Institution: London School of Hygiene & Tropical Medicine (LSHTM)
Unit of Assessment: UoA2 – Public Health, Health Services & Primary Care
a. Context

LSHTM is a world-leading institution for research and postgraduate education in public and global health. Numerous pathways for translating research findings into policy and practice are provided by our excellence in multidisciplinary research, our research collaborations in over 100 countries, our awareness of national and international health needs, and our close, long-term relationships with research users across the globe.

The table below summarises our main non-academic users and beneficiaries – globally and in the UK – and examples of our research areas relating to each.

Main global users/beneficiaries	**Examples of research areas**
Governments in low- and middle-income countries	Disease control; maternal, newborn and child health; nutrition; mental health; health policy; health systems
International agencies: WHO, UNICEF, UNAIDS, Global Fund to Fight AIDS, Tuberculosis and Malaria, GAVI Alliance, International Organisation for Migration	Vaccines; maternal, newborn and child health; sexual health; global mental health; HIV, TB, malaria and other infectious diseases; eye health; violence against women; universal health coverage; health needs of trafficked women
The World Bank and regional development banks	Hygiene promotion; universal health coverage; evaluation methods
European agencies (e.g. EU and European Centre for Disease Prevention and Control)	Cancer policy; financing and organisation of health services and systems; impact of patient mobility for health care; vaccine confidence
Bilateral aid agencies	Infectious diseases; maternal, newborn and child health; nutrition; mental health
Industry (pharmaceuticals, pesticides, clothing)	Clinical trials; insecticide development and testing
Major NGOs (e.g. Médecins Sans Frontièrs [MSF], Sightsavers)	Eye health; disability; health provision in conflict areas and refugee camps; mental health
Main UK users/beneficiaries	**Key research areas**
English DH, National Health Service England, Public Health England, NICE, Royal Colleges of Surgeons, Obstetrics and Gynaecology and GPs, Faculty of Public Health	Vaccines; pandemic influenza; cancer; smoking cessation; sexual health; alcohol and drugs; obesity; quality of care; NHS market reforms; health care commissioning; climate change; heat wave and cold weather plans; cost-effectiveness of new drugs and technologies; pharmacoepidemiology; national surgical audits
Department for International Development (DFID)	Malaria, newborn health; neglected tropical diseases; nutrition; family planning; health systems
Other government departments (e.g. Home Office, Education, Energy and Climate Change, Environment, Food and Rural Affairs, Transport, Food Standards Agency)	Crime and mental health; health needs of trafficked women; urban regeneration and health; transport and wellbeing; housing, insulation and health; food supplements and organic foods
The London Mayor's Office and Transport for London, Camden and Islington, Greenwich	Transport and wellbeing; obesity; evaluation methodology; health promoting schools
UK industry	Handwashing with soap, insecticide development and testing, phone app for eye testing
Health management and policy think-tanks: Nuffield Trust and King's Fund	Health care commissioning; primary care organisations; performance of NHS across the UK; rating hospitals

Charities working in the UK, including development and human rights charities	HIV prevention; sexual health; maternal, newborn and child health; alcohol abuse; health needs of trafficked women; health care financing

The public, including patients, benefit directly from our research via better interventions, stronger health systems and robust patient information, and indirectly through the use of our research by the above users.

The primary impact of our work in UoA2 is **improved health and wellbeing**. Examples from our case studies include:

- improved population health (e.g. reduced infant and child mortality in African and Asian countries) and reduction in specific diseases (such as prevention of invasive pneumococcal and Hib diseases)
- improved public health and wellbeing (e.g. through encouraging more widespread handwashing)
- new and improved methods of prevention and health promotion (e.g. male circumcision for HIV prevention, mobile phone messaging to support smoking cessation)
- changed guidelines for clinical care (e.g. preventive TB therapy for HIV patients, hypertension treatment in the very elderly, mental health care in resource-poor settings)
- improved health care training (e.g. textbooks on mental health care, guidelines on preventing blindness caused by retinopathy of prematurity, provision of health care to trafficked women)
- changed policy of public bodies (e.g. on pandemic flu planning and cancer control)
- increased public awareness of health risks and benefits (e.g. information on quality and outcomes of care that can be used by patients in choosing particular treatments and providers)
- improved approaches to the control of specific diseases (e.g. for malaria: intermittent preventive treatment in infants, seasonal malaria control for children, insecticide-treated bed nets, new insecticides, use of retail sector to increase access to treatment).

Our work in UoA2 also has an impact in four other broad areas. First, our research brings **economic benefits** to many low-income countries. It has: improved health, which contributes to economic growth; helped create markets for local firms (e.g. bed net manufacturers); and led to direct financial savings (e.g. we showed there is no need for a hepatitis B vaccine booster or for vitamin A supplementation during pregnancy).

Second, many of our impacts on health are mediated through impacts on **public policy and services**. For example, we coordinated the DH-funded programme of independent research on Labour's health system reforms in England which was drawn on extensively in the Impact Assessment of the Health and Social Care Bill/Act, 2012. We also influenced the EU directive on patients' rights in cross-border care, increased attention paid to adolescents in HIV prevention programmes and encouraged the Indian government to give greater attention to mental health. Our methodological and modelling innovations have produced evidence drawn on by many governments to inform decisions on new vaccines and other maternal and child interventions.

Third, our innovative **environmental** research on the health consequences of climate change and climate change mitigation has received widespread attention, though it is too early to identify direct impacts on policy. Finally, we contribute significantly to debates and policies on **international development**. Examples include our participation in the influential *Lancet* Commission on the Millennium Development Goals, which has informed the debate on the post-2015 goals, and our efforts to increase attention to nutrition in international development policy. Our extensive work strengthening capacity for research and innovation in many low- and middle-income countries also

supports sustainable development goals, for example creating capacity in Ghana to bring evidence to bear on health policies.

b. Approach to impact

Maximising synergies between research, education and knowledge translation and innovation is one of our core values. Our Director since 2010, Peter Piot, set up UNAIDS and spent 12 years as its Director. Most staff join and remain at the School because they want their research to have an impact, and the School enables them to achieve this. Our approach to impact has three main elements: generic activities which support staff to achieve impact; mechanisms which help build long-term relationships with research users; and activities relating to specific research projects.

Generic activities designed to support staff to achieve impact

Over the REF period we have significantly enhanced our support to staff in communicating their research to both specialist and public audiences. Following a review of our communications, we formed a Department of External Relations, bringing together communications, alumni relations, development, events management and public engagement. We launched a new website in autumn 2011 and have continued to develop this to cover our research activities, projects and partnerships around the world. We also have an active social media presence with over 4,000 Twitter and over 4,000 Facebook followers as of 31 October 2013.

In addition to the work of four full-time communications staff in the new External Relations Department, 20 grant-funded positions in our three faculties support the communication of UoA2 research. Through regular communications forum meetings and an email group, staff share experience and best practice to ensure a School-wide high standard of communication. The press office supports staff in interacting with the media: our research is increasingly covered in the mainstream UK press and in countries such as China, India and Singapore where we work and are strengthening partnerships. We achieved a 67% increase in global media coverage in 2012/2013 compared with 2011/2012. Our top five countries for increased media coverage were the USA (64% increase), the UK (74%), Australia (58%), Canada (36%) and India (36%). Our researchers are regularly interviewed on radio and television (e.g. BBC Radio 4's *Today* and science and health programmes, and BBC TV's *Horizon*, *Newsnight* and Channel 4's *Embarrassing Bodies*); we also hosted *Celebrity Masterchef*! Our leading UoA2 research communicators include Dangour on nutrition (2,699 pieces of coverage since 2008) and Watts on gender violence (1,056 pieces).

Since we recruited a Public Engagement Co-ordinator (in September 2012) and developed a public engagement strategy, we have been far more proactive in bringing the public into contact with health issues and with our research. Previous activities included our prize-winning secondary school scientist programme, public health and history walks, the annual Open House and individual staff members' activities such as the Gresham lectures delivered by Gilbert, 2011. We now also have regular exhibitions and film screenings at the School, and participate in the Bloomsbury Festival, Cafe Scientifique and in a number of science festivals. In 2012/2013, over 15,000 members of the general public were involved in our public events, compared with 1,900 in 2007/2008, and we have become a place for public debate in public and global health.

Our 13 School Centres, which focus on topics of high strategic priority, also play an important role in achieving impact. Centres support communication of research findings, enhance links with research users and the general public, and also interact with relevant select committees (e.g. International Development) and all-party parliamentary groups (e.g. malaria).

We encourage and assist staff to achieve impact in a number of other ways. For example:

- After a 2009/2010 review of the School's 'career map', research dissemination activities and policy and practice impact were made more explicit requirements for promotion, being given greater weight at higher levels of seniority.
- Our HR policies support staff to be based overseas where they can interact closely with local research users (29 staff submitted to UoA2 are based overseas).
- Our staff development programme offers communication skills training (18 staff have completed one-day media training workshops since April 2012). In summer 2013 we ran a competition on data visualisation with 23 entrants. Four winners have now taken one-day *Guardian* masterclasses and we are working with DesignScience, funded by the Wellcome Trust, to improve how we use visual design, graphics and multimedia to communicate research ideas and outcomes.
- In 2013 'Achieving impact' was the theme of our annual staff symposium; we used this opportunity both to showcase good practice within the School and to discuss how to overcome specific difficulties in achieving impact.
- Together with *The Lancet* we co-host regular 'Global Health Lab' public debates, and are major contributors to *Lancet* Special Series: between 2008 and 2013 our staff contributed 84 papers to 30 series.

In the REF assessment period we also considerably expanded staff members' opportunities to share the knowledge gained through their research.

- Our open access repository (LSHTM Research Online) went live in 2012, making research outputs publicly available; over 4300 full text articles are now online.
- A research data management policy was drafted in 2013 as a first step in making the School's data resources widely known and a catalogue for research data is in development, informed by staff (Roberts, Leon) who have already made their datasets accessible to others.
- Consultancy support is provided as part of the grants support services. Our short course programme provides professional education, and we have created a Centre for Evaluation to draw together our research expertise and coordinate our work in this area.
- A School-owned company, Chariot Innovations Limited, was set up in November 2012 to translate know-how generated in the School into products and services (see below).

Finally, we recognise that strategies for achieving impact can be informed by research. A number of our academic staff study the relationship between research, policy and practice (e.g. Ettelt, Gilson, Lee, Mays, Parkhurst). Mays and Ettelt showed that policy advisors, implementers and evaluators are likely to hold different expectations of policy pilots, which need to be taken into account early in the piloting process. Lee is studying how policy ideas are framed by different constituencies and how this then goes on to shape policy actions. We share this knowledge through regular seminars (e.g. to the DH) and in 2013 through our annual symposium.

Mechanisms which help build long-term relationships with research users

We encourage our academic staff to play an active role in international, regional and national organisations that shape health policy. During the REF period, UoA2 staff were members of:

- 68 WHO advisory committees including the Scientific and Technical Advisory Committee for HIV/AIDS (Coker), Global Advisory Committee on Vaccine Safety (Smith chair, Evans), Expert Advisory Committee for the Pesticide Evaluation Scheme (Rowland), Expert Advisory Panel on STIs (Grosskurth), WHO Expert Committee on Leprosy (Fine), Advisory Committee on Health Monitoring and Statistics (Zaba), WHO Europe Advisory Committee on Health Research (McKee chair), Global Alliance for the Elimination of Trachoma (Bailey, Solomon).

- 59 UK and European advisory and steering committees including the European Forum on Forward Looking Activities (Piot chair), Joint Committee on Vaccines and Immunisation (Hall chair), UK Scientific Pandemic Influenza Advisory Group (Edmunds, Whitty), DH National Advisory Group for Clinical Audit and Enquiries (Black chair, Van der Meulen), DH Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (Peto), National Expert Panel for New and Emerging Infections (Whitty chair), NICE Technology Appraisal Committee (Cairns), Industrial Injuries Advisory Council (Pearce), European Medicines Agency Pharmacovigilence Risk Assessment Committee (Evans), joint UK-US military medical committee to revise combat medical care guidelines (Roberts).
- 76 global health initiatives and NGO advisory committees, including the Commission on the Future of Health in Africa (Piot), Global Health Advisory Committee, Soros Foundation (McKee chair), IPPF's International Medical Advisory Panel (Wellings).

Several staff have shared appointments (e.g. Haines with Public Health England as Chief of Climate Change, and Lawn and Dangour are Senior Research Fellows at DFID). Others were seconded to policy and implementing agencies: Whitty to DFID as Chief Scientific Advisor, Lines to the WHO malaria programme for two years, Godfrey-Fausset to UNAIDS as their Senior Science Advisor, and Foster to the overseas disability charity CBM as Director.

We also build long-term relationships with research users by:

- Acting as intermediaries and coordinators of government-funded research programmes, ensuring the best 'fit' between the policy needs of government and the interests and skills of researchers, while maintaining scientific independence (e.g. Mays was Scientific Coordinator of the DH's Health Reform Evaluation Programme).
- Providing formal and informal support to policy-makers and government advisors. For example, we provide tailor-made training on nutrition and health systems to DFID health advisors and additional support during DFID annual retreats (Dangour: nutrition, Mills and Hanson: financing); Berridge briefed the DH alcohol policy team which was revising the government alcohol strategy.
- Maintaining close links with UK-based think-tanks (e.g. Mays is currently advising King's Fund-Nuffield Trust research on the new local commissioning arrangements; Black is involved in various Nuffield Trust review groups, Smith, R and Lee were associate fellows at Chatham House and Heymann heads its global health security programme).
- Providing expert advice to many other countries, for example, to the US Environmental Protection Agency's Scientific Advisory Board on Asbestos (Peto), the US Institute of Medicine's Expert Consultation on the contagion of violence (Watts) and the Indian Taskforce on Mental Health Policy (Patel).
- Advising development NGOs such as Merlin (Whitty, Roberts) and Oxfam (Balabanova).
- Taking on consultancy roles to support evidence-informed policy or practice. For example, Gilbert provided expert advice to Sightsavers and the Lions SightFirst paediatric cataract initiative; Mills advised on the design of a universal health care policy in India and Thailand.
- Engaging with industry to further develop and market innovations such as new insecticides (e.g. Rowland, Logan).

We host three WHO collaborating centres (injury and violence prevention, global change and health, and health of societies in transition) which provide opportunities for ongoing input into UN policy and technical guidance. We also partner with professional and implementing agencies to embed research within their activities. For example, we run the research units for the Royal Colleges of Surgeons, Obstetrics and Gynaecology, and GPs. We support mechanisms which facilitate rapid response to policy questions. For example, our Policy Innovation Research Unit

devotes at least 20% of its resources to responsive work for the DH and provides advice on the development of initiatives and strategies, and design of evaluations.

Our alumni network is another important mechanism keeping us connected with research users. Many alumni have held influential positions (e.g. Muhammad Ali Pate, Nigerian Minister of Health; Gilbert Bukenya, former Vice President of Uganda; Walter Ricciardi, President, European Public Health Association; John Ashton, President, Faculty of Public Health).

Finally, our policy of enabling staff to live in other countries means they can develop a deep understanding of the local context, foster long-term relationships with local research users and help strengthen capacity. For example, our research unit in Malawi works closely with the Ministry of Health, and Gilson has worked in South Africa for nearly 18 years and has formal roles with a number of policy partners (e.g. on a national health insurance task team and on the advisory board of the new academy for health leadership and management).

Activities relating to specific research projects and programmes

Staff submitted to UoA2 include those who are recognised worldwide as pioneers in their area of concern, combining top-quality research programmes with global advocacy to change policy and practice (e.g. Curtis for hygiene promotion, Patel for mental health, Lawn for neonatal mortality, Watts for intimate partner violence, among many others).

To maximise impact we actively engage research users from an early stage. For example:

- Our four DH-funded Policy Research Units and our workstream for the School for Public Health Research (SPHR) negotiate their work with 'customers' in the DH and NHS/local authorities in order to increase take-up and use of findings.
- In developing a proposal for a research consortium on health systems to DFID (RESYST), we and our partners conducted an extensive exploration of the policy priorities of partner countries through stakeholder consultations; during the inception phase we further mapped key research audiences and developed a research uptake strategy; and during research implementation we are annually monitoring and reporting on uptake.
- Before submitting the proposal (with UCL) for the National Survey of Sexual Attitudes and Lifestyles (Natsal3) we convened a multi-sectoral panel of end-users to ensure that the questions included would address their data requirements.

The specialist communications experts employed by many of our large research programmes (e.g. on malaria, HIV/AIDS, neonatal health, water and sanitation, health systems) ensure that dissemination plans are drawn up to suit different audiences. For example, the Structural Determinants of HIV Consortium is using social media to share findings effectively and promote global debate. Monthly 'learning labs' host invited speakers to give online presentations that interested listeners around the world can log onto. A facilitated discussion is used to exchange ideas, and the talks are then posted on 'STRIVE TV' on Facebook, so they can continue to be accessed. The Malaria Capacity Development Consortium and the Good Health at Low Cost programme produced country-focused videos to highlight their work for general audiences.

Researchers often become involved directly in ensuring implementation of their research findings and this also helps them track their impact:

- Roberts mounted a sustained national and international campaign to ensure rapid action when he found that tranexamic acid (TXA) reduced the risk of death from severe blood loss by one third. The UK Ministry of Defence quickly adopted TXA into combat care treatment protocols and TXA was rolled out for use by ambulance crews in England. In 2011 TXA was added to

WHO's List of Essential Medicines, and Roberts' worldwide communication efforts included commissioning an animated video to reach doctors in Brazil, China, India, Russia and Africa.

- Curtis created a worldwide campaign to ensure her research on the importance of handwashing with soap was acted on, drawing in private sector marketing expertise. She instigated a public-private partnership of more than 300 members from civil society, governments and the private sector, and spearheaded an annual Global Handwashing Day (200m people participated in 2012). She ensures that headline-catching research is published on that day (e.g. that 25% of male commuters' hands in four UK cities were contaminated with faecal bacteria).
- Following School studies showing the burden caused by untreated syphilis and the effectiveness of single-dose treatment in preventing newborn mortality, Peeling and colleagues evaluated new point-of-care tests for screening pregnant women, and worked with collaborators in seven countries to roll out same-day testing and treatment. They prepared a toolkit to help other countries scale-up testing and treatment. The test has been made available through WHO bulk procurement, and Peeling has established a global partnership, including industry partners, dedicated to eliminating congenital syphilis.
- The research of many School staff was fundamental in supporting the roll-out of insecticide-treated mosquito nets for malaria prevention: we helped develop and evaluate the intervention, produced the systematic review and meta-analysis on effectiveness, advised WHO on policy, evaluated alternative insecticides and delivery mechanisms (in the public and private sectors), and evaluated the effectiveness, costs and equity implications of large-scale implementation.

c. Strategy and plans

Knowledge translation is one of the three pillars of the School Strategy for 2012–2017, encompassing knowledge transfer, communications and public engagement. For knowledge transfer, Chariot Innovations will develop know-how generated in the School through products (e.g. vaccine development with commercial partners), training (e.g. development of a wider range of continuous professional development courses and audiences), consultancy (e.g. on infectious disease control) and services (e.g. diagnostic testing and verification). For 2013/2014, we anticipate a maximum of 3 ventures through Chariot Innovations (a testing facility for insect repellents, an innovative portable eye examination kit, and a rapid test for impregnated bed nets) and plan to have 10 by 2017.

Our communications strategy aims to raise the profile and reputation of the School, and enhance the impact of our research locally and globally. Objectives, regularly monitored and evaluated, include: enhancing understanding of our work and contributions to public and global health among key audiences and stakeholders; improving communications with staff, students, alumni, prospective students, research partners, media and other stakeholders; and improving the quality of two-way multi-channel communications across a range of platforms (physical, publications, audio-visual, online and digital media).

With the support of partners, including the Wellcome Trust, DFID, the British Science Association and the National Coordinating Centre for Public Engagement, we are developing an inclusive strategy to embed and facilitate public engagement across the School. We aim to: foster a rich programme of activities to stimulate public health knowledge and discussion; motivate and support staff and students to engage with various sections of the public; transform our research and learning through dialogue and collaboration. Priority audiences are groups engaged in, and relevant to, our research in the UK and worldwide, policy-makers and practitioners, and communities, schools, the general public and organisations in the School's immediate vicinity.

d. Relationship to case studies

Our 27 case studies demonstrate the success of our approach to achieving impact. They cover:

- malaria control (6 case studies): insecticide-treated mosquito nets; insecticides; intermittent/seasonal prevention of malaria; rapid diagnostic tests; global drug subsidies
- HIV prevention (2 case studies): circumcision; adolescent prevention strategies
- HIV/TB (2 case studies): treatment guidelines, screening
- childhood vaccinations (4 case studies): pneumococcal conjugate, Hepatitis B and Hib vaccines; effectiveness and cost-effectiveness models
- child, neonatal and maternal health (4 case studies): vitamin A supplementation; preventing retinopathy of prematurity; promoting handwashing using soap; priority-setting models
- health services for specific groups (7 case studies): patient-reported outcome measures in elective surgery; cancer survival; patient mobility in the EU; health care for trafficked women; mental health care in Africa and Asia; hypertension treatment in the >80s; traumatic bleeding
- other public health (2 case studies): smoking cessation; influenza pandemics.

Our very long term and close engagement with the beneficiaries of our research is fundamental to our impact on infectious diseases in the developing world (the malaria, HIV, TB, vaccines, and child, neonatal and maternal health case studies listed above). These include the communities affected by the diseases; local and national governments; WHO, which has high legitimacy to advise on new policies; agencies such as the Global Fund, GAVI and other international and bilateral agencies which allocate funding; NGOs active in areas such as blindness and HIV; and industry, which is critical in developing, testing and marketing new vaccines, drugs, diagnostics, and insecticides, and in shaping behaviour through advertising its health-promoting products. Our HR policies facilitate this long-term engagement (e.g. supporting researchers to reside in and travel to endemic countries), and reward not just research achievements but also active engagement with policy- and decision-makers to encourage take-up of research findings.

Our multidisciplinary expertise has meant that we have been able to provide decision-makers with comprehensive information to support decision-making. For example, when WHO was considering whether to adopt a policy on intermittent treatment for malaria control, we provided information on choice of drug, drug resistance, cost-effectiveness, acceptability to communities, mortality impact and community effectiveness. Another feature of our approach has been to develop close and enduring relationships with decision-makers, and develop rigorous analytical methods and models which closely respond to their information needs. For example, our research on cancer survival has provided critical support for the English Cancer Plan, helping to set its targets and monitor progress, and our vaccination models support decision-making in PAHO and its member states.

In some cases, our strategy has been to focus on changing the general climate of world opinion in addition to researching specific interventions. This is best exemplified by our case studies on global mental health and handwashing, where our multi-faceted and long-term global communications strategies targeting influential groups, and including innovative elements such as Global Handwashing Day, have been backed by rigorous research which identifies highly cost effective interventions for governments, funding agencies and private sector partners to adopt.

In summary, our UoA2 submission shows the many different ways our research is improving health in the UK and in countries around the world. The critical success factors in this process are: policy-relevant, top-quality research; collaboration across disciplines, sectors, stakeholders and countries; effective communication; and perhaps most important, long-term commitment to close relationships with potential research users.