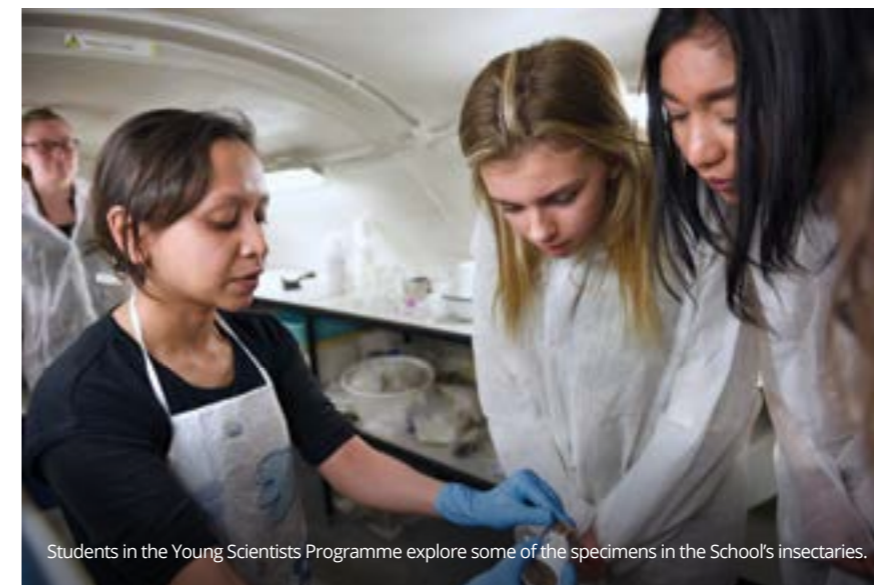
Andrew Bastawrous using the Peek smartphone system for eye health. Photo courtesy of Rolex/Joan Bardoletti.

Public engagement

We are committed to engaging with diverse public audiences about our research, understanding the perspectives of the various communities with whom we work and embedding these within our research practices. This is recognised through academic careers pathways, and core funded with help from a five-year Wellcome Trust Institutional Strategic Support Fund grant. This will enable the establishment of a School-wide grants programme to support innovative public health-related engagement with communities in the UK and worldwide.

Co-ordinated by Erin Lafferty, we have continued to expand our public engagement activities throughout the year. Staff and students at the School have engaged with school pupils in the UK and abroad on topics including medical statistics, Ebola and the environmental impacts of our food choices. 25 pupils from local schools and colleges took part in the School's Young Scientists Programme, conducting their own biomedical research projects, and a further 22 took part in work experience placements with individual members of staff.

From January to March, Judith Glynn and Cicely Marston participated in the Bloomsbury Festival Creative Development Lab, which brought together academics



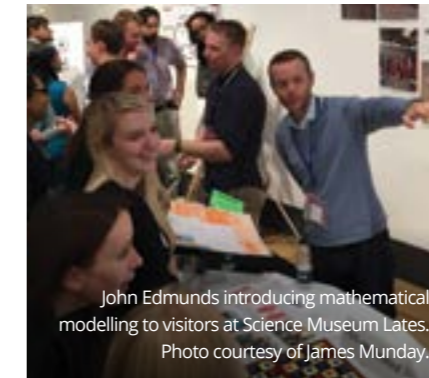
Students in the Young Scientists Programme explore some of the specimens in the School's insectaries.



Erin Lafferty demonstrates to schoolchildren how an infection can spread through a population using brightly coloured balls at the Cheltenham Science Festival. Photo courtesy of mcphersonstevens.com.

and artists in innovative partnerships. Judith created an art piece on the Festival's theme of 'Language', visualising the building blocks of DNA in a single mobile. Cicely is developing further cross-disciplinary collaboration with artists to engage with young people about her research on sexual and reproductive health.

At the Cheltenham Science Festival in June, staff interacted with more than 200 school children and 500 adults on topics including Ebola, Zika, antimicrobial resistance, mathematical modelling and hygiene.



John Edmunds introducing mathematical modelling to visitors at Science Museum Lates. Photo courtesy of James Munday.

In October, staff and students from all three faculties participated in 'Science Museum Lates' on the theme of Contagion,

engaging with more than 4,000 visitors to the Museum. Helen Fletcher discussed her research on the immune response to tuberculosis and Ford Hickson spoke about the politics surrounding sex and HIV in the UK. Members of ARCTEC hosted an interactive booth on Zika, the *Aedes* mosquito and repellents. Our NIHR Health Protection Research Unit in Immunisation transmitted a virtual 'infection' that they tracked in real time as it spread through the Museum, and used this to discuss LSHTM research during the Ebola epidemic.

We have also conducted a range of public engagement projects in low and middle-income countries. Adrianna Murphy received a Wellcome Trust award to inspire and empower families participating in research in Tanzania on health expenditure for cardiovascular disease, conducting workshops and developing participant-led data collection.



Sadia Saeed, a small grants scheme recipient, demonstrating the spread of germs with school children in Pakistan using glitter.

Our Faculty of Infectious and Tropical Diseases small grants scheme, launched in 2015, has expanded to support public engagement activities across all four departments. This year, funding was awarded to seven projects in the UK, Nigeria, Ghana, Malawi, Pakistan and Mexico, on topics as diverse as water pollution and hand hygiene, maternal and newborn health, malaria prevention and diagnostics, mental health and cerebral palsy.

Our people: equality, diversity and inclusion

The London School of Hygiene & Tropical Medicine embraces and values the diversity of its staff and student population and seeks to promote equality as an essential element in enhancing the School's contribution to improving health worldwide.

In 2016, we have continued embedding initiatives that support career development for all staff and students and promote an inclusive culture. We are proud of the high proportion of female staff at all levels within the School, and are committed to providing a family-friendly working environment through policies and flexible working.

This year, we launched our new Equality and Diversity Strategy 2016-19. We have sought to embed unconscious bias and equality and diversity training into our School staff development programme, with new staff required to complete equality and diversity training as part of their induction process. We continue to engage with equalities frameworks, such as Athena SWAN.



Staff networking at the Professional Support Pathway meeting, December 2016.

Our School's broad ethnic diversity reflects our global presence. In October 2016, we celebrated the achievements of our black and minority ethnic community in a series of events and lectures, as part of Black History Month. The School also has a lesbian, gay, bisexual and transgender network, and we continue to support our LGBT community as a Stonewall Diversity Champion.

Working environment and careers development

We have continued to build on improvements to the School's management and administration systems, introducing a new online Performance and Development Review system for all staff.

The School's talent and education development programme supports our commitment to staff engagement and career development through a number of initiatives, including an institution-wide mentoring scheme, a London-wide job shadowing scheme, and enhanced management and leadership development opportunities such as the Aurora women's leadership scheme.

We have also run a programme of health and wellbeing activities, including a commitment to work towards the London Healthy Workplace Charter, backed by the Mayor of London to make workplaces healthier and happier.

In Spring, Council approved our new Human Resources Strategy, with six key themes:

- maintaining good employee relations and developing School policy
- promoting equality, diversity and inclusion
- improving HR systems and processes
- developing leadership, management and staff capabilities
- implementing transparent, fair and appropriate promotion and reward systems
- increasing the engagement and supporting the wellbeing of our staff

Human Resources Strategy 2016

“We seek to create a positive, inclusive working environment that encourages the recruitment, development and retention of excellent staff using efficient systems and processes.”



Honours and Prizes won by staff in 2016

January: Professor John Edmunds, Dean of Faculty of Epidemiology & Population Health, awarded an OBE in the Queen's New Year Honours list for his services to infectious disease control.

February: Clare Gilbert, Professor of International Eye Health, awarded the Jules Francois Golden Award by the International Council of Ophthalmology for her outstanding contribution to ophthalmology.

March: Claudia Allemani named as the first ever recipient of the Global Public Health Award by the UK's Faculty of Public Health for her work on the worldwide CONCORD programme, a collaboration for global surveillance of cancer survival.

April: Professors Joy Lawn and Liam Smeeth elected Fellows of the Academy of Medical Sciences, in recognition of their contributions to medical research and healthcare, the generation of new knowledge in medical sciences and its translation into benefits to society.

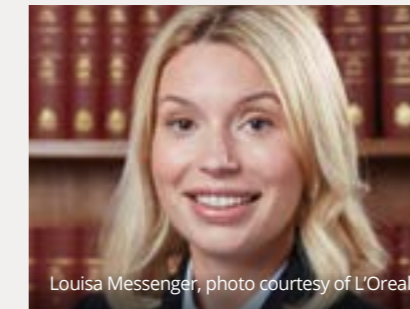


Professors Joy Lawn and Liam Smeeth.

May: Sinead Langan, National Institute for Health Research Clinician Scientist, part of a team from Guy's and St Thomas' Hospital named Dermatology Team of the Year at the British Medical Journal (BMJ) Awards.

June: Antonio Gasparini, Ben Armstrong and colleagues awarded Best Environmental Epidemiology Paper for 2015.

Louisa Messenger, Research Fellow, awarded a L'Oréal-UNESCO for Women in Science Fellowship worth £15,000 for her ongoing work improving Chagas disease control and surveillance in Bolivia.



Louisa Messenger, photo courtesy of L'Oréal.

Melissa Parker, Fred Martineau and Clare Chandler awarded the Economic and Social Research Council Outstanding International Impact Prize for the Ebola Response Anthropology Platform.

September: Vikram Patel, Professor of International Mental Health, conferred an honorary OBE by the UK government for his services to global mental health.

Peter Piot received the Bloomberg Hopkins 100 Award for his outstanding commitment to public health, his work on the Ebola virus, and his leading role in the global response to HIV/AIDS.

October: Vikram Patel awarded the 2016 Pardes Humanitarian Prize in Mental Health for his transformative work in advancing mental healthcare in resource-poor countries.

November: Andrew Bastawrous, awarded the Rolex Award for Enterprise and 100,000 Swiss Francs for his innovative work to improve eye health around the world using the Peek smartphone system.

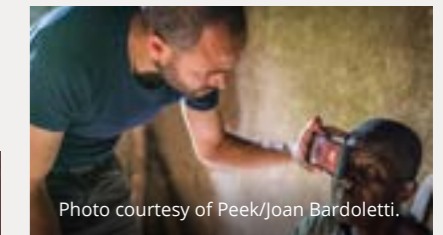
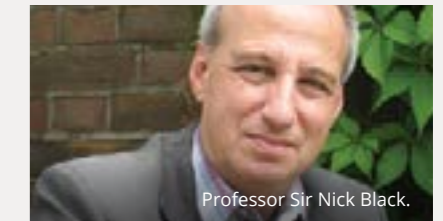


Photo courtesy of Peek/Joan Bardoletti.

Anne Mills received the award for lifetime service in Health Policy and Systems Research, from the Alliance for Health Policy and Systems Research at the Health Systems Global conference in Vancouver.

Peter Piot named Ghent University Amnesty International Chair 2016 for contributions to human rights in global health.

December: Nick Black, Professor of Health Services Research, knighted for his services to healthcare research in the New Year Honours list.



Professor Sir Nick Black.

Peter Piot awarded Honorary Knight Commander of the Most Distinguished Order of St Michael and St George (KCMG) for services to the global response to AIDS and the Ebola epidemic. Vikram Patel and Francesco Checchi awarded Honorary OBEs.

STAFF DIVERSITY:

BY GENDER	Female	Male	Total
Academic	500 (60%)	338 (40%)	838
Professional Support	380 (67%)	191 (33%)	571
Total	880 (62%)	529 (38%)	1409

BY ETHNICITY	White	BME	Not Known	Total
Academic	650 (77%)	149 (18%)	39 (5%)	838
Professional Support	378 (66%)	171 (30%)	22 (4%)	571
Total	1028 (73%)	320 (23%)	61 (4%)	1409

BY ORIGIN	UK	Other EU	Non-EU	Total
Academic	490 (58%)	197 (24%)	151 (18%)	838
Professional Support	453 (79%)	64 (11%)	54 (10%)	571
Total	943 (67%)	261 (19%)	205 (14%)	1409

BY AREA OF THE SCHOOL	FACULTIES			Other*	Total
	EPH	ITD	PHP		
Academic	306	270	247	15	838
Professional Support	102	113	42	314	571
Total	408	383	289	329	1409

*Central Services, Division of Education and London International Development Centre

Faculty Review: Epidemiology and Population Health

KEY DATA

Dean of Faculty:
Professor John Edmunds
Number of staff total: 408
Academic: 306
Professional support: 102

Departments

Department of Infectious Disease Epidemiology

Head: Professor Véronique Filippi

Department of Population Health

Head: Professor Basia Zaba

Department of Medical Statistics

Head: Professor Neil Pearce

Department of Non-communicable Disease Epidemiology

Head: Professor Liam Smeeth

Research Degrees Directors

Professor Suzanne Filteau and Professor Simon Cousens

Taught Course Director

Craig Higgins

New grants awarded in 2015/16: top five by total value

1. Bill & Melinda Gates Foundation – Partnership with PEPFAR to reduce HIV incidence among adolescent girls and young women – Isolde Birdthistle: **USD 7.69 million**
2. Childrens Investment Fund Foundation – Transforming Measurement for Every Newborn Phase 2 – Joy Lawn: **£ 4.56 million**
3. GAVI Alliance - Clinical Trial of a Correlate of Risk Targeted Screen & Treat Strategy to Impact TB – Anthony Scott: **USD 3.24 million**
4. Bill & Melinda Gates Foundation/ DFID - Upscaling participatory action and videos for agriculture and nutrition in Odisha, India - Suneetha Kadiyala: **USD 3 million**
- 5= Bill & Melinda Gates Foundation – CHAMPS network: Ethiopia – Anthony Scott: **USD 2.5 million**
- 5= Commission of the European Community – Understanding asthma phenotypes beyond the atopic/non-atopic paradigm – Neil Pearce: **EUR 2.35 million**



Professor John Edmunds

The Faculty of Epidemiology and Population Health aims to bring methodological excellence in epidemiology, statistics and allied disciplines to improve the health of populations worldwide.

Note: In December 2016, we were awarded £7.9 million over five years from the UK government as part of the £20 million UK Public Health Rapid Support Team, in partnership with Public Health England.



Laura Rodrigues working in Recife, Brazil, photo courtesy of Wellcome Images.

Infectious disease outbreaks

Outbreaks of infectious diseases continue to cause suffering as well as major disruption and economic loss across the globe. We have expanded our activities in this area over the last few years, typified by Laura Rodrigues's work on the epidemic of microcephaly in South American babies. Laura was one of the members of the Microcephaly Epidemic Research Group in Brazil that played a key role in establishing the cause of the outbreak (infection with the Zika virus). She has also helped establish cohort studies to measure the risk and consequences of Zika virus infection in pregnancy and has campaigned to provide improved access to contraceptive services in Brazil. A clearer demonstration of the application of rigorous epidemiological methods to help improve population health would be hard to find.

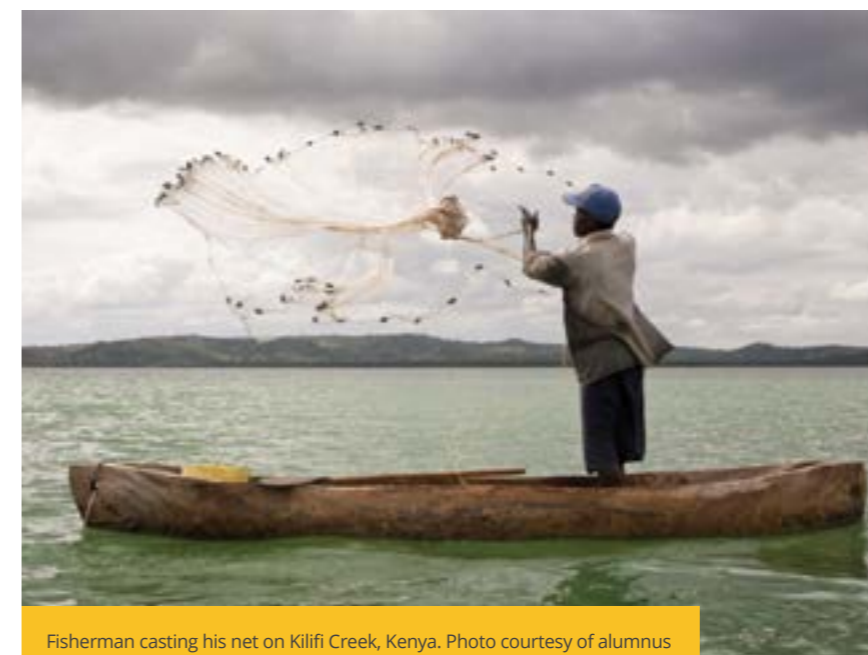
The growing presence of the School in the area of outbreak analysis and control has been recognised by a major grant from the National Institute for Health Research, led by Jimmy Whitworth. The award is to establish, in collaboration with Public Health England, a national Rapid Support Team, which can be quickly deployed to investigate outbreaks all over the world. The team is multidisciplinary in nature, involving not just epidemiologists and data managers but also logisticians, behavioural scientists and specialists in infection control, underlining the complex nature of infectious disease outbreaks and the wide impact they have on society. This major new partnership puts the School at the forefront of efforts to tackle infectious disease outbreaks at source, helping the global community respond more rapidly and appropriately to infectious disease threats.

Nutrition

An expanding human population and increases in development can lead to pressures on the environment. One way these pressures can manifest is in a less secure food supply. This interdisciplinary interface between environmental change, agriculture, food systems, nutrition and health has become an increasing emphasis of the Nutrition Group. Supported by the Wellcome Trust, researchers are estimating the environmental impact of existing dietary patterns and defining potential sustainable diets that are more resilient to future environmental and demographic changes.

Maternal and child health

Maternal and child health continues to be a great strength. Last year, the MARCH Centre launched a free online course on improving the health of women, studied by 11,000 people from 93 countries. In addition, our members co-ordinated two *Lancet* Series in maternal and child health this year: Joy Lawn and her team helped produce a Series on Ending preventable stillbirths and Oona Campbell, Wendy Graham and others also co-ordinated one on Maternal Health. The two Series reviewed the current state of the fields, including assessments of inequalities in access to appropriate care, and prioritised actions to accelerate improvements over the coming years.



Fisherman casting his net on Kilifi Creek, Kenya. Photo courtesy of alumnus Mark Foulerton, conducting an MSc research project following up long term disability in children who had previously had cerebral malaria.

Engagement

As scientists we need to work with policymakers, the media and the public to ensure that our findings are acted on appropriately. Over the last few years there has been increasing emphasis placed on engaging with the public, as they are the ultimate funders of most of our research and the end-users. Over the last year our staff have been involved in many public engagement activities, as detailed elsewhere in this report.

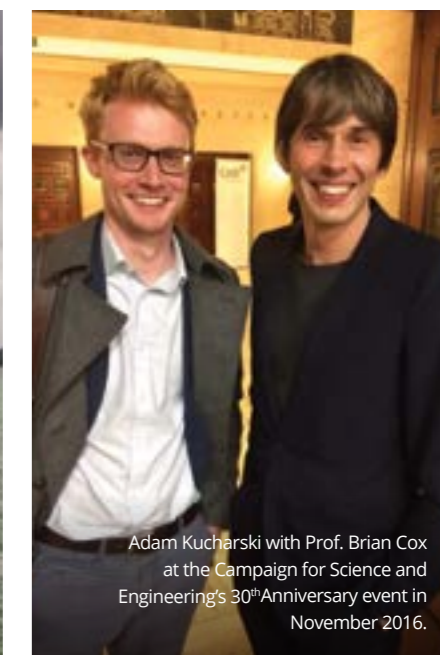
An exemplary instance of engaging with the media was provided by Anthony Matthews and colleagues in the Electronic Health Records group work on statins, which was published in the *BMJ* earlier this year. They used a massive database of General Practitioners' medical records in the UK, combined with internet search statistics, to demonstrate that large numbers of people stopped using statins in response to press coverage about possible muscle side-effects. The extensive media coverage that followed Anthony's study helped to reframe the debate. For example, key newspapers and news channels changed their editorial line to supporting wider statin use.

Rhian Daniel and others from Medical Statistics helped organise the 4th UK Causal Inference Meeting in April, on the theme of Causal Inference in Health, Economic and Social Sciences.

Fellowships and awards

Obtaining competitive personal funding is a recognition of outstanding potential. Likewise, a healthy number of fellows is a good measure of the quality of the research environment. We are obviously doing something right and attracting excellent researchers, as last year nine of our members received a personal fellowship: Lily Tellinghe, Kathryn Church, Nicky McCreesh, Emily Herrett, Helen Brotherton, Charlotte Warren-Gash, Rohini Mathur, Rachel Lowe, and Clara Calvert.

In addition to these fellowships, several other staff received awards and prizes. Claudia Allemani was presented with the Global Public Health Award by the Faculty of Public Health for her work on global surveillance of cancer survival; Ruth Keogh and Shaun Seaman (of the MRC Biostatistics Unit in Cambridge) won the International Biometrics Society Member Best Paper award with their paper on missing data in case-control studies; Sarah-Jo Sinnott won the Best Oral Presentation at the International Society of Hypertension Conference in Seoul, Korea; and Adam Kucharski gave the British Science Association's prestigious Rosalind Franklin Award Lecture for Physical Sciences and Mathematics at their annual conference, as well as speaking on a distinguished panel at the Campaign for Science and Engineering's 30th Anniversary event with Brian Cox and Science Minister Jo Johnson.



Adam Kucharski with Prof. Brian Cox at the Campaign for Science and Engineering's 30th Anniversary event in November 2016.

Faculty Review: Infectious and Tropical Diseases

KEY DATA

Dean of Faculty:
Professor Brendan Wren
Associate Dean:
Professor David Mabey
Number of staff total: 383
Academic: 270
Professional support: 113

Departments

Department of Clinical Research
Head: Professor Philippe Mayaud

Department of Disease Control
Head: Professor Joanna Schellenberg

Department of Immunology and Infection
Head: Professor Greg Bancroft

Department of Pathogen Molecular Biology
Head: Professor David Conway

Research Degrees Directors
Professors Ron Behrens & Jayne Webster

Taught Course Director
Professor Graham Clark

New grants awarded in 2015/16: top five by total value

1. Bill & Melinda Gates Foundation – IDEAS Phase 2: Measurement for Better Maternal & Newborn Health – Joanna Schellenberg: **USD 10 million**
2. Bill & Melinda Gates Foundation – PAMVERC – Mark Rowland: **USD 9.2 million**
3. BBRSC – Glycoengineering of Veterinary Vaccines – Brendan Wren: **£5.35 million**
4. Wellcome Trust - Sustainable Community Action for Lung Health, (SCALE) Malawi – Liz Corbett: **£ 4.1 million**
5. Medical Research Foundation – comparative trial of seasonal vaccination with the malaria vaccine RTS,S/AS01 – Brian Greenwood: **£3.16 million**



Professor Brendan Wren

The Faculty undertakes research from bench to bedside. Examples include understanding how sugars modify proteins through to the mass distribution and evaluation of self-test HIV kits. Selected highlights this year include:

Zika virus and vector control

We have been active in the response to the Zika outbreak, advising the Department for International Development, Public Health England, and other agencies (including the GB Olympic and Paralympic Teams). With EU funding, we are working with The Global Health Network at Oxford University to develop a new online resource called The Global Vector Control Hub, which aims to provide information about the world's most important vectors of disease. The resource will be a one-stop shop for vector control and will help countries to be better prepared to deal with vector-borne outbreaks in the future.



Aedes Aegypti mosquito transmits Zika and dengue. Photo courtesy of Vectorbase.

We were awarded €2 million from the EU to work on Zika as part of a consortium to better understand the disease, prevent its spread and build a sustainable response capacity in Latin America for Zika and other emerging infectious diseases. Faculty researchers will develop and test new diagnostic tools and evaluate methods for controlling the mosquito vector, as well as the virus itself, help control Zika in the short-term, and also help ensure the world is better prepared for Zika and other future disease outbreaks.

In 2016, we were awarded US \$9.2 million from the Bill & Melinda Gates Foundation to develop and evaluate new vector control tools in collaboration with the International Vector Control Consortium (IVCC) and industry partners. Another Gates grant of US \$5m was awarded to develop research capacity in Ethiopia for public health evaluation. This involves 10 PhD students from universities in Ethiopia, whose projects will contribute to the evaluation of efforts to improve utilisation of community-based child health services in the country.



Glycoengineering

Staff continue to study glycosylation as a fundamental biological process that modifies proteins and has a significant role in the virulence of bacteria. New findings have revealed the importance of modifications to flagellin proteins in *Clostridium difficile* and *Campylobacter jejuni* that facilitate adhesion to host epithelial cells. An application of studying basic glycosylation mechanisms in bacteria has been the development of glycoengineering, the cloning of recombinant glycoproteins in *E. coli*. The technological applications of this innovation are mentioned on page 10.

Malaria and TB

Research into malaria remains a central theme of the Faculty. Recent work has broadened our approach beyond *P. falciparum* to the biology of other *Plasmodium* species. An example is the research identifying a protein expressed in the zoonotic malaria parasite *P. knowlesi* that is critical for invasion of human red blood cells. We contributed to the first published whole genome studies of the two main sub-species of *Plasmodium ovale*. In addition, work continues to improve and develop our mosquito transmission facilities and to develop models of transmission. This will be the basis to pursue an in vitro model of latent hypnozoite forms, and studies of drug effectiveness against liver-stage parasites.

Research into the immunological mechanisms underlying the development of new TB vaccines is ongoing with research describing immune correlates of risk in BCG vaccinated infants, new in vitro mycobacterial killing assays and the correlation of polyfunctional CD4+ T cells with in vitro killing of mycobacteria in BCG vaccinated infants. Staff have been actively involved in a large international consortium, studying the immunological mechanisms underlying Diabetes Mellitus as a risk factor for tuberculosis. In addition, staff are exploring the common immunological basis of tuberculosis and human melioidosis. A major new collaboration is being developed with the Africa Health Research Institute, based in South Africa.



HIV Self-Testing

HIV self-testing (HIVST) represents an opportunity to make testing for HIV accessible and convenient, particularly for people who are unable to access traditional testing modes. Despite its potential, self-testing is not available in most countries in sub-Saharan Africa, and evidence on how best to introduce, market and regulate self-tests devices is limited. The UNITAID/PSI HIV Self-Testing Africa (STAR) project is the largest evaluation of HIVST in Africa to date, involving the distribution of nearly 750,000 self-test kits. The results from the project will inform WHO guidance, support the establishment of appropriate policy and encourage new manufacturers to enter the self-test market.

Phase One of STAR aims to improve access to HIV testing through HIV self-tests in Malawi, Zambia, and Zimbabwe. The research component is generating information on how to distribute self-tests effectively, ethically and efficiently, with adequate post-test support services, and is answering key questions on the feasibility, acceptability and impact of this intervention.

Global training and career development

The Wellcome Trust DELTAS funded Makerere University – Uganda Virus Research Institute Centre of Excellence for Infection and Immunity Research and Training (MUII-plus) has had a major role in the development of immunology and Molecular Biology in Uganda. MUII alumni have been achieving positions of influence in the University (Deputy Dean of the School of Medicine; Dean of the School of Veterinary Medicine) and two have recently been awarded Career Development Fellowships. Building upon the earlier MUII strategic award, we were awarded £4.6m to launch the new programme in January 2016. Six new Masters fellows, four new PhD fellows and five new post-doctoral fellows have been appointed, with more appointments in the pipeline.

Disability and Eye Health

In October 2016, the £11.5m Commonwealth Eye Health Consortium, funded by the Queen Elizabeth Diamond Jubilee Trust Fund, held a symposium on Diabetic Retinopathy, an increasing cause of global blindness, in Durban, South Africa. Attended by 115 participants from many Commonwealth and other countries, this brought together practitioners and Ministry of Health representatives to develop national policies and plans for the integration of diabetic retinopathy control within the NCD sector. A key outcome of the symposium was the finalisation of a manifesto about diabetic retinopathy to be presented to Commonwealth Ministers of Health in 2017.

The Commonwealth Symposium on Diabetic Retinopathy in Durban. Photo courtesy of the Queen Elizabeth Diamond Jubilee Trust.



Faculty Review: Public Health and Policy

KEY DATA

Dean of Faculty:
Professor Richard Smith
Associate Dean, Research:
Professor Kara Hanson
Number of staff total: 289
Academic: 247
Professional support: 42

Departments

Department of Global Health and Development
Head: Professor Susannah Mayhew

Department of Health Services Research and Policy
Head: Professor Pauline Allen

Department of Social and Environmental Health Research
Head: Professor Chris Bonell

Research Degrees Director
Professor Simon Cohn

Taught Course Director
Dr Hannah Babad

New grants awarded in 2015/16: top five by total value

1. Wellcome Trust – Creating the building blocks for better treatment and control of non-communicable diseases among poor and vulnerable households in Malaysia and the Philippines – Martin McKee: **£1.2 million**
2. Medical Research Council (MRC) – Understanding & enhancing approaches to quality improvement in small and medium sized private facilities in sub-Saharan Africa – Catherine Goodman: **£0.9 million**
3. Oak Foundation – Learning Initiative on Norms, Exploitation and Abuse – LINEA II – Ana Buller Soto: **£0.9 million**
4. Wellcome Trust – Health Systems in History: ideas, comparisons, policies – Martin Gorsky: **£0.9 million**
5. NIHR – Positive Choices – evaluating interventions for sexual health in UK secondary schools – Chris Bonell: **£0.6 million**



Professor Richard Smith

The Faculty of Public Health and Policy continued its mission to improve health and health equity in the UK and globally through research, teaching and engagement in areas of health systems and services, health policy, and the individual, social and environmental determinants of health. This year saw significant profile and policy impact for our research concerning major health issues.

Health systems and services research

Health systems across low, middle and high-income countries continues to be a major area of work across the Faculty. The RESYST consortium, funded by the UK Department for International Development and led by members of the Health Economics and Systems Analysis Group, within the Department of Global Health and Development, is bringing new insights to the health systems resilience agenda, including the idea of “everyday resilience”, a feature of effective health system response to the chronic stresses facing health systems in low-resource environments, not only fragile or crisis-affected countries.

A new project funded by the Medical Research Council, and led by members of the Anthropology, Policy and Politics Group, is similarly analysing lessons for building resilient health systems in post-Ebola Sierra Leone, building on the previous work of the Anthropology Ebola Response Platform. Staff from this Group have also led on major developments for our Distance Learning MSc in Global Health Policy with the development of two new modules; Research Design and Methods for Political Analysis and Public Health Law in a Global Health Context.

Closer to home, staff from the Department of Health Services Research and Policy have been working with the Royal College of Obstetricians and Gynaecologists for the past decade on projects assessing the quality of health services for women. This year the partnership initiated a quality improvement project, funded by the Health Foundation, to roll out and simultaneously evaluate a quality improvement exercise that aims to reduce the occurrence of severe perineal tears during childbirth. This project, in common with others undertaken by the partnership, uses existing clinical and administrative databases, combined with data collected directly from patients and clinicians where necessary. Furthermore, strong involvement of patients, clinicians, NHS providers and commissioners, and regulators, ensures that the work meets the needs of patients and service providers and facilitates dissemination of results and uptake of recommendations.

“ Our Centre for History in Public Health was awarded two Wellcome Trust investigator awards. ”

Our work on historical aspects of health system and services development continues to expand. Our Centre for History in Public Health was awarded two Wellcome Trust investigator awards – on health systems, and the role of the public in public health. The Centre’s annual lecture this November involved Nicholas Timmins and Sir Michael Rawlings speaking about the history of NICE.

The NIHR School for Public Health Research at LSHTM, a partnership between eight leading academic centres of excellence in applied public health research in England, has pioneered a programme of evaluative research with practitioners on a range of local policies. This year saw the end of its first five-year programme of research, which has produced proactive and responsive policy evaluations, and led the development of evaluation methodology. Staff have also been involved in developing innovative methods for evaluating public health interventions, including *Dark Logic* – a paper theorising and assessing harmful unintended intervention effects, which was awarded the best paper in 2015 prize by the European Society for Prevention Research.

Methodological innovation has also been undertaken elsewhere. For example, members of the Department of Health Services Research and Policy have developed a decision-support model to help countries evaluate the costs, impact and cost-effectiveness of introducing a range of different vaccines. The model has been rolled out to more than 100 vaccine professionals from 25 countries in the Latin America and Caribbean region.



Houses of Parliament from the London Eye.

Engagement with policy and practice

Much of our research informs policy and practice. The work of staff in the Social and Mathematical Epidemiology Group, for example, has influenced policies on trafficking and labour exploitation and gender-based violence, most recently informing WHO guidelines on preventing violence against children. We also continue to place high value on forging and maintaining close engagement with policy and practitioner communities. This year, one of our English Departments of Health Policy Research Units, the Policy Research Unit in Commissioning and the Healthcare system (PRUComm), has seen its research directly support policy activity in the Department of Health and NHS England. The GP Worklife survey was used as evidence by the national GP pay review board, and PRUComm’s review of evidence on primary care recruitment and retention supported the development of a national policy document, The GP Forward View, published in 2016.

We are also engaged in evaluating policy. For example, staff from the Department of Social and Environmental Health Research led a study investigating the extent to which a dramatic recent fall in rates of teenage pregnancy reflected the work of the Teenage Pregnancy Strategy (TPS) launched by the Labour government in 1999. The strategy combined a national media campaign with improvements to sex education and contraception services, and support to young parents. The researchers combined analysis of data on under-18 conceptions, deprivation and Strategy-related spending from 148 local authority areas in England with analysis of data from successive waves of the National Survey of Sexual Attitudes and Lifestyles (Natsal) to model changes in under-18 conceptions before and after implementation of the TPS. Their findings, published in May in *The Lancet* showed under-18 conception rates to have fallen most markedly in areas of highest deprivation and, after adjusting for deprivation, in areas that received the most TPS funding.



Networking at the Public Health and Policy summer event.

School Centres: progress and highlights in 2016

There are currently 15 School Centres, which are strongly multidisciplinary, drawing on a diverse range of expertise across the School to address global health challenges.

Antimicrobial Resistance Centre - Co-directors: Richard Stabler and Clare Chandler

Our new AMR Centre was launched in December 2016 as a focus for innovative and interdisciplinary research and international engagement. Building on the uniquely diverse set of disciplinary strengths at the School, the Centre will strengthen the development of innovative approaches to research, practice and policy, with the aim of reducing the burden of drug-resistant infection around the world.

Centre for Evaluation - Director: James Hargreaves

The Centre for Evaluation brings together staff working on the evaluation of public health interventions in the UK and internationally. A number of major new projects were launched, including several evaluating approaches to improve adolescent health in low and middle-income countries. An active student group brought staff and partners working in public health agencies together to discuss career pathways in evaluation.

Centre for Global Mental Health - Co-directors: Alex Cohen and Julian Eaton

The Mental Health Innovation Network, now the leading global mental health site of its kind with a membership of 3,000, launched MHIN Africa and organised an Innovation Fair at the World Bank/WHO meeting on mental health. The MSc in Global Mental Health, run in collaboration with King's Institute of Psychiatry, continues to expand, with 41 students joining in 2016/17. The Programme for Improving Mental Health Care in low-income settings (PRIME) published a special issue of the British Journal of Psychiatry.

Centre for Global Non-Communicable Diseases - Pablo Perel

The Centre has been an active participant in key global NCDs initiatives. We have organised 12 seminars on cutting edge issues, the Basel Dialogues, joint symposium with the Novartis Foundation on Improving care for chronic patients in lower-income countries, and hosted the launch of *The Lancet* Physical Activity Series 2. We also ran a successful CPD course, Issues in Global Non-Communicable Diseases: from research to policy.

Centre for Health and Social Change (ECOHOST) - Director: Bayard Roberts

ECOHOST organised two large symposia on new frontiers in public health data, exploring the use of social media and other innovative data sources in public health research, and on 'non-communicable diseases in humanitarian emergencies' organised with the Centre for Global NCDs and Médecins Sans Frontières. New research projects include cancer care in Europe, refugee mental health in Europe, and models of public health evidence in the UK. The European Observatory on Health Systems and Policies housed in ECOHOST contributed to health reform in Finland, Ireland and Slovenia, providing evidence and helping to shape national debates.



Professor Martin McKee with Kai Ruggeri and Sanne Verra (Cambridge) at the ECOHOST Symposium, New frontiers for public health data, in February.

Health in Humanitarian Crises Centre - Director: Karl Blanchet

Launched in June 2016, the Centre focuses on improving the health of populations affected by humanitarian crises through quality research, teaching, consultancy, training and dissemination of objective, evidence-based information. In February 2017 it will launch a new free online course (MOOC) on health in humanitarian crises.



Syrian refugees in Turkey, courtesy of EC/ECHO.

Centre for History in Public Health - Director: Virginia Berridge

New Wellcome Trust investigator awards made to Centre Deputy Directors Martin Gorsky and Alex Mold on health systems, and the role of the public in public health, have brought in new staff. HIV and prison is a new area of research developed through Virginia Berridge's involvement in the Warwick/Dublin investigator award on prisons and health. The Centre is a hub for overseas visitors, and we look forward to the arrival of Professor Marcos Cueto from Brazil to work on the Piot papers in 2017.



A lab session at the School in 1900, with founder Sir Patrick Manson. Photo courtesy of LSHTM Archives.

Avian malaria slides prepared in the 1890s in India by Sir Ronald Ross, who first identified mosquitoes as the vector of malaria. This is part of the Ross Collection in our School Archives.



Disability and Sustainable Development Conference in February. Photo courtesy of Nigel Kingston, ICED.

International Diagnostics Centre - Director: Rosanna Peeling

We are working with countries in Africa to strengthen quality assurance (QA) for point-of-care testing, with ongoing support from UNITAID. We developed a QA web portal to make a toolkit for point-of-care testing widely accessible. IDC helped establish the Early Infant Diagnosis Consortium, to accelerate the evaluations of new diagnostics to identify HIV infected infants. We are planning an IDC network to collectively advocate the value of diagnostics, foster innovation and improve patient outcomes.

International Centre for Evidence in Disability (ICED) - Co-directors: Allen Foster and Hannah Kuper

ICED held a conference on Disability and the Sustainable Development Goals in February, attended by more than 250 people. We also organised a vibrant seminar series and have continued to strengthen our work through winning new grants and attracting new doctoral and MSc students. In particular, we have made an important contribution to the School's work on Zika. We have a widespread reach outside of LSHTM, through our representation on WHO and UN committees related to disability and our close ties with leading disability NGOs.

Malaria Centre - Director: Chris Drakeley

2016 saw the completion of two of the Malaria Centre's major research initiatives: the ACT Consortium, which ran 25 research projects in 10 countries in Africa and Asia, and the Malaria Capacity Development Consortium, which partnered five African and four European universities to improve malaria research capacity in Africa. This year also saw the positive review of GSK's RTS,s/AS01 vaccine after phase three trials in children in several African countries, a major project on which Centre members have made substantial contributions.

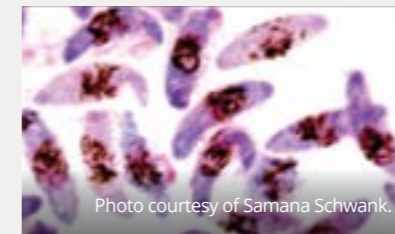


Photo courtesy of Samana Schwank.

Centre for Maternal Adolescent Reproductive & Child Health (MARCH) - Director: Joy Lawn

More than 15,000 participants globally studied our free online course, Improving the Health of Women, Children and Adolescents, and we organised over 20 events on topics ranging from Zika and disability through to hosting two *Lancet* series global launches each with over 350 attendees - Ending Preventable Stillbirths (January) and Maternal Health (October). In October, MARCH awarded a £30,000 career re-entry fellowship to Lenka Benova, thanks to the Millby Foundation.



Photo courtesy of Paolo Patrino/IDEAS.

Centre for Mathematical Modelling of Infectious Diseases - Director: Sebastian Funk

CMMID organises a vibrant series of seminars as well as journal clubs and regular meetings. Last year, we also hosted an international workshop on vector-borne disease modelling, and took part in the Science Museum Lates public engagement project (see page 11).

Centre for Statistical Methodology - Co-directors: Bianca DeStavola and Richard Silverwood

In April, we hosted the fourth UK Causal Inference Meeting, with 244 participants from 18 countries and 10 invited speakers, all world leaders in the field. There were presentations on a plethora of methodological topics and interesting applications in genetic epidemiology, social networks, HIV, and race. The Centre also ran 17 seminars, attracted an average of 2200 monthly visits to its website, and supported the application of several successful methodological fellowships.

TB Centre - Director: Helen Fletcher

We ran a series of seminars that covered a wide range of topics around TB prevention and care. A major conference for World TB Day was hosted in partnership with UCL, which included a special issue for BMC Medicine. The student TB interest group attracted more than 50 students to its various activities. TB Centre members continued their leadership in global policy and research, including the appointment of Professor Anna Vassal to the WHO Strategic and Technical Advisory Group for TB, and the Young Investigator Prize for Rein Houben at the World Union Conference in Liverpool.

Vaccine Centre - Director: Anthony Scott

We hosted a variety of events in 2016, including a WHO sponsored symposium on the measles and rubella vaccination progress in Europe, a two-day retreat, and many scientific meetings focused on areas including pneumococcal vaccination, conducting clinical trials during an epidemic and efficacy, safety and policy.

Resources and support

The School's range of projects and programmes in the UK and worldwide has continued to grow strongly over the year, funded by the UK government, the European Union, the Bill & Melinda Gates Foundation and the Wellcome Trust, among others. Total income from research grants and contracts increased by more than 10% to £110 million in 2015/16, at a time when the funding environment is increasingly uncertain.

Such continuing expansion requires investment in more efficient support services, and these have been extensively reviewed by Matt Lee, our new Chief Operating Officer who joined in May. In 2016, we also welcomed John Starmer as Director of Estates, Lucinda Parr as Secretary, responsible for academic, governance, and executive services, Court Clayton as Director of development and alumni relations, and other new members of the executive team (see page 24). We have begun work on developing the 2017-22 School Strategy, with staff meetings and consultations held in December 2016, and this process is continuing in the new year, with the strategy to be published in summer 2017.



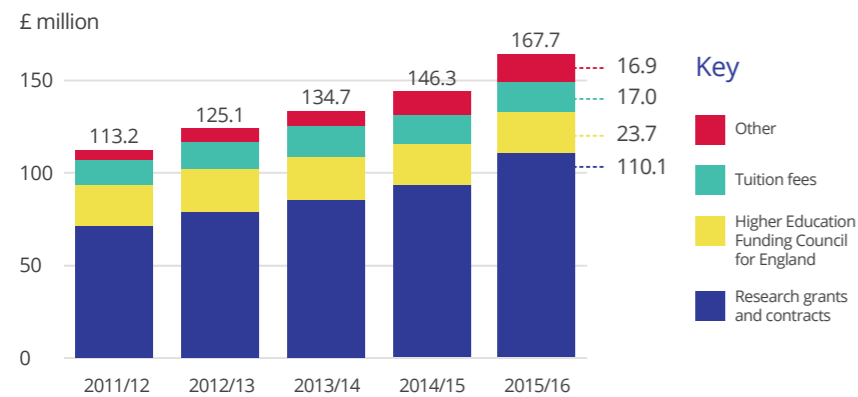
Lucinda Parr
Secretary



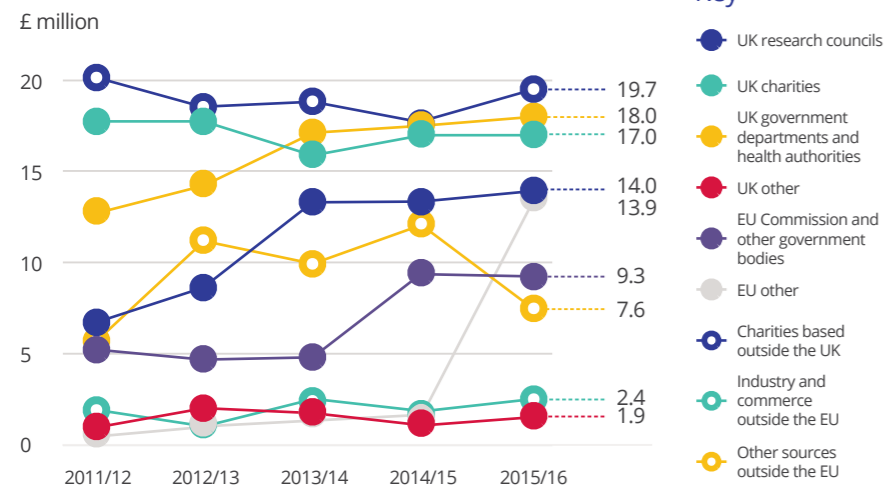
Matt Lee
Chief Operating Officer



Income from all sources 2011/12 to 2015/16



Research income: grants and contracts



Development and alumni relations



Court Clayton
Director of Development and Alumni Relations

The School has big ambitions for the future, and philanthropy will play an increasing role in bringing these plans to fruition.



2016/17 Janssen Scholars with representatives from Janssen Pharmaceutica.

Development

In 2016, the Development team developed a number of new partnerships with corporations, foundations and other global philanthropists. These efforts resulted in new student scholarships, laboratory refurbishments and funding for pioneering research. Highlights included a six-figure gift from the Millby Foundation to launch a new initiative supporting early and mid-career faculty members. This initiative will support two outstanding researchers per year for the next three years.

The School community launched the Jeroen Ensink Memorial Fund. The full scholarship will be awarded to students from sub-Saharan Africa or South Asia to study the MSc in Public Health for Development in 2017-18.

Jeroen Ensink, who was tragically killed in 2015, was passionately committed to improving access to water and sanitation around the world, above all in low-income countries where children continue to die due to lack of basic services. To date, the memorial fund has received more than 400 donations, totalling around £90,000.



Jeroen Ensink, photo courtesy of Nadja Ensink-Teich.

We are grateful to everyone who made gifts to the Annual Fund. This year's appeal raised over £125,000 for scholarships to train the health leaders of the future.

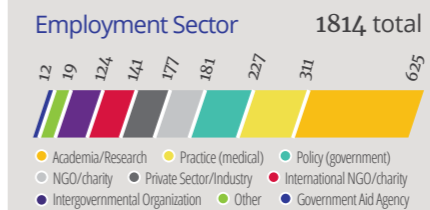
Alumni Relations

In 2016, the Alumni Relations team and our network of Chapter volunteers organised more than 40 events around the world, many in conjunction with scientific conferences. Major events included the annual Distance Learning Reception, a joint Director's Lecture with Royal Veterinary College, a donor stewardship reception and the annual Director's Circle Lunch at Buckingham Palace.

Dr Patricia Mechael was awarded the Social Impact Award at the 2016 British Council Alumni Awards. The award honours her exceptional contribution and commitment to creating positive social change and improving the lives of others. Dr Mechael has been a pioneer of 'mHealth', the subject for her PhD at the School exploring how health and well-being can be improved using mobile phones. This is the second year running that our alumni have won this prestigious award: in 2015, it went to MSc Community Eye Health alumnus Dr Rajesh Babu Bhattachala.

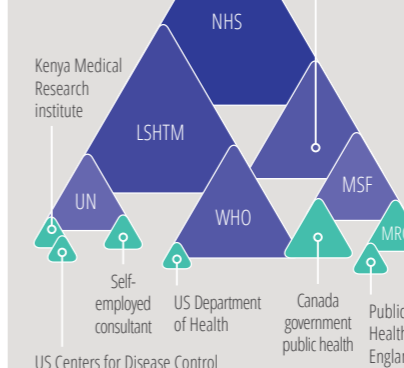
Alumni destinations

The data below are based on a sample of alumni from the School's Alumni database, updated in 2016.



Top Employers

Top employers encompasses organisations where 13 or more alumni work.



"I chose to study at the London School of Hygiene & Tropical Medicine because of its international reputation as a centre of excellence for training in public health, and the chance to meet with inspiring global health leaders. I wanted to have the opportunity to be exposed to the everyday realities of public health in England, as well as have a full introduction to the theories of good practice in the UK. My time at the School was a fantastic year of my life. I loved discovering London and forging new personal and professional relationships that have stood the test of time."

Professor Kevin Fenton
MSc Public Health 1992, now Director of Health and Wellbeing at Public Health England

Read more Alumni Profiles on <http://blogs.lshtm.ac.uk/alumni/>

Governance and management

Council membership as at January 2017

- Chairman**
 Dame Marjorie Scardino, DBE, FRSA
- External members**
 Dr Andrée Carter, PhD FISOilSci MCIWEM
 Mr Kash Chandarana, BSc, ACA
 Ms Ann Grant, BA MSc
 Mr Paul Klingenstein
 Mr John O'Donnell, LLB LLM
 Mr Sushil Premchand, BA FCA
 Mr Jon Roper, MA (Cantab)
 Professor John Stephenson, BSc PhD CBiol FIBiol
 Dr Diana Walford, CBE MA BSc MSc MD FRCP FRCPath FFPH

- Elected staff members**
 Professor Alison Grant, MB BS, MSc, PhD, DTM&H, FRCP
 Ms Gemma Donaldson, MA (Cantab)
 Dr Susannah Mayhew, BA, MA, PhD
 Professor Helen Weiss, MSc DPhil

Director
 Professor Baron Peter Piot, MD, PhD, FRCP, KCMG (ex officio)

President of the Student Representative Council
 Ms Farzana Kalladi Puthanpurayil, MSc (ex officio)

Secretary
 Ms Lucinda Parr, BMus MMus (ex officio)



Council meeting in November 2016, chaired by Dame Marjorie Scardino (centre).

Honorary Fellows

An Honorary Fellowship is the School's most prestigious honour and is conferred on those people who have rendered exceptional service to the School or have attained exceptional distinction in any of the subjects taught in the School.

- Dame Valerie Beral
- David Bradley
- André Capron
- President Jimmy Carter
- Baroness Chalker Of Wallasey
- Manuel Dayrit
- John Robert Evans
- Sir Richard Feachem
- William Foege
- Tedros Adhanom Ghebreyesus
- Tore Godal
- John Godfrey
- Coluthur Gopalan
- Sir Brian Greenwood
- Demissie Habte
- Donald Henderson
- Ralph Lainson
- Robert Logan
- Adetokunbo Lucas
- Dame Sally Macintyre
- Halfdan Mahler
- Tony McMichael
- David Nabarro
- Sadako Ogata
- Sir Eldryd Parry
- Sir Richard Peto
- K Srinath Reddy
- Amartya Sen
- John Hilary Smith
- Alfred Sommer
- Robin Weiss
- Peter Williams

Patron

HRH Prince Philip
 Duke of Edinburgh KG KT

Organisational chart with post holders – January 2017

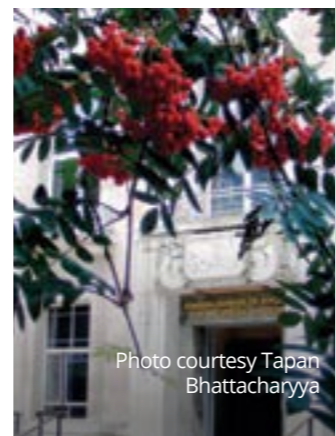
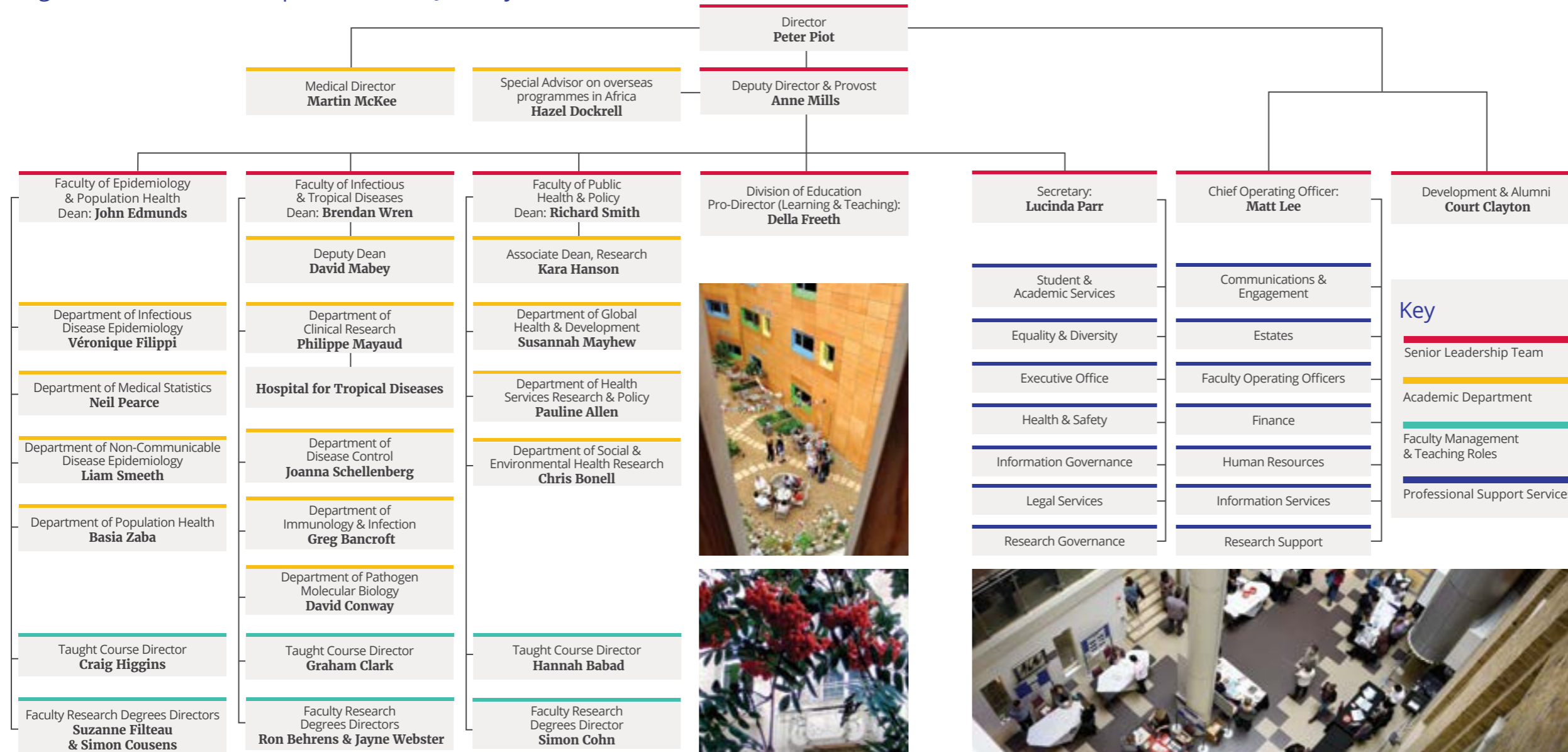
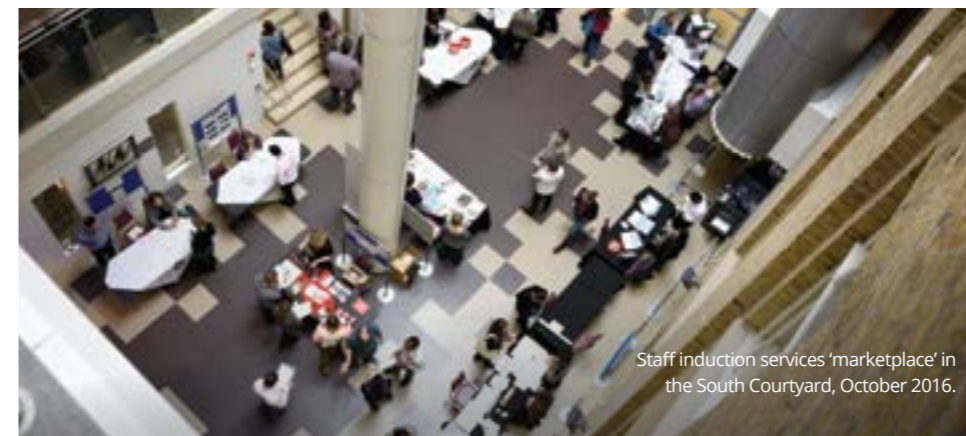


Photo courtesy Tapan Bhattacharyya



Staff induction services 'marketplace' in the South Courtyard, October 2016.



HRH the Duke of Edinburgh with staff and supporters at the Director's Circle lunch, Buckingham Palace in October 2015, photo courtesy of Robert Irving.