



Word cloud terms include: MALARIA, HEALTH, ECONOMICS, OUT OF POCKET, ORGANISATION, OUTCOMES TAXES, MODELLING COST EFFECTIVENESS, VACCINES, CHILD HEALTH, MATERNAL HEALTH, ANALYSIS, CLIMATE CHANGE, LOW INCOME, HIGH INCOME, UNIVERSAL HEALTH COVERAGE, PAYMENT, TRIALS, DRUGS, RESOURCES, HIV/AIDS, HEALTH SYSTEMS, PRIMARY HEALTH CARE, STATISTICS, EQUITY, ANTIBIOTIC RESISTANCE, CANCER, MIDDLE INCOME, NURSES, DIABETES, FLU, MEDICAL TOURISM, METHODOLOGY, SCIENCE, POLICY, STATISTICS, SEXUAL HEALTH, PAYMENTS, OUTCOMES TAXES, MODELLING COST EFFECTIVENESS, VACCINES, CHILD HEALTH, MATERNAL HEALTH, HEALTH SYSTEMS, PRIMARY HEALTH CARE, STATISTICS, EQUITY, ANTIBIOTIC RESISTANCE, CANCER, MIDDLE INCOME, NURSES, DIABETES, FLU, MEDICAL TOURISM, METHODOLOGY, SCIENCE.

Annual Report 2014

London School of Hygiene & Tropical Medicine
Keppel Street
London WC1E 7HT
United Kingdom
ExternalRelations@lshtm.ac.uk

www.lshtm.ac.uk

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Improving health worldwide

From Our Partners



Professor Sir Michael Rawlins
Chair of the Medicines and Healthcare Products Regulatory Agency, President of the Royal Society of Medicine and former Chairman of the National Institute for Health and Clinical Excellence



Adrian Alsop
Director, Research, Partnerships and International, Economic and Social Research Council



Professor Tuman Corrah
Director, Africa Research Development, Medical Research Council

“The National Health Service relies critically on high-quality clinical and economic research, and the London School of Hygiene & Tropical Medicine is a leading contributor, in terms of both research evidence and policy guidance. The School's wide experience in the UK and worldwide has benefited the development of methods used by health agencies, and supported the development and strengthening of health systems in many countries.”

“As Research Councils, we seek to support excellence with impact, and this is increasingly found where research is co-produced, problem oriented and trans-disciplinary. The London School of Hygiene & Tropical Medicine is pioneering in many ways, and one of these is how the social sciences are fully integrated into clinical trials, interventions, systems and public health research in the UK and around the world. This is why the School has recently been successful in attracting ESRC funding, and we look forward to seeing more of this exciting work in future.”

“The London School of Hygiene & Tropical Medicine is a key contributor to our work, and is helping governments, universities and hospitals to strengthen their research and teaching capacity, knowledge and expertise. I am delighted to be associated with one of the world's leading global health institutions.”



The School of Tropical Medicine and Global Health is a new venture at Nagasaki University supported by the government of Japan, with the London School of Hygiene & Tropical Medicine as a key partner. In October, senior academics from both institutions presented at the Global Health Forum in Tokyo. Photo courtesy of Nagasaki University.

Chair's Foreword



Sir Tim Lankester
Chairman of Council

How does our research make a difference in the wider world, and how can we measure this impact? As a former civil servant and academic administrator, I have looked at this issue from both sides of the equation, and it is interesting to see how the evidence and knowledge generated in universities influences policy.

Impact is now included as a key measure in the UK government's Research Excellence Framework, and the outcome of this seven-year exercise, published in December 2014, confirms that the London School of Hygiene & Tropical Medicine leads the way on this measure, with strength in depth of research that contributes to policy and drives significant improvements in clinical medicine, global health and international development.

This is just one of many achievements outlined in this report. 2014 was a year in which the work of the School has been in the spotlight as never before, not least

in connection with Ebola. However, this is the tip of a very large iceberg, with a tremendous amount of work in all areas, in research, education, innovation and knowledge exchange.

Looking ahead, 2015 promises to be very exciting for the School, with major new institutional partnerships and initiatives underway, not least the development of our joint £51 million Bloomsbury Research Institute with UCL, dedicated to finding treatments, vaccines and diagnostics for prevention and control of major diseases including healthcare-associated infections and antimicrobial resistance.

It will also be my final year as Chairman of Council. I took up this role in 2006 and have thoroughly enjoyed working with two wonderful Directors and their teams, and seeing the tremendous growth and development of the institution, while we remain focused on our outward-facing mission, to improve health worldwide.

Sir Tim Lankester

Our vision is to be a world-leading school of public and global health, working closely with partners in the UK and worldwide to address contemporary and future critical health challenges.

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.

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Director's Introduction – A Year to Remember



Professor Baron Peter Piot

2014 has been a year when public and global health moved to the top of the agenda and became the focus of intense media attention. Two topics that have been particularly prominent are the current Ebola crisis in West Africa, as well as concern about antibiotic resistance and the need to identify new ways to treat resistant infections. Both these challenges have highlighted yet again that, contrary to what I was told as a student, the threat of infectious diseases is far from over.

The response by the international community to both the looming threat of antibiotic resistance and the acute and rapid spread of Ebola in West Africa has been too slow. On the one hand, pharmaceutical companies and governments have only this year - often thanks to the forceful advocacy of Dame Sally Davies, the UK's Chief Medical Officer - recognised the urgency to develop new antimicrobials and new approaches to tackle resistance. The delayed reaction to the Ebola epidemic, both nationally and by the international community, has been an enormous concern for me and has undoubtedly cost many lives, allowing the virus to spread and establish itself in communities. This has underlined the political and logistical challenges of coordinating an effective response to disease outbreaks.

Since September 2014, there has been a concerted effort to treat and manage the epidemic. I am proud of the remarkable response of staff, doctoral students and alumni to my call for volunteers to help

support this effort, with several hundred coming forward offering their skills and services. Colleagues have been working with partners Médecins Sans Frontières and Save the Children in the affected countries, where they are training clinical teams, caring for patients, providing logistical and epidemiological support and advising governments and international agencies, while others are supporting the World Health Organization. In December, Ebola volunteers were collectively honoured by *TIME* magazine as 'Person of the Year 2014'.

It is imperative to invest in new Ebola prevention and treatments, and the School is well equipped to help with these efforts. We are already involved in research projects ranging from the development of an anthropology platform to modelling the spread of the disease, contact tracing, and trials of experimental treatments and vaccines.

Beyond Ebola

However urgent it is to manage this epidemic, the human and economic costs of Ebola are dwarfed by the continuing burden of malaria, AIDS, tuberculosis and other infectious diseases, as well as the rising tide of chronic conditions and injuries. Our staff are very active in major biomedical, social and implementation studies, which have contributed to policy and practice in many areas of health. This also means a continued rapid growth in our core business of research, and this is set to continue with major new programmes in the pipeline.

We have also been increasingly successful in raising funds from philanthropic sources, including School alumni who have generously contributed to successive campaigns for student scholarships, projects and centres.

In the UK, as globally, we continue to shape health policy, generating evidence and undertaking evaluation of health interventions. We are pleased that both the Policy Innovation Research Unit and the Policy Research Unit in Commissioning and the Healthcare System have been awarded continued funding from the UK Department of Health. We have also been successful in bidding for three Health Protection Research Units, working closely with Public Health England, in the following fields: immunisation, environmental change and health and, in partnership with University College London, blood-borne and sexually transmitted infections. Our three Cochrane Review Groups on Eyes and Vision, Heart, and Injuries, hosted at the School, are providing robust, independent evidence relevant for policy makers around the world.

Another growing area for which the School is increasingly recognised is the social sciences, including health economics. These disciplines provide a critical perspective on health and also help to deliver more effective interventions for individuals and populations. In 2014, we made new senior appointments, and hosted one-day conferences on social sciences and health economics.

Our institutional partnerships, both in the UK and globally, are essential for delivering our research and teaching programmes. One which represents a significant new phase in the School's history is the Bloomsbury Research Institute, a partnership with University College London, which brings together more than 200 leading researchers to investigate and discover new treatments, vaccines and diagnostics for prevention and control of infectious diseases. One of the Institute's main priorities is antimicrobial innovation. Following the Higher Education Funding Council for England's award of a Catalyst Fund grant of £7.5 million for the building, and recruitment of a Director for the Institute, our priority for the year ahead is to obtain planning permission for the new building, and to raise further funds for the development.

New initiatives in a very busy year include support to the Wellcome Trust Africa Centre for Health & Population Studies. Institutional partnerships are expanding in Asia with the secondment of senior academic staff: these include a joint Centre for Chronic Conditions and Injuries hosted by the Public Health Foundation of India, and we have initiated partnerships in China with Sichuan University and with Nagasaki University in Japan.

The results of the UK government's Research Excellence Framework, announced in December, confirm the School's position as a centre for world-class research. This demonstrates both our success in translating the results of rigorous research into real life benefits, and our supportive research environment.

The profile of our research underpins the teaching and training we deliver. During 2014, our Deputy Director and Provost, Professor Dame Anne Mills, led a review of the School's education programmes. Breaking down the boundaries between the face-to-face and online learning modes of delivery will provide a more flexible and personalised learning experience for each student, and in 2015 we will begin to implement the recommendations of the review.

Looking forward

The year ahead will see the consolidation of a number of initiatives, including our continuing efforts to improve administrative support and management.

I am committed to building the support for junior and intermediate researchers, identifying the future leaders and fostering their talent and expertise. We also have an ambitious programme of activities to support and enhance women's careers and opportunities throughout the School, building on the fact that we have the highest proportion of female professors among British universities. Alongside these initiatives, we aim to raise the quality of the student experience, from prospective students to alumni, ensuring that our educational provision meets the needs of students and future employers.

In early 2015, we are launching the first of our MOOCs (Massive Open Online Course), with Ebola in Context starting in January and Maternal and Child Health in April. These are free online courses, using the FutureLearn open platform, and it is encouraging that more than 12,000 people registered in the first few weeks following the initial announcement in December. We hope they will be inspired to learn more, and we are planning to use this high-quality online material increasingly as part of our blended learning.

We cannot ignore the league tables, and I am pleased that the School was highly rated in a number of world rankings published throughout 2014. The School was one of only 10 UK universities included in the world's top 100 universities according to assessment of reputation, published in March by the *Times Higher Education Reputation Rankings*. In November, we appeared for the first time in the *US News Best Global Universities Rankings*, where the School was rated 91st overall, 26th in clinical medicine, 17th in immunology, 42nd in microbiology, and third in the world, after Harvard and Johns Hopkins, for social science and public health. This is a solid foundation, and I hope and believe we can further improve on this in the future.

Honours and Awards in 2014

Congratulations to all colleagues whose achievements have been recognised publicly by honours and awards over the course of the past year. Here is a selection:

January

- Peter Piot received the Prince Mahidol Award in the field of Public Health.
- Julian Peto, Professor of Epidemiology, awarded the 2014 Lifetime Achievement Award by the British Thoracic Oncology Group.

March

- Sian White, research assistant at the School's Environmental Health Group, awarded the Order of Australia Medal for her work in Papua New Guinea as Project Manager for the National Tuberculosis Programme.

April

- Professor Clare Gilbert, co-director of the International Centre for Eye Health, awarded the L'OCCITANE Sight Award in recognition of her work to tackle avoidable blindness in low income countries.

May

- Eleanor Riley, Professor of Immunology, elected a Fellow of the Academy of Medical Sciences.
- Richard Hayes, Professor of Epidemiology and International Health and Rosanna Peeling, Professor of Diagnostics Research, named as joint winners of the 2014 George Macdonald Medal, awarded jointly by the School and the Royal Society of Tropical Medicine and Hygiene.

June

- David Mabey, Professor of Communicable Diseases, awarded a CBE for services to international health development in Africa and Asia, and Polly Roy, Professor of Virology, awarded an OBE for services to Virus Research in the Queen's Birthday honours list.



Polly Roy receiving her OBE from the Queen at Windsor Castle in December, courtesy of the Press Association

October

- Vikram Patel, Professor of International Mental Health, awarded the 2014 Rhoda and Bernard Sarnat International Prize in Mental Health by the Institute of Medicine.
- Charlotte Watts, Professor of Social and Mathematical Epidemiology, elected a foreign associate member of the Institute of Medicine of the US National Academies of Science.

- Nick Black, Professor of Health Services Research, and Ben Goldacre, Wellcome Research Fellow at the School, were honoured by the Health Service Journal Clinical Leaders list for the second year running, as individuals making the greatest impact on health policy, service transformation, and innovation.

December

- Peter Piot named as part of *TIME* magazine's 'Person of the Year 2014 - the Ebola Fighters'.
- Anne Mills, Deputy Director & Provost and Professor of Health Economics and Policy, made a Dame in the Queen's New Year Honours list in recognition of her services to international health.
- Chris Whitty, Professor of Public and International Health (currently seconded as Chief Scientific Advisor at the Department for International Development), made Companion of the Order of the Bath for public and voluntary service to Tropical Medicine in the UK and Africa.

Research Excellence and Wider Impacts



Professor Dame Anne Mills
Deputy Director and Provost

The results of the UK government's Research Excellence Framework, announced at the end of December 2014, confirm the School's position as one of the UK's leading centres for world-class research. According to 'grade point average', the School was ranked in the top 10 of all universities in the UK, and second (after the Institute for Cancer Research) on the key measure of impact.

On the measure of impact, the School performed particularly well, reflecting the extent to which its research has influenced policy and the wider world. It submitted a large number of individual impact case studies, listed below, in both Public Health and Clinical Medicine, which were judged to be outstanding. This very positive outcome demonstrates our success in translating the results of rigorous research into real life benefits.

Our supportive research environment, recognised in the ranking as world-leading, is a critical factor in our success. In the School's overall submission, the gender balance of staff was precisely equal, 180 female and 180 male, and many early-career researchers were included, reflecting our commitment to nurturing world-class research across the School.

Impact case studies for the Research Assessment Exercise 2014

Unit of Assessment 1 Case Studies: Clinical Medicine

- Eliminating blinding trachoma through single dose treatment
- Elucidation of the global dispersal of antimalarial drug resistance and strategies to combat future emergence and spread
- ▶ Evaluating drugs and devising strategies for reducing malaria transmission
- Exploitation of virus-like particles for vaccinology and the development of safe efficacious bluetongue virus vaccine
- Detection and identification of malaria parasites in human blood
- Miltefosine for the treatment of leishmaniasis
- ▶ Preventing newborn mortality due to syphilis

Unit of Assessment 2 Case Studies: Public Health, Health Services and Primary Care

- Cancer survival: impact on cancer control policy in England
- Controlling the hepatitis B virus in Africa and preventing unnecessary expenditure
- Developing a new approach to malaria prevention in children: seasonal malaria chemoprevention in West Africa

- Encouraging adoption of new children's vaccines through the development of methods for decision support modelling
- Enhancing evidence-based policy decisions for neonatal and child survival in the highest mortality countries
- ▶ Expanding access to effective antimalarial treatment through the private sector
- Identifying and promoting a new trauma treatment which could save over 100,000 lives a year
- ▶ Improving access to mental health care in low and middle income countries
- Improving the control of blindness in children in low and middle income countries through programmes, policy and legislation
- Improving treatment of hypertension in the very elderly
- Influencing EU and national policy on patient mobility within Europe
- ▶ Influencing the widespread adoption of pneumococcal conjugate vaccines in low and middle income countries
- Informing policy and decision-making on vitamin A supplementation for mothers and children
- Intermittent preventive treatment for malaria control

- ▶ Introducing patient reported outcome measures (PROMs) into the NHS
- Isoniazid preventive therapy for people with HIV
- ▶ Male circumcision as an HIV prevention strategy
- Preventing disease through promotion of handwashing with soap
- Preventing HIV in African adolescents
- Reducing the overdiagnosis of malaria and improving case management of fever in East and West Africa
- Scaling up insecticide treated net coverage: evidence to support strategic policy decisions and investment
- Screening for TB in people living with HIV
- ▶ Securing action to address the health needs of trafficked women
- Smoking cessation support by text message: the impact of the txt2stop trial
- Supporting decision-making on the introduction of *Haemophilus influenzae*, type b (Hib) vaccine in low- and middle-income countries
- Supporting influenza pandemic preparedness
- The technology of insecticide treated nets for malaria control

▶ Selected examples on facing page - [full details of case studies are available on the School's website](#)

Selected examples of impact case studies:

▶ Evaluating drugs and devising strategies for reducing malaria transmission

A substantial programme of research at the School has provided evidence for a major shift of strategy and progress in global efforts to eliminate malaria. As a result, the World Health Organization now recommends a policy designed to ensure medically-treated individuals are non-infectious to mosquitoes in appropriate settings. Several countries have made strategic decisions for the prevention of malaria transmission on the basis of the research, and the senior investigators act as advisors to national and international initiatives for the prevention of malaria. Furthermore, drug development partnerships such as the Medicines for Malaria Venture now include transmission interruption in the target product profiles for new medicines.

■ Chris Drakeley, Geoff Targett, Colin Sutherland and Teun Bousema with partners in The Gambia, Uganda, Kenya and The Netherlands

▶ Male circumcision as an HIV prevention strategy

An estimated 2.7 million people are newly infected with HIV every year, and despite advances in scaling up antiretroviral treatment, 1.8 million per year die of HIV-related causes. Research on the effects of male circumcision on HIV prevention has contributed to important policy recommendations by the World Health Organization and UNAIDS, the joint UN Programme on HIV/AIDS. The research showed a strongly reduced risk of HIV infection among circumcised men, and modelling studies estimated that male circumcision programmes in 13 priority countries in Africa could avert 4 million HIV infections by 2025. Members of the research team serve on key international advisory groups, and these results have been widely used to underpin international policy guidelines.

■ Helen Weiss and Richard Hayes with partners across Africa

▶ Expanding access to effective antimalarial treatment through the private sector

Research carried out at the School has made a fundamental contribution to the creation and evaluation of the Affordable Medicines Facility – malaria, a financing mechanism to improve access to effective antimalarials through subsidies and price negotiations with drug manufacturers. By demonstrating the importance of the private sector in supplying antimalarial medicines, this influenced the development of the concept of a high level private sector subsidy. Following the launch of the Affordable Medicines Facility in 2009, the School has participated in evaluating eight national scale programmes, and the findings of the evaluation influenced the Global Fund's decision to integrate this subsidy mechanism into their core funding streams in 2012.

■ Kara Hanson, Catherine Goodman, Sarah Tougher, Barbara Willey, Andrea Mann, Anne Mills and various country partners

▶ Introducing patient reported outcome measures into the National Health Service

Research into patient reported outcome measures (PROMs), which measure health outcomes from the patient perspective, has demonstrated the feasibility of routinely collecting such measures before and after elective operations. Following research and testing by staff at the School, in 2009 the UK government mandated that PROMs should be collected on all National Health Service patients in England undergoing one of four surgical operations. This remains the only nationwide programme of its kind worldwide, providing essential data for comparing providers' performance, patient choice and other quality improvement approaches. In addition, the value of PROMs for more sophisticated estimates of NHS productivity has been recognised by the Office of National Statistics and the National Audit Office. Their value to surgeons was hailed by Professor Norman Williams, President of the Royal College of Surgeons, as a "major development in the history of surgery".

■ Nick Black, Jan van der Meulen, Andrew Hutchings, Jenny Neuburger and John Browne

▶ Influencing the widespread adoption of pneumococcal conjugate vaccines

A trial of a pneumococcal conjugate vaccine showed a significant reduction in invasive pneumococcal disease, severe pneumonia, hospital admissions and deaths in vaccinated children. These results played an important role in encouraging the World Health Organization to recommend the introduction of this vaccine into the routine immunisation programme of all countries with a high child mortality. 42 of 57 eligible countries have now adopted the vaccine, saving the lives of tens of thousands of children globally.

■ Brian Greenwood, Shabbar Jaffar and Felicity Cutts with partners across Africa



Courtesy of Rodrigue Barry, WHO

▶ Improving access to mental health care in low and middle income countries

Mental health problems make a substantial contribution to the global burden of disease. In low and middle income countries, more than 20% of all disability related to health conditions is caused by mental health problems. Research by the School has promoted new approaches to mental health care and influenced donors, practitioners and policy-makers, contributing to changing global priorities in this area, and these research findings have been translated into treatment guidelines used to train health workers in managing mental illness in many countries.

■ Vikram Patel, Alex Cohen, Mary De Silva with Sangath, Public Health Foundation of India and CBM International

▶ Preventing newborn mortality due to syphilis

Syphilis in pregnant women results in half a million stillbirths and newborn deaths every year, the majority occurring in countries that lack access to screening. Studies conducted in Africa defined the health burden of congenital syphilis and the effectiveness of single dose benzathine penicillin treatment in pregnant mothers. Further research on validation and implementation of rapid tests for prenatal syphilis screening resulted in increased screening of pregnant women in more than 30 countries. The research has contributed to the rationale and strategy for action for the global elimination of mother-to-child transmission of syphilis launched by the World Health Organization in 2007. The World Health Report 2013 highlighted the importance of this research in contributing to changes in policy and practice to save newborn lives.

■ Rosanna Peeling, David Mabey and Deborah Watson-Jones with partners across Africa

▶ Securing action to address the health needs of trafficked persons

Millions of people are thought to be trafficked globally, and are subjected to violence, deprivation and exploitation, with profound damage to their health and well-being. Research conducted by the School put the physical and mental health of women trafficked for sexual exploitation and men, women and children trafficked for other forms of exploitation firmly on the international agenda. The research generated the first-ever guidance for health providers caring for trafficked persons and internationally recognised ethical and safety recommendations from the World Health Organization. Many law enforcement training materials in the UK, Europe and other regions have incorporated these findings.

■ Cathy Zimmerman, Mazedra Hossain, Ligia Kiss and Charlotte Watts with partners Amnesty UK, International Organization for Migration (Ukraine & Moldova), La Strada (Czech Republic), Animus Association Foundation (Bulgaria), On the Road (Italy), Pagasa (Belgium) and Poppy Project (UK)

Ebola: Responding to the Challenge



Ebola in Guinea courtesy of EU/ECHO

One of the most significant events of the year has been the continuing Ebola epidemic in West Africa, the largest and most deadly since the virus was discovered nearly 40 years ago.

The outbreak began in March in the rural Guéckédou region of Guinea, and in the absence of effective infection control, it spread rapidly into Liberia and Sierra Leone, reaching urban areas. The international response was initially slow, but by August, with mortality soaring in the affected countries, and imported and suspected cases appearing in the USA, Spain, Nigeria and Mali, the World Health Organization declared a state of emergency.

The School's Director, Peter Piot, one of the team who first discovered and tracked the virus in 1976, along with colleagues including David Heymann, Professor at the School and Chair of Public Health England, and Jeremy Farrar, Director of the Wellcome Trust, have been

at the forefront of the public debate, and staff across the School are active in the international response to the crisis.

Between September and December, nearly 500 staff members, research students and alumni had responded to a call for volunteers, offering their skills and services in various capacities. School staff are now working in the field, training clinical teams, conducting research, providing logistical support, and advising governments and international agencies.

By December, the epidemic appeared to have peaked in most of the affected area. However it had claimed more than 8,000 lives, with an estimated 20,000 people infected, and continued urgent action is required to save lives and control the virus.

Volunteer profile

“I learned a lot from the process, it felt like we had a very clear purpose. We were working flat out and the days seemed to merge, but there was a great team spirit and it felt like we were all trying to move a mountain together!”

Shunmay Yeung, Paediatrician and Senior Lecturer in Health Economics and Policy, was one of the first people from the School to travel to Sierra Leone to support the response to the Ebola outbreak. Working with Save the Children, Dr Yeung helped set up a 100-bed Ebola Treatment Centre in Kerry Town, training medical staff, local community health officers and health assistants. Her main role was the training of health workers to use personal protective equipment in the high risk environment of the Ebola Treatment Centre.



Shunmay Yeung (centre) with healthcare workers in Kerry Town, image courtesy of Catherine McGowan

Initiatives currently underway include:

Convalescent serum and vaccine trials

Following a World Health Organization expert meeting in September recommending convalescent blood therapies as one of the most promising strategies meriting urgent evaluation as treatment of Ebola disease, an international consortium including Peter Smith and Tansy Edwards began assessing whether treatment with antibodies in the blood of Ebola survivors could help infected patients to fight off the disease. If proven effective, this straightforward intervention could be scaled up in the short term and provide an urgently needed treatment option for patients in West Africa. Researchers from the School are working with the Institute of Tropical Medicine in Antwerp, Guinea's National Blood Transfusion Centre, the Institut National de Recherche Biomédicale, Democratic Republic of Congo, and the Belgian Red Cross, on the €2.9 million European Union funded project.

From January 2015, the School will be partners in a major international three-year project to develop and evaluate an effective vaccine for Ebola.

Anthropology

In November, the Ebola Response Anthropology Platform was launched to advise agencies and healthcare workers on the best approaches for key interventions such as identifying and diagnosing Ebola cases, caring for the sick, and managing the dead. Led by Melissa Parker and colleagues at the School, in partnership with the Institute of Development Studies, University of Sussex and the University of Exeter, the platform draws together an international network of anthropologists with expertise in West Africa and medical anthropology. Working closely with communities in the affected areas, the team is seeking to increase the effectiveness of interventions by adapting them to local circumstances. The project is funded by the Wellcome Trust and the Department for International Development.

Contact tracing

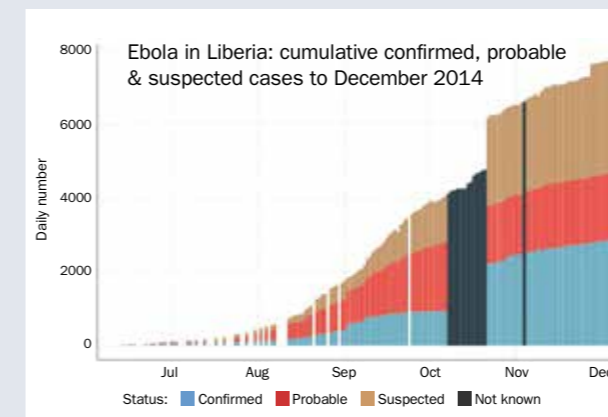
Containing the Ebola outbreak in West Africa requires rapid identification, diagnosis and isolation of those who develop Ebola, but the current system for tracing Ebola contacts may be slowing down this process. David Ross and colleagues from the School are working with the International Medical Corps and Innovations for Poverty Action Sierra Leone to introduce and evaluate the use of an electronic system which uses mobile devices to identify and track Ebola contacts. If successful, the electronic system could be scaled-up rapidly. The project began in November and is funded by the German Society for International Cooperation.



Courtesy of Shunmay Yeung

Modelling and mapping

John Edmunds and colleagues are modelling possible scenarios for the future of the outbreak, and assessing the level of response, including healthcare facilities, that may be needed to cope with different scenarios. Funded by the Wellcome Trust and the Department for International Development, they have been undertaking statistical modelling to analyse data collected by Médecins Sans Frontières in West Africa to look at how many cases and deaths from Ebola might be expected over time.



The team is also publishing weekly real-time epidemiological analysis and forecasts online using daily situation reports from the governments of Liberia, Sierra Leone and Guinea. Their visualised data on the number of cases, deaths, use of treatment centres and number of health-care workers infected is informing the response of numerous organisations including Médecins Sans Frontières, Epicentre, Save the Children, the Red Cross, UK-Med, the UK Department for International Development, the US National Institutes of Health, and GlaxoSmithKline.

Events and educational resources

The School has been running a series of seminars, workshops and events about Ebola, with speakers including School experts involved in the response, and special guests such as Jean Jacques Muyembe, Director of the Institut National de Recherche Biomédicale, Democratic Republic of Congo. Lectures and seminars will continue throughout 2015.

In December, the School launched a free massive open online course (MOOC). [Ebola in Context: Understanding Transmission, Response and Control](#), is designed mainly for health professionals and students. Led by Judith Glynn, the course examines the science behind the Ebola outbreak to understand why it has occurred on this scale and how it can be controlled. Topics include the principles of infectious disease transmission, the social context of the epidemic, treatment and control measures, and the challenges of implementation and innovation in an emergency. The two-week course starts in January 2015, with over 12,000 participants registered.

Media and public information

School staff have been contributing authoritative information and comment to the global news media. As well as writing high profile feature articles calling for action in the early stages of the outbreak, experts have spoken about key moments and issues throughout the year, including imported cases, airport screening, the use of new treatments and experimental vaccines. There have been more than 13,000 pieces of global media coverage about Ebola mentioning the School in 2014.

In December, *TIME* magazine announced their 'Person of the Year 2014' as the 'Ebola Fighters' in a special issue which includes profiles of Peter Piot, as well as Kaci Hickox, a volunteer who is a graduate of the School's Diploma in Tropical Nursing course.

Knowledge Translation and Innovation



Ann Fazakerley
Director of External Relations

Turning those ideas and specialist knowledge into products, services and shareable expertise is an important strategic aim for the School. We encourage innovation and provide a supportive environment for ideas to flourish and develop into contributions for improving people's lives and health worldwide.

Key aims of our knowledge translation and innovation activities include stimulating take-up of new research findings and tools and maximising the impact and benefit of the School's research. This means exploiting our expertise and innovation, and setting up responsible partnerships with industry, in ways which are consistent with our mission and core values.

In 2013, we launched Chariot Innovations Limited, a wholly-owned subsidiary of the School, to focus on commercially-viable knowledge translation activities. Chariot Innovations is a separate entity, acting as an incubator for innovation in the School, bridging the gap between research and enterprise and ensuring appropriate checks and balances are in place.

Over the past year, we have been working hard to strengthen the foundations of Chariot

Innovations Limited and ensure it provides a robust framework so our academic staff can confidently pursue creative and innovative approaches to solving some of the world's biggest challenges in health.

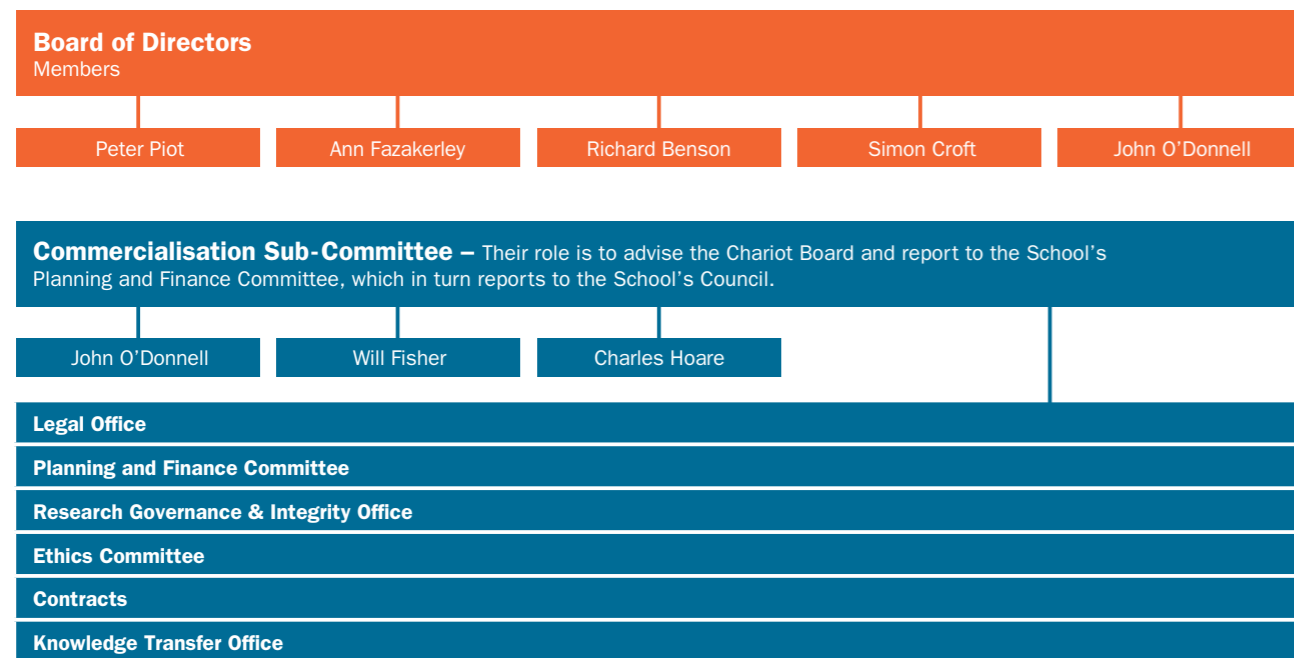


Courtesy of arctec

With the consolidation process complete, the School is now in a strong position to work with our researchers to translate ideas into successful products and services. For our scientists, this means having the freedom to be innovative while knowing that legal, ethical and financial support will be provided at every step of the way. For industry, it means the School has streamlined processes which enable work to be carried out efficiently without compromising on quality or safety.

When you have some of the world's brightest brains working on research to improve health worldwide it's no surprise that they come up with some brilliant ideas.

Chariot Innovations Limited – Who's Who



+ streamlined services from the School including IT, HR, Communications.

Ventures within Chariot Innovations Limited
arctec

Developing arthropod testing services

The School's [Arthropod Control Product Test Centre \(arctec\)](#) was the first division to be formed as part of Chariot Innovations Limited in 2013. Since then it has expanded its activities to become a leading force in the development of better vector and pest control products to keep people safe and healthy. By forming successful partnerships with more than 30 clients including multinational companies and top brands, arctec's team of experts, including entomologists, clinical trials managers, and research nurses, work at the heart of developing exciting new innovations to protect people against insects that transmit disease.

A world-leading independent test centre for consultancy and the evaluation and development of arthropod pest control technologies, arctec provides rigorous laboratory and field testing of products including insect repellents, head lice



Courtesy of arctec

treatments, insecticides and insecticide-impregnated textiles. The team also works closely with regulatory authorities including the Health and Safety Executive and provides a high quality scientific service to ensure that accurate data are used to inform decisions about which products should be promoted for use, and which should not be made available.

Led by Dr James Logan, a Senior Lecturer at the School, arctec has grown significantly in 2013-14, doubling the number of active projects to more than 70 and increasing staff numbers from five to 14. New staff include a Business

Development Manager, Cecilia Andvik, who is leading efforts to grow the business further, strengthen relationships with clients and develop new areas such as head lice treatment testing. In June, arctec boosted its profile as a public health information and education service, launching the first ever Insect Repellent Awareness Day in June. The Bug Off campaign gave people in the UK key facts about using repellents to protect themselves from insect bites and diseases in the summer holiday season, and this will expand in 2015 to cover other aspects of travel health.

As well as public and industry engagement, the arctec team contributes to the School as a whole through teaching, research and supporting the development of improved policies and procedures. A proportion of arctec's profits are returned to the School, with the Chariot Innovations Limited Board deciding this year to re-invest that money into refurbishing the School's historic and valuable insectaries.

Getting smartphone eye tests to people who need them

Experts from the School have been working with partners at the University of Strathclyde and the NHS Glasgow Centre for Ophthalmic Research to develop a [Portable Eye Examination Kit, known as Peek](#). Combining ophthalmic skills with technological know-how, engineering and access to field trials, they have worked with people in low and high-income settings to design a smartphone-based eye testing system which is portable, affordable and easy to use. It consists of apps and a unique clip-on adapter called Peek Retina which turns the phone's camera into an ophthalmoscope capable of capturing high-quality images of the inside of the eye. People in remote areas often have no way of finding out that their vision could be improved or cured with treatment. By providing a kit which can be taken into the community, the Peek team hopes it can offer a solution to the lack of access.

Funding has come from various sources including a major grant from The Queen Elizabeth Diamond Jubilee Trust which has enabled research and development. The next challenge is to get Peek into the hands of community health workers all over the world so they can start using it on those who need it most. To raise the money needed to manufacture Peek Retina, the developers turned to crowdfunding, offering the public the chance to buy Peek Retina for themselves or pledge a donation to give one to someone else.



Images courtesy of Peek and Sony Mobile Communications Inc.

Bloomsbury Research Institute

Work on bringing together world-class expertise in infectious diseases under one roof is gathering pace with a major funding boost from the Higher Education Funding Council for England.

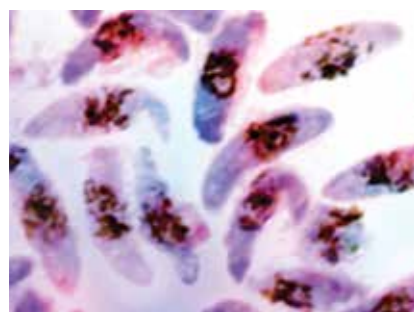
[The Bloomsbury Research Institute](#) will enable scientists to work together in a new state-of-the-art laboratory facility.

A unique partnership between the School and UCL, the Institute aims to break down institutional and research boundaries, and develop new tools and treatments that will save lives around the world.

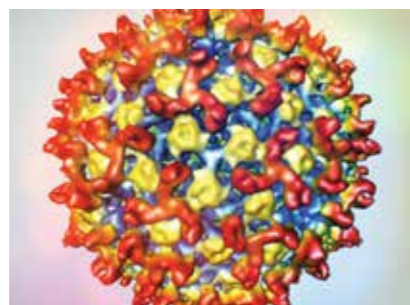
The two partner institutions have recently been awarded a Catalyst Fund grant of £7.5 million to develop the Institute. The funding will go towards the establishment of a dedicated research facility in the heart of London, near other research facilities such as the Francis Crick Institute, which together make up the largest biosciences hub in Europe. The Bloomsbury Research Institute will bring together more than 200 leading researchers who will work with National Health Service and healthcare industry partners across the UK and worldwide.

The Bloomsbury Research Institute's mission is to find new treatments, vaccines and diagnostics for the prevention and

control of infectious diseases. It will focus on the major global killers tuberculosis, HIV and malaria, as well as healthcare associated infections including MRSA, food borne pathogens and neglected tropical diseases. It will contribute to the international effort to address antimicrobial resistance and develop new antimicrobial treatments and tools, a key priority for the World Health Organization and the UK Government.



The two partner institutions have recently been awarded a Catalyst Fund grant of £7.5 million to develop the Institute.



School Centres

School Centres are strongly multi-disciplinary, drawing on a diverse range of expertise across Faculties to address global health challenges. There are currently 14 Centres across the School, as well as numerous research groups and consortia.

Bloomsbury Centre for Genetic Epidemiology & Statistics advances the understanding of the genetic mechanisms underlying health and disease, through the development and application of computational tools and quantitative methods and models.

Centre for Evaluation improves the design and conduct of public health evaluations through the development, application and dissemination of rigorous methods, facilitating the use of robust evidence to inform policy and practice decisions.

Centre for Global Mental Health fosters research and capacity building in policy, prevention, treatment and care for mental, neurological and substance abuse disorders in low resource settings.

Centre for Global Non-Communicable Diseases strengthens and promotes research, training and international networking in research and health policy on non-communicable diseases.



Photo courtesy of Adam Koon



Photo courtesy of Anthony Solomon

Centre for History in Public Health promotes and undertakes high quality research to develop and deepen historical understanding in the field of public health and health services policy.

Centre for Maternal, Adolescent, Reproductive & Child Health (MARCH) strengthens and promotes innovation, evaluation and evidence-based policy making by fostering communication and collaboration between researchers and policy makers.

Centre for the Mathematical Modelling of Infectious Diseases focuses on understanding and predicting the epidemiology of infectious diseases so that more effective control programmes can be devised.

Centre for Statistical Methodology enhances statistical and methodological expertise to strengthen research capacity in epidemiology and public health.

ECOHOST – The Centre for Health and Social Change provides high quality evidence on the impacts of social change on health in the UK, Europe and globally through research, policy engagement and teaching.

International Centre for Evidence on Disability develops tools, techniques and evidence about disability, leading to scalable interventions for public health and development.

International Diagnostics Centre facilitates the development, evaluation and implementation of accessible, quality assured in-vitro diagnostics for global health, through information sharing and advocacy.

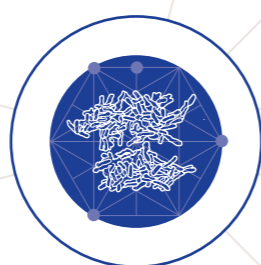
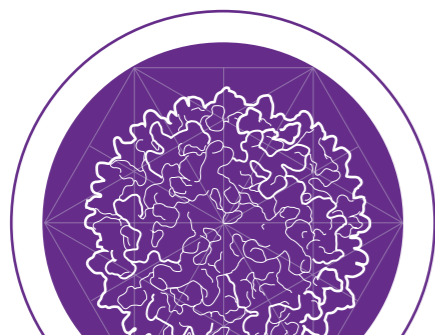
Malaria Centre provides evidence for policy and practice in the prevention, diagnosis and treatment of malaria around the world.



Children receiving Seasonal Malaria Chemoprevention from community health workers, photo courtesy of Paul Milligan

TB Centre provides a focus for global research expertise in tuberculosis epidemiology, immunology, diagnosis and treatment.

Vaccine Centre brings together research from vaccine design and immunological characterisation through clinical trials to epidemiological evaluation, safety, economic, social science and policy analysis.



The Year in Review

Selected Research Highlights from our 2014 news archive

January

■ **Controlling blood sugar levels in critically ill children** – A major UK-wide study found that the NHS could reduce the length of hospital stay for critically ill children and save around £12 million a year by changing the way paediatric intensive care units commonly control blood sugar levels for some patients, according to a study published in the *New England Journal of Medicine*.

April

■ **Training programmes for health workers** could halve over-diagnosis of malaria and help prevent valuable drugs from being wasted on patients who don't have the disease. The research was carried out by the ACT (Artemisinin-based Combination Therapy) Consortium based at the School. Their findings, published on World Malaria Day in *The Lancet Global Health*, shows that the roll-out of malaria rapid diagnostic tests in endemic countries should be accompanied by these new training programmes.

■ **A mother's diet before conception can permanently affect how her child's genes function**, according to a study published in *Nature* by School researchers based at the Medical Research Council International Unit in The Gambia. This is the first evidence of this epigenetic effect in humans, and indicates that a mother's diet before pregnancy could influence her children's lifelong health.

■ **Half of all cancer patients now survive at least 10 years** – In the early 1970s just a quarter of people diagnosed with cancer survived 10 years. Professor Michel Coleman, head of the Cancer Survival Group at the School, whose team produced the survival figures, said: "These results come from detailed analysis of the survival of more than 7 million cancer patients diagnosed in England and Wales since the 1970s. They show just how far we've come in improving cancer survival, but they also shine a spotlight on areas where much more needs to be done."

February

■ **Boris bikes: health benefits outweigh risks** – The London cycle hire scheme has had a positive overall effect on the health of its users by increasing physical activity within the capital, according to the results of a large-scale study published in the *British Medical Journal*.

May

■ **Each year 5.5 million babies are born and die without being recorded**, and one in three newborns – over 45 million babies – do not have a birth certificate by their first birthday. The findings, from the Every Newborn Series, published in *The Lancet*, provide the clearest picture to date of a newborn's chance of survival and the steps that must be taken to end preventable infant deaths.

July

■ **A reduction in alcohol consumption**, even for light-to-moderate drinkers, could be linked to improved cardiovascular health, including a reduced risk of coronary heart disease, lower body mass index and blood pressure. These findings, published in the *British Medical Journal*, challenge the results of previous observational studies which found that the consumption of light to moderate amounts of alcohol (12-25 units per week) may have a protective effect on cardiovascular health.

■ **Bill Gates visits Moshi malaria trials** African mosquitoes are rapidly developing resistance to pyrethroid and other insecticides now widely used on mosquito bed nets or spraying of walls. This means new insecticides and formulations are urgently required.

Bill Gates and Dr Sue Desmond-Hellmann, CEO of the Bill & Melinda Gates Foundation, travelled to the PAMVERC Trials Site in Moshi, northern Tanzania, where they met Mark Rowland, Professor of Medical Entomology and Malaria Control at the School, Professor Franklin Masha of Kilimanjaro Christian Medical College, and Matt Kirby and Natacha Protopopoff, School staff who are managing these projects to develop the next generation of products to control malaria vectors.

March

■ **Climate change could result in numerous health risks** due to heat waves, under-nutrition and diseases, with specific risks for Europe, according to the latest report from the Intergovernmental Panel on Climate Change. The chapter *Human Health: Impacts, Adaptation, and Co-Benefits* was co-authored by Sari Kovats and edited by Andy Haines.

June

■ **A new genetic 'barcode' for malaria parasites** has been discovered which could be used to track and contain the spread of the disease, according to new research published in *Nature Communications*. A highly predictive barcode in the genetic sequence of the malaria parasite *Plasmodium falciparum* can be used to identify the geographic origin of a parasite from a blood sample and monitor its spread.

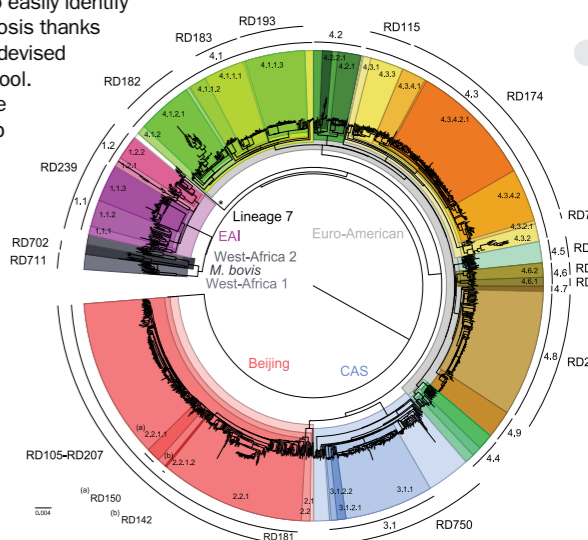
August

■ **Obesity linked to 10 common cancers** – A higher body mass index increases the risk of developing 10 of the most common cancers, according to the largest study of its kind, involving more than 5 million adults in the UK, published in *The Lancet*.

■ **Commuting to work by active and public transport** is linked to lower body weight and body fat composition compared with those using private transport, suggests a UK study published in the *British Medical Journal*.

September

■ **Phylogenetic tree for TB**: Doctors and researchers will be able to easily identify different types of tuberculosis thanks to a new genetic barcode devised by scientists from the School. A circular phylogenetic tree represents the relationship between over 1,600 tuberculosis bacteria, constructed using 92,000 genome-wide markers.



A circular phylogenetic tree represents the relationship between over 1,600 tuberculosis bacteria

October

■ **Drones help understand emerging zoonotic malaria** – The Monkeybar project, funded by the UK Research Council Living with Environmental Change initiative, is a large multi-disciplinary study into *Plasmodium knowlesi*, a malaria parasite which previously was thought to affect only macaque monkeys but is now increasingly found in humans. The researchers are using a drone to map changes in human, mosquito and monkey habitats and understand how these affect human infection.

Research Online activity in 2014

The School is committed to making the results of research freely available and accessible. Research Online is our searchable open access repository – researchonline.lshtm.ac.uk.

- Downloads of full-text papers: **230,554**
- Full-text papers deposited in Research Online: **992**
- **Top 5 downloading countries (in order of highest downloads):**
 1. Germany
 2. China
 3. United States
 4. United Kingdom
 5. France

November

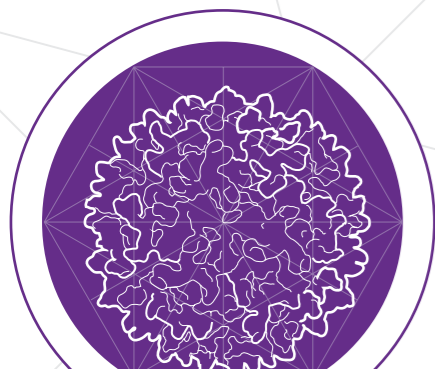
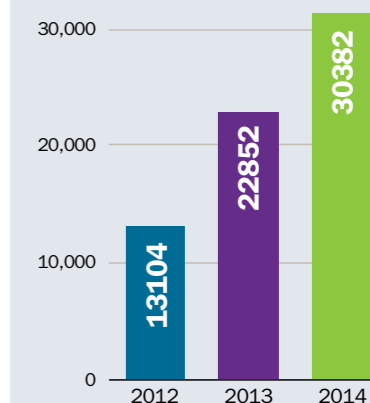
■ **Scientists studying a bacterial sample from a World War I soldier** have uncovered useful new information about dysentery, a disease that kills hundreds of thousands of children under five each year in developing nations. While working on reconstructing the complex genome of this bacterium, the team from the School, with colleagues from the Wellcome Trust Sanger Institute, used a sample from a man who had been infected and died in the trenches of the Western Front in 1915. Their research was published in a special World War I edition of *The Lancet*.

December

■ **Combining insecticide sprays and bed nets** does not protect children from malaria any more effectively than using insecticide-treated bed nets alone, according to new research by School researchers with colleagues at Durham University, the Medical Research Council Unit and the National Malaria Control Programme in The Gambia, published in *The Lancet*.

Media coverage 2014

Number of articles mentioning the School



Faculty Review: Epidemiology and Population Health

KEY DATA

Dean of Faculty:

Professor John Edmunds

Number of staff total: 412

Academic: 305

Professional support: 107

Departments

Department of Infectious Disease Epidemiology

Head: Dr Véronique Filippi

Department of Population Health

Head: Dr Phil Edwards

Department of Medical Statistics

Head: Professor Neil Pearce

Department of Non-communicable Disease Epidemiology

Head: Professor Liam Smeeth

Research Degrees Directors:

Professor Suzanne Fliteau and Professor Simon Cousens

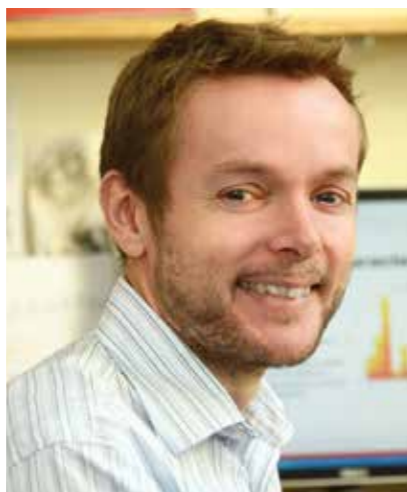
Taught Course Director:

Craig Higgins

Top five funding awards:

New grants awarded in 2013/14 ranked by value:

1. Medical Research Council – Epidemiological and statistical research on health problems of developing countries – Tropical Epidemiology Group **£3.9 million**
2. National Institute for Health Research – Health Protection Research Unit: Immunisation and Immunity **£3.5 million**
3. Bill & Melinda Gates Foundation – The WOMAN Trial: completion, dissemination and implementation **US \$2.9 million**
4. Bill & Melinda Gates Foundation – Modelling to support TB control policy and implementation decision making in South Africa **US \$2.0 million**
5. Wellcome Trust - Karonga Prevention Study database for public health and biomedical research **£1 million**



Professor John Edmunds

Uncovering the causes of disease and ill-health is a central aim of epidemiology. This year, our faculty has continued to maintain and develop its position at the forefront of both applied and methodological research into epidemiology and population health; making key contributions to understanding the causes of disease, and evaluating new ways to improve health.

One of the most important public health challenges of our times is the increasing prevalence of obesity in many countries. One sometimes overlooked aspect is the consequences for cancer risk. In a paper published in *The Lancet*, members of the Department of Non-Communicable Disease Epidemiology reported the largest ever study done on this topic. It used electronic health records data from 5.2 million UK adults to investigate the association between body mass index (BMI) and 22 types of cancer. Higher BMI was clearly associated with an increased risk of 10 cancers including those of the uterus, colon, breast (in post-menopausal women), and kidney. Overall, being overweight or obese was estimated to be responsible for 12,000 cases of these 10 cancers each year in the UK.

Another major study into lifestyle and disease risk focused on the effects on health of reduced alcohol consumption. The research looked at the drinking habits and cardiovascular health of over 260,000 people. It found that individuals who carry a genetic variant that tends to lower their alcohol consumption have, on average, a more favourable cardiovascular profile, and this was true even for light to moderate drinkers. These results were published in the *British Medical Journal*, attracting considerable media interest.

Previous research has shown that exposures in early life can influence the later development of disease. However, the MRC International Nutrition Group, hosted within the Department of Population Health, went one further by demonstrating that a mother's diet before conception permanently affects epigenetic patterns in her offspring. The group's ongoing work in The Gambia, West Africa, indicates that the methylation machinery, which affects how genes are activated, can be disrupted by nutrient deficiencies which cause disease. This opens up the possibility of defining an optimal diet for mothers-to-be that would prevent defects in the methylation process and significantly improve health.

“One of the most important public health challenges of our times is the increasing prevalence of obesity in many countries.”

Many colleagues in the faculty are involved in the conduct and analysis of large-scale clinical trials. Betty Kirkwood's team in the Department of Population Health and the Kintampo Health Research Centre completed the Neovita trial in Ghana, which together with similar trials in Tanzania and India, recruited 100,000 babies in order to provide a definitive answer on the benefits or otherwise of newborn vitamin A dosing. At the time of writing (December 2014) the findings are in press with *The Lancet*; newborn supplementation is not recommended.



Mother and baby Kiang West The Gambia
© MRC International Nutrition group by Ian Farrell

Conducting clinical trials is not easy, and care must be taken to ensure that patients understand why certain processes and procedures are followed. Researchers must also understand what patients expect from their participation, particularly in vulnerable groups. Claire Snowden and Diana Elbourne undertook an innovative qualitative study into bereavement subsequent to enrolment in trials on neonatal intensive care unit. They found that almost all bereaved parents wanted access to the trial results as an acknowledgement of their baby's contribution to research, and as an opportunity for further remembrance and commemoration. They also concluded that the practice of routinely excluding bereaved parents from studies of how trials should be conducted should be changed. These and other study findings are already being implemented in new neonatal and paediatric intensive care trials.

“Faculty members have been at the forefront in the fight against Ebola, with some volunteering to work in West Africa, and others taking on critical roles reviewing trial protocols...”

The Ebola outbreak in West Africa has served to remind us how infectious diseases can have a devastating effect on the health and economic wellbeing of populations, and can spread at alarming speed with frightening consequences. Faculty members have been at the forefront in the fight against Ebola, with some volunteering to work in West Africa, and others taking on critical roles reviewing trial protocols, collating and analysing emerging data and developing information systems for agencies such as the World Health Organization and Save the Children. The modelling team within the Department of Infectious Disease Epidemiology has been at the heart of the response: helping to analyse data, developing and fitting models to the emerging data in real-time and feeding their results back to national and international agencies. Their efforts have undoubtedly helped the international community respond better to this devastating epidemic.

Faculty Review: Infectious and Tropical Diseases

KEY DATA

Dean of Faculty:

Professor Brendan Wren

Associate Dean:

Professor David Mabey

Number of staff total: 369

Academic: 258

Professional support: 111

Departments

Department of Clinical Research

Head: Professor Philippe Mayaud

Department of Disease Control

Head: Professor Joanna Schellenberg

Department of Immunology and Infection

Head: Dr Colin Sutherland

Department of Pathogen Molecular Biology

Head: Professor John Kelly

Research Degrees Directors:

Dr Ron Behrens & Dr Jayne Webster

Taught Course Director:

Dr Graham Clark

Top five funding awards:

New grants awarded in 2013/14 ranked by value:

1. Queen Elizabeth Diamond Jubilee Trust – Commonwealth Eye Health Consortium
£7.1 million
2. World Health Organization and UNITAID – Global Network to Improve Access and Quality of HIV Monitoring Technologies
US \$4.9 million
3. Medical Research Council – Combination interventions for controlling malaria transmitted by pyrethroid resistant mosquitoes
£1.9 million
4. Wellcome Trust – Deciphering the bacterial glyco-code
£1.1 million
5. Wellcome Trust – Wolbachia transinfection of *Culex tritaeniorhynchus* mosquitoes
£0.7 million



Professor Brendan Wren

This has been an exciting year for the Faculty of Infectious and Tropical Diseases, with significant new funding and strategic developments such as the Bloomsbury Research Institute (see page 10), as well as many important research outputs, findings and contributions across all our departments, centres and consortia.

The diversity and significance of these reflect the development and exploitation of new technical advances, and our extensive engagement with partners worldwide. Much of our work is multidisciplinary, combining laboratory sciences, clinical medicine and population health. This enables us to focus on problems of major public health importance, and produce results that can be readily translated into policy and practice.



Genome sequencing and other technical innovations

In recent years, we have made many advances in techniques including genomics, computational biology and bioinformatics, imaging technology, reverse genetics, high throughput functional screening and glycol-engineering. Whole genome sequencing, using state-of-the-art sequencing technology, has led to exciting breakthroughs in this field.

These range from genetic bar coding of both the malaria parasite *Plasmodium falciparum* and the causative agent of tuberculosis, which have helped understand the spread and diagnosis of both diseases, to high-throughput genome-wide functional screens of the parasite responsible for sleeping sickness, *Trypanosoma brucei*, which have identified key host immune factors and potential drug targets.

We are now upgrading our facilities for experimental malaria transmission to *Anopheles* mosquitoes. This will facilitate our work on drug and vaccine development for malaria as well as improved understanding of parasite, host and vector biology. In particular, we are developing tools and resources to investigate the liver stage of malaria infections as targets for interventions to prevent disease and block onward transmission of infection.

Other technical innovations have enabled us to:

- identify a key regulator of sexual development in *Plasmodium falciparum*, which may provide a novel means of blocking malaria transmission;
- use real-time imaging to investigate the progression of Chagas disease, and to test the effect of novel antimicrobials;
- identify gene expression signatures to differentiate active from latent tuberculosis infection and response to treatment;
- discover an association between host genotype, control of human cytomegalovirus infection and immunosenescence in The Gambia.

Global health resources and expert advice

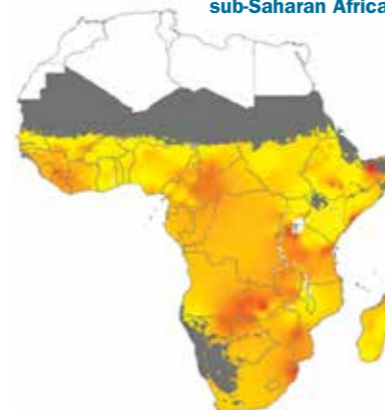
Over the past year, expert advice from our Faculty has been taken up by policy makers, funders and health practitioners globally, and continues to inform the work of the UK Department for International Development and All-Party Parliamentary Groups including those on Global Tuberculosis and on Malaria and Neglected Tropical Diseases.

For example, the ACT Consortium has carried out 25 studies in 10 countries across Africa and Asia to improve the targeting of and access to antimalarial medicines, and to assess their quality and safety. This research has shown how antimalarials can be better targeted to those who need them, by educating local communities and training health workers in the public and private sectors to help patients with malaria, as well as those with non-malarial fever who are presenting with similar symptoms. The findings from these studies are now being taken up by national and international programmes for antimalarials.

School-aged children experience some of the greatest burdens of parasitic infections, including helminths and malaria, often simultaneously. As well as contributing to ill-health, these parasites can impair cognitive performance and education and are also a source of transmission to other community members.

The Faculty has led on developing the Global Atlas of Helminth Infections, an open access resource based on rigorous spatial analysis, which is now being used successfully to investigate the epidemiology of neglected tropical diseases transmitted by worms, including schistosomiasis, and lymphatic filariasis. It enables governments, agencies and health workers to better target de-worming efforts geographically, and track changes in infection levels over time.

Global Atlas of Helminth Infections: sub-Saharan Africa



Bill Gates recently visited our malaria vector control trials site in Moshi, Tanzania. Courtesy of Bill & Melinda Gates Foundation/Samantha Reinders

The life-saving importance of sanitation and clean water was underlined by International Development minister Stephen O'Brien, at an event for our Sanitation and Hygiene Applied Research for Equity consortium, which has published



Apiny in her accessible washroom, Katakwi District, Uganda, WaterAid/Jane Wilbur

research showing that inadequate water sanitation and hygiene practices were responsible for 1.5% of the total global burden of disease, with around 840,000 deaths from diarrhoea in 2012.

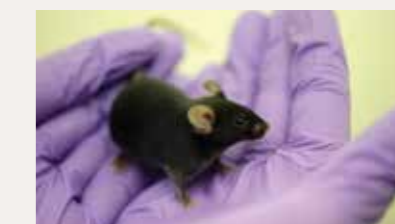
The consortium has now launched a randomised controlled trial to investigate the effectiveness of a behaviour change intervention in improving food preparation and handling by mothers weaning infants.

Looking to the future

Research in low and middle income countries has shown that blindness from retinopathy of prematurity is increasing but can be reduced by improving the quality of neonatal care, and by early detection and treatment. In June, the Queen Elizabeth Diamond Jubilee Trust announced its support for a national programme for control of retinopathy of prematurity in India which will evaluate approaches which are integrated into the government's initiative to establish 1,000 special newborn care units across the country. The Trust is also supporting the Commonwealth Eye Health Consortium to achieve major long-term impact in strengthening eye health systems and improve the quality of eye care for people in Commonwealth countries through an integrated five year programme of fellowships, research and technical innovation.

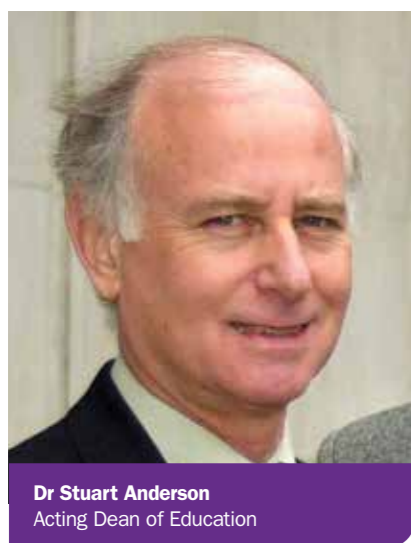
Concordat on animal research

The School, together with more than 70 other leading research institutes and funding agencies in the UK, is a signatory to the Concordat on Openness on Animal Research. To understand the basic biology and progression of diseases such as malaria and tuberculosis, which kill millions of people every year, and to design new strategies for their prevention and treatment, research using animals is essential.



The majority of research in the Faculty does not involve animals, and in the small proportion of cases where researchers work with animals within our specialist facility, small laboratory rodents - mostly mice - are the only animals used.

Education: Teaching and Learning



Dr Stuart Anderson
Acting Dean of Education

2014 was another successful year for the School's education programmes.

In our graduation ceremony in March, 513 students graduated with Master's degrees studied in London, and a total of 71 were awarded doctoral degrees (including 62 PhD and nine Doctors in Public Health). In addition, 279 students completed Master's degrees by distance learning, and a further 994 people successfully completed short courses at the School.

To meet increased demand and new priorities in public and global health, our programmes have continued to evolve and we are increasingly developing joint provision with partners in the UK and worldwide. A new course has been set up with the Royal Veterinary College, the MSc One Health (Infectious Diseases), which equips students to address diseases at the interface between humans, animals and the environment.

As an entirely postgraduate institution, the School has been less affected than many universities by changes to funding arrangements for taught courses introduced in recent years. In 2014, we undertook a review of our education programmes, to ensure they remain globally competitive and relevant for students' future careers over the next 10 to 15 years.

The review found that the School has an excellent reputation globally for the quality of its teaching and that this reputation is founded on the strong links with excellent research. The recommendations of the review will enable the School to build on these strengths. It is planned to increasingly provide flexible, blended (face-to-face and online) programmes, to address the developing needs of students and employers.



In 2015, we will continue to invest in development of the teaching programmes, and will launch our first Massive Open Online Courses (MOOCs), on the FutureLearn platform, with the first courses, on Ebola in Context and Maternal and Child Health, starting early in 2015.



MSc summer project fieldwork in Cambodia, courtesy of Molly Miller-Petrie

Scholarships

In 2014, we were particularly successful in attracting new scholarships to the School, with generous awards, gifts and pledges from Janssen Pharmaceutica, the China Medical Board, the Said Foundation, the Shauna Gosling Trust and Gilead Europe, among others. We also concluded new joint funding agreements with prestigious government scholarship schemes, including Marshall Partnership Scholarships, Chevening Partnership Scholarships and Commonwealth Shared Scholarships. These partnerships are already attracting top-flight students from around the world, although there is still a great need to identify and secure new sources of philanthropic income.

Student recruitment

In 2014, we held our first annual open day, with over 200 prospective students attending. We also launched our [virtual open day](#), a dedicated multimedia website featuring 360 degree tours of the building, staff and student videos and blogs. The School now has a dedicated group of 40 student ambassadors from a range of nationalities and courses who share their experiences of studying at the School with prospective students.

Public engagement

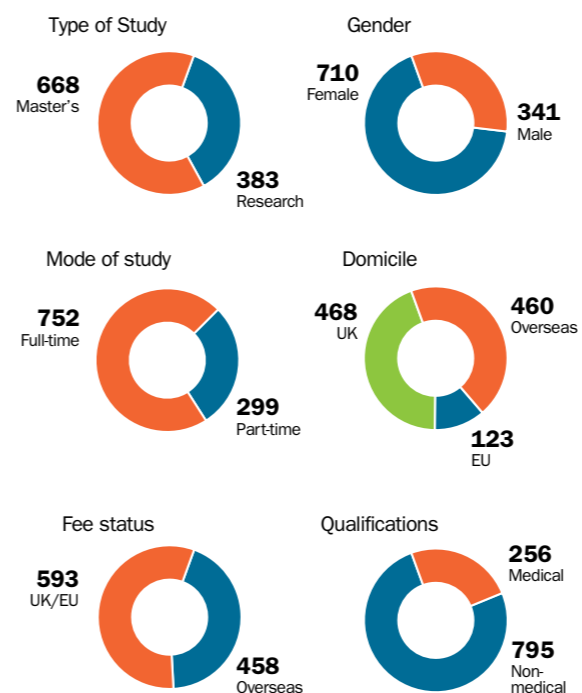
Supporting education in our local communities is important to us, and our staff and students find working with young people very rewarding.



During the 2013/2014 academic year, we hosted 26 school students for work experience through the School's Young Scientists Programme, and a further 28 students took up placements supervised by individual members of staff. Staff and students also interacted with over 2,300 pupils at primary and secondary schools, and gave enthusiastic talks on subjects including: healthy diets; how humans smell to mosquitoes; how diseases spread; and the relationship between disgust and hygiene habits.

TOTAL STUDENTS ENROLLED 2014/15	3964
London-based Master's and research (all)	1051
Distance learning	2913

TOTAL LONDON-BASED STUDENTS 2014/15	1051
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DISTANCE LEARNING STUDENTS 2014/15	2913
Clinical Trials	259
Epidemiology	623
Global Health Policy	258
Infectious Diseases	387
Public Health (all streams)	1125
Individual courses	261
TOTAL	2913

SHORT COURSES RUN IN 2013/14	Total number of participants: 994
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	MSc Modules
Diploma in Tropical Medicine and Hygiene	Pathogen Genomics & Genomic Epidemiology of Infectious Disease
Diploma in Tropical Nursing	Practical Pharmacoepidemiology
East African Diploma in Tropical Medicine and Hygiene	Researching Gender-based Violence: Methods and Meaning
Epidemiological Evaluation of Vaccines: Efficacy, Safety and Policy	Statistical Analysis with Missing Data Using Multiple Imputation and Inverse Probability Weighting
Factor Analysis & Structural Equation Modelling	Systematic Reviews and Meta-Analyses of Health Research

LONDON-BASED MASTER'S DEGREE STUDENTS 2014/15	668		
COURSE	UK/EU	Overseas	TOTAL
MSc – Control of Infectious Diseases	36	19	55
MSc – Demography & Health	8	13	21
MSc – Epidemiology	24	26	50
MSc – Global Mental Health ¹	16	15	31
MSc – Health Policy, Planning & Financing ²	30	24	54
MSc – Immunology of Infectious Diseases	10	1	11
MSc – Medical Entomology for Disease Control	2	4	6
MSc – Medical Microbiology	15	10	25
MSc – Medical Parasitology	15	4	19
MSc – Medical Statistics	25	10	35
MSc – Molecular Biology of Infectious Diseases ³	6	4	10
MSc – Nutrition for Global Health	18	10	28
MSc – One Health ³	12	4	16
MSc – Public Health	111	60	171
MSc – Public Health for Eye Care	1	10	11
MSc – Public Health in Developing Countries	11	33	44
MSc – Reproductive & Sexual Health Research	20	15	35
MSc – Tropical Medicine & International Health	19	15	34
MSc – Veterinary Epidemiology ³	9	3	12
TOTAL			668

¹ with Institute of Psychiatry, King's College London | ² with London School of Economics | ³ with Royal Veterinary College

RESEARCH DEGREE STUDENTS 2014/15	383		
FACULTY	UK/EU	Overseas	TOTAL
Epidemiology and Population Health	61	51	112
Infectious and Tropical Diseases	69	67	136
Public Health and Policy	74	61	135
TOTAL	204	179	383

People and Resources

The continued growth in the School's projects and programmes in the UK and worldwide, and our success in attracting research funding from a diverse range of sources, has brought additional demands on our facilities and other central services. Total income from research grants and contracts increased by 8% to £85.7 million in 2013/14, a significant achievement at a time when the funding environment is increasingly competitive. Particularly notable was the 55% increase in grants from the UK research councils, and a 20% increase from government departments and health authorities.



Andrew Young
Chief Operating Officer

This year, we have continued to make progress improving the School's management and administration systems, with improved structures for Faculty management, training for academic and service managers, and career development for professional support staff across the School. The School's staff development programme has been streamlined and targeted to key initiatives, including the transferable skills development programme for early career researchers, and the School's Postgraduate Certificate in Learning and Teaching, accredited by the Higher Education Academy, which will be submitted for re-accreditation in 2015.

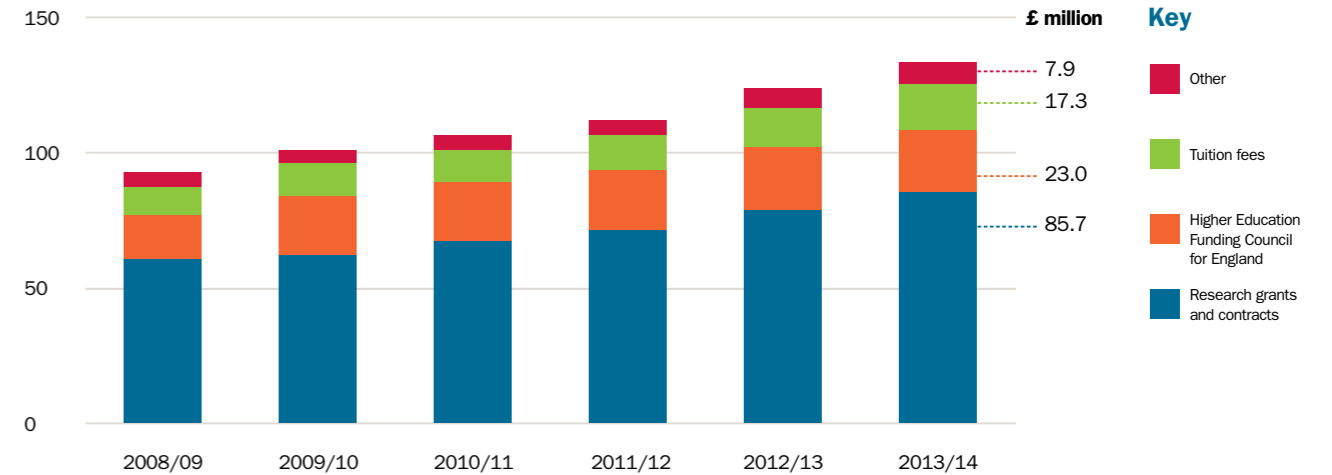
We also reaffirmed our commitment to equality and diversity as a Stonewall Diversity Champion, with meetings and events for lesbian, gay, bisexual, and transgender staff and students. We built on the success of our Athena SWAN award activities to promote women in science, with the embedding of family-friendly policies and a guest lecture by Dame Sally Davies, the UK's Chief Medical Officer. In November, the School submitted its application for the Athena SWAN Silver award. This year, we have continued to develop the School's participation in the Aurora leadership development initiative for women, run by the Leadership Foundation for Higher Education.



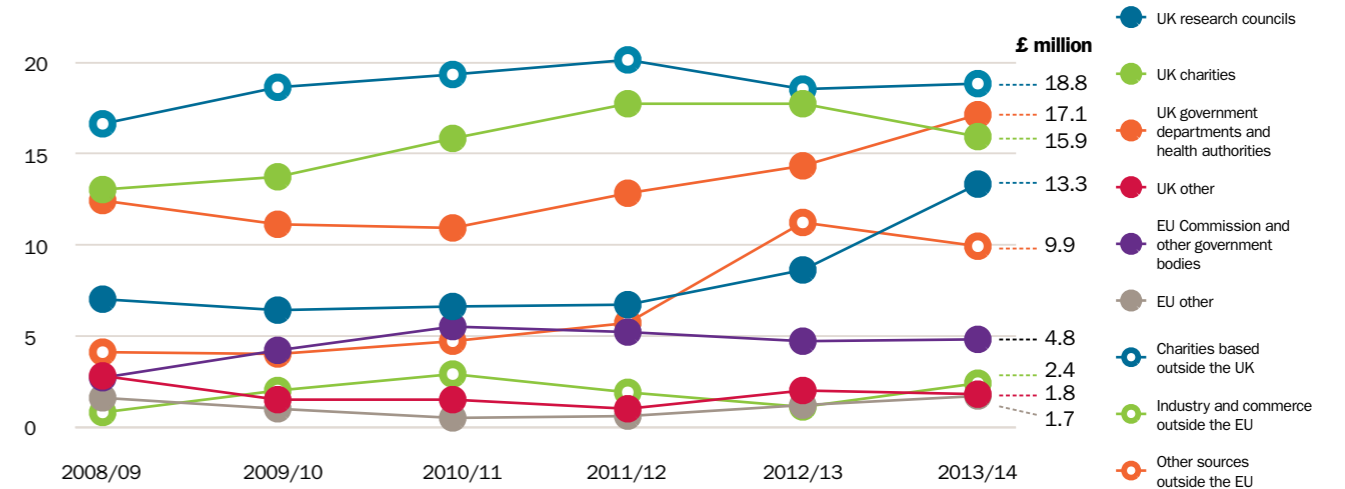
Richard Benson
Secretary and Director of Resources and Planning



Income from all sources 2008/09 to 2013/14

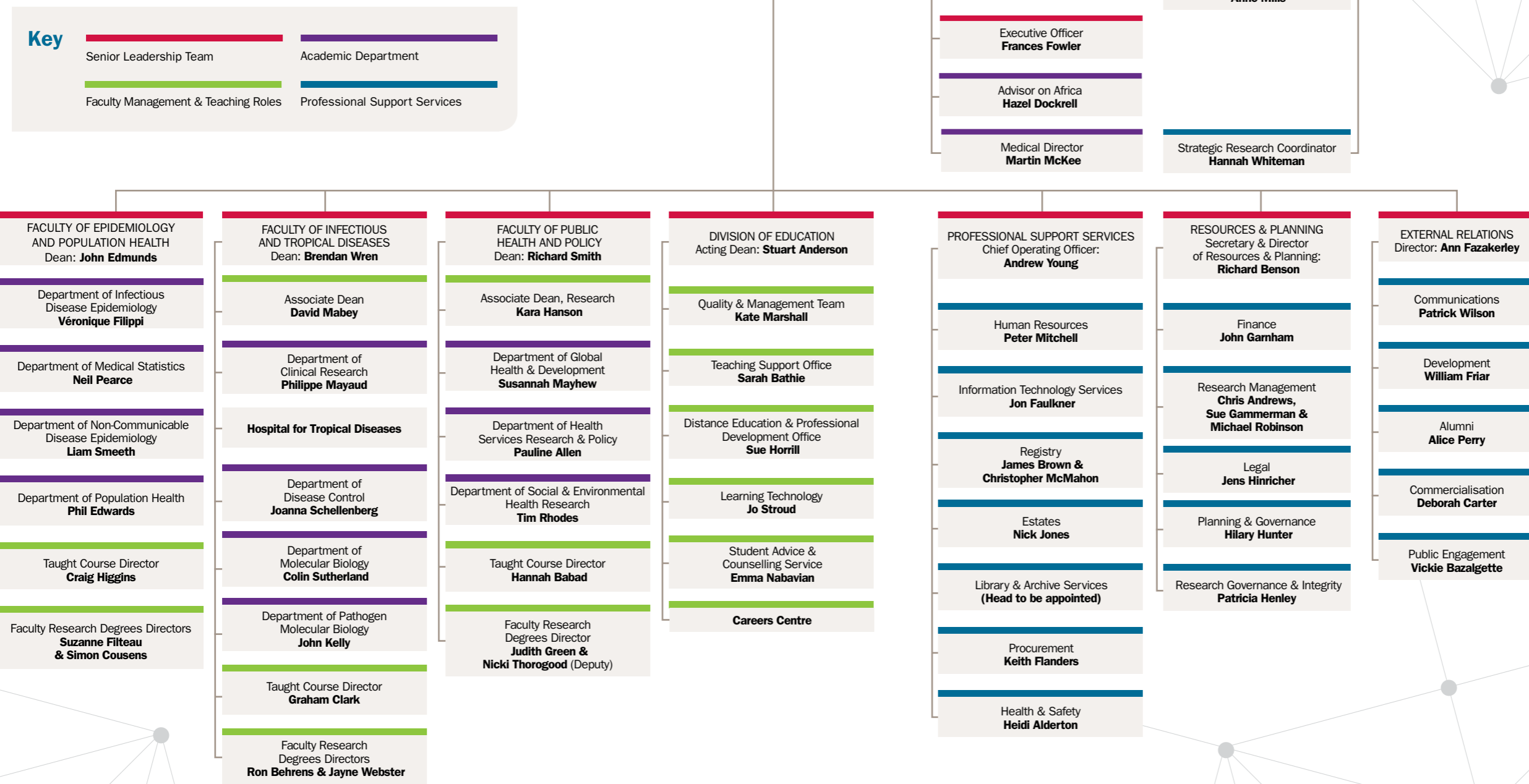


Research income: grants and contracts



Management and governance

Organisational chart with post holders from January 2015



Patron
HRH Prince Philip
Duke of Edinburgh KG KT

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.

- Valerie Beral
- David Bradley
- André Capron
- 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

Council membership 2014

Chair
Sir T Lankester
KCB, MA (Camb), MA (Yale)

Deputy Chair
Dr D Walford
CBE, MA, BSc, MSc, MD, FRCP, FRCPath, FFPH

External members
Dr A Carter, PhD, FISoSci, MCIWEM
Mr K Chandarana, BSc, ACA
Ms A Grant, BA, MSc
Dr D S Jolliffe, CB, FRCP (until 31/07/14)
Sir T Lankester, KCB, MA (Camb), MA (Yale)
Mr J O'Donnell

Mr J Pethick (Honorary Treasurer and Chair of Planning & Finance Committee)
Mr S Premchand, BA, FCA
Mr J Roper, MA (Cantab)
Professor J Stephenson, BSc, PhD, CBiol, FIBiol
Dr D Walford, CBE, MA, BSc, MSc, MD, FRCP, FRCPath, FFPH

Elected staff members
Mr D Arthur, BSc (until 31/07/14)
Professor A Grant, MB, BS, MSc, PhD, DTM&H, FRCP (ITD)
Professor K Hanson, BA, MPhil, ScD (until 31/07/14)
Mr J Hinricher, LL.M, FRSPH (PSP)
Dr S Mayhew, BA MA PHD (PHP)
Professor D Ross, MA, BM, BCh, MSc, PhD, DLSHTM (until 31.07.14)
Professor H Weiss, MSc, DPhil (EPH)

Director
Professor Baron P Piot, CMG, MD, PhD, FRCP, FMedSci (ex officio)

Chair of the Student Representative Council
Ms C Degen, BS (ex officio)
Mr D Motti (until 31/07/14)

Secretary
Mr R Benson, Secretary & Director of Resources and Planning

Following a formal review, the School's Council has updated its constitution and terms of reference, with clearer role descriptions for Council members. These changes are explained in the governance section of the School's website: www.lshtm.ac.uk