



LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE





# LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

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

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## MISSION STATEMENT

The mission of the London School of Hygiene & Tropical Medicine is to contribute to the improvement of health worldwide through the pursuit of excellence in research, postgraduate teaching, advanced training and consultancy in international public health and tropical medicine. To achieve this mission the School will enhance its role as:

- *Britain's national school of public health,*
- *a leading institution in Europe for research and postgraduate education in public health and tropical medicine, and*
- *an international centre of excellence in public health and medicine in developing countries.*



## FOREWORD



Just as academic researchers must submit their work for peer review, it is vital that institutions such as the London School are evaluated rigorously and regularly. Last year I was able to express delight at the confirmation of the excellence of the School's research following the Research Assessment Exercise. This year I am able to congratulate the School on achieving the highest rating possible in the assessment of its teaching quality by the Quality Assurance Agency. Such quality continues to be respected worldwide as reflected in the continuing success of the School's distance learning programme, with almost 1000 students registered this year.

The School has embarked on a fundraising campaign under the name *Health Worldwide* which will be formally launched in 2004 and I look forward to reporting progress in future years. As this Report goes to press, the concluding works on the new North Courtyard building are being undertaken. This will significantly enhance the facilities in which the School carries out its research and socializes. On behalf of the Board I wish to thank all those involved in its design, planning and construction, principally the architects Devereux, the main contractor Willmott Dixon and the School's Project Liaison Officer Claire O'Connor. Thanks, too, to staff and students who have had to cope with the inevitable disruption over the last fourteen months.

The School was shocked and saddened by the sudden death of Professor Steve Bennett (*see page 51*). On behalf of the Board, which Professor Bennett joined in 2000, I wish to express our deep sadness at the loss of a valued and so-wise colleague who made such a significant contribution, not just in his academic achievements but also to the life of this institution.

I wish to express my gratitude to Sir Richard Sykes and Professor Lance Lanyon who stood down this year after many years distinguished service to the School as members of the Board of Management. I should like to conclude by expressing on behalf of the Board our pride in the achievements of the School's staff, students and alumni and their dedication to the goal of improving the health of peoples around the world.

*The Rt Hon the Baroness Chalker of Wallasey PC, CHAIRMAN OF THE BOARD OF MANAGEMENT*

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## REVIEW OF THE YEAR



*The Senior Management Team*

*Seated, from left:*

*Sharon Huttly (Reader in International Health, Teaching Programme Director); Andy Haines (Professor of Public Health and Primary Care, The Dean); Wendy Surridge (Secretary & Registrar)*

*Standing, from left:*

*Phoebe Roome (Secretary to SMT); Hazel Dockrell (Professor of Immunology, Head of Department of Infectious and Tropical Diseases); Gill Walt (Professor of International Health Policy, Head of Department of Public Health and Policy); Pat Doyle (Reader in Epidemiology, Head of Department of Epidemiology and Population Health); Keith Harrison (Deputy Secretary (Planning & Resources))*

The last year has seen a number of important developments in the School. We were one of the first institutions to be assessed by the Quality Assurance Agency for Higher Education under its new procedures. Our mechanisms for ensuring teaching quality and the standards of its awards were assessed and the panel expressed 'broad confidence' in the School's procedures – the highest rating possible. The success of the QAA review owes much to the work of Craig Higgins and Sharon Huttly in particular but also to those many students and staff who prepared material for the visiting panel.

Significant progress has been made in implementing the outcomes of the Strategy Review launched in 2000-01. In particular, a draft Research Strategy has been prepared and consulted on, and a career map for academic staff is being piloted. Further progress has been hindered by the need to address fluctuations in government funding, something which will continue to be a management challenge.

The arrival of Lindsay Wright as Press Officer has led to a significant raising of the School's profile in the media, which is described more fully in *People and Places* (page 47). For example the School's *Great Smog Conference* in December commemorating the 50th anniversary of the London smog of 1952 received massive coverage, with pieces appearing in the national press, on national TV and radio news programmes and interest from USA and Germany. As another part of our strategy for improving communication, a redesigned website was launched this year. Kenny Hermansen (Web Development Officer) carried out an online survey to gauge users' reaction, which was overwhelmingly favourable.

The new building in the North Courtyard is now well on its way to completion and will provide accommodation for around 100 staff. The building makes exceptionally good use of the limited space available for its construction and will enable staff to be brought together from elsewhere in the School, providing space to accommodate recent and projected expansion in research activity. It will also provide excellent quality meeting areas, social space and room for the storage of samples and archive materials. I wish to thank all those involved and wish them well as they strive to complete an excellent facility.

The School has been awarded £6.7 million of capital funds from the second round of the Higher

*The North Courtyard building  
nears completion*







Education Funding Council for England's (HEFCE) Science Research Investment Fund (SRIF). This will help support the purchase of a further building in Bedford Square, relocation and refurbishment of our Category III laboratories and the next phase of the development of the IT network. In addition, funds will be spent on ensuring that our basic science remains at the cutting edge, by supporting protein expression facilities, imaging equipment to permit the study of host-pathogen interactions and further investment in bioinformatics.

Triennially the School confers Honorary Fellowships, its most prestigious honour, on those persons who have rendered exceptional service to the School or have attained exceptional distinction in any of the subjects taught in the School. On 15 February 2003, as part of the School's annual Diploma Presentation Ceremony, we were honoured and delighted to confer Honorary Fellowships on four outstanding recipients: **Dr Tore Godal** (Executive Secretary, Global Alliance for Vaccines and Immunization, UNICEF) for outstanding services to international public health and tropical disease control; **Professor Sally McIntyre** OBE (Director, MRC Social and Public Health Sciences Unit, Glasgow University) for her work on sociological factors in health; **Professor Amartya Kumar Sen** (Master, Trinity College, Cambridge), for his work on improving the understanding of inequalities in health; and **Professor Robin Weiss** FRS (Professor of Viral Oncology, University College London) for outstanding services to virology. At the same ceremony, the Donald Reid Medal, awarded triennially for distinguished contributions to epidemiology, was awarded to **Professor Peter Smith** CBE, Professor of Tropical Epidemiology at the School. Peter has made many major and wide-ranging



RIGHT: *Donald Reid Medallist, Professor Peter Smith CBE*

contributions to epidemiology, including work on communicable and non-communicable diseases, in developing and developed countries, and of both an empirical and methodological nature.

Sadly the year was marred by the death of Professor Steve Bennett, who was much loved and respected (*see page 51*). Steve was promoted to a professorial chair in epidemiology and statistics in recognition of his outstanding academic contributions shortly before his death. His personal warmth, kindness, technical skills and commitment to the School are sorely missed. A symposium to commemorate his life and work is being held in November 2003.

Dr Pat Doyle has taken over from Professor Charles Normand as Head of the Department of Epidemiology and Population Health and Professor Gill Walt has taken

over from Professor Nick Black as Head of the Department of Public Health and Policy. The School owes a significant debt of gratitude to Charles and Nick for their outstanding leadership and sustained effort. Their wise counsel and extensive experience of the School has been invaluable to the Senior Management Team. The handover has in both cases been a smooth one and we wish Pat and Gill every success in their new roles.

The School's distance learning programme continues to expand, with 955 students registered – an increase of almost 20% over last year. The international profile of the distance learning programmes has risen dramatically in recent years and the continuing increase in students seeking to improve their qualifications is proof of the effectiveness of this form of learning by students around the world. The School will soon be introducing mixed-mode studying, which will allow students to combine London-based and distance learning approaches.

Overall it has been another successful year for the School and it is my pleasure to acknowledge the significant contributions made by staff and students in achieving that success.

*Professor Andy Haines, DEAN*

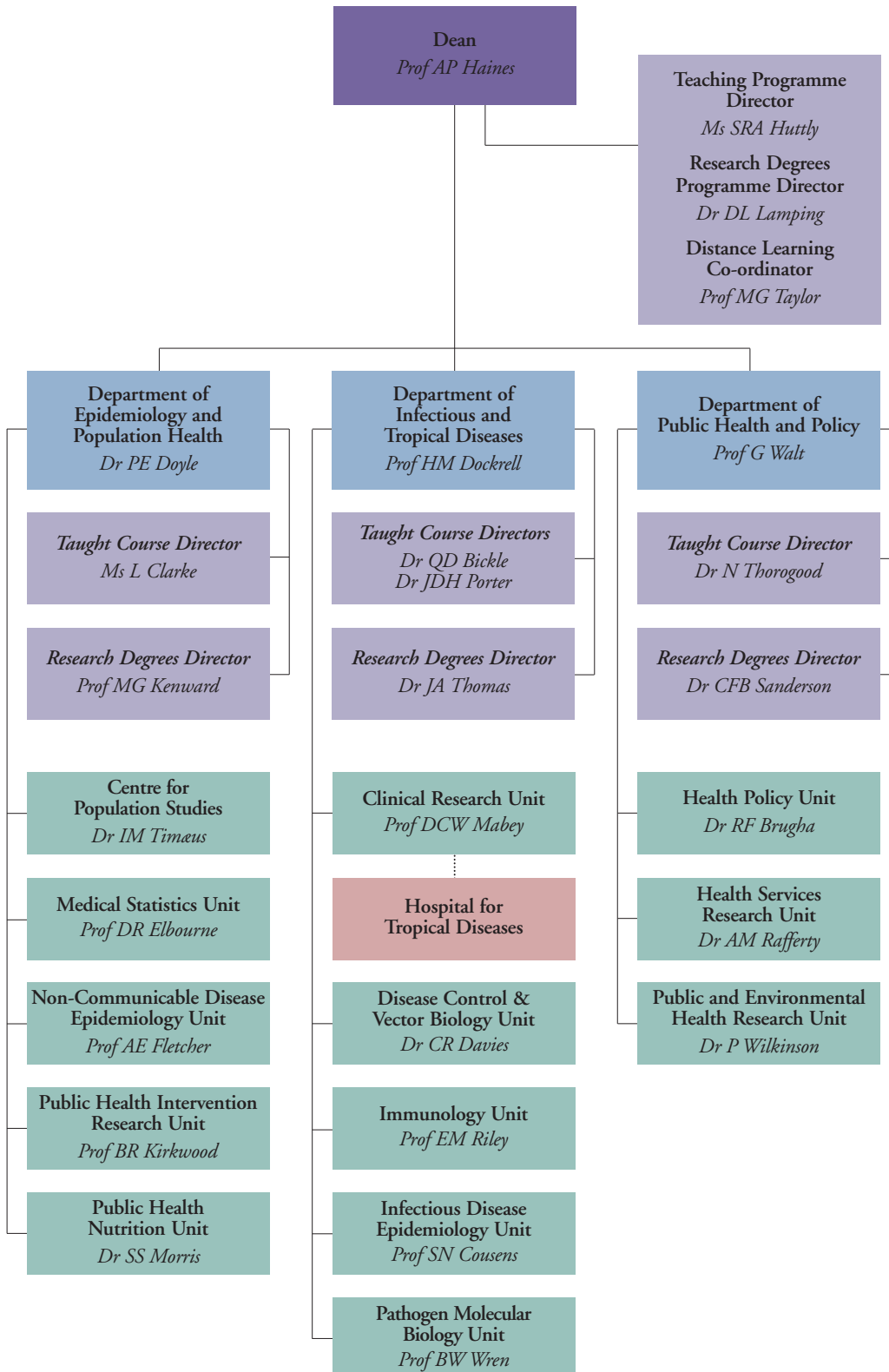


*The School's new Honorary Fellows. (From left): Dr Tore Godal, Professor Sally Macintyre OBE, Professor Amartya Kumar Sen, Professor Robin Weiss FRS*



# ACADEMIC MANAGEMENT STRUCTURE

(At 1 November 2003)





## DEPARTMENT OF EPIDEMIOLOGY AND POPULATION HEALTH



*Emily Grundy, Professor of  
Demographic Gerontology*

The broad focus of the Department's work is on identifying the determinants of ill-health and evaluating interventions to improve treatment and reduce the burden of disease. There is a strong emphasis on the relevance of such work to public health and the translation of findings into programme action and health policy. The Department is multidisciplinary and the research work diverse. Many programmes involve collaboration with Units throughout the School, and between the Department and collaborating researchers in the UK and throughout the world. The profile of current research work within the Department is described under the individual Units below.

This year has seen some management changes within the Department. Professor Charles Normand stood down as Head of Department in March 2003 to rejoin the Department of Public Health and Policy. The Department benefited greatly from his experience and leadership and we wish him well for the future. Dr Pat Doyle, an epidemiologist who has been at the School since 1986, succeeds him.



*Ian Timæus (Head, Centre for  
Population Studies)*

We congratulate staff who received honours in recognition of their contribution to medical science: Professor John Cleland was elected Fellow of the British Academy, Professor Betty Kirkwood was elected Fellow of the Academy of Medical Sciences, and Professor Stuart Pocock was presented with the Bradford Hill Medal at the Royal Statistical Society's annual general meeting.

### CENTRE FOR POPULATION STUDIES

One area of the Centre's research is ageing. This programme examines inequalities in the health of older people and demographic and other influences on family support systems. Staff have used data from the Health Survey for England to demonstrate that a strong link exists between poverty in old age and poor health, even after controlling for smoking history and other relevant factors. Men and women aged 65-84 in receipt of income support are much more likely to self-report bad health and longstanding illness. They also have higher psychiatric morbidity and increased chances of taking three or more prescribed medicines.



*Pat Doyle (Head, Department of  
Epidemiology and Population  
Health) and Mike Kenward  
(Research Degrees Director)*



Working with Dr K Glaser (King's College London), Centre staff have shown that one consequence of these social inequalities in health is that older people from manual backgrounds are more likely than those from more advantaged groups to be care-givers. The proportion of husbands and wives providing care for their spouse is much higher in couples who both had manual occupations than in other couples.

Of course, older people provide, as well as receive, family support. Research in collaboration with Professor J Henretta (University of Florida) has found that a third of married British women in late mid-life, and nearly half of equivalent American women, provide regular help with grandchildren. The explanation of this is in part demographic – on average, American women have more grandchildren. US parents are also more likely than their British counterparts to help their adult children financially. In both countries, higher-income parents are the most likely to assist their adult children financially and, surprisingly, are also more likely to provide other types of help.

The Centre continues to provide technical assistance to the Joint UN Programme on HIV/AIDS (UNAIDS) Reference Group on Estimates, Projections and Modelling. A methodology has been developed for estimating 'net' mortality due to HIV in developing countries – that is, mortality if HIV-related illness was the only cause of death operating. This hypothetical construct enables one to project deaths from AIDS in populations with a variety of background mortality levels. For adults, the 'net' median survival time post-infection in the absence of anti-retroviral therapy is about nine years, while for children it is two years. These findings have been incorporated into the projection models used by UNAIDS, UN Population Division and UNICEF. In collaboration with Dr Nicholas Grassly (Imperial College), Centre staff also developed the methods that these agencies now use to project the future number of AIDS orphans and other orphans in sub-Saharan Africa. The new approach allows one to forecast paternal and dual orphans, as well as maternal orphans, from numbers of adult deaths.

In the Centre's programme of research on reproductive health a developing area is the analysis of the factors influencing sexual and reproductive health policies, particularly the impact of current health sector reforms. One study has found that service decentralization can enhance sexual and reproductive health services, for example by producing services tailored better to local needs through promoting community-based, participatory and locally-accountable service delivery. However, our research emphasizes that such benefits will only be realized if the decentralization process is managed carefully and supported by sufficient capacity development. Most importantly, decentralization is only likely to benefit service provision if all of the stakeholders in reproductive health programmes have been involved in the design of the reforms.

### MEDICAL STATISTICS UNIT

The Unit undertakes a broadly based research programme both in applied projects and in statistical methodology. The applied work generates methodological questions, and the methodological research feeds back into the applied studies.

Much of the Unit's work can be classified under four research groupings: statistical methodology, neurology, pharmaco-epidemiology and clinical trials. The methodological work includes exploration of approaches to missing data in longitudinal studies and of bootstrap methods for confidence intervals and bias correction in multilevel models, funded by the Economic and Social Research Council (ESRC). As part of an MRC Co-operative Group on life-course and inter-generational influences on health, Unit staff are exploring the utility of a range of statistical methods for modelling the complex series of temporal relationships and causal structures that are inherent in life-course epidemiology.

Work with the Institute of Neurology is leading to the development of a broad research programme in disease areas such as multiple sclerosis and dementia, and involves the analysis of longitudinal sets of three-dimensional brain images.

A new initiative concerns the practice and methodology of statistical pharmaco-epidemiology



$$X^2 = \sum \frac{(O-E)^2}{E}$$







*Stuart Pocock (right, Professor of Medical Statistics) receiving the Bradford Hill Medal from Professor Peter Green, President of the Royal Statistical Society*

using large primary care data bases (such as the General Practice Research Database), with a particular interest in identifying the long-term health risks of hormone replacement therapy.

A substantial part of the Unit's research relates to clinical trials in three main respects: statistical collaborations, trial co-ordination and methodological initiatives. In the past year, achievements include publication of major trial findings in: the management of neonatal hip instability; candesartan treatment for heart failure (CHARM), international strategies for angina (Stent or Surgery (SOS)) and Randomized Intervention Treatment of Angina (RITA-2 and RITA-3). Other foci include non-inferiority trials, survival plots, reporting, methods for systematic reviews, and qualitative work on views of research participants. The results of a research collaboration on data monitoring committees have been presented at a number of international meetings.

Much of the Unit's work could fall under more than one of these four research groupings, and other work does not easily fall within any of the four. Rather, the nature of much of the work is essentially collaborative, bringing statistical thinking and a variety of statistical methods to bear on a wide range of research issues both internally (within the Unit, the Department and the School), as well as with many external collaborators.

#### **NON-COMMUNICABLE DISEASE EPIDEMIOLOGY UNIT**

Research in this new Unit, formed from the merger of the former Cancer and Public Health and Epidemiology Units, is carried out under several broad research themes.



*Astrid Fletcher (Head, Non-Communicable Disease Epidemiology Unit)*

#### **Reproductive epidemiology**

Reproductive epidemiology focuses on the determinants of reproductive outcome and child health. Unit staff have just completed the Medical Research Council/ Ministry of Defence study of reproductive outcome in UK veterans of the first Gulf War and the results are soon to be published. A large-scale survey of women in the general population has also recently been completed. The study investigated risk factors for miscarriage and infertility as well as estimating the proportion of births in the UK resulting from assisted reproductive technology (ART). In another study, the group did not find evidence that treatment for infertility increased the risk of ovarian cancer. Other ongoing work with postgraduate students includes: a study of risk factors for poor semen/sperm quality; an investigation of the relationship between consanguinity and congenital heart disease; a programme of research to develop a valid clinical tool for classification of perineal trauma during childbirth; and a study of maternal morbidity and progression to mortality in Uganda.



### Life-course epidemiology

This programme includes the MRC-funded life-course co-operative group. With colleagues in other Units, the University of Bristol and the Institute of Child Health, particular emphasis is being given to exploring the link between early growth trajectories and body composition, blood pressure, cardiovascular disease, diabetes and cancer. The Uppsala Family Study has established that blood pressure in childhood is inversely associated with differences in size at birth within sibships. It is also being used to explore candidate gene associations with fetal growth. The links between cognitive test performance in childhood and later health is a major focus of work in the newly established 'Aberdeen Children of the 1950s' cohort.



### Epidemiology of ageing

This programme encompasses randomized trials of screening elderly people, determinants of health in old age including nutrition, and studies in ophthalmic epidemiology. The large MRC-funded trial of multidimensional screening has provided the opportunity for several add-on studies. We found that, in this elderly age group, vitamin C levels were generally low and there was a strong inverse association between vitamin C levels and subsequent mortality. In work funded by the ESRC, we found substantial inequalities in quality of life and psychological well-being in elderly people, in part explained by differentials in poor health, lifestyle factors and earlier socio-economic influences. A trial of vision screening nested within the main trial showed that visual acuity testing by a practice nurse did not lead to improvement in visual outcomes. Data collection has been completed in the seven-country EUREYE Study investigating risk factors (principally nutrition and light exposure) for macular degeneration. We have recently completed a Wellcome-funded feasibility study looking at macular degeneration in India and its possible association with antioxidant vitamins and indoor biomass fuels.



### Cancer

The epidemiology of reproductive cancers is a major focus. Ongoing studies include: birth weight and pre-diagnostic serum insulin-like growth factor (IGF) levels in relation to mammographic density and breast cancer risk; a case-control study of breast cancer risk and life-long vegetarianism among South Asian migrant women in England; and a follow-up study of young women in the intervention arm of mammography in young women (the Age Trial) to investigate the relationship between endocrine factors and breast cancer risk. Research on the health effects of radiation exposure includes assessment of the long-term effects of cosmic radiation in a large cohort of British aircrew and air traffic controllers (in collaboration with the Civil Aviation Authority), and a study of skin ageing and naevi in relation to ultraviolet exposure and sunburn in young women (with the Institute of Cancer Research and University of Leeds).

Cancer survival is high on the health policy agenda, in part because international studies have indicated lower survival in the UK than in some other European populations. Socio-economic and geographic differences in cancer survival are being explored both within the UK and as part of the EURO CARE and CONCORD projects in Europe and worldwide respectively, in collaboration with cancer registries and research institutions in more than 20 countries. Trends in the cure of childhood leukaemia up to 1997 are being examined, in collaboration with the Childhood Cancer Research Group and the UK Clinical Trials Service Unit in Oxford. Incidence, mortality and survival from prostate cancer are being compared in the UK and the USA, in collaboration with the Prostate Cancer Outcomes Group of the US National Cancer Institute and the Northern and Yorkshire Cancer Registry and Information Service.

### Genetic and metabolic epidemiology

We are studying the genetic epidemiology of complex diseases, using novel approaches that build upon earlier studies of ethnic variation in disease risk that rely on modelling the genetic structure of admixed populations. This work is supported by the National Institutes of Health, MRC and the Arthritis Research Campaign. Working with several US and Caribbean researchers in this field, case-control collections of hypertension and systemic lupus erythematosus have been completed and results published. Computationally intensive Bayesian analysis programs have been extended to deal with population structure and enable modelling of haplotypes in gene



association studies, as part of a collaboration with the Institute of Child Health. Recently the European Commission have funded the EUDRAGENE study (website: [www.eudragene.com](http://www.eudragene.com)) to establish a large European case-control DNA collection from multiple classes of adverse drug reaction. This will act as a resource for studying genes which influence serious or adverse drug reactions.

The Unit's work on health determinants in Russia is continuing through a large case-control study of the behavioural and socio-economic determinants of mortality in working age men funded by The Wellcome Trust. Inequalities in health and mortality in low- and middle-income countries are being investigated in a project funded by the Dreyfus Health Foundation. We are also developing a programme of pharmaco-epidemiology using the resource of several large general practice databases.

### PUBLIC HEALTH INTERVENTION RESEARCH UNIT

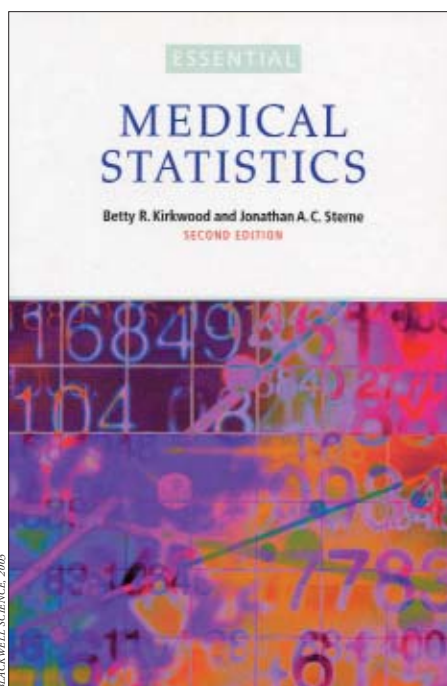
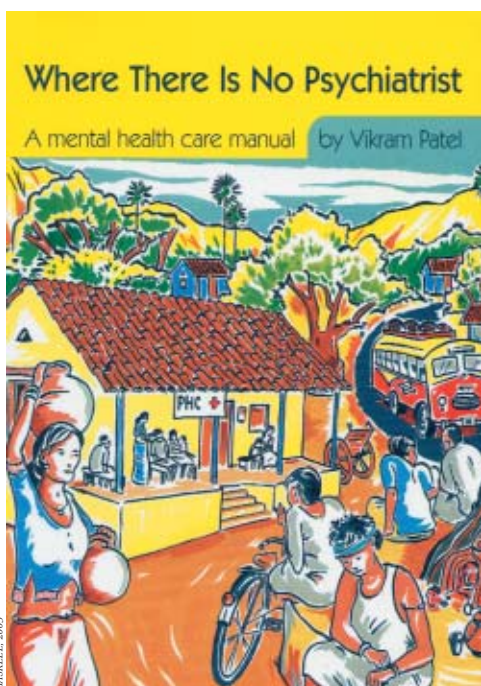
This Unit was established in March 2001 as a methodological centre of excellence supporting the development and evaluation of public health interventions in the UK and developing countries. Current research areas (conducted in collaboration with a network of colleagues in over 30 countries) are: maternal and child health (including neonatal health); injuries; nutrition; mental health; poverty, inequalities and health; and methodology.

Unit staff acted as members of the Child Health Epidemiology Reference Group, providing technical guidance to the World Health Organization (WHO) and the United Nations Children's Emergency Fund (UNICEF) on the distribution of causes of child mortality. They took part in a workshop which led to a series of articles in *The Lancet* on child survival, which form part of a larger advocacy movement to move child survival higher up the agenda of international organizations and national governments, and have already proven to be highly influential in policy circles.

*Members of the Public Health Intervention Research Unit have published new books which demystify two complex, but very different topics – medical statistics, and the assessment and management of mental health problems*

*Young Lives* ([www.younglives.org.uk](http://www.younglives.org.uk)) is a collaborative study of childhood poverty in four countries – Ethiopia, India, Peru and Vietnam – involving follow-up of cohorts of children over time. We are working with academic institutions and Save the Children UK in the four countries, and in the UK and South Africa, and by the end of 2002 approximately 2000 children aged 6-17 months in each country had been enrolled. Preliminary findings will be released at an international conference in the autumn of 2003. A sample of 1000 8-year old children in each

country has also been enrolled: further details can be found in the chapter *Working for Young People* (see pages 33-35).



A large field-research effort involving more than 120,000 women is under way in collaboration with Kintampo Health Research Centre, Ghana to evaluate the benefits for pregnancy outcome and maternal mortality reduction of regular weekly low-dose vitamin A supplementation. A companion programme of collaborative research is focusing on the babies born during the trial, and includes: a trial assessing the impact on the child's vitamin A status of linking child vitamin A supplements to early





immunization; an evaluation of the use of verbal autopsies to establish the cause of neonatal deaths (deaths within the first month of life); a prospective cohort study to assess whether exclusive breastfeeding and its early introduction can save these early deaths; and a formative research study aimed at identifying potential community-based interventions to save newborn lives. In addition, a new trial is being planned to evaluate the impact on infant mortality of intermittent malaria treatment linked to early childhood immunizations. Finally, analysis of a small trial assessing the effect of low-dose vitamin A supplementation during pregnancy on immunity to malaria suggests that vitamin A supplementation may increase the rate of parasite clearance mechanisms from the placenta.



Unit staff are also based in Mongolia, investigating the effect of swaddling on lower respiratory tract infections in young infants and, in Goa, India, co-ordinating a community cohort study on the aetiology of common gynecological complaints, such as vaginal discharge. The latter has completed its recruitment phase – 2500 women, representing a participation rate of 83%, have entered the study.

The Cochrane Injuries Group has continued to grow steadily: there are currently 60 published systematic reviews and protocols in the Cochrane Library. The team completed a compendium of good practice in road safety on behalf of WHO, and a systematic review entitled *Post-licence driver education for the prevention of road traffic crashes*, commissioned by the Head of Occupational Safety of AstraZeneca. The group has also continued to contribute to the work of the Global Road Safety Partnership, and has developed links with a number of external organizations, including the WHO's Injury and Violence Prevention Programme, the International Federation of Red Cross and Red Crescent Societies, and the International Labour Office.

The CRASH (corticosteroid randomization after significant head injury) trial, which is assessing the impact of a short-term corticosteroid infusion on the risk of death and disability following head injury, has successfully entered its third year. Over 6000 patients have been randomized making it the largest-ever trial into head injury. It aims to recruit and follow up 20,000 patients by the end of 2005 with collaborators in over 50 countries. The results will inform clinical decision-making in an area of increasing public health importance (see [www.crash.lshtm.ac.uk](http://www.crash.lshtm.ac.uk)).

Evaluation of ongoing health programmes presents particular challenges. In Brazil, the government has implemented a national policy of 'Kangaroo Mother Care' (KMC) in hospitals caring for high-risk pregnancies, to help reduce neonatal mortality. This makes a traditional controlled trial of KMC untenable yet many questions remain about its effectiveness. Using a combination of methods, data are being collected to assess the impact of KMC on neonatal mortality and morbidity.

#### PUBLIC HEALTH NUTRITION UNIT

This Unit undertakes research in four areas: basic mechanisms linking diet and disease; the science base for nutrition interventions to reduce non-communicable diseases; interventions to reduce death, disease and disability from malnutrition; and the effectiveness of large-scale nutrition programmes and policies.

The MRC International Nutrition Group in the Unit successfully underwent the MRC's quinquennial review process and has had its funding renewed until 2008. During the year, researchers completed significant components of a programme of research on early-life nutritional programming of immunity. In Lahore, Pakistan, researchers demonstrated a strong relationship between size at birth and adult responses to the typhoid Vi vaccine, but not to rabies vaccine. Studies in a birth cohort from rural Gambia have shown that seasonal changes in thymus size and function may be mediated by trophic factors in breast milk. Work on nutrient-gene interactions demonstrated that common variations in haptoglobin (an acute-phase protein involved in haem recycling) influence rates of childhood anaemia across a malaria season, and several other large projects within the nutrient-gene interaction programme have completed fieldwork and moved to the genotyping and analysis stages.





In April 2003, following a two-year-long expert consultation chaired by Ricardo Uauy, the Food and Agriculture Organization of the United Nations (FAO) and WHO launched a significant new report *Diet, Nutrition and the Prevention of Chronic Diseases*. The report, which provides the science basis for a global strategy on diet, physical activity and health, attracted much public and press attention (*see also page 46*). Professor Uauy also chaired the International Obesity Task Force, co-editing a report entitled *Prevention and Control of Childhood Obesity*. At the School, a working group was set up to develop new research on obesity. The Unit was awarded funding to begin a randomized controlled trial of the effect of n-3-long-chain polyunsaturated fatty acids as a dietary means to slow cognitive decline in older people in the UK. In Chile, a feasibility study investigated different options for evaluating the cost-effectiveness of a nation-wide micronutrient supplementation programme for older people.



*Saul Morris (right, Public Health Nutrition Unit) is collaborating on a trial of monetary incentives in primary health care in Honduras*

In South Africa, Unit researchers in conjunction with the Health Systems Trust and the University of the Western Cape evaluated the quality of infant feeding counselling offered as part of the standard package of care to mothers in a national pilot programme for the prevention of mother-to-child HIV transmission. In north-east Brazil, Unit staff, in collaboration with other groups, assessed at 8 years of age the visual acuity, hearing, neurological function, motor development, cognition, school achievement and behaviour of low birth weight infants born at term and a group of comparable infants of appropriate birth weight. The Unit continued to play a key role in WHO training programmes to improve inpatient management of children with severe malnutrition: Unit staff helped train teams from 18 countries in West Africa, southern Africa and South-East Asia.

Preliminary results were obtained from three evaluations of large-scale government programmes intended to improve nutritional and food security outcomes in Latin America by transferring cash to poor households. At least two of the programmes clearly altered food consumption patterns in beneficiary households, but none of the three improved nutritional status, either in the elderly (Mexico) or in children (Honduras, Brazil). New work based on an analysis of Demographic and Health Survey data from 46 countries suggests that national nutrition programmes for children that use geographic targeting to allocate resources are likely to result in high levels of both under-coverage and leakage because of the consistently low geographic clustering of undernutrition. Unit staff reported in *The Lancet* that underweight is associated with over one-half of all child deaths worldwide, and that appropriate breastfeeding and complementary feeding are, respectively, the first and third most promising interventions for saving children's lives.



*Staff from the Department relaxing 'in the field'!*



## DEPARTMENT OF INFECTIOUS AND TROPICAL DISEASES

The Department of Infectious and Tropical Diseases provides the home for a multidisciplinary group of researchers working on all aspects of infectious diseases, from the pathogens themselves and their genomes, through the immune responses they induce and then try to evade, to the study of the vectors that spread these infections and to clinical and epidemiological intervention studies. Much of the work is performed overseas, mainly but not exclusively in Africa, with large groups working on different aspects of malaria, sexually transmitted infections, and tuberculosis.

The Department has lost some key members this year. The tragic death of Professor Steve Bennett (*see page 51*) has left a large hole in our research and teaching, and he is badly missed. In happier circumstances, we said goodbye to Barbara Sawyer, who retired having looked after our mosquito colonies for 49 years (*see also page 50*). We have welcomed new members of staff, and some senior staff based overseas have returned to London – including Professor Jimmy Whitworth, formerly head of the MRC Virus Research Centre in Entebbe, Uganda and Dr David Ross, who directed studies on HIV in Mwanza, Tanzania for 8 years. Our strategy of attracting younger researchers through fellowship funding is also proving very successful.

In addition to the five research units whose work is described below, the **Teaching and Diagnostics Group** provides practical teaching and a national, diagnostic parasitology laboratory service to NHS and other users. As well as providing over 200 practical classes and performing more than 7000 diagnostic tests each year, senior members of the group are researching the role of parasites in Irritable Bowel Syndrome and idiopathic Parkinson's disease, rapid detection methods for malaria and *Acanthamoeba* infections; and provide specialist advice on the diagnosis of primate parasitic infections.



*David Mabey (Professor of Communicable Diseases and Head, Clinical Research Unit) and Hannah Kuper (Lecturer, CRU) examine children for trachoma in Tanzania*

### CLINICAL RESEARCH UNIT

Trachoma research in the Unit covers a variety of disciplines, from human genetics and immunology to epidemiology and public health; and includes collaboration with colleagues in the Infectious Disease Epidemiology (IDEU) and Disease Control & Vector Biology Units, at



the Wilmer Eye Institute, Johns Hopkins University and at the Wellcome Trust Centre for Human Genetics, Oxford. A new method for quantifying the amount of *Chlamydia trachomatis* present in the eye, using real-time PCR, has been developed and applied to trachoma-endemic communities in Tanzania and The Gambia. Most heavy infections are found in young children, especially infants less than one year old, and in those with severe inflammatory disease.

Unit staff provide support to several research projects in Africa on ways of treating and preventing malaria, supported by the Gates Malaria Partnership. A trial of a DNA/viral vector malaria vaccine has been undertaken in The Gambia. Clinical trials of antimalarial drug combinations to treat malaria in children and pregnant women, and studies of barriers to accessing treatment, are being undertaken in Tanzania, Ghana and Yemen.

A study of travellers from the UK visiting The Gambia found that, although chloroquine/proguanil provides inadequate protection against malaria among travellers to this area, many continue to take it, contrary to national recommendations. Research on travellers' health has been strengthened by links with the new National Centre for Travel Health whose Director, Professor David Hill, is an honorary professor at the School.

In collaboration with Imperial College London and the Blue Peter Research Centre, we have used information from the *Mycobacterium leprae* genome to look for strain variation in isolates of *M. leprae* from leprosy patients in Hyderabad, India. Preliminary results show that there is some genetic diversity in these isolates. This is exciting because it provides a new tool to study transmission and relapse.

Two Knowledge Programmes, on tuberculosis and on HIV/AIDS and sexually transmitted diseases, are funded in the Unit by the Department for International Development (DFID) (*see also pages 29-32*). Selected highlights of our work on these diseases follow.

Recent work with IDEU has shown that genital herpes, caused by herpes simplex virus type 2 (HSV2), greatly increases the risk of HIV transmission between sexual partners. Since HSV2 is a common infection in developing countries, a high proportion of HIV infections could be prevented if HSV2 could be prevented or suppressed. New studies are examining the relationship between these two viruses, and measuring the impact of treatment for HSV2 on HIV shedding or HIV acquisition, in Tanzania, South Africa, Burkina Faso, Central African Republic and Ghana.



A study on the aetiology of common gynaecological complaints, such as vaginal discharge, is being conducted in Goa, India. Preliminary findings suggest that the strongest association with the complaint is with psychosocial problems such as depressive disorders and the experience of marital violence. Reproductive tract infections are not associated with the complaint, suggesting that the syndromic approach for treatment is missing its target in such low-prevalence populations.



A study in collaboration with the Biomedical Research and Training Institute, Harare and Oxford University is testing whether actively promoted voluntary counselling and testing (VCT), linked to intensified primary health care, is acceptable in the workplace; and investigating the impact of HIV infection on TB epidemiology. Twenty-two factories in Harare have been randomized to receive access to VCT services through on-site or off-site services delivered through industrial clinics. Uptake of VCT was significantly higher (56%) when it was on-site than when it was off-site (15%). This indicates that on-site HIV testing through industrial clinics has the potential to reach large numbers of workers and to deliver HIV care at low cost.



In Zambia, Unit staff are involved in a multicentre study led by the International Center for Research on Women (ICRW) in Washington, which aims to understand the causes of HIV-related stigma, to describe the impact of stigma on different population groups; and to develop both quantitative and qualitative indicators of stigma. Two sub-studies focus on children's experiences of TB- and HIV-related stigma and discrimination.





In collaboration with Aurum Health Research, South Africa, staff are involved in the implementation of an antiretroviral programme for HIV-infected employees of a number of companies in South Africa, and in evaluation of clinical and economic outcomes.

The Rural AIDS & Development Action Research Programme, University of the Witwatersrand works in collaboration with the Unit on HIV/TB-related projects in rural South Africa. As part of the WHO's ProTEST initiative, the site has completed three years of pilot activities looking at operational models for prevention, care and support for HIV and TB. VCT has been established, with rapid testing in over 60 clinics, and 4 hospitals; access provided to preventive therapies for HIV-positive patients including isoniazid and co-trimoxazole, and methods evaluated for optimizing adherence to treatment. We also conducted the first population-level HIV prevalence survey in South Africa, using an oral mucosal transudate collection device. HIV prevalence was 7% in girls aged 17-18 years, and 17% in women aged 18-24 years. We explored the burden of undiagnosed TB in a rural population with known high HIV prevalence at a Demographic and Health Surveillance Site (10,000 households; 60,000 people). Results suggest that the WHO case finding target of 70% is being met, though cases identified through active case-finding or verbal autopsies had been coughing for long periods.

A randomized, double-blind, placebo-controlled trial of prednisolone as an adjunct to treatment in HIV-positive patients with pleural tuberculosis was conducted in Kampala with colleagues from the Ugandan National Tuberculosis Treatment Centre and Case Western Reserve University, USA. The rate of resolution of TB symptoms, signs and radiological abnormalities was faster in the prednisolone group, but prednisolone had no effect on mortality and little effect on most opportunistic infections. However six cases of Kaposi's sarcoma occurred in the prednisolone group, compared with none in the placebo group. We conclude that prednisolone should not be used in the treatment of pleural tuberculosis.

#### DISEASE CONTROL & VECTOR BIOLOGY UNIT

This Unit focuses on the control of diseases that are insect-borne, water-borne or associated with poor hygiene. It houses two DFID Resource Centres: the Malaria Consortium (with the Liverpool School of Tropical Medicine) and the Resource Centre for Water and Environmental Health (WELL). The new and rapidly growing Consortium regional offices in Ghana and Uganda have helped establish the Roll Back Malaria (RBM) Partnership's Sub-Regional Network in East Africa. Other activities have included: developing a drug policy and malaria pregnancy strategy (Ghana); implementing a revised drug policy (Uganda); Global Fund proposal development (Nigeria, Uganda, Ghana); and establishing the West African Network for Monitoring Antimalarial Treatment (WANMAT II). The Consortium also contributed technical support to restructuring of the RBM Global Partnership, and to development of an RBM strategic framework on case management.

WELL and the School's new Hygiene Centre make up the Environmental Health Group (EHG), which continues its leadership role in research and operational support for hygiene promotion, water supply and sanitation. The adoption in August 2002 by the UN Johannesburg Summit of the goal to halve by the year 2015 the proportion of the world's population who lack sanitation, was an example of this leadership. Having measured the baseline in compiling the global statistics for the year 2000, EHG proposed a goal of this form to DFID who lobbied for it and briefed those leading the advocacy effort, culminating in the goal's adoption.

A major systematic review by EHG has shown that handwashing with soap can halve diarrhoeal disease risk, and may have a similar impact on acute respiratory infections in developing countries. An observational dataset has been identified to test this. This simple intervention could be effective against these principal killer diseases of young children in the developing world. EHG is also researching social marketing of low-cost sanitation, seeking ways in which those who build latrines can be supported to build a sustainable sanitation industry in developing countries.

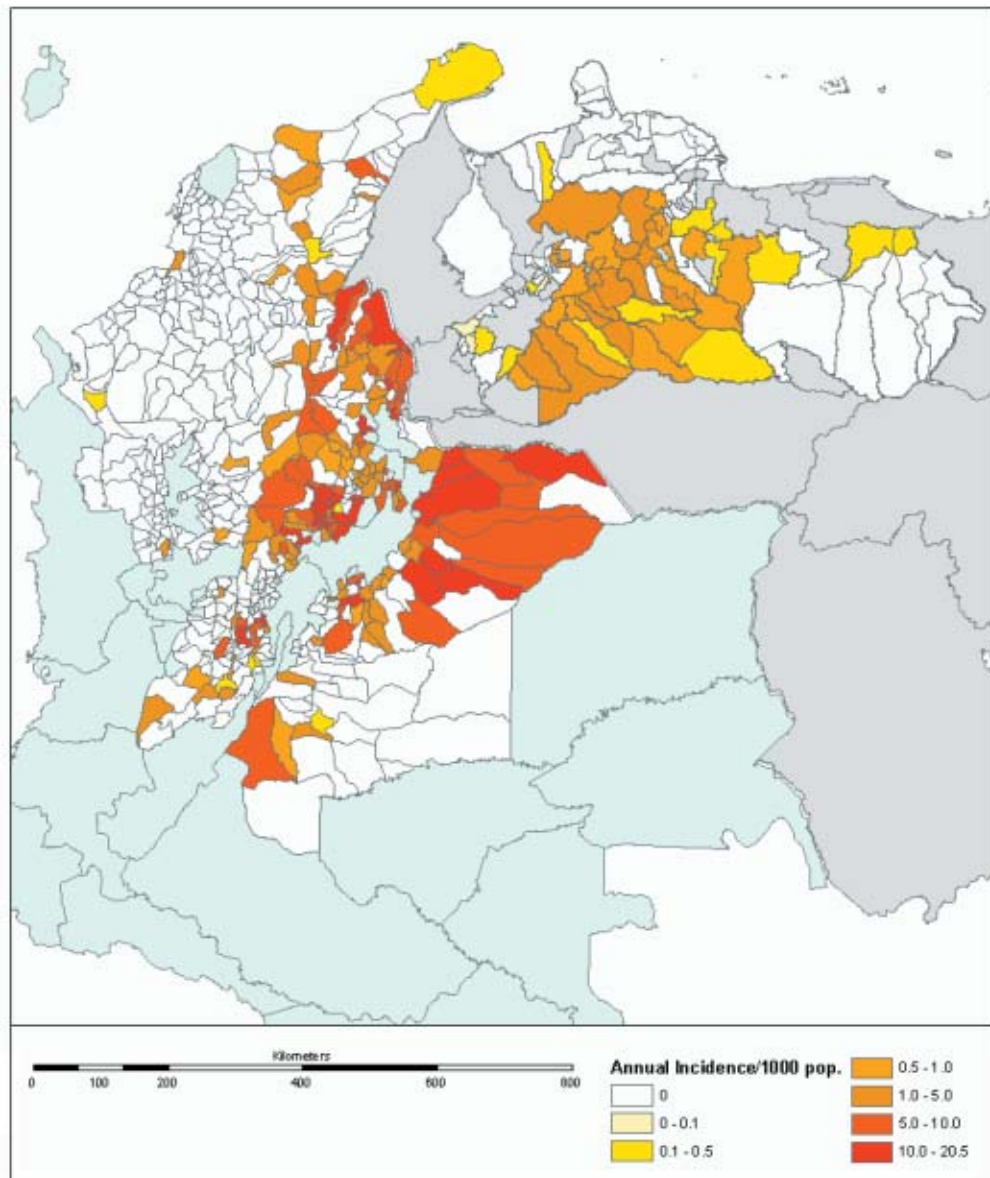
In collaboration with the Public and Environmental Health Research Unit, we have helped set







*Spatial distribution of Trypanosoma cruzi infection rates in Venezuela and Colombia fitted from age-adjusted seroprevalence data collected from national surveys*



up the new Centre for Spatial Analysis in Public Health, which consolidates School research and teaching using geographical information systems (GIS), remote sensing and spatial statistics. Unit staff are involved in a range of studies investigating disease patterns both in time and space. These include analyses of: the distribution of schistosomiasis across Africa in order to target better drug interventions (with the Gates-funded Schistosomiasis Control Initiative based at Imperial College); the distribution of Chagas disease infection rates (*see above*) and costs of interventions, to help target vector control and surveillance activities in both Colombia and Venezuela; the spatio-temporal distributions of dengue vectors and disease in Mexico, Singapore, Sri Lanka and Thailand; and the maintenance and spread of sleeping sickness in Uganda (with the Centre for Tropical Veterinary Medicine, University of Edinburgh). We are currently developing a multi-agency GIS platform in Iran for rationalizing zoonotic disease surveillance and control activities by medical and veterinary services. Spatial analytical methods are also being exploited by EHG, who have developed a new survey methodology to measure water supply and sanitation coverage at country, district or city level, which has been field tested in Kosovo, Kenya, South Africa and Laos.

Funded by the Gates Malaria Partnership (GMP) the HIMAL project is developing GIS-based surveillance/epidemic early detection systems for epidemic-prone highlands in Kenya and Uganda, and is generating predictive models based on meteorological and remote sensing data.



With GMP funding we are investigating the distribution of malaria drug resistance across Africa. Staff are developing a quantitative framework linking population genetics and economics of antimalarial drug resistance for the economic evaluation of alternative drug policies. These findings helped secure funding from WHO/RBM to conduct a cost-effectiveness analysis of artemisinin-based combination therapies. Research on combination therapy in Pakistan and Afghanistan to delay the selection of resistance has already led to a change in the WHO Eastern Mediterranean Regional Office guidelines for treatment of falciparum malaria.

The development and evaluation of new malaria vector control tools is another key Unit activity. Our MRC-funded team in Muheza, Tanzania, has shown that reductions in malaria morbidity due to insecticide-treated nets are sustainable for at least 3-4 years. In the treated-net villages pyrethroid resistance was found in bedbugs, but not in mosquitoes. Nevertheless, pyrethroid resistance in malaria vectors remains a threat to the use of treated nets. With GMP support, Unit staff are collaborating with the WHO Pesticide Evaluation Scheme and with industry to identify and evaluate alternative insecticide products for use on nets and other materials. These include novel or existing insecticides that have the potential to overcome resistance, and long-lasting net treatments that can withstand repeated washing. We are collaborating with WHO to evaluate factory-impregnated polyethylene tarpaulins for use in refugee camps and natural disasters. Field studies in Muheza have shown that a modified kerosene lamp that vaporizes mosquito repellent is affordable and acceptable to the community, and the lamp is now being tested with volatile pyrethroids and neem oil. The Unit's mosquito colonies continue to test mosquito-repellent products for manufacturers and consumer associations worldwide.

A multidisciplinary team from the Unit based at Moshi, Tanzania has been studying malaria epidemiology in a series of hill ranges. The Joint Malaria Programme/MRC collaborative project undertook wet- and dry-season cross-sectional surveys in six altitude transects to investigate the relative impact of socio-economic factors and altitude (as a proxy of transmission intensity) on the prevalence of malaria and anaemia. In highland areas, the incidence of severe malaria was lower in all age groups. As expected, the relative proportion of cerebral malaria increases with altitude, while that of severe anaemia declines.

Though focusing on developing countries, the Unit also works on UK health concerns. A clinical evaluation of head louse treatments for children found that none of the existing over-



*Joint Malaria Programme/MRC  
Office, Moshi, Tanzania*



*Asher Maroof (Research Fellow) using a recently acquired high-speed cell sorter, which allows the Department's immunologists to identify and isolate rare cell populations. See pages 41-43 for further details*



the-counter products were fully effective and the most commonly used pyrethroid-based products were effective in <1 in 5 cases. A new collaboration with Professor J Pickett (Rothamsted Research) is investigating the chemical ecology of house dust mites that trigger asthma.

#### IMMUNOLOGY UNIT

The Unit welcomed two new research fellows this year. Helena Helmbly (Wellcome Trust Career Development Fellow) is studying the immunological interactions between malaria and gastrointestinal helminths in mixed infections. Theresa Ward (Royal Society Dorothy Hodgkin Fellow) is using live-cell microscopy techniques to analyse trafficking in the secretory pathways of mammalian cells with a focus on the processes involved in B cell activation and proliferation.

Research into the mechanisms of vaccine-induced immunity against leishmania has led to the exciting discovery that natural antibodies together with complement act as endogenous adjuvants for the generation of vaccine-specific CD8<sup>+</sup> T cells. This opens new avenues for identifying vaccine candidates directly from a variety of pathogen proteomes.

Staff working on inflammation have been investigating the possible role of serum amyloid A protein (SAA), produced in the liver, in protection against infection. Recent work has tested the ability of SAA to bind to a number of pathogenic bacteria. The mechanism of interaction and how this results in control of infection is being investigated.

The malaria immunology group has further dissected the mechanisms of activation of human natural killer cells by *Plasmodium falciparum*-infected red blood cells, has demonstrated cross-talk between IL-10 and TGF- $\beta$  in the regulation of inflammatory cytokine responses to malaria, and has shown that parasite-derived enzymes are able to activate host TGF- $\beta$ . This latter observation represents a novel mechanism of parasite-mediated immunoregulation.

A collaborative programme with Johns Hopkins University, Cornell University and the Public Health Laboratory, Ivo de Carneri, Pemba Island, Zanzibar is under way in Pemba, looking at the development of specific immune responses (cytokines, acute phase proteins, antibodies) to gut worm infections in infants, the influence of such infection on the development of responses to BCG vaccination, the effect on these specific and non-specific immune responses of periodic treatment with anthelmintics, the relationship of such parameters with the development of wasting malnutrition and the 'anaemia of chronic disease' in infants.

A new study to compare immune responses induced by BCG vaccination in infants in Malawi and the UK was initiated with the Infectious Disease Epidemiology Unit (*see also page 48*). This





work extends earlier studies on BCG vaccination in adolescents and young adults in the same sites. We predict that vaccination of immunologically naïve infants in the two sites should induce similar immunity, but, with greater exposure to infections such as malaria in Malaŵi, this immunity may be lost more quickly. Other studies on tuberculosis include the analysis of CD4 and CD8 genes induced by *M.tuberculosis* using microarrays, and on the virulence of defined mutants of the bacterium.

We are also investigating cell-mediated immunity in infection with *Burkholderia pseudomallei*, with colleagues at CBDE, Porton Down and in Thailand, including the role of T cells, the cytokine IFN $\gamma$  and neutrophils.

Work on viral immunopathology in the immunocompromised host has encompassed studies of HIV2 infection in immunologically privileged sites such as the central nervous system and testicular tissue and studies of risk factors for Epstein–Barr Virus (EBV)- and SV40-associated B cell lymphoma in transplant recipients.

Studies on interactions between host immunity and chemotherapy have continued within the Drug Discovery Group. The group has been involved in industrial collaborations to identify novel inhibitors of malarial lactate dehydrogenase, and to develop an artemisinin derivative and a pyronardine-artesunate combination for malaria chemotherapy. Progress has been made in understanding the mechanism of action of the novel antiprotozoal miltefosine. Using a rational pharmaceuticals approach, topical formulations of the drugs sitamaquine and buparvaquone have been designed for the treatment of cutaneous leishmaniasis.

Studies of artemisinin-containing combination therapy for malaria have shown a marked reduction in transmission of gametocytes carrying molecular markers of resistance to the companion drug, chloroquine, but the effect is short-lived due to the emergence of drug-resistant parasites.

Investigations into the adhesion properties of developing *P. falciparum* gametocytes are identifying the parasite molecules that mediate this adhesion, determining whether gametocyte-positive malaria patients have antibodies to these putative antigens and whether such antibodies might contribute to ‘transmission-blocking’ immunity.

#### INFECTIOUS DISEASE EPIDEMIOLOGY UNIT

The Unit conducts research on the epidemiology and control of infectious diseases of public health importance. Major areas of interest are HIV and other sexually transmitted infections (STIs), tuberculosis, maternal and perinatal health and vaccine-related epidemiology. Other topics of interest include malaria, Creutzfeldt–Jakob disease (CJD) and autoimmunity. Work is carried out both in developing countries and in industrialized countries including the UK.

In Tanzania and Zimbabwe, in collaboration with various institutions, staff have been conducting randomized trials of approaches to preventing HIV infection in adolescents while in Uganda, with the MRC Programme on AIDS, Unit staff are studying HIV risk behaviour among youths in highly mobile settings in an urban slum and in a roadside town along the trans-African highway. Results from the trial in Mwanza, Tanzania are reported in the chapter *Working for Young People* (pages 33–35).

In collaboration with Mahidol University, Thailand, Unit staff conducted a randomized trial of multiple micronutrients versus placebo in HIV1 infected men and women living in and around Bangkok. Micronutrients were associated with better survival among the subgroup of individuals with CD4 counts below 200 cells per microlitre at baseline. These findings may have important public health implications in areas where access to antiretrovirals remains poor.

Staff continue to work on the epidemiology of HSV2 infection and its interaction with HIV.



*The new molecular diagnostics laboratory at the National Institute for Medical Research, Mwanza, built with a grant to the School from the Parthenon Trust to support our collaborative studies on HIV and other sexually transmitted infections*





A cross-sectional study in The Gambia found that women in polygynous marriages, or whose husbands had previous spouses, were three times more likely to be HSV2 seropositive, suggesting that much HSV2 transmission occurs within marriage. Analyses of longitudinal data from Mwanza, Tanzania, showed that, after adjusting for other factors, men who were HSV2-positive at baseline were 6 times more likely than HSV2-negative men to acquire HIV during follow-up, while men who seroconverted to HSV2 were 17 times more likely to acquire HIV. Overall, 74% of new infections in men and 22% in women could be attributed to HSV2 infection. We are now collaborating in randomized trials to determine whether HSV2 treatment interventions are effective in reducing HIV incidence.

The Karonga Prevention Study, funded primarily by the Wellcome Trust and LEPR, continues its work in Malawi on tuberculosis, leprosy, HIV and immune responses to BCG. Large case-control and multicase family studies (with the Wellcome Trust Centre for Human Genetics, Oxford) have failed to confirm many of the associations between various genes and TB and leprosy which have been reported elsewhere. Dried blood spots collected more than 20 years ago have yielded evidence (in collaboration with the University of Ireland at Maynooth) of the oldest-known type-C HIV viruses. Trials of *Mycobacterium vaccae* immunotherapy (with University College London and University Teaching Hospital, Lusaka, Zambia) failed to reveal any benefit, but cotrimoxazole prophylaxis in HIV-positive TB cases resulted in appreciable reductions in mortality, leading to recommendations for such treatment within the national tuberculosis control programme in Malawi.

In South Africa the impact of prophylactic treatment with isoniazid and cotrimoxazole among HIV-positive men was measured in gold miners. Over 2000 HIV-infected miners were recruited to a special clinic in random order, and pre-clinic and post-clinic incidence of severe disease was compared. Isoniazid was found to reduce the number of TB admissions.

In research on maternal health, a major study of near-miss audits (in-depth case reviews of women who came close to dying during pregnancy or delivery) in Ghana, Benin, Côte d'Ivoire and Morocco is almost complete. These audits document areas of concern in quality of care and promote problem-solving approaches to improve emergency obstetric care. The frequency of near-miss events is high and was a good indicator of the quality of the referral system. Unit staff have begun working with the 'Initiative for Maternal Mortality Programme Assessment' (IMMPACT), supported by an alliance of funders, including the Bill and Melinda Gates Foundation and DFID, and co-ordinated by the University of Aberdeen. Unit staff lead the IMMPACT work programmes on process indicators and outcomes after pregnancy.

Staff are involved in a number of vaccine-related studies. Fieldwork for a randomized trial of the protective efficacy against TB and leprosy of a second dose of BCG given to schoolchildren was completed in Salvador and Manaus, Brazil. In collaboration with the MRC Unit, The Gambia, and other School staff, we are involved in a large randomized trial of a conjugate pneumococcal vaccine. In Lusaka, Zambia, in collaboration with the University of Zambia and Johns Hopkins University, staff are studying the impact of HIV infection on children's immune response to measles vaccine. Unit staff and colleagues in the Department of Epidemiology and Population Health are studying the epidemiology of autism in the UK using the General Practice Research Database. 1410 children diagnosed as suffering from a Pervasive Developmental Disorder have been identified and a case-control study is investigating the role, if any, of MMR vaccination and examining other potential causes of autism. Staff are also working with the WHO Global Polio Eradication Initiative to develop plans for an emergency outbreak response in the post-certification era.

In collaboration with the Centre National de Lutte contre le Paludisme, Burkina Faso and Camerino University, Italy, Unit staff completed the analysis of a 6-year follow-up of children protected against malaria by insecticide-treated materials (ITM). No evidence was found to support the hypothesis that the initial reductions in child mortality associated with ITM are subsequently eroded by a shift in mortality to older children. In a double-blind randomized trial



conducted in five African countries, chlorproguanil–dapson was shown to be effective and safe in the treatment of children with uncomplicated falciparum malaria.

Unit staff continue to work in a number of other areas including the epidemiology of CJD with the National CJD Surveillance Unit, Edinburgh and the Communicable Disease Surveillance Centre, London and methodological work on the design and analysis of cluster randomized trials.

#### PATHOGEN MOLECULAR BIOLOGY UNIT

Research in the Unit focuses on the molecular biology and genetics of pathogens and their hosts in order to improve the understanding and control of infectious diseases. Topics being investigated include: determining the mechanisms of infection of globally important viral, bacterial and parasitic pathogens; deciphering the genetic diversity of selected disease agents in natural populations and their epidemiological impact; studying immune evasion mechanisms; exploiting parasitic, bacterial and viral pathogens as model biological systems; and developing practical applications, including improved diagnostic tests and the identification and characterization of vaccine candidates and drug targets. Selected highlights of our research follow.

A study has investigated the mechanisms of genetic exchange in the American trypanosome *Trypanosoma cruzi*. For the first time, with the aid of transfection and drug-resistance markers, it has been proved experimentally that *T. cruzi* has an extant capacity for genetic exchange. Hybrids show fusion of parental genomes, associated with allele loss and homologous recombination. There are strong genetic parallels between the experimental hybrids and natural isolates of *T. cruzi*. Furthermore, hybrid strains are common among domestic transmission cycles of *T. cruzi* in southern South America, where chronic Chagas disease is particularly severe. The discovery of multiple hybrid genotypes associated with cutaneous and mucocutaneous leishmaniasis in Peru, suggests that a similar phenomenon of genetic hybridization may occur in the *Leishmania* subgenus *Viannia*.

Researchers have identified and characterized a novel enzyme from *T. cruzi* that is involved in the detoxification of hydrogen peroxide, a by-product of aerobic processes and in the case of *T. cruzi*, drug metabolism. The enzyme is a vitamin C-dependent haemoperoxidase, and is the first example of this class of enzyme in the trypanosomatids. It is a potential drug target as humans lack a similar protein.

Unit staff studying the role of cyclic nucleotide signalling pathways in the development of the malaria parasite *Plasmodium falciparum*, have characterized two key adenylyl cyclases. These enzymes synthesize cAMP from ATP and may have been acquired by lateral gene transfer. Research on the role of cyclic nucleotide signalling pathways in the life cycle of *P. falciparum* will expedite the development of new antimalarial drugs.

Other Unit staff have found that the erythrocyte binding antigen (eba) gene family of *P. falciparum* shows diversifying selection on the sequence encoding the binding region of eba-175. The importance of acquired immune responses to these antigens is now being investigated. More recent studies on the apical membrane antigen 1 (ama1) gene showed that such analyses in different populations give highly concordant results. Mapping of antibody epitopes in the polymorphic repeat sequences of the merozoite surface protein 1 (Msp1), previously indicated to be under selection, has been carried out and construction of a polyvalent 'super repeat' antigen undertaken as a candidate component of an experimental malaria vaccine.

A study of the flanking sequences of resistance alleles of the *dhfr* and *dhps* genes in *P. falciparum* has revealed that the ancestral origins of resistance to sulphadoxine/pyrimethamine in south-east Africa are, like chloroquine, highly restricted and point to a succession of selective sweeps throughout the region of three *dhfr* resistance alleles and then subsequently one *dhps* resistance allele. The significance of these findings for the strategic management of drug resistance in any African country are considerable and demonstrate the extreme mobility of resistance within the continent. Containment of the spread of resistance



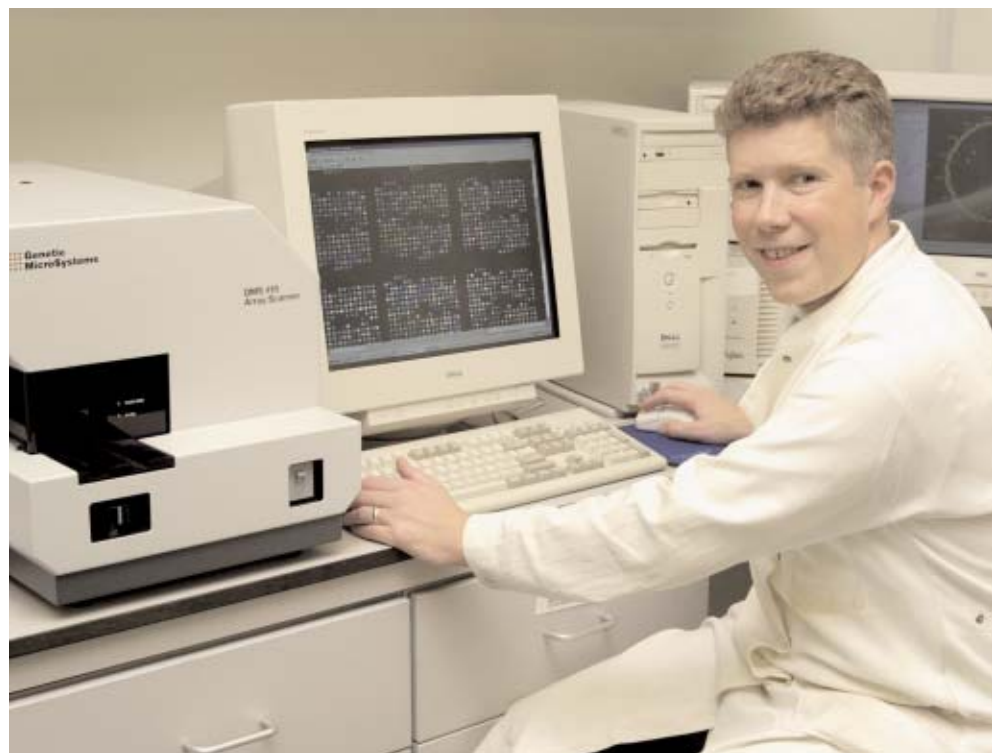


genes is potentially the key to management of resistance and a means by which the useful life of drugs in Africa might be prolonged.

Researchers have recently shown that the Blue Tongue Virus (BTV) non-structural protein NS3 forms a 'bridge' between the maturing virions and a cellular protein p11 part of the Annexin II complex (that is involved in exocytosis), directing virus to the cellular exocytic machinery. The data describe the first host-protein involvement in Orbivirus egress and provides new insights into understanding arbovirus interactions with their hosts. The data also form a platform from which further understanding of the mechanisms of non-lytic versus lytic release of BTV can be approached and may lead to understanding of the general mechanisms whereby arboviruses modulate their relative cytotoxicity. Other studies from this group have provided the first evidence of a possible RNA packaging mechanism for viruses with segmented genomes.

A serendipitous discovery has led to the discovery and subsequent characterization of human-like glycosylation machinery in the genome of the simple gut bacterium *Campylobacter jejuni*. In higher organisms glycosylated proteins are implicated in a wide range of cellular recognition events that are vital in biological processes ranging from fighting infectious disease to cancer development. Understanding the basic processes of glycosylation in a model system such as *Escherichia coli* will help the understanding of this complex process in higher organisms. The cloning of the *C.jejuni* glycosylation machinery in *E. coli* provides an unprecedented opportunity for the production of appropriately modified proteins for glycoengineering, enabling tailor-made glycoproteins to be produced with broad research, medical and industrial applications. Thus the determination of the genome sequence of a simple bacterium may prove to have enormous unexpected potential benefits.

Staff are, or have been, involved in several pathogen genome projects and with recent funding from The Wellcome Trust and the Biotechnology and Biological Sciences Research Council functional genomics initiatives, are involved in functionally dissecting *Campylobacter*, *Plasmodium* and *Trypanosoma* spp. The genome resource facility funded through the Science Research Investment Fund is now operational and has already greatly increased productivity. The interpretation and exploitation of this basic information is leading to new research on pathogenesis, epidemiology and the evolution of virulence.



*Nick Dorrell (Pathogen Molecular Biology Unit) using the microarray scanner in the Department's genome resource centre*



## DEPARTMENT OF PUBLIC HEALTH AND POLICY

Linking public health, policy and practice through research and analysis is the main thrust of this Department's work. It has the largest multidisciplinary group in Europe focused on public health, with epidemiologists, statisticians and mathematicians, economists and policy analysts working together with anthropologists, sociologists, historians, psychologists and geographers. Amongst these disciplines, the key health care professions are well represented by doctors, nurses and pharmacists.

Staff are engaged in primary and secondary research which informs both policy and practice. They collaborate with many diverse public sector organizations: municipal and government departments in the UK and other countries; international agencies such as the World Bank, European Union (EU), International Committee of the Red Cross and the World Health Organization; as well as private sector bodies, such as Oxfam, the Gates Foundation or the Royal College of Surgeons of England. Collaborations occur through scientific exchange, commissioning or sponsoring research, as well as consultancies, when staff are asked to provide specific advice. The focus is on the interface between scientific research, practice and policy, and permeates all research units in the Department, whether they are looking at current or historical concerns, or are concentrating on low-, middle- or high-income countries.

Central to all research is a concern to apply rigorously the best methodological frameworks to the research questions being asked. The multiplicity of methods utilized mirrors the great variety of research being undertaken: from qualitative interviewing of individual patients or policymakers or observations of health providers, to mathematical modelling of cost-effectiveness of interventions, or assessments of appropriate use and cost of health technologies, among many others. One group has used an epidemiological mathematical model to highlight the substantial public health impact of introducing microbicides – a product that is being tested for use by women to protect against HIV infection.

### WHAT HAS HAPPENED DURING THE YEAR?

Research currently involves studies in developed and developing countries. Among new awards this year, one study, supported by the governments of Denmark, Ireland, the Netherlands and the UK, is exploring the early stages of the Global Fund to Fight AIDS, Tuberculosis and Malaria. Working with national collaborators in four countries in Africa, the research will provide insights to, and learn lessons from, the application and co-ordination processes that countries have to put in place to receive funds to address these three diseases. An economic evaluation of the introduction of anti-retroviral therapy in mining workplaces has started in South Africa, with funding from Aurum Health Research, and modelling microbicides for future policy is being funded by Path and USAID. In the UK, the Royal College of Surgeons of England is continuing to support epidemiological research into the quality of care of surgical services. One of the studies is on outcomes after total hip replacement, comparing outcomes with different prostheses, different surgeons, and how often hip replacements last for the remaining lifespan of the patient. The Department of Health is funding follow-up research on hospital-acquired infections, estimating the cost-effectiveness of faster testing of cases admitted for hip and knee replacements, and another study of the inter-relationship between outdoor pollution, infant mortality and adverse birth outcomes. Other climate-related work, supported by the Colt Foundation, is looking at temperature-related mortality in Delhi and Cape Town.

The public health effects of conflict, violence and injury are increasingly recognized, and the Department is one of the few in public health conducting national and international research on violence and health. Staff are making a major contribution to a WHO multi-country study on women's health and domestic violence, and studying the health needs of women who have been trafficked. Work is proceeding with WHO to prepare guidelines for community surveys of injuries, written good-practice guidelines for violence prevention and guidelines on the ethical conduct of research on gender violence. Researchers have also been engaged in some of the most



*Colin Sanderson (Research Degrees Director)*







troubled areas of the world such as the Democratic Republic of Congo and Afghanistan collaborating on programmes to provide assessment and support to reconstruction of health sectors, and are increasingly exploring the links between health, foreign policy and security.

As is clear from the diverse research being undertaken in the Department, making the link between research and the wider public is an important activity. Among many other events, a highly successful conference was held last December, fifty years after the 1952 Great Smog of London. Organized by the environmental epidemiology and history groups, it attracted a great deal of media interest (*see page 48*). Work based on globalization and trans-national tobacco companies was presented at the World Conference on Tobacco or Health, held in Helsinki, and a photographic exhibition entitled 'Fashion and Smoking' was organized for 'World No Tobacco Day' in May. Two new books<sup>1</sup> on the impact of European Union law and health policy have influenced the debate on the future of health care systems in the European Union. The Belgian Social Affairs Minister said these books were '... not just pioneering work on a very large issue: their analytical approach to social issues is innovative'.

There have been some changes in the Department: Gill Walt took over as head of department while Nick Black went on well-deserved study leave. Nick Mays joined as a new Professor of Health Policy, having been adviser on health in the New Zealand Treasury. The Public and Environmental Health Research Unit was formed, led by Paul Wilkinson. Kaye Wellings was appointed to a chair in Sexual and Reproductive Health and Donna Lamping was appointed Reader in Psychology. This year also saw the creation of the Centre for History in Public Health, established to strengthen formal links with scientists as well as to consolidate the practice of contemporary history of public health matters.



*Gill Walt has succeeded Nick Black as Head, Department of Public Health and Policy*



*Ruairi Brugha (Head, Health Policy Unit)*

#### HEALTH POLICY UNIT

The Unit is a multidisciplinary research unit emphasizing public health and social science approaches to the study of health policy. It houses two DFID Knowledge Programmes, on Health Economics and Financing and Health Systems Development, and is the home of social scientists working on other DFID knowledge programmes on TB and HIV/AIDS, and in the Gates Malaria Programme. There are also active interests in infectious disease policy, public-private partnerships and violence and public health.

In 2002, the Unit was awarded a School Initiative Fund grant to consolidate and develop work further in the field of public-private partnerships (PPPs). One study examined the organizational features of a sample of 18 prominent global PPPs. These partnerships were embedded in multilateral and non-governmental organizations, as well as established as legally independent organizations. The hosting arrangements were found to have implications for: the composition

<sup>1</sup>McKee M, Mossialos E, Baeten R (eds) *The impact of EU law on health care systems*. Brussels: Peter Lang, 2002  
Mossialos E, McKee M, *EU law and the social character of health care*. Brussels: Peter Lang, 2002



and authority of governing bodies; oversight mechanisms including audits; secretariat staff accountability; and the industries, commercial firms and activities which were deemed 'acceptable' as partners and for partnership. The study also revealed, among other things, that the governing bodies of many of the embedded partnerships lack substantial authority and do not provide the means for joint decision-making involving both public and private partners, while poor representation of the South is common across most initiatives.

The Health Systems Development knowledge programme was launched in April 2001 and is a partnership with the University of Manchester, the Centre for Health Policy, University of Witwatersrand, the Institute of Public Health, Makerere University, the Policy Research Unit in the Ministry of Health and Family Welfare, Bangladesh and Moscow Medical Academy.

This year, several important pieces of work began. Situation analyses have been completed in relation to the health systems dimensions of maternal health in four partner countries. The gaps in existing knowledge identified have formed the basis of two new research projects which are under way. The first seeks to understand the construction of midwifery practice through an ethnographic, participant observation approach in South Africa. The second seeks to understand the constraints to accessing maternal health care from the perspective of an understanding of the networks implicated in women's decision-making in Uganda and Bangladesh.



Human resources has emerged as a main theme in the Programme as well as in the Health Economics and Financing Programme. Funding for a project comparing impacts of reform on human resources issues in Bangladesh and Uganda was secured from the Alliance for Health Policy and Systems Research and work has begun. Programme members are also drafting a chapter on human resources for the revision of the book *Disease Control Priorities in Developing Countries*, published in 1993, which is a multilaterally supported effort involving the Gates Foundation and the World Bank among others, and the Health Economics and Financing Programme as one of the two major academic collaborators.

Another new theme emerging is that of primary care reform, with projects planned or under way both in Russia and Cameroon. In Russia, models of primary care will be compared with the UK, to seek to understand better the constraints to the implementation of the general practice model in Russia. In Cameroon, the project, funded by the EU, will focus on contracts between districts and primary care providers, and their impact on health worker motivation and performance. This provides a useful bridge between the primary care reform and human resources themes within the Programme.

*In post-conflict Afghanistan the Health Policy Unit's Conflict and Health programme is supporting the Ministry of Health in the development of a health system that will address the needs of both women and men*





*A typical private medical clinic  
in Pune, India*



Under the auspices of the DFID TB Knowledge Programme, anthropological research is examining constraints and innovations in the local TB control programmes in Pune, India, from the administrative, provider and patients' perspectives. Work continues in exploring decision-making in the delivery of services for the management of HIV patients in Pune's highly diverse and unregulated private medical sector.

*Martin McKee (Professor of  
European Public Health) was  
awarded the 2003 Andrija  
Stampar Medal of the Association  
of Schools of Public Health in  
recognition of his contributions to  
European public health*

The HIV Tools research group has been working on the impact and cost-effectiveness of HIV prevention activities. In Bangladesh, research has shown how early intervention among injecting drug users and sex workers can prevent an explosive HIV epidemic, and how the cost-effectiveness of these interventions changes over time. The findings were presented to key players at the World Bank in Dhaka, and used in training programme managers and planners. As well as evaluation of specific interventions, mathematical and economic modelling is being used to explore the scaling-up of the response to the HIV epidemic and the impact of new technologies for HIV and STI preventions such as vaccines, microbicides and rapid tests for diagnosing sexually transmitted infections.

#### HEALTH SERVICES RESEARCH UNIT

This Unit aims to provide research evidence that will lead to improvements in the quality of health services, largely through better decision-making and organization. Studies range in scope from epidemiological and economic assessments of specific health technologies, through sociological studies of approaches to providing care, to the evaluation of health sector reforms.

The Unit includes the Department of Health's National Centre for Health Outcomes Development, the NHS Co-ordinating Centre for Service Delivery and Organisation Research & Development (*see pages 36-37*), the Centre for Policy in Nursing Research, the European Centre on Health of Societies in Transition (ECOHST), the Collaborative Centre for Economics of Infectious Diseases, the Royal College of Surgeons of England's Clinical Effectiveness Unit; and hosts part of the European Observatory on Health Care Systems.

#### Economics of infectious disease

A systematic review of interventions to prevent and control methicillin-resistant *Staphylococcus aureus* (MRSA) in hospitals using screening and isolation wards has been completed. Advice has been given on aspects of hospital-acquired infection to a variety of bodies including the National Audit Office, Department of Health and the Belgian government on hepatitis C. A new study on faster testing for MRSA is beginning, and work on TB and leprosy in Brazil is being completed.





### Health Technology Assessment

Evaluations of the effectiveness, appropriateness and cost of health technologies include how best to manage patients with chronic obstructive pulmonary disease or asthma requiring critical care because of acute respiratory failure. The cost-utility of photo-dynamic therapy for people with age-related macular degeneration, the commonest cause of blindness in the UK, is also being evaluated.

### Quality improvement

The Clinical Effectiveness Unit at the Royal College of Surgeons analyses variations in treatment practices in relation to health outcomes, e.g. national audits of liver and heart and lung transplantation, sub-arachnoid haemorrhage and tonsillectomy. The national directory of clinical databases ([www.lshtm.ac.uk/docdat](http://www.lshtm.ac.uk/docdat)) provides a rich source for methodological projects, both with respect to quality improvement and health technology assessment.

### Health and health systems in transition

ECOHST's work spans the range of health determinants in the former communist countries of central and eastern Europe and the former Soviet Union. Analysis of the health consequences of fruit and vegetable consumption was provided for the current WHO study on the global burden of disease. Work on the international tobacco industry continues to expose the tactics and covert influence on governments used to penetrate these new markets. Research in Russia and Ukraine to understand better the transmission of diseases such as HIV and TB is helping to define the policy responses necessary to combat them. New research will produce a major report on health in south-east Europe, and is being undertaken in collaboration with the Open Society Institute, DFID and UNICEF.

### Outcome measures

Studies to validate new measures of quality of life across a wide range of conditions – cardiac, intensive care, and sino-nasal surgery patients – have been undertaken in the UK. New work continues on measuring outcomes in difficult-to-assess populations and measurement scales. The impact of variations in nurse staffing upon patient outcomes is continuing through the Centre for Policy in Nursing Research. One of the products from research is a compendium of patient-related measures in surgery for internet dissemination. Outcome measures are also being used to evaluate alternative models of care and improve service delivery and organization.

### Service delivery and organization

Research in this area examines how services are delivered and organized for different conditions, user groups, or health care sectors. A current focus is on the concept of organizational 'turnaround' in health care organizations. This study aims to understand why organizations become identified as 'failing' and the lessons that can be drawn from the experience of changing their management. We are studying the implementation of electronic patient records (EPRs) in the NHS to evaluate the impact on costs, hospital staff and patients when EPRs are introduced.

### Science: policy interface

A policy analysis model for coronary heart disease is being designed for the Department of Health in collaboration with the Universities of Southampton and Birmingham. Our part of the model simulates risk factor changes and the development of coronary heart disease in a population, and the benefits and direct costs of different primary prevention strategies.

### PUBLIC AND ENVIRONMENTAL HEALTH RESEARCH UNIT

An exciting development for the Department was the formation, on 1 August 2003, of the Public and Environmental Health Research Unit, bringing together the former Environmental Epidemiology Unit, the Health Promotion Research Unit and the Globalization Programme of the Health Policy Unit. The new Unit has programmes on environment and health; ethics, public health and human rights; globalization and health; health impact and decision analysis; health promotion; history and health; reproductive and sexual health; and social medicine.

Over the year, environment and health research has included work relating to each of the



*Paul Wilkinson (Head, Public and Environmental Health Research Unit)*





A mind map of environment and health issues by students from Eastbury School, Barking, who gained work experience in the Public and Environmental Health Research Unit



'elemental forces': *earth* (projects on pesticides, landfill sites, food), *air* (ambient and indoor pollution), *fire* (climate change) and *water* (arsenic contamination of drinking water). Climate research has focused on housing in relation to the health impacts of low temperature and on adaptation to climate change. The recently-completed ISOTHURM project compared associations of temperature with mortality in twelve low- and middle-income cities. Almost all cities showed clear adverse effects of both high and low temperatures suggesting potential vulnerability to future climate change. Research on environmental health policy and perceptions of environmental health risks has included two recent studies, one in East London and one in several developing countries, which focus on the perspectives of children – an affected but often unconsulted constituency.

In the area of health impact and decision analysis, work continues on developing a rigorous mathematical framework for the stochastic evaluation of policy options, particularly non-health sector interventions, from a health impact perspective. Initial applications of the framework involve the decision modelling of the government's Warm Front initiative and of policy options at varying levels of determination (socioeconomic, cognitive, behavioural and health service) in relation to childhood obesity. Other activities involve the pursuit of conceptual issues in evidence processing for stochastic Bayesian cost-effectiveness analysis and the development of user-friendly web-based programs in the areas of probability evaluation and training on the one hand and preference elicitation on the other.

The 'International Programme for Ethics, Public Health and Human Rights' has further developed over the last year, and now has a new website ([www.lshtm.ac.uk/pebrulipeph/home.html](http://www.lshtm.ac.uk/pebrulipeph/home.html)). Research areas of interest have included the environment and ethics, mental health policy and human rights, and HIV and ethics. Work on research ethics has involved collaborative project development with South Africa, Egypt and Sri Lanka.





The study of internal tobacco industry documents continues to highlight the globalization of the tobacco industry. Analyses of Kenya, south-east Asia and former Soviet Union are well under way, with further work developing on East Africa, the Middle East, China/Hong Kong, India and the European Union. Research on health, foreign policy and security has been initiated in collaboration with The Nuffield Trust and University of Wales, Aberystwyth. The completion of a literature review is being followed up by wide-ranging empirical research aimed at informing emerging policy debates on public health security. A review of the links between globalization and infectious disease has been completed for WHO.

The health promotion group has built on its established record in the critical evaluation of health promotion and other public health interventions, extending its research in the fields of sexual health, physical activity, tobacco control and the social and economic implications of screening for familial hypercholesterolaemia. Participation continues, through the health informatics group, in the development of a global database of evidence for the effectiveness of health promotion, with partners worldwide, in collaboration with St John's College, Bangalore.

The history group started work on a Wellcome Trust-funded three-year project on gynaecological cancer and public health. Another Wellcome University Award at Senior Lecturer level will support research on the pre- and post-NHS health service and the relationships with voluntarism. Members helped organize the School conference and witness seminar commemorating the 1952 London smog (*see page 48*).

The reproductive and sexual health group has continued analysing *Natsal 2000* (National Survey of Sexual Attitudes and Lifestyles), in collaboration with Natcen and University College London. The group's evaluation work continues apace: that on the government's Teenage Pregnancy Strategy is in its third year; evaluation of the Welsh condom initiative is under way; and the roll-out of the pilot scheme introducing disinfectant tablets into British prisons for the purpose of preventing HIV transmission through injecting drug use will begin shortly. Other projects include measurement of the prevalence of unplanned pregnancy, a study of long-term contraception and the development of a sexual health communication tool for use in general practice.



## WORKING WITH THE DEPARTMENT FOR INTERNATIONAL DEVELOPMENT



The Department for International Development (DFID) is the UK Government department responsible for promoting sustainable development and reducing poverty. Though its work is concentrated in the poorest countries of sub-Saharan Africa and Asia, it also contributes to poverty reduction and sustainable development in middle-income countries, including those in Latin America and Eastern Europe. The School has worked closely for many years with the Department and its predecessor, the Overseas Development Administration.

DFID supports seven groups of researchers in the School. These are the Knowledge Programmes in: Sexual and Reproductive Health Policy and Practice; HIV Disease, AIDS and Sexually Transmitted Infections in Developing Countries; Tuberculosis; Effective Services, Effective Policies for Safe Motherhood; Health Economics and Financing; Health Systems Development; and Malaria. These Programmes carry out research designed to have a relatively prompt influence on public health policy and practice in developing countries. Their aim is to contribute to DFID's goals: poverty reduction, reducing the burden of disease among the world's poorest people and most vulnerable groups, and achieving the Millennium Development Goals. In some cases, the research concerns the function of public health systems in poor countries, while in others it focuses on novel interventions, generating the technical and operational knowledge needed for large-scale implementation. The work is typically collaborative and multidisciplinary, involving research institutions and public health staff at district and/or national levels. It is often designed in close consultation with WHO and other international agencies and much of the work is carried out in consultation with DFID's health advisers. Its quality and output is assessed by DFID primarily in terms of demonstrable impact on policy and practice and, to a lesser extent, in terms of publications in the formal scientific literature. The following paragraphs summarize selected studies from the work of the programmes.

### HIV/AIDS

The HIV/AIDS Programme has been working with the Tanzanian National Institute of Medical Research and the African Medical and Research Foundation (AMREF), to conduct a rigorous evaluation of an innovative package of adolescent sexual and reproductive health interventions. Implemented by AMREF with funding from various donors including DFID, it included in-school sexual and reproductive health education, promotion of youth-friendly reproductive health services, condom promotion and distribution, and support for community-based activities. Twenty communities, including 121 schools, were selected for the trial and were randomly divided into two groups of ten. The package of interventions was introduced into one group of ten at the start of the trial (January 1999), and it is hoped that the other group (and all other communities in the four project districts) will receive the intervention in 2004. Evaluation showed that the interventions had a substantial and statistically significant impact on adolescents' knowledge and reported attitudes, and on reported condom use. However, there was no significant impact on pregnancy rates, nor on HIV or other sexually transmitted infections (STIs). This may be because (a) improved knowledge did not translate into changes in actual behaviour; (b) interventions of this kind need more time for their impact to be detectable; or (c) other additional interventions are needed for short-term impact on biological outcomes. These results emphasize the importance of including biological outcomes in future evaluations, as well as identifying further effective ways to prevent HIV, STIs and unwanted pregnancies in adolescents.

### SEXUAL AND REPRODUCTIVE HEALTH

Most studies in sub-Saharan Africa have found strong resistance to condom use within marriage to protect against HIV infection and unintended pregnancy, partly because of its association with illicit sex. However, in Kwa-Zulu Natal, this is changing. A study by the Sexual and Reproductive Health Programme has shown that about 10% of rural couples reported condom use and this figure rises to 30% in urban areas. From a family planning viewpoint, switching from highly effective contraceptives, such as the pill, to less-effective condoms raises fears that



the rate of unintended pregnancies and unsafe abortions may rise. However analysis of data from 16 national surveys suggests that these fears are largely unfounded. Since the vast majority of unintended pregnancies in developing countries are the direct result of non-use of any method of contraception, switching from pills to condoms would have trivial reproductive consequences.

## TUBERCULOSIS

The Tuberculosis programme links anthropological studies on the stigma surrounding TB and HIV; molecular genetic studies of different strains of *Mycobacterium tuberculosis*; health policy studies of how the international standard for TB control (the DOTS strategy) is interpreted and transferred to national and district public health programmes; and cluster randomized trials of improved care for TB and HIV in industrial settings. In Lusaka, rates of tuberculosis are now over 1000/100,000 population/year in several of the high-density residential areas (compared to 12/100,000/year in the UK). Programme staff have been unravelling the diagnostic pathways to reach tuberculosis treatment. New technologies, using either nucleic acid amplification or mycobacteriophage technology, have proved to have disappointingly low sensitivity and the strongest determinants of delay in seeking care in the public sector turn out to relate to poor patient perception of care. As a result of these studies, the District Health Management Team



(DHMT) has established an Action Research Unit, supported by the Programme, that will use the results to generate interventions to improve access to diagnosis and carry out further research to identify bottlenecks in urban tuberculosis control. The DHMT has also taken over the ProTEST project, one of several pilot projects in Zambia, Malawi and South Africa supported by the Programme as part of a WHO-supported ProTEST initiative. These projects encourage HIV testing and counselling as part of a more comprehensive approach to tackling the combined burden of TB and HIV. More than 140,000 people chose to be tested for HIV over the 2-3 years of the projects. Experience generated through these operational research projects has been incorporated into wider plans for expansion of joint TB and HIV activities included in proposals submitted to the Global Fund against AIDS, Tuberculosis and Malaria for all three countries. Lessons learned have been incorporated into the new Strategic Framework for Tuberculosis and HIV released by WHO and UNAIDS and provide insight into approaches to delivering comprehensive care for HIV and TB in resource-poor settings that will help to guide the scaling up of antiretroviral treatment.

## MATERNAL HEALTH

Clinical audits provide obstetricians and midwives with mechanisms for reviewing systematically the quality of the care they give and finding solutions for deficiencies. Whilst there are a number of different audit methods successfully tested in maternal health, to succeed in routine practice audits must be applied in a 'supportive' health services environment. The Maternal Health

*Staff from the School's DFID-funded TB Knowledge Programme at the Stop TB Press Conference for World TB Day, 24 March 2003. From left: Hamidou Traore (Pathogen Molecular Biology Unit (PMBU)), Peter Godfrey-Faussett (Clinical Research Unit), Clara Mbwili (Lusaka Urban District Health Management Team), Dr Jong-Wook Lee (Director-General, WHO) and Ruth McNerney (PMBU)*





Programme has gained considerable expertise in conducting maternal near-miss case reviews (one form of clinical audits), through the DFID/EU-funded Near-miss Audit Project in West Africa. This multi-country project showed that audits were feasible and acceptable and that the main factor behind long delays between admission and treatment time was the absence of clear hospital policy towards ensuring prompt and adequate emergency obstetric care. Clinical audits have now become one of the most important strategies promoted by WHO to reduce maternal mortality and many countries have expressed great enthusiasm for audit implementation. Experience with obstetric audits remains scant however, and the DFID maternal health programme is collaborating with WHO to support the effective implementation of the audit approaches promoted in their guidelines.

#### VITAMIN A AND MATERNAL HEALTH

The School's Public Health Intervention Research Unit and the Maternal Health Programme have been working in Ghana, with the Kintampo Health Research Centre, on a DFID-commissioned study in partnership with USAID. Through a large-scale, randomized double-blind placebo controlled trial it is investigating the benefits of regular weekly low-dose vitamin A supplementation, provided to women of childbearing age. The study involves more than 100,000 women aged 15-45, from four contiguous districts in central Ghana. Weekly vitamin A/placebo supplementation is delivered through regular 4-weekly follow-up visits, and is supported by a range of IEC (information, education and communication) activities promoting capsule taking. The impact on pregnancy outcome and maternal mortality will be measured. Results from the trial will help to assess the role of vitamin A in the Safe Motherhood Initiative. If successful, it will confirm the potential of a promising new intervention for reducing maternal mortality, in Ghana and worldwide.

#### HEALTH ECONOMICS AND FINANCING

The Health Economics and Financing Programme has been estimating the human resources needed to achieve the Millennium Development Goals (MDGs). By endorsing these goals, the international community has committed itself to significant improvements in the health of the poor. Until now, international attention has focused on the financial resources that will be needed, including those needed for 'scaling up' of some key interventions. Human resources, however, may be an even more significant constraint. In recognition of this, DFID has funded the Programme to study the human resource implications of expanding coverage of priority health interventions in Tanzania and Chad, comparing human resource requirements at current (2002) and expanded (2015) coverage levels with current and future human resource availability. The study estimated that in 2015, there would be a shortage of 62,580 FTE (full-time equivalent) health workers in Tanzania and 15,390 in Chad, making it very clear that the health workforce in Tanzania and Chad – and probably in many other sub-Saharan countries as well – is grossly insufficient for the expansion of health care needed to attain the MDGs. An immediate response at both national and international levels is required to ensure progress towards the MDGs, especially given the likely losses from AIDS of qualified staff in many of these countries.

The Programme has also been evaluating contracts for primary care in South Africa, working with research centres in the Universities of Johannesburg and Cape Town. Through a DFID-funded project, valuable information has been obtained on the advantages and disadvantages of contracting out primary care services to private providers, and lessons learned on contract design and monitoring. Services delivered under actual contracts and existing private sector arrangements that might be contracted by the government in the future were evaluated. The researchers presented their results to the Department of Health Management Group and included their findings on commercial clinic chains. They offer low-cost, fixed fee, one-stop primary care, with diagnosis and treatment guided by computerized treatment protocols, and are highly popular with users despite very low clinical and drug costs. These clinic chains demonstrate to the public sector that highly acceptable care can be provided at low cost. They also offer the possibility of being contracted to serve state patients, though it remains to be seen both whether these companies are willing to open clinics in underserved areas, and how they would cope with the greater demands of delivering services to the poorest sections of the population.



## HEALTH SYSTEMS DEVELOPMENT

The Health Systems Development Programme uses ‘probes’ which seek to understand health system functioning from the perspective of a specific condition or service. One of these is maternal health, and the Programme is undertaking a range of projects in Uganda, Bangladesh, South Africa and Russia which focus on the health systems dimensions of maternal health services. Programme staff are also collaborating with the Institute of Public Health, Makerere University and the Health Economics Unit, Ministry of Health and Family Welfare in Bangladesh on research which seeks to understand how poor women overcome the barriers to use of skilled attendance at delivery. While most existing research on this subject focuses on the characteristics of individuals who do and do not use services, this study tries instead to understand the community-level factors that constrain and enable access. Women are being interviewed about the community-level influences on their decision making. In South Africa, there is good access to skilled delivery, but problems have been identified in quality of care, in particular in relation to inter-personal relationships between midwives and mothers. Programme staff are working in the Centre for Health Policy, Witwatersrand University to conduct ethnographic research, following midwives over time in order to understand the broader influences on their practice. This has shown that in some cases the change of management accompanying reform measures is resented by midwives, and patients may bear the brunt of their resulting discontent. The Programme is also collaborating with Moscow Medical Academy and Manchester University on this programme of research.

## MALARIA

The MDGs will not be achieved in Africa unless there is greatly improved control of malaria, which remains the most important killer of young children in this region, and is a major cause of disease among pregnant women. Insecticide-treated nets (ITNs) are a very effective means of preventing child mortality due to malaria, but coverage remains low, despite rapidly increasing international investment. The Programme has been collating the lessons of operational experience in local and national ITN programmes, and has been involved, with other Roll Back Malaria (RBM) Partners, in a consensus-building exercise which led to RBM’s ‘Strategic Framework for scaling up treated net coverage in Africa’. Part of the debate on alternative approaches to ITN implementation concerns the role played by the private sector. There is much interest in the delivery of subsidies through the use of vouchers given to pregnant women in antenatal clinics, and exchanged for a treated net in local shops and markets. If such a system can be made to work on the large scale, it would have many advantages. Subsidies would be targeted to those most at risk (pregnant women and young children), public health systems would not have to procure and handle a bulky commodity, commercial markets in nets and insecticide would be stimulated, not suppressed, and the recipient of the voucher would be able to choose her own net. The Programme has been working with DFID and USAID in Ghana on the introduction of such a voucher system and will be particularly involved in designing and overseeing the monitoring and evaluation of the scheme.

Also in Ghana, and with DFID support, the Programme has been conducting a major trial of another highly promising anti-malaria intervention for reducing child mortality in Africa – the Intermittent Presumptive Treatment for Infants (IPTi). Results of early trials are extremely encouraging, and although our knowledge remains limited, there has already been pressure from agencies such as UNICEF for large-scale routine implementation. The Ghana trial, which is being carried out with the Navrongo Health Research Centre, will be the first to report the impact of this intervention on overall child mortality. Programme staff have also played an active role in the creation of the ‘IPTi Consortium’, an international network of researchers that will conduct, with support from the Bill and Melinda Gates Foundation, a further series of large-scale effectiveness trials. The Consortium hopes to generate, as quickly as possible, the technical knowledge needed for large-scale implementation.





## WORKING FOR YOUNG PEOPLE

In today's society, the images portrayed of young people are frequently negative. A more positive view, even in the face of difficult circumstances, emerges in the selection of the School's research in this flourishing area described here. This involves adolescent populations and a relatively neglected group, school-age children, and includes research conducted *by* school children with School staff.

### AIDS AND ORPHANS

By the end of this decade, 25 million children are expected to have lost one or both parents to AIDS. Millions more will be caring for sick parents or guardians and younger siblings, often dropping out of school or turning to the streets for work. There are warning signs that such children affected by AIDS are among the most vulnerable to HIV infection, yet links between orphanhood and HIV risk in adolescents are not well understood. Researchers in the Infectious Disease Epidemiology Unit are working with UNICEF and the Community Child Care Project of Highfield, a high-density area of Harare, Zimbabwe, to explore the sexual health risks to children affected by AIDS. A large community-based study combined with qualitative research is being planned to understand how orphanhood and other effects of AIDS influence the circumstances, behaviours and HIV and STI risk of adolescent girls. It is hoped the study will identify protective measures that can halt the cycle of HIV infection within families.



*Caring for young orphans in Highfield, Zimbabwe. Members of Young Hurricane Women – a club for teenage girls affected by AIDS – advise and participate in the Highfield Adolescent Project*

### SEXUAL AND REPRODUCTIVE HEALTH

*MEMA kwa Vijana* ('Good Things for Young People' in Swahili) is a collaboration between staff in the Infectious Disease Epidemiology and Clinical Research Units and AMREF, the Tanzanian National Institute for Medical Research, and the Government of Tanzania, with support from the European Commission, Development Cooperation Ireland, the MRC, UNAIDS, and DFID. Since January 1999, an innovative package of adolescent sexual and reproductive health interventions has been implemented in 62 primary schools, 18 health facilities, and their 60 surrounding villages.

The intervention was implemented as a randomized controlled trial and had four major components: in-school sexual and reproductive health education; youth-friendly reproductive health services; community-based condom promotion and distribution; and community activities. Detailed process evaluation showed that the interventions were implemented well, with excellent coverage and high quality.



*MEMA kwa Vijana Intervention Team in Tanzania. Class peer educators perform a dramadance to the rest of the school*



The impact evaluation involved almost 10,000 adolescents who were followed up over three years. The results showed that there had been a substantial improvement in knowledge and reported attitudes related to sexual and reproductive health in both males and females. This was confirmed in an independent reproductive health test administered to Year 7 school students. Reported sexual behaviour had also improved, especially among males, with greater reported use of condoms among those who reported having had sex, and fewer intervention participants reporting sexual debut during the follow-up period. However, there was no consistent impact on the biological outcomes: HIV, herpes simplex virus type 2, syphilis, gonorrhoea, chlamydia, trichomonas and pregnancy.

With these positive results, funding is being sought to expand the interventions to all schools, health facilities and communities throughout the four project districts, with detailed operations research to understand how to expand and integrate such a pilot programme into routine government systems, and also to conduct a further survey of the key project outcomes among 15-24 year olds in the communities in 2005-06.

### PROMOTING HEALTH

Successful health promotion depends on many factors including appropriate communication and understanding attitudes and practices. Staff in the Centre for Population Studies (CPS) found in Mexico that interventions intended to improve sexual health may instead inadvertently reinforce communication barriers, not only by failing to address the social pressures that exacerbate gendered communication but also, more insidiously, by using language that actively contributes to these pressures. In research carried out with CEDPA (Centre for Development and Population Activities) and its local partners in Mali, CPS staff found that young people stated that they were wary of using either the Pill or injectable contraceptives because they believed they would leave them sterile. Unmarried women's contraceptive decision-making was not primarily driven by contemporary needs to limit fertility, but rather by future needs to maximize it, so as to gain status (through child-bearing) in their marital households. Findings revealed that menstrual disruption (in the form of amenorrhea or prolonged bleeding) appeared to have dire repercussions comprising accusations of witchcraft and immoral behaviour that could result in a woman being divorced or in her acquiring a co-wife. The social consequences of side effects were perceived to be more important than their biological manifestations, and together with the fear of sterility, resulted in the condom being the preferred method of protection.

### SCHOOL CHILDREN

Young Lives is an innovative international study of childhood poverty in Ethiopia, India, Peru and Vietnam (Website: [www.younglives.org.uk](http://www.younglives.org.uk)). Phase 1 included information collected in each country on approximately 1000 eight-year old children, their families, the communities in which they live and the policy environment at national and local level. The data include a core set of child welfare indicators and their determinants in all countries, and country-specific issues identified by researchers, government, policymakers and other key stakeholders in each country. In addition to wide-ranging information provided by the caretaker, the children were interviewed directly about aspirations, perceptions of quality of life, social relations, study, work, health, numeracy and literacy. They also completed a cognitive development test and were weighed and measured. One use of these data will be to provide international comparisons on this relatively neglected age group and preliminary results suggest there are many fruitful avenues to explore. These include investigation of children's health in relation to their schooling, work and home environment. The first phase of *Young Lives* was funded by DFID and partners include academic institutions and Save the Children UK in the four countries, the UK and South Africa. The value of longitudinal studies is increasingly recognized and it is hoped that further funding will enable follow-up of these eight-year old children as well as the main cohorts of 2000 one-year olds in each country.

In London, transport policies affect health and proposed transport changes will change health impacts. Often, however, key groups affected by health problems related to transport, such as children, are excluded from discussions of the issues. Researchers in the Public and







*Young people from Eastbury School, Barking, with Carolyn Stephens (2nd from right,) who undertook work experience this year in LSHTM*

Environmental Health Research Unit are piloting the development of community-led analysis of transport and health problems and solutions in London. This research includes working with over 50 children in three London schools. Workshops with the children from these schools identified road traffic accidents as a key theme and they requested an analysis of who (vehicle type and from where) was involved in such accidents with children – data that had never been released until now for such an analysis. Staff are producing these analyses and the children are working with them to interpret the results and produce posters and feedback sessions for their local community and council. The children have been so enthused by the project that several came to the School for their week's work experience in July 2002 (*see also page 27*). They carried out short projects including web page design and reviewing literature on mosquitoes and disease.



## WORKING WITH THE NATIONAL HEALTH SERVICE

The School contributes to, and works in close collaboration with, agencies and organizations from the NHS as part of its tripartite mission of research, teaching and consultancy. This rewarding relationship takes many forms, ranging from research programmes, projects, consultancy and clinical work, to training and educational programmes. Clinical connections continue through infectious and tropical diseases facilities at UCL Hospitals NHS Trust. Funding to support the School's management of research programmes such as NHS Service Delivery and Organisation (SDO) R&D Programme has been renewed.

### NHS RESEARCH AND DEVELOPMENT PROGRAMMES

The School's Health Services Research Unit (HSRU) is responsible for running two large programmes for the NHS. The **National Centre for Health Outcomes Development (NCHOD)** is run jointly with the Institute of Health Sciences, University of Oxford to provide information about indicators of clinical and health outcomes, methods of assessment, uses of indicators, areas for action, gaps in knowledge and other related material. It provides analysis at the NHS Strategic Health Authority, Hospital and Primary Care Organization and local authority levels. It makes the best use of existing information while co-ordinating the development of better information and tools for the future. Alongside publications, it regularly disseminates the results of its work throughout the NHS through the Clinical and Health Outcomes Knowledge Base, available via the NHS intranet. This includes information provided by the School's Non-Communicable Disease Epidemiology Unit on survival rates for eight major cancers in each of the former English health districts. It is intended that this latter information, along with the other data NCHOD provides, will be used as indicators of the performance of NHS organizations.

The **NHS Service Delivery and Organisation (SDO) R&D Programme** is a national research programme established to consolidate and develop the evidence base on the organization, management and delivery of health services. The **National Co-ordinating Centre for NHS Service Delivery and Organisation R&D (NCCSDO)** manages the work of the Programme and ensures that its aims are achieved. The Centre, under contract from the Department of Health, has been based at the School since 1999.

Priorities for the SDO Programme are established through 'listening exercises' with the range of people working and using the NHS, and from the Department of Health and other national agencies. The Programme commissions to meet NHS national priorities and examples include research on: the diffusion and sustainability of innovations in health services, including a study on priority scoring systems used to improve access to surgery on behalf of the NHS Modernisation Agency; services to support carers of people with mental health problems, and on alternatives to traditional care for mental health inpatients to inform the Mental Health National Service Framework; an evaluation of rapid access chest pain clinics to inform the Coronary Heart Disease National Service Framework; and the lessons the NHS can learn from other sectors about managing across networks for the Department of Health's Strategy Unit.

### Royal College of Surgeons' Clinical Effectiveness Unit

The Royal College of Surgeons' Clinical Effectiveness Unit is a collaboration between the Royal College of Surgeons of England and the HSRU. The major part of its work is carrying out 'national surgical audits', which involves producing high-quality quantitative evidence on the processes and outcomes of surgical care in the NHS as well as on the determinants of variations in these processes and outcomes. These audit projects can be viewed as 'epidemiological studies' of the quality of surgical care in the UK. Some of these projects are directly commissioned by the Department of Health or the NHS, while others are initiated by Unit staff but carried out in collaboration with NHS trusts.

Examples include: the UK and Ireland Liver Transplant Audit and the UK Intrathoracic



*Sir Nigel Crisp, Chief Executive, National Health Service (left) with Professor Andy Haines (Dean)*



Transplant Audit which monitor the outcomes in the individual transplant centres and interpret the differences; the National Prospective Tonsillectomy Audit, which is a national study of the complication rate after tonsillectomies in England and Northern Ireland; the Subarachnoid Haemorrhage National Comparative Health Outcome Study; and a study of the quality of care of urological cancer services on the basis of available/routine databases.



### RESEARCH PROJECTS

Research projects cover a wide variety of topics including: the workforce, wound infection, sexual health, cancer care, clinical guidelines, consensus decision-making methods, and historical and policy issues. One example of a workforce project is concerned with the introduction of a ward-based medical team system within a General and Emergency Medical Directorate, in collaboration with the Royal London Hospital, and the Barts and The London NHS Trust. The project is exploring the impact of a ward-based medical team system on inter-professional collaboration and assessing the impact of this new system of work on the clinical service delivered to patients. Researchers in the School working on sexual and reproductive health have been evaluating the government's Teenage Pregnancy Strategy, a four-year programme of work assessing progress towards the Strategy's goals of reducing under-18 conception rates and mitigating social exclusion among young parents. A communication tool to enhance sexual health consultations in general practice is also being developed, funded by the Medical Research Council.



Also in the area of communication, allied to another government priority, cancer care, HSRU staff are working with frontline workers such as consultant oncologists, specialist nurses and information radiographers, examining verbal interaction during outpatient oncology sessions. Historians in the School work on a selection of NHS-related topics, including the relationship between the NHS and private clinicians in addition treatment since the 1970s, the role of health education and its agencies, and responses to gynaecological cancer.

### COLLABORATION

Staff collaborate with a range of regulatory, policy and provider organizations such as the National Institute of Clinical Excellence (NICE), the Commission for Health Improvement (CHI), Primary Care and Acute Hospitals Trusts. Some staff posts are directly funded by the NHS, enabling staff to combine public health and academic work.

Clinicians in the School continue to contribute to patient care while also conducting research. One study in the Non-Communicable Disease Epidemiology Unit, in collaboration with the Northwick Park Hospital in Harrow and Princess Royal Hospital in Telford. is exploring the relationship between recent respiratory infection and heart attacks.

### TRAINING, EDUCATION AND CAPACITY BUILDING

A major component of the School's work is in training and teaching both existing and future NHS staff. The Doctorate in Public Health (DrPH) programme is increasing in popularity with senior NHS staff. In addition, a large number of clinical, specialist and managerial staff in the NHS attend our Masters courses. Clinicians working in the NHS who wish to develop their epidemiological research often gain their initial training from either the MSc Epidemiology course or a specially-designed short course. In addition, the School's ongoing development of distance learning is particularly suited to professionals working in the NHS who may have problems in finding the time to study full-time. MSc student projects are often stimulated by topics generated by students' NHS employer needs. The School continues to be involved in the public health training of, and contributes to capacity building initiatives for, nurses, midwives, health visitors and allied health professionals through programmes funded by the Department of Health and The Health Foundation.

The need for evidence-based policy and practice approaches within the NHS increases the demand for the high quality research produced by the School. The School has an important role to play in shaping health policy within the NHS at local and national as well as international levels - a role which the School intends to strengthen in the future.



## WORKING ON BLINDNESS

Every 5 seconds one person in our world goes blind – and a child goes blind every minute. An estimated 45 million people worldwide are blind, and this number is increasing by 1-2 million per year. The prevalence of blindness is estimated to be 5-10 times higher in low-income communities than the western world. More than two-thirds of blindness is treatable or preventable, and restoration of sight is one of the most cost-effective interventions in health care. The School's work on eye health, described below, aims to improve eye care interventions and services so as to reduce blindness and visual loss. The three main areas of activity are, research into prevention and treatment of the causes of blindness and visual loss; training in both the UK and overseas, and information dissemination to policy makers, health workers and society.



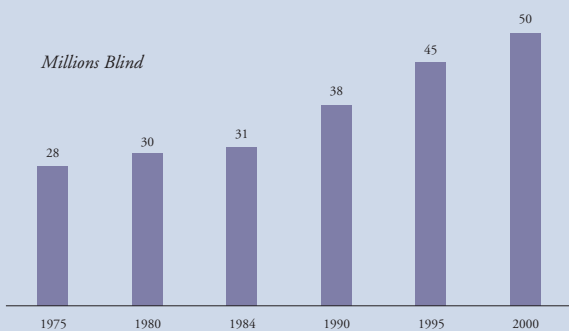
### VISION 2020

In 1999 the International Agency for the Prevention of Blindness (IAPB; a consortium of non-governmental organizations and professional bodies) and the World Health Organization jointly launched VISION 2020: The Right to Sight, the goal of which is to eliminate unnecessary blindness, promote good vision and thereby improve the quality of life of people with visual loss in the world. Over the next two decades, VISION 2020 will take steps to prevent an estimated 100 million people from becoming blind.

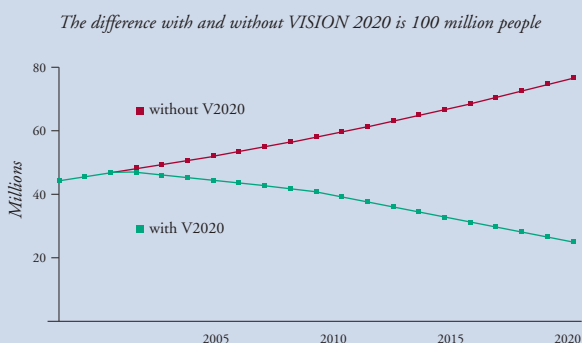
### INTERNATIONAL CENTRE FOR EYE HEALTH

The International Centre for Eye Health (ICEH) is a WHO Collaborating Centre for Prevention of Blindness. Initially established in 1980 as part of the Institute of Ophthalmology, the group moved to the School in 2002 to become part of the Clinical Research Unit in the Department of Infectious and Tropical Diseases. The International Office of IAPB for the Global VISION 2020 programme under the leadership of Mike Whitlam CBE joined the School this year.

### TRENDS IN GLOBAL BLINDNESS



### PREDICTED NUMBER OF BLIND WITH AND WITHOUT VISION 2020



### RESEARCH

The School's research into eye diseases is divided into three areas matching VISION 2020 priorities, namely cataract (and other eye diseases associated with ageing); trachoma and other ocular infections; and visual loss in children. Much of this work is carried out by the ICEH and examples are described below, as well as work in other Units of the School.

#### Adult visual loss

In Bangladesh and Pakistan, national cross-sectional surveys of the prevalence and cause of visual loss have been undertaken by staff in ICEH, and a further one is being planned for Nigeria in 2005. A cohort study by the Infectious Disease Epidemiology Unit with colleagues in Uganda, to measure the incidence of visual loss in adults, showed the age standardized incidence rate to be 1300 per million population per year. Assuming this rate is typical throughout Uganda, about 30,000 people develop bilateral blindness or bilateral visual impairment each year. The commonest causes of incident visual loss were cataract, refractive error, diseases of the retina and glaucoma. This burden of new disease needs to be taken into account, alongside existing levels of eye disease, when planning national eye services.





The EUREYE study into risk factors for age-related macular degeneration in seven European countries is being undertaken by staff in the Non-Communicable Disease Epidemiology Unit (NCDU); and a pilot study of the prevalence and risk factors of age-related macular degeneration in India has just been completed. Staff in NCDU have also completed a trial of screening for vision impairment in the setting of general practice in the UK, and a new project involving ICEH, colleagues in the Public and Environmental Health Research Unit and Moorfields Eye Hospital is studying the cost-effectiveness of treatment for eye disease in the UK.

A multicentre study to develop and trial a system for monitoring the outcome of cataract surgery has been completed by ICEH in collaboration with eight partner centres in Africa and Asia. It is planned to produce this methodology in CD format for distribution to eye surgeons. The Cochrane Eyes and Vision Group moved to the School in April 2003 and has continued undertaking and distributing systematic reviews of eye care interventions.



*25 million people are blind from cataract*

#### Trachoma

Trachoma is a leading cause of global blindness, being most common in Africa and Asia. The SAFE strategy – Surgery for trichiasis (in-turned eyelashes); Antibiotics to treat *Chlamydia trachomatis* infection; Face washing; and Environmental improvements to reduce transmission of infection – is recommended by WHO for the control of trachoma, aiming to eliminate blinding trachoma by 2020.

The International Trachoma Initiative has sponsored the implementation of the SAFE strategy in projects in various countries and has asked the School's International Centre for Eye Health TIME group (Trachoma Initiative in Monitoring and Evaluation) to evaluate projects in eight of these countries. The group, through a participatory workshop, has developed and is now implementing a common framework for monitoring and evaluating these trachoma control programmes in eight countries. The emphasis is on ownership of the evaluation process and the establishment of individual country goals for the elimination of blinding trachoma. Seven countries have so far been evaluated and reports produced for the national governments, WHO and international donors.

Staff in the Clinical Research Unit, with colleagues in The Gambia and Tanzania, have been investigating the effective use of azithromycin in the control of trachoma, demonstrating that this once-a-year oral antibiotic is extremely effective at reducing the level of infection in the community and suppressing transmission. Other work on trachoma control is being co-ordinated by ICEH staff with other Units in the School and includes: the development of a global map for trachoma; a study on the indications for and results of trichiasis surgery; and a study of the impact of improving water availability on water utilization and prevalence of disease.



#### Visual loss in children

A large national study of the causes of blindness in children in Bangladesh, including over 600 children with cataract, has been conducted by ICEH staff. Barriers to early referral are being identified and the children are being followed up for at least two years to look at the results of surgery. In Brazil, Clare Gilbert, who leads the ICEH research work, is evaluating screening criteria and results of treatment for newborn babies with retinopathy of prematurity, as this disease is emerging as an important cause of avoidable blindness in middle-income countries. In



Dar-es-Salaam, Tanzania, the most cost-effective means of implementing school eye health programmes is being investigated with an emphasis on screening and the provision of spectacles for myopia.

*Poor sanitation means too many flies which transmit trachoma from child to child*

#### Funding

Research funding comes from a variety of sources including the British Council for Prevention of Blindness, CBM International, the European Union, Guide Dogs for the Blind, International Trachoma Initiative, SightSavers International, The Wellcome Trust, and other organizations supporting prevention of blindness. Results are given to the WHO and to non-governmental organizations, contributing to the evidence base for policy making and programme development.

#### TRAINING PROGRAMMES

The MSc in Community Eye Health course was launched in September 2002 with ten students from Africa, India, Pakistan and Australia. It is designed for eye care personnel who have actual or potential leadership roles either within their governments or in the NGO sector. Also short courses on VISION 2020 and Tropical Ophthalmology are available as 3-5 day courses, and a 14-week course on control of blinding eye diseases can be taken as a short course for interested applicants.

A programme of 22 one-week courses in overseas countries was conducted throughout 2003 as part of the VISION 2020 initiative with more than 500 participants.

#### INTERNATIONAL RESOURCE CENTRE FOR EYE HEALTH

The International Resource Centre for Eye Health at the School develops educational resources and information services to support VISION 2020, and a network of Regional Community Eye Health Resource Centres in India, Pakistan, South Africa, Tanzania and Colombia has been established to provide regionally specific information and educational materials for eye care. The *Journal of Community Eye Health* is published 4 times per year and distributed free-of-charge to 15,000 health workers worldwide and is available on the web at [www.jceh.co.uk](http://www.jceh.co.uk)



*Allen Foster (Professor of International Eye Health) examines a patient in a Ghanaian village for trachoma*



## WORKING WITH IMAGING

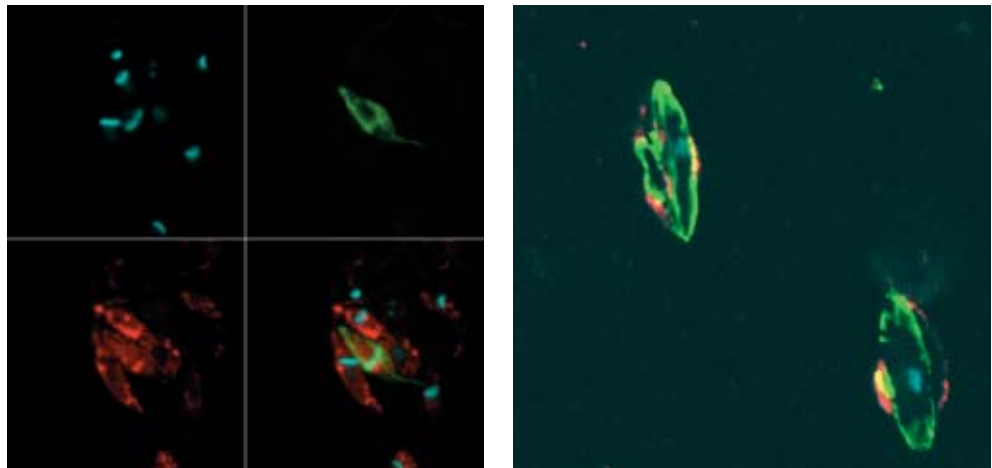
*"I then most always saw, with great wonder, that in the said matter there were many very little living animalcules, very prettily a-moving."*

In his letter to the Royal Society in 1683, Antony van Leeuwenhoek gave one of the first descriptions of bacteria, in this case seen in a sample of plaque taken from his own teeth. The technology for examining the microbial world and for examining the interactions of microbes with their hosts has undergone many revolutions since these first observations employing single hand-ground glass lenses.

LEFT:

*Relative localization of the Trypanosoma cruzi beta propeller protein-1 (N-terminal fusion with GFP; green) showing the mitochondrial lattice, the endoplasmic reticulum (red; anti-Bip) and the kinetoplast (TOTO-3; cyan).*

[Courtesy of Colin Sutherland]



RIGHT:

*Gametocytes of the malaria parasite Plasmodium falciparum express the protein Pfs16 (green) in and around the parasitophorous vacuole that contains the parasite within the host erythrocyte. STEVOR protein (red) is clearly distributed outside the parasite, around the host cell membrane. The parasite nucleus is stained blue.*

*Confocal image.*

[Courtesy of Martin Taylor]

### SUPPORT FOR IMAGING STUDIES AT LSHTM

The power of imaging approaches to enlighten biological processes, and the rapidity of developments in this field, has required a strategy for the development of imaging facilities within the School. Importantly, this incorporates significant capacity for work with viable human pathogens, a central focus of the School's laboratory and clinical research. In 1999, with funds from the Wolfson Foundation, a Centre for Cell Biology was established as the focus for the development of imaging resources. With capital funds won from various government initiatives, this has been equipped over the past three years with a diverse range of the most up-to-date equipment for the analysis of cells and tissues by confocal microscopy, flow cytometry, and laser microdissection. A new imaging system able to localize cells and pathogens non-invasively during the course of active infection has recently been acquired and the Centre also incorporates resources for electron microscopy and histopathology. Full details of the equipment available for use by internal and external users can be found on the internet at [www.lshtm.ac.uk/immu/WCBF/index.htm](http://www.lshtm.ac.uk/immu/WCBF/index.htm)

Some of the internationally recognized research from the Department of Infectious and Tropical Diseases that has capitalized on this resource centre is summarized below.

### INVESTIGATING HOW PATHOGENS WORK

The question of what makes pathogens work at the molecular level is of inherent scientific importance and may also allow us more readily to identify targets for new drugs or vaccines to combat the infections these pathogens cause. In many instances our work involves coupling imaging techniques with in-house expertise in the genetic modification of bacterial and protozoan pathogens, to enable the precise cellular localization of molecules engaged in regulating key processes of cellular survival or infectivity.



One area of particular interest in the Pathogen Molecular Biology Unit is the role of pathogen adenylyl cyclases as possible regulators of stage differentiation. The genes for novel enzymes have been identified in *Trypanosoma cruzi* and the malaria parasite *Plasmodium falciparum* and the proteins expressed as fusions with the green fluorescent protein (GFP) to allow their subcellular



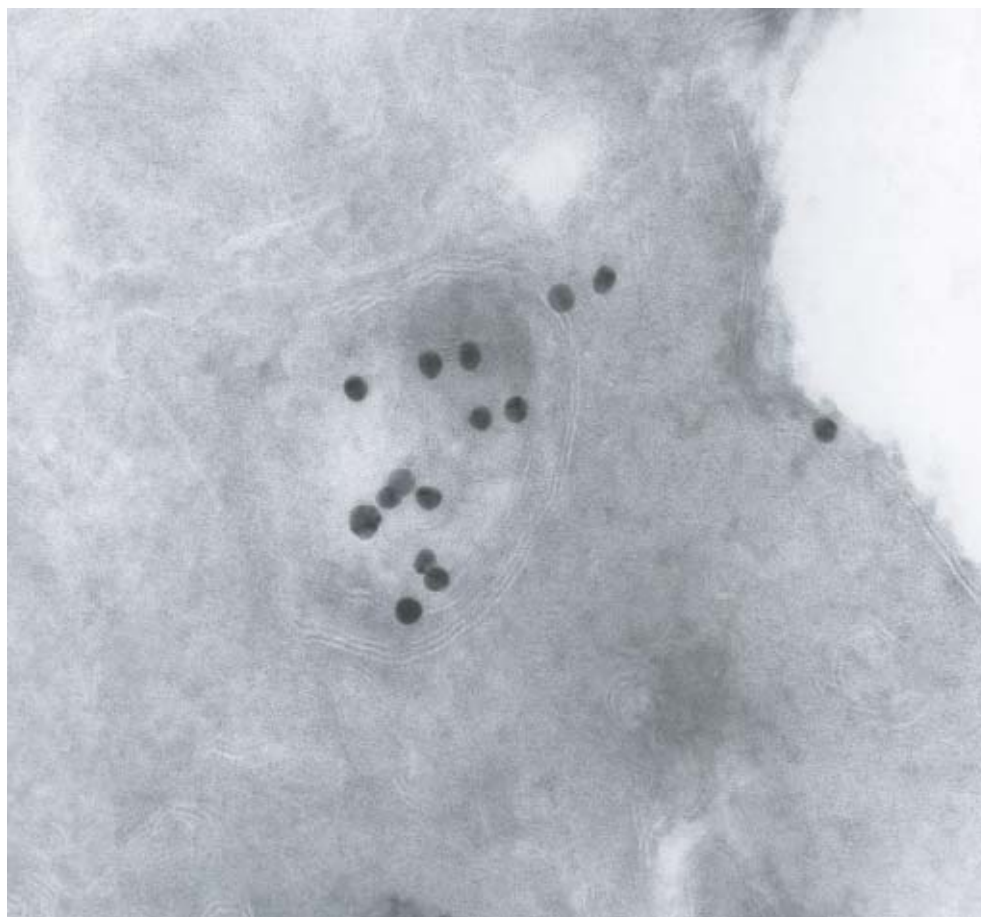


localization. Similarly, a novel beta-propeller protein (Bpp-1) was identified in *T. cruzi* and localized to the mitochondrion. STEVORs are parasite-derived proteins found on erythrocytes infected with *P. falciparum* and may play a role in parasite sequestration. The trafficking of these molecules in gametocyte-infected erythrocytes has recently been described by members of the Immunology Unit, and further studies should determine whether STEVOR antigens are targets for vaccination. The helminth parasites of man are also studied in the Department. By cryo-electron microscopy, researchers in the Immunology Unit have identified the distribution of potential vaccine candidate antigens and their relationship to the membranous compartments of these complex pathogens.

### STUDIES OF HOST IMMUNE FUNCTION

Studies of host immune function and of host–pathogen interactions are studied at all levels in the Department. At the single cell level, basic investigations into the function of the Golgi apparatus and the endoplasmic reticulum are in progress, using state-of-the-art methods for examining molecular mobility and molecular interactions. Fluorescence recovery after photobleaching (FRAP) has recently been used to identify the relationship between coat proteins and their cytosolic pools. A novel mechanism whereby stromal cells provide adhesion-dependent support for the development of dendritic cells has been identified. Dendritic cells are responsible for initiating and regulating T cell immunity and these studies open new avenues for manipulating their function through manipulation of stromal populations.

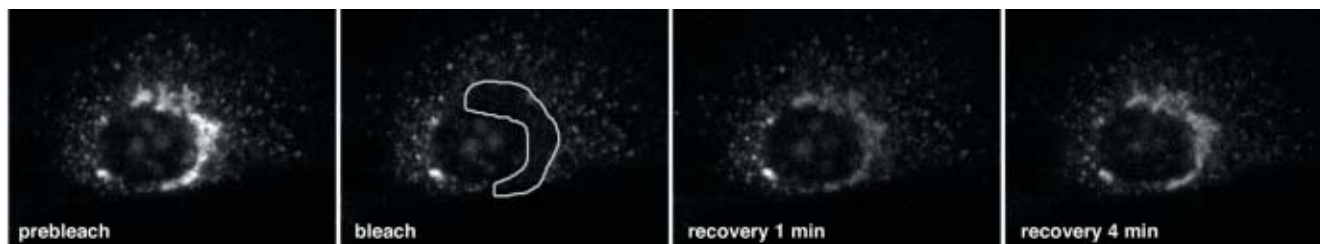
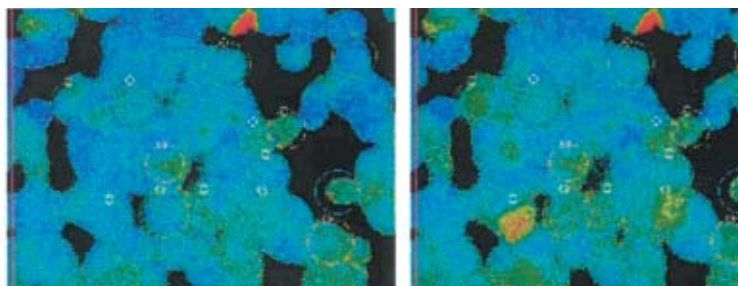
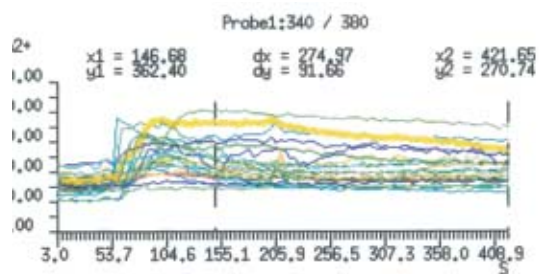
Viruses such as the herpes viruses have elaborate ways to subvert immune responses. Recent work (in collaboration with GlaxoSmithKline) has examined how chemokine receptors and ligands expressed by human herpes virus 6 (HHV6) may participate in cellular signalling. Using a novel approach to image calcium fluxes, inducible calcium signalling was shown to mirror novel chemokine ligand binding profiles with similarities and differences to other cellular models.



*The 16kD antigen of Schistosoma mansoni is associated with membranous vesicles that deploy membrane to the surface of post-penetration larvae. Cryoelectron microscopy with immunogold staining.*

*[Courtesy of Quentin Bickle]*





TOP

*Inducible calcium signalling by virus chemokine receptors.*

*Cells were imaged before and after chemokine ligand addition using calcium-sensitive fluorescent indicators. The graph shows relative calcium levels over time (secs) in individual cells by quantitative image analyses*

[Courtesy of Ursula Gompels]

Imaging techniques are applied extensively in studies of the host response to infection by these pathogens. Flow cytometry is a well-known and broadly applied technique for investigating changes in cellular function, but relies upon isolating cells into single cell suspensions. Immunohistochemistry, often using confocal microscopy to allow imaging of multiple labels, has been used to discover new features associated with the pathology of diseases such as cerebral malaria and visceral leishmaniasis. A new tool, laser microdissection, now allows the isolation of single cells or groups of cells (e.g granulomas) from tissue sections. This, coupled with real-time PCR or microarray analysis, allows precise evaluation of gene expression at a level of cellular resolution not previously achievable.

BELOW

*Fluorescence recovery after photobleaching (FRAP) analysis to demonstrate exchange between a green fluorescent protein-tagged Golgi-associated coat protein and its cytosolic pool*

[Courtesy of Theresa Ward]



## PEOPLE AND PLACES

### EAST EUROPE

Staff from European Centre on Health of Societies in Transition (ECOHOST) travel extensively. Two events, under the auspices of the European Observatory on Health Care Systems, are especially noteworthy. In February Martin McKee and Charles Normand participated in a workshop held in Tbilisi for senior policy makers from Armenia, Azerbaijan and Georgia. This is a region of rapidly increasing geopolitical importance where the School is strengthening its involvement. In June, in Warsaw, seven members of ECOHOST participated in a series of three linked workshops, aimed at academics, politicians and the media respectively, discussing EU enlargement. This offered an opportunity to review the Observatory's forthcoming book on this topic, edited by Martin McKee, Laura MacLehose and Ellen Nolte.

ECOHOST staff travelled frequently to Athens to support the work of the Greek presidency of the European Union. In Sarajevo, Bernd Rechel presented the results of a major study on health in south-east Europe, conducted jointly with DFID, UNICEF and the Open Society Institute. ECOHOST staff continue to have extensive involvement in Russia, with Martin McKee, Dina Balabanova, and Kirill Danishevski working on health sector reform, largely in Moscow and surrounding regions; Richard Coker, Boika Dimitrova and Olga Leonova working on tuberculosis in Samara, on the Volga (see below); and Dave Leon, Susannah Tomkins and Martin McKee conducting a study on premature mortality in Ishevsk, in the Urals.



### TUBERCULOSIS

Russia has witnessed seismic political and economic changes over the past decade. Levels of poverty have increased markedly for much of the population, while health services have suffered from a decline in public support. Increased rates of some infectious diseases have coincided with these changes and challenged already over-stretched health services.

Tuberculosis rates have increased and the spread of the multidrug-resistant form,

particularly in the prison sector, has been recognized as a significant threat to public health. Dramatic increases in HIV infection among young people in Russia in the past few years further challenge public health systems and may stretch efforts to support control to breaking point unless new approaches are adopted.

Staff of the School's European Centre on Health of Societies in Transition are leading a TB project in Russia which is aiming to support regional Russian health systems to respond to the public challenge of the disease. Research areas include: behavioural responses to TB of patients, prisoners, clinicians and administrators; risk factors for developing the disease; analysis of hospitalization rates; costs and influences; the impact of HIV on TB and multidrug-resistant TB; and the potential impact on these diseases of policy changes.

The project has also implemented a WHO strategy of tuberculosis control in the region and most patients now receive standardized treatment regimens. This approach has been supported by the development of a laboratory network to facilitate efficient diagnosis, a computerized recording and reporting system and social support for vulnerable, homeless patients and ex-prisoners. The project will continue for a further two years.



*An anti-smoking poster in Hungary*

*(2nd and 3rd from left): Members of ECOHOST, Martin McKee (Professor of European Public Health) and David Leon (Professor of Epidemiology) with Russian colleagues in Ishevsk (home of the Kalashnikov rifle) where they are conducting a Wellcome Trust-funded study of premature mortality*





## MALARIA

It is often difficult for scientists from developing countries who obtain a higher qualification in Europe or North America to establish their own research programme on their return to their home country. As part of its capacity development programme, the Gates Malaria Partnership is supporting six post-doctoral fellows from sub-Saharan Africa to achieve this. All the post-doctoral fellows have now developed their new research programmes and obtained financial support from the Research Committee of the Gates Malaria Partnership. They have chosen very practical research topics which will provide information that will help to improve the management or prevention of malaria in Africa, and are developing research links with staff in the School.



*Seth Owusu-Agyei*

**Kalifa Bojang**, based in The Gambia, is investigating a treatment to reduce morbidity in children who have been admitted to hospital with severe anaemia. **Wilfred Mbacham**, based in Cameroon, is working on trials of alternative forms of treatment for malaria, while **Theonest Mutabingwa** in Tanzania is running trials of new approaches to the treatment of malaria in an area of high drug resistance. **Obinna Onwujekwe** is carrying out equity and performance analyses of private and public providers of malaria treatment services in eastern Nigeria and **Seth Owusu-Agyei** is defining the epidemiology of malaria in Kintampo District in the middle belt of Ghana prior to intervention studies. **Amabelia Rodrigues** is looking into the effects of BCG vaccination on malaria in Guinea-Bissau.

## GLOBAL BLINDNESS

The School's work in this field is described more fully in the chapter *Working on Blindness* (see pages 38-40) but two events this year are featured here. HRH The Countess of Wessex visited the School in her capacity as Patron of *VISION 2020: The Right to Sight*, a worldwide campaign to eliminate avoidable blindness by 2020, to be briefed on current work. Allen Foster, Head of the School's International Centre for Eye Health, described the work of the Centre, while the directors of Sight Savers International, VISION 2020 UK, Orbis UK and a representative from the International Trachoma Initiative (ITI) described the work of their organizations in relation to VISION 2020. In the ensuing discussion, it was noted that in many cases NGOs compete for resources and donations but in the case of VISION 2020 a huge number of agencies from around the world have come together to fight the common enemy of avoidable blindness.



*HRH the Countess of Wessex with Mike Whitlam (CEO, VISION 2020, right) and Allen Foster (International Centre for Eye Health), at a briefing meeting at the School*





VISION 2020 also ran a global photographic competition, *Visions of Children*, in which entrants were invited to submit images of children affected by blindness or images of those others affected by blindness where there is a direct impact on children. Over 300 entries were received from all over the world and the quality was impressively high.

In July the celebrated royal photographer Lord Lichfield visited the School to join the panel of judges, which included Martin Frigg (Secretary, Sight and Life), Nick Perry (Chairman, *Business Traveller Magazine*), Hannah Faal, President of the International Association for the Prevention of Blindness), Mike Whitlam, CEO of IAPB/VISION 2020 and Dr Serge Resnikoff, Co-ordinator, Prevention of Blindness and Deafness, WHO. The winning entries and runners up will be displayed in exhibitions in London, New York, Sydney and Zurich.



#### HIV & AIDS

Shabbar Jaffar (Infectious Disease Epidemiology Unit) is working on several epidemiological studies in developing countries. His main area of interest is HIV/AIDS. This year, he visited South Africa to evaluate the impact of highly active antiretroviral therapy in Kwz-Zulu Natal where more than a quarter of the young adults are infected with HIV.

*Jesse Kagimba (right), who attended the MSc Public Health in Developing Countries course in 2001-02, and Shabbar Jaffar, organizer for the course this year, are studying the correlates and measures of adherence to highly active antiretroviral therapy in Uganda*

#### NUTRITION

Ricardo Uauy, Head of the Public Health Nutrition Unit, chaired the Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases which was launched in early 2002. The consultation report, released in Spring 2003, recommended limiting fat to between 15 and 30 per cent of total daily energy intake, and saturated fats to less than 10 per cent. It also suggested that carbohydrates should provide the bulk of energy requirements – between 55 and 75 per cent of daily intake, but that free (ie added) sugars should remain beneath 10 per cent, daily intake of salt restricted to less than 5 grams a day and that intake of fruit and vegetables should be at least 400 grams.

The International Nutrition Group maintains a permanent field station in Keneba, a village in an isolated rural area of The Gambia. The 110 miles of badly potholed road from the country's main airport to Keneba has to cross a river and then cut back on itself, giving a journey time of about 4 hours. The distance as the crow flies is a mere 39 miles. After 26 years of taking the land route Andrew Prentice (Professor of International Nutrition) decided there must be a better way



*Ricardo Uauy (Professor of Public Health Nutrition)*



*Andrew Prentice has no shortage of enthusiastic passengers to fly in his microlight aircraft, based at Keneba*





Sharon Cox (Public Health Nutrition Unit) arrives in Keneba to conduct malaria studies

to travel. He obtained his pilot's licence, bought a second-hand microlight, cleared an airstrip at Keneba and now completes the trip in 40 minutes. Dr Dave Hilmer, a collaborator from Houston who achieved four shuttle missions in his previous career as an astronaut, delighted in demonstrating fighter-jet landings once he had learnt to ignore the lack of an ejector seat. As for the villagers – they knew that scientists were crazy long before they started arriving on a motorbike with an umbrella on top!

**TOBACCO INDUSTRY**

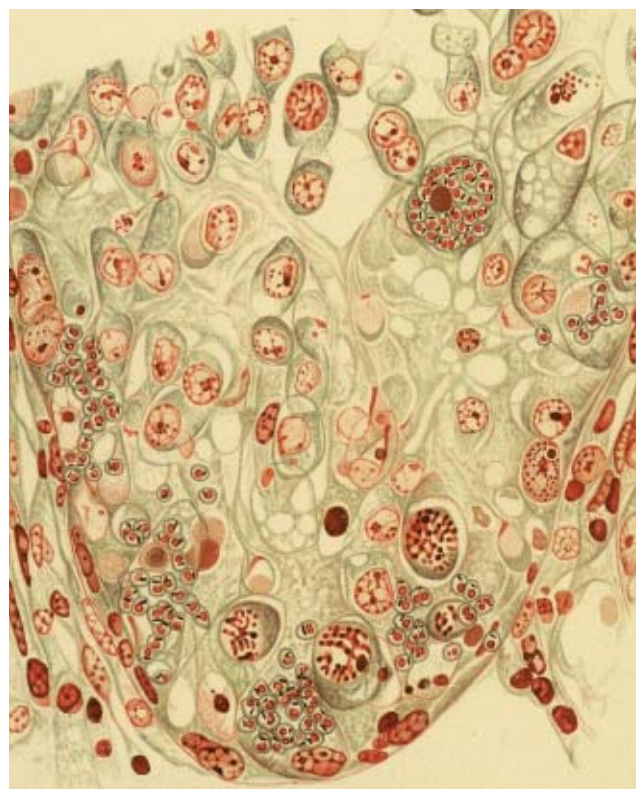
The Centre on Global Change and Health has undertaken a two-year programme of research to analyse the political economy of the tobacco industry in south-east Asia, based primarily on internal tobacco industry documents. The programme is being carried out in close collaboration with national partners, and with support from regional and international partners in Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam. All are participating in the research process, and assisting with the development of research questions, training activities, analysis and dissemination.

Overall, the project will provide new empirical knowledge of the activities of the tobacco industry in the region, using industry documents previously inaccessible or not yet analysed. It will contribute to the capacity of national partners to undertake research using tobacco industry documents, and inform policy development on strengthening tobacco control in the region.

The project's first regional workshop was held in January 2003 to bring together the full project team including LSHTM staff, national researchers and international and regional partners. The workshop brought together participants from the six case-study countries, in addition to a research team from the University of Hong Kong.

*Trypanosoma cruzi*-infected heart muscle. (Drawing, Castro Silva, 1911)

**TRYPANOSOMA GENETICS**  
*Trypanosoma cruzi* is the parasite which causes the serious heart condition Chagas' disease that affects 18 million people worldwide. A team headed by Michael Miles (Pathogen Molecular Biology Unit) has discovered that the parasite has a unique way of shuffling its genetic material. Two variants of the parasite were grown in culture and, to their surprise, the team found that a few of the progeny had genes from both original variants and had much more DNA than normal. They suspect that two parasites merged to form a new individual that at first had all the genetic material from both parents, but then lost some of it. The discovery was reported in *Nature* [27 February 2003, 421, (6926): 936-939].



**THE SCHOOL IN THE MEDIA**

The School is concentrating on significantly raising its profile in the media. This year saw extensive coverage of research by School staff on a range of topics, examples of which here give some flavour of the breadth of our research interests.

**ANDREW PRENTICE**

Andrew Prentice (Public Health Nutrition Unit (PHNU)) gave an address at the British Association for the Advancement of Science's annual meeting in which he predicted that, because of the rise of obesity in young people, parents might soon outlive their children. This led to a vast amount of media coverage, ranging from national papers to women's magazines and

because of the rise of obesity in young people, parents might soon outlive their children. This led to a vast amount of media coverage, ranging from national papers to women's magazines and



radio programmes. Ricardo Uauy (PHNU) chaired a WHO Expert Group that reported on the nutritional factors responsible for the rise of non-communicable diseases and obesity in many countries: the implications for the food industry arising from the report also resulted in numerous media reports.

The School's *Great Smog Conference* held in December 2002 (*see below*) commemorating the 50th anniversary of the London smog of 1952 received massive coverage, with pieces appearing in the national press, on national TV and radio news programmes and interest from USA and Germany.

Jeff Collin and Kelley Lee of ECOHOST published a book about transborder health risks which, given the SARS outbreak during the year, proved highly topical and led to a high-profile article in *The Observer* and consequent radio interviews on the topic.

Other initiatives leading to extensive media coverage included: a letter in the *British Medical Journal* by Martin McKee (Professor of European Public Health) and Anna Gilmore (Health Services Research Unit), asking why more hospitals were not becoming smoke-free; a piece by Ruari Brugh (Health Policy Unit) on how failure to stick to HIV treatment regimens was leading to a build-up of resistance to anti-retrovirals; and a report by Dave Leon (Professor of Epidemiology) on how the Scots (especially women) had worse health than those living in economically poorer eastern European countries, and calling for drastic measures to counteract this.



A series of articles on child survival produced in conjunction with *The Lancet*, and involving Saul Morris (PHNU) and Jo Schellenberg, (Disease Control and Vector Biology Unit) received broad coverage in national papers and broadcast media, as well as internationally, including the BBC World Service, *The Washington Post* and *The Vancouver Times*). The new Centre for History in Public Health, and the work of Virginia Berridge (Professor of History), Victoria Killick (Archivist) and other historians in the School featured in *The Guardian Higher Education* supplement.

(From left): Elizabeth Gisborne, Rose Blitz (Immunology Unit), Freddy and phlebotomist Gita Patel

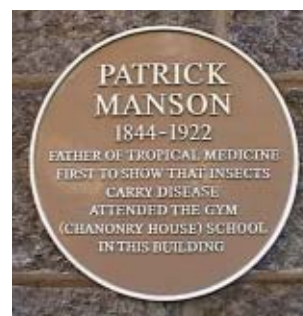
staff Elizabeth Gisborne, was the first infant to take part in a new study of the infant immune response to BCG vaccination that is being carried out by the Immunology and Infectious Disease Epidemiology Units, in collaboration with Waltham Forest & Redbridge Primary Care Trusts. All results are being compared with data from a parallel project at the Karonga Prevention Study field site in Chilumba, Malawi.

**LONDON SMOG OF 1952**

The School hosted a hugely successful conference in December to commemorate the 50th anniversary of London's Great Smog, which caused the deaths of up to 12,000 of the capital's citizens. The Smog was one of the worst examples of air pollution ever and a watershed in the development of the public health agenda. It led to a Government inquiry (the Beaver

A commemorative plaque in honour of Sir Patrick Manson, the School's founder, has been erected on the wall of his former school, now part of Aberdeen University

[Courtesy: RPC Johnson]







Committee) and subsequently the first Clean Air Act (1956), and prompted the establishment of pressure groups dedicated to improving air quality.

Held over two days, the Conference attracted delegates from a wide range of disciplines and sectors. Tony Fletcher (Senior Lecturer in Environmental Epidemiology), the Conference's organizer, commented: "Air pollution is as topical today as it was 50 years ago and we hope this event helped contribute to the debate on how to avoid similar episodes around the globe in future." Further information can be viewed at [www.lshtm.ac.uk/smog/prog.html](http://www.lshtm.ac.uk/smog/prog.html)



'SMOG', an art exhibition inspired by London's Great Smog, was held at the School from 10 December to 14 February, curated by Pam Skelton (Central Saint Martins) and Tony Fletcher (Public and Environmental Health Unit). The artists – Beth Harland, Richard Layzell, Caroline List, Chris Meigh-Andrews, Jacqueline Morreau, Mario Rossi and Mare Tralla – exhibited new works reflecting their responses, impressions and fears related to ideas of fog, smog, pollution, fear, suffocation and reduced visibility. As well as paintings and photographic images, the exhibition included performance art and audiovisual works involving sounds and film. The exhibition attracted much media attention and numerous visitors, both to the School to view the works *in situ*

Art exhibited at the School and inspired by the London Smog of 1952 included (top) Impression of Killer Fog – Embankment, 1952 by Jacqueline Morreau, and Souvenir by Caroline List

and to the website [www.lshtm.ac.uk/art/smog/](http://www.lshtm.ac.uk/art/smog/) where further information is available.

#### STUDENTS' REPRESENTATIVE COUNCIL

The Students Representative Council (SRC) is the representative body for all students studying at the School. On 20 May 2003 over sixty students and staff took part in the first SRC Charity Jog and raised over £800 in aid of the African Medical and Research Foundation (AMREF). Other functions organized by the students this year included a staff-versus-students cricket match, a summer barbecue, yoga sessions, and a table football tournament.

#### ALUMNI ASSOCIATION

The School now has 10,000 alumni working in over 160 countries around the world and the Alumni Association encourages them to keep in touch by publishing a regular newsletter,



The start of the first-ever charity jog by the School's Students' Representative Council



answering enquiries from alumni wishing to re-establish contact with friends, classmates and colleagues, and by holding in-country reunions whenever the opportunity arises. This year reunions were held in Montreal, Vancouver, Cernobbio (Italy), Peru, Denver, New Delhi and London.

We wish to congratulate Dr Ernest Huddy, our oldest-known alumnus who studied at the School in 1938-39, who celebrated his 100th birthday in May, 2003.

#### NEWS ABOUT STAFF

Barbara Sawyer (Disease Control & Vector Biology Unit) was awarded an MBE in the New Year Honours list in recognition of her work at the School since 1954 maintaining insect colonies.

Nick Black (Professor of Health Services Research) was elected a Fellow of the Royal College of Surgeons of England, in recognition of his contributions to advancing health services research and audit in surgery.

John Cleland (Professor of Medical Demography) was elected a Fellow of the British Academy in recognition of his contributions to demography.



*Barbara Sawyer MBE*



Stuart Pocock (Professor of Medical Statistics) was awarded the Royal Statistical Society's 2003 Bradford Hill Medal for his development of clinical trials methodology, including group sequential methods; his applied work, notably in the epidemiology and treatment of heart disease; and his exposition of good practice nationally and internationally, and through his service on influential government committees.

Betty Kirkwood (Professor of Epidemiology & International Health) was elected a Fellow of the Academy of Medical Sciences.

Mike Kenward (GlaxoSmithKline Professor of Biostatistics) was elected President of the British Region, International Biometric Society.

We are pleased to record that professorial titles have been conferred upon: Simon Cousens (Professor of Epidemiology & Medical Statistics); Simon Croft (Professor of Parasitology); Allen Foster (Professor of International Eye Health); Emily Grundy (Professor of Demographic Gerontology); Laura Rodrigues (Professor of Infectious Disease Epidemiology); and Kaye Wellings (Professor of Sexual and Reproductive Health). Readerships were awarded to Quentin Bickle (Reader in Parasite Immunology), Peter Godfrey-Faussett (Reader in Infectious and Tropical Diseases) and Donna Lamping (Reader in Psychology).

#### LECTURES

Professorial Inaugural Lectures were given this year by: Jack Dowie, entitled 'Decision technologies and health: can the model in the middle end the muddle?'; Diana Elbourne, 'Evaluation of health care: confessions of a

*Professor Nick Black becomes a Fellow of the Royal College of Surgeons of England*





qualitative statistician'; Andy Haines, 'From primary care to hot air: tales of an eclectic enquirer'; Andy Hall, 'Preventing liver cancer'; Jenny Roberts, 'Costing bugs? Economic evaluation and governance of infectious disease'; Polly Roy, 'Journey to the core of a complex emerging virus'; and Gill Walt, 'International health policy: in defence of compelling stories'.



Dean's Lectures were given by: Dr Derek Yach (Executive Director, Non-Communicable Diseases and Mental Health, WHO) on 'Impact of non-communicable diseases on world health'; Dr Liam O'Toole (Director, National Cancer Research Institute) on 'Role of the National Cancer Research Institute'; Dr Simon Stephens (Health Adviser to the Prime Minister) on 'NHS reform: progress and prospects'; Sir Nigel Crisp (Chairman and Chief Executive, NHS Executive) on 'NHS and the future'; Professor Walter Holland (Visiting Professor LSE, Health and Social Care) on 'Foundations for health improvement'; Mike Hollingdale (Disease Control & Vector Biology Unit, LSHTM; seconded to MRC) on 'European funding of clinical trials in Africa on HIV/AIDS, TB and Malaria: Partnership or neo-colonialism?'; Sir Joseph Rotblat (Co-founder and President Emeritus, Pugwash Conferences on Science and World Affairs) on 'The Pugwash movement and the current nuclear issue'; Professor Rudolf Klein (Emeritus Professor of Social Policy, University of Bath; Visiting Professor, LSHTM and LSE) on 'Rigours of regulation'; Professor Whitney Addington (Visiting Professor; President Emeritus, The American College of Physicians) entitled 'Heat kills: The Chicago heatwave'; Dr Ravi Narayan (Co-ordinator, People's Health Movement Secretariat, Bangalore) on 'Primary care 25 years after Alma Ata – a view from the People's Health Movement'; Nigel Edwards (Policy Director, NHS Confederation) on 'Policy delivery in the NHS – where is the NHS going?'; Professor Richard Horton (Editor, *The Lancet*) on 'Political violence and public health: Healing "the raging smart"'; and Dr Angus Nicoll, Dr John Watson and Dr Maria Zambon (Health Protection Agency) on 'SARS – A successful global and UK response'.

The 12th Bradford Hill Memorial Lecture was given by Professor Valerie Beral (University of Oxford) on 'Causes of breast cancer'.

The 17th Annual Health Services Research Lecture was delivered by Richard Cooper (Health Policy Institute, Medical College of Wisconsin) on 'Gender revolution in medicine: new rules for an old profession'.

## OBITUARY



*Professor  
Steve Bennett  
1950 - 2003*

The School was shocked and deeply saddened by the sudden death of **Steve Bennett**, who died in March 2003 aged 52 after a series of strokes. Steve was an internationally respected statistician, who contributed to understanding the epidemiology and control of tropical diseases, particularly malaria and tuberculosis. His major research was carried out during the 16 years he spent at the School, much of it in collaboration with scientists at the Medical Research Council Laboratories in The Gambia.

A generation of LSHTM students benefited from his wise counsel and innovative teaching approaches, as well as the many students he taught on courses given in developing countries ranging from Uzbekistan to Guinea, and Indonesia to Zambia. His kindness and consideration were the hallmarks of his approach to peers and students alike. In recent years, he had become the enthusiastic organizer of the new distance learning course, MSc Epidemiology: Principles & Practice, on which more than 350 students are now registered worldwide.

Steve's advice was sought by the WHO, UNICEF and other international agencies. He published widely in medical journals and collaborated with research workers in a range of disciplines, brought together by a desire to understand and control some of the world's most devastating diseases. His academic contributions were recognized by a professorship, awarded only a few weeks before his death. A symposium is being held in the School in November 2003 to honour his achievements.



## THE TEACHING AND TRAINING PROGRAMME



*Diplomates at the Diploma Presentation Ceremony, 15 February 2003*

This year the School's teaching and training programme was subjected to an institutional audit by the UK's Quality Assurance Agency for Higher Education. The School was one of the very first institutions to undergo their new method of audit which examines the management of the quality of educational programmes and the standards of the degrees awarded, in the institution as a whole and in selected subject areas. The School was awarded the highest grade, expressed as a level of confidence, in all these aspects. Their report is publicly available on the QAA's website at [www.qaa.ac.uk/revreps/instrev/londonhygiene/summary.htm](http://www.qaa.ac.uk/revreps/instrev/londonhygiene/summary.htm)

The audit team identified a number of features of good practice in the School, including: procedures for monitoring and supporting the experience of students undertaking research degrees; the way that the School obtains, and acts upon, feedback from its London-based Masters students; and the handbooks and teaching guides for students and staff. The subject area selected for detailed scrutiny, whereby the School's general quality assurance procedures were 'tested out' in a particular subject, was the MSc Epidemiology course. The audit team reported very favourably on the quality of learning opportunities available to its students.

### MASTERS PROGRAMME

The Masters programme has had a very successful year. Over 450 students came to London to study while almost 1000 were enrolled on our distance learning courses. The School welcomed the new MSc Community Eye Health course which transferred from the Institute of Ophthalmology and several new Teaching Units were added to the programme. Many of the Masters' Teaching Units, both in London and by distance learning, can be studied separately as short courses by individuals requiring short, specialized training or study. This particularly suits students who, for a variety of reasons, do not wish to undertake an entire Masters course but find this a useful opportunity to study with the School. Through this mechanism, the School participates in the pan-European TropEdEurop Masters in International Health course, whereby students registered at other institutions in Europe undertake some of their studies with the School.





Preparation for the QAA Institutional Audit involved staff and students over the year. The main forum for student involvement was through the Students' Representative Council (SRC), which comprises elected representatives from the Masters courses and the research degrees students and is an important route for staff–student dialogue on all matters concerning studies at the School. The new method of Institutional Audit introduced a more explicit mechanism for student input, including preparation of an evaluative report by the SRC and several meetings between the visiting Audit team and student groups. The Audit team found student input to be a very valuable component of the process by which they made their judgements – the postgraduate and diverse profile of our students seemed to help foster particularly lively discussions! The SRC were very active in other areas over the year, including developing an extensive sports programme and expanding the website. Despite their busy schedules, the SRC and many others dedicated time to these activities which all contribute to making the School such a stimulating environment in which to study and work. It is less easy for distance learning students to participate in these extra-curricular activities but this year, through a 'virtual election', a representative joined the SRC and they have helped communication and the bringing together more closely of the distance learning and London-based programmes.

During the year, the School has been preparing to introduce new features for its 2003-04 programme to provide more study flexibility. Students studying on our courses in London will be able to take some of their teaching units by distance learning – a feature which we think will be particularly attractive to students studying part-time or who live far from the School. From 2004-05, students enrolled on the distance learning courses will be able to take some units at the School. A further form of half-time study has been introduced for all our London-based Masters courses: students may attend full-time for six months (October–March), return home for a year and then undertake the remaining six months' study in their second year (April–September).

#### RESEARCH DEGREES PROGRAMME

We are delighted that this year the number of research degree students was the highest-ever, a growth of 53% over the last five years. Such a growth reflects the exciting opportunities to pursue independent research in a supportive and stimulating environment through undertaking a DrPH, MPhil or PhD degree at the School. In addition to providing one-to-one supervision, we offer individually tailored advisory committees, supportive procedures and processes, and an intellectual environment that provides unparalleled opportunities and inspiration for scientific inquiry and career development.



*Donna Lamping (Research Degrees Programme Director)*

One area of particular enthusiasm and growth is our DrPH programme. Targeted at future leaders in public health, the DrPH provides an alternative to the PhD for those who expect their careers to be in the practice of public health rather than in research. We currently have 33 students in the DrPH programme and are very proud of the 13 individuals who have obtained their DrPH degree to date.

The School's research degrees programme formed part of the institutional audit undertaken this year by the Quality Assurance Agency for Higher Education. Their final report noted that the School's procedures for monitoring and supporting the experience of students undertaking research degrees represented good practice.

#### SHORT COURSE PROGRAMME

There continues to be strong demand for short courses offered by the School, with a large increase this year in the number of students attending the short courses in Ageing, Health & Well-being in Older Populations, Evaluation of Health Promotion Interventions and the Certificate in Pharmacoepidemiology & Pharmacovigilance. Applications for short courses have also shown a steady increase with the Advanced Course in Epidemiological Analysis, the Intensive Course in Epidemiology & Medical Statistics, the Diploma in Tropical Medicine & Hygiene and the Diploma in Tropical Nursing remaining the most popular.



## LONDON-BASED MSc STUDENTS 2002-03

<i>Course</i>	<i>HECS</i>	<i>Overseas</i>	<i>Total</i>	<i>% Medically Qualified</i>	<i>% Female</i>	<i>Number of Countries Represented</i>
Biology & Control of Disease Vectors	1	4	5	0	40	4
Community Eye Health	1	9	10	80	20	7
Control of Infectious Diseases	14	19	33	18	85	13
Demography & Health	13	4	17	0	82	4
Environmental Epidemiology & Policy	5	3	8	25	75	4
Epidemiology	47	13	60	45	75	14
Health Policy, Planning & Financing	15	17	32	44	56	17
Health Promotion Sciences	9	4	13	8	92	3
Health Services Management	17	7	24	54	58	13
Health Services / Systems Research	11	4	15	27	60	7
Immunology of Infectious Diseases	6	3	9	0	67	5
Medical Microbiology	4	8	12	8	75	8
Medical Parasitology	8	2	10	0	70	3
Medical Statistics	20	4	24	8	63	7
Molecular Biology of Infectious Diseases	7	4	11	9	36	6
Public Health	44	5	49	45	78	14
Public Health in Developing Countries	18	24	42	62	64	24
Public Health Nutrition	23	12	35	6	83	17
Reproductive & Sexual Health Research	11	14	25	24	88	13
STIs & HIV	8	4	12	75	67	5
Tropical Medicine & International Health	6	8	14	100	21	9
Veterinary Epidemiology	5	1	6	50	50	5
Virology	3	0	3	0	67	2
<b>LONDON-BASED TOTAL</b>	<b>296</b>	<b>173</b>	<b>469</b>	<b>34</b>	<b>69</b>	<b>79</b>

## DISTANCE LEARNING STUDENTS (MSc/Diploma) 2002-03

<i>Course</i>	<i>HECS</i>	<i>Overseas</i>	<i>Total</i>	<i>% Medically Qualified</i>	<i>% Female</i>	<i>Number of Countries Represented</i>
Epidemiology: Principles & Practice	-	-	367	-	53	86
Health Systems Management	-	-	329	-	51	99
Infectious Diseases	-	-	259	-	48	69
<b>DISTANCE LEARNING TOTAL</b>	<b>-</b>	<b>-</b>	<b>955</b>	<b>-</b>	<b>52</b>	<b>120</b>





## RESEARCH STUDENTS 2002-03

Department	HECS	Overseas	Total	% Medically Qualified	% Female	Number of Countries Represented
Epidemiology and Population Health	27	30	57	23	61	26
Infectious and Tropical Diseases	78	64	142	19	61	48
Public Health and Policy	68	47	115	18	60	36
<b>SCHOOL TOTAL</b>	<b>173</b>	<b>141</b>	<b>314</b>	<b>19</b>	<b>61</b>	<b>66</b>



$$X^2 = \sum \frac{(O-E)^2}{E}$$



## SHORT STUDY PROGRAMME 2002-03

Course	Number of Students
Advanced Course in Epidemiological Analysis	38
Ageing, Health & Well-being in Older Populations	9
Clinical Trials	19
Current Concepts in Cancer Epidemiology	21
Diploma in Tropical Medicine & Hygiene*	63
Diploma in Tropical Nursing	114
Evaluation of Health Programmes in Complex Emergencies	18
Evaluation of Health Promotion Interventions	24
Infectious Disease Modelling	33
Intensive Course in Epidemiology & Medical Statistics	60
Laboratory Diagnosis of Malaria	25
Laboratory Diagnosis of Parasites	19
Pharmacoepidemiology & Pharmacovigilance	18
Planning for VISION 2020	16
Sexual & Reproductive Health Research	26
Teaching Units	60
Travel Medicine	78
<b>SCHOOL TOTAL</b>	<b>641</b>

\* Diploma awarded by the Royal College of Physicians, London

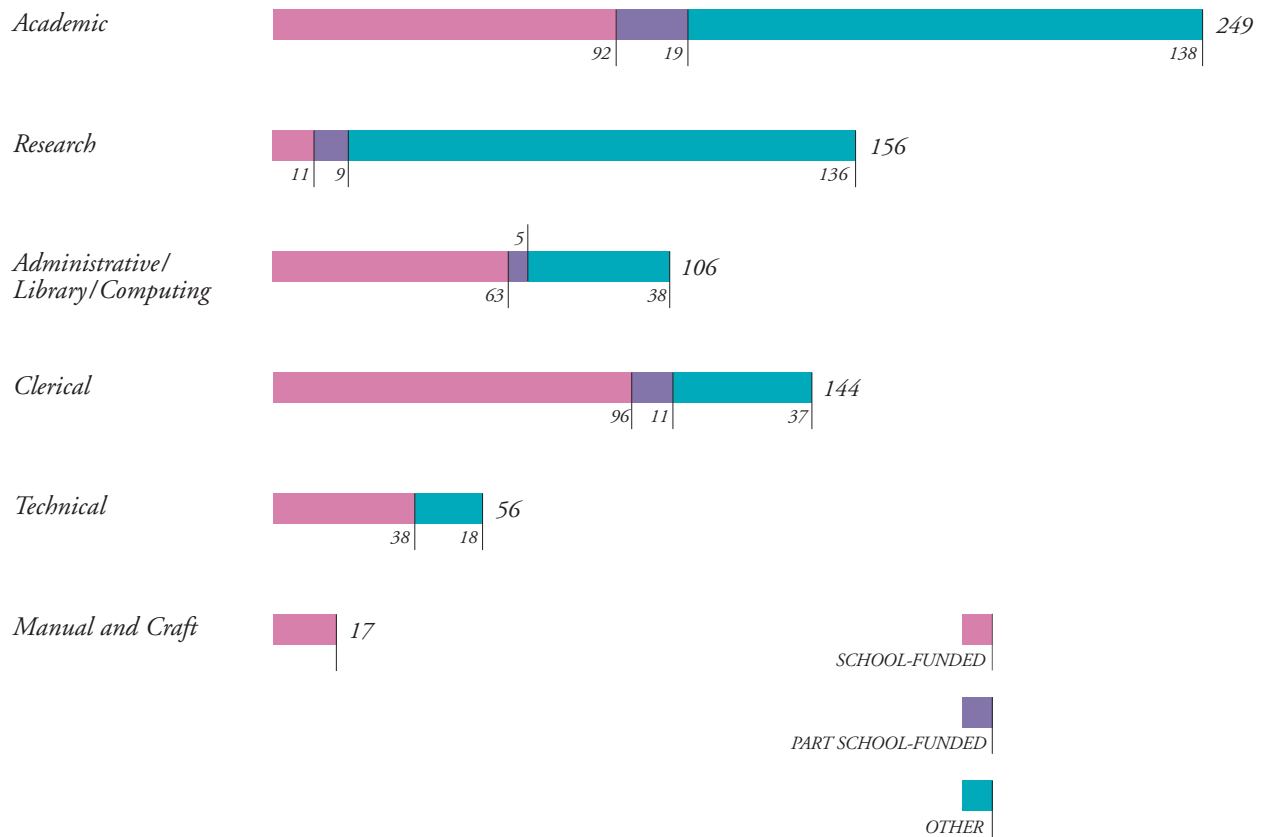


## FACTS AND FIGURES

### STAFF NUMBERS

(At 30 June 2003)

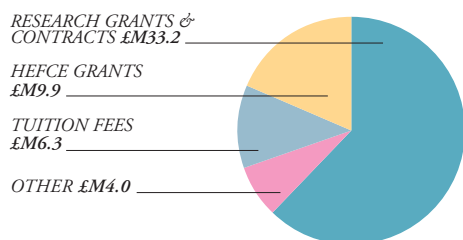
#### FULL-TIME EQUIVALENT STAFF



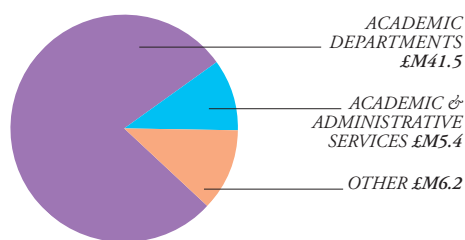
### FINANCE

(2002-03)

#### Income: £M53.4



#### Expenditure: £M53.1





# FACTS AND FIGURES

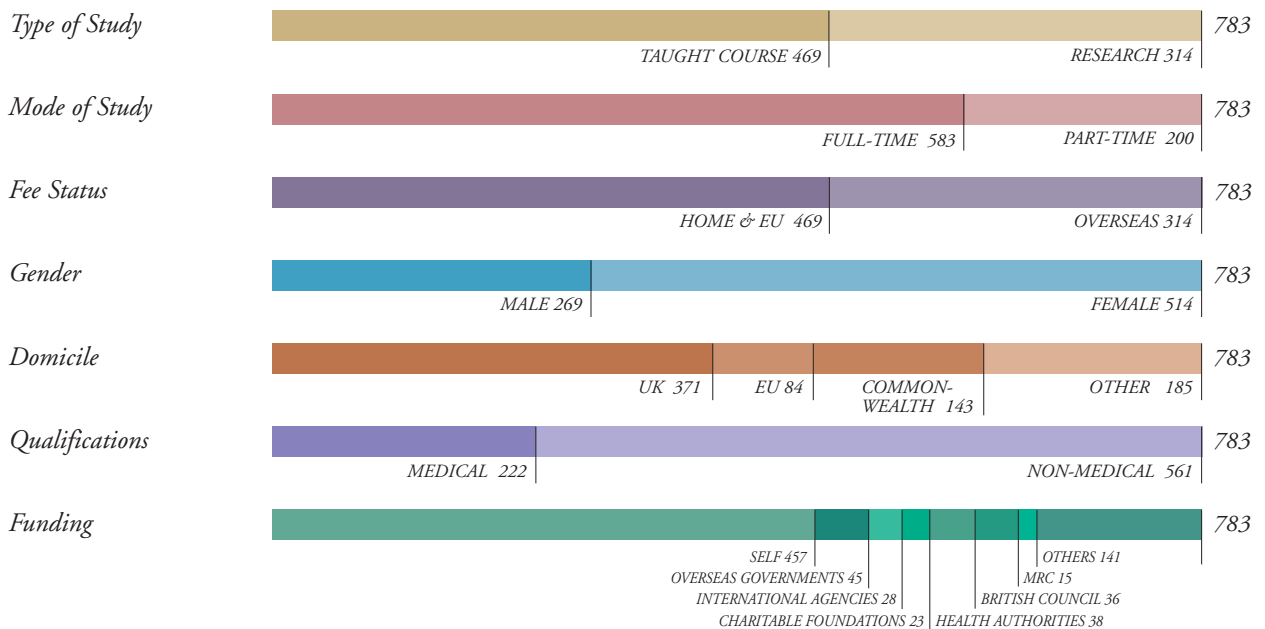
## STUDENT NUMBERS

(At 1 December 2002)

### TOTAL STUDENTS



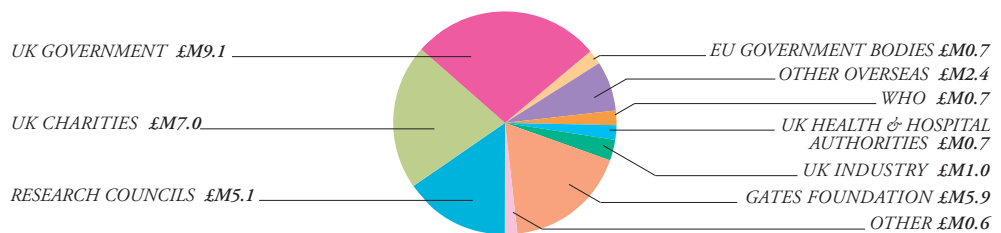
### LONDON-BASED FULL-TIME & PART-TIME STUDENTS



## RESEARCH FUNDING

(2002–03)

**Research Income: £M33.2**





# STAFF OF THE SCHOOL

(At 1 October 2003)

Dean: Professor AP HAINES MBBS MD FRCGP FFPHM FRCP FMedSc

## Department of Epidemiology and Population Health

### Reader in Epidemiology and Head of Department

PE DOYLE BSc MSc PhD

### Professor of Community Nutrition

A ASHWORTH HILL BSc PhD

### Professor of Medical Demography

JG CLELAND BA MA FBA

### Professor of Epidemiology & Vital Statistics

(also Deputy Chief Medical Statistician at the Office for National Statistics)

MP COLEMAN BA BM BCh MSc MFPHM

### Professor of Health Care Evaluation

(jointly with the Institute of Education)

D ELBOURNE BSc MSc PhD CStat

### Professor of Epidemiology & Ageing

AE FLETCHER BA DipPhysAnthrop PhD HonMFPHM

### Professor of Demographic Gerontology

E GRUNDY MA MSc PhD

### Glaxo Smithkline Professor of Biostatistics

MG KENWARD BSc MSc PhD

### Professor of Epidemiology & International Health

BR KIRKWOOD MA MSc HonMFPHM FMedSci

### Professor of Epidemiology

DA LEON BA PhD

### Professor of Metabolic and Genetic Epidemiology

PM McKEIGUE MA MBBChir MSc MFPHM PhD

### Emeritus Professor

TW MEADE CBE FRS MD FRCP FFPHM FMedSci

### Professor of Cancer Epidemiology

(jointly with GKT)

H MÖLLER BA BSc MSc DM FFPHM

### Cancer Research UK Professor of Cancer Epidemiology

(jointly with the Institute of Cancer Research)

J PETO MA MSc MFPHM

### Professor of Medical Statistics

SJ POCOCK BA MSc PhD

### Professor of International Nutrition

AM PRENTICE BSc PhD

### Professor of Epidemiology & Public Health

IG ROBERTS MBBCh MRCP PhD FFPHM

### Professor of Public Health Nutrition

R UAUY MD PhD

### Emeritus Professor of Human Nutrition

J WATERLOW CMG FRS MD ScD FRCP

### Reader in International Child Health and Development

SRA HUTTLY BSc MSc MA

### Reader in Demography

IM TIMEUS MA MSc PhD

### Senior Lecturers

E BREEZE BA MSc CStat PhD

JR CARPENTER BSc MSc DPhil ARCO

L CLARKE BSc MSc

BL DE STAVOLA MSc PhD

CD FROST DipStat BA MA

NES MACONOCHE BA MSc PhD

SS MORRIS BA MSc PhD

IM dos SANTOS SILVA MD MSc DipPH&TM PhD

L SMEETH MBBCh MRCPG DCh DRCCOG MSc PhD

BW ŻABA BSc MSc

### Lecturers

MI ABDALLA BSc PhD

D ALTMANN BA MSc DPhil

RJ BELLAMY BMedSci MBBS MRCP DPhil DipMgmt MSc DLSHTM MMedEd

J BUSZA BA MSc

SE CASTLE BA PhD

T CLAYTON BSc MSc

AD DANGOUR MSc PhD

PJ EDWARDS BSc CStat

O FLETCHER BA MSc PhD

C FREE MBBCh MScHSM MRCP PhD

P HARDY BSc MSc

CD HIGGINS BSc MSc

J KIM BS MPH PhD  
VZ MANN MSc PhD  
S MAYHEW BA MA PhD  
M MOLOKHIA BSc MedSci MBBS MRCCGP  
K MOSER BA MSc  
L NACUL MD DLSHTM MSc PhD  
GM PRICE BSc MSc MSc PhD  
B RACHET MD PhD  
SM SALWAY BA MSc PhD  
EC SCHOFIELD BA MSc  
AB SLOGGETT BSc MSc MRPharmS  
D WANG BA MSc PhD  
HC WATT MA MSc  
RG WHITE BSc MSc

### Research Staff

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F CLEMENS BSc MSc  
TJ COLLIER BSc MSc  
C COOK BSc MSc  
SE COX MSc  
MR DOUTHWAITE BA MSc  
KM EDMOND MBBS MFPHM MSc FRACP FAFPHM  
SJ EVANS BA MSc CStat FRCPEd  
B FENN MSc  
J FERNANDES BSc  
A FRASER BSc RGN NDN  
AJ FULFORD MSc PhD  
G GARGARO RGN BA MA (Econ)  
C GIBBONS BSc  
LJ GIBSON MPhil  
EF HALL MBBChir MSc  
ZE HILL BA MSc  
CJ HOGGART BSc MSc PhD  
V HOSEGOOD BSc MSc PhD  
S KALOGIROU BSc MSc  
KA KER BSc  
VA McCORMACK BSc MSc  
ASM McCOY BSc MSc  
CMA MCKENZIE BSc MSc  
S MANASEKI-HOLLAND MSc MBBS BMedSci MRCP MFPHM

E MITRY MD PhD  
SE MOORE BSc PhD  
E NG BSc MSc  
D NITSCH MD MSc  
G PALMER BA MSc  
EME POSKITT OBE MA MBBChir FRCP FRCPCB  
GA RONALDS BA  
R SHARP  
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E SLAYMAKER BA MSc  
CM SNOWDON BA MA  
SC TOMKINS BA MA MSc  
N WETTERS  
HR YOUNG BA MSc

**Computing Staff**  
DJ ARTHUR BSc  
MW BENNETT BSc MSc  
AR KING BA  
D MAYER BSc MSc  
Z QIAO MSc MPH  
AWS REID BA MSc  
AN ROSS BSc  
J SANDERSON BSc  
AJ TAIT BSc PGCE  
FK TWEEDY BAppSci  
E WILLIAMSON BA

### Departmental Administrator

DM HARTE

### Teaching Administrator

J COSTELLO

**Other Related Staff**  
K BLACKHALL MA  
P CHINNOCK BSc MSc MBBiol  
K DIALLO BA  
J GARCIA BA MSc  
RC KNIGHT SRN  
R MASHRU BSc  
SA ROBERTSON BA  
H SHAKUR RGN BSc MSc  
K TOMLIN BSc MSc  
AC TRUESDALE BSc

### Honorary Professors

DG ALTMAN BSc CStat DSc  
RG CARPENTER MA DipMathStats PhD  
LW COOK BA MSc

G DAVEY-SMITH MA MSc MD FFPHM  
KM DUNNELL BSc MA HonMFPHM FFFPRN  
(jointly with Public Health & Policy)  
RGA FEACHEM CBE BSc PhD DSc(Med) FEng FICE  
FWSM HonFPPHM  
(jointly with Infectious & Tropical Diseases)  
AJ FOX BSc PhD  
T HARPAM BA PhD  
CF LANATA MD MPH  
R J LILFORD PhD FRCOG FRCP MFPHM  
K McPHERSON MA PhD HonMFPHM FMedSc  
D METZ BSc MSc PhD  
E ROMAN BSc PhD  
PD SASIENI BA MSc PhD  
S SIMPSON HonMFPHM OBE  
A SWERDLOW BA BM BCh MFCM PhD DM  
C VICTORA MD PhD

### Honorary Senior Lecturers

JGC BLACKER BA MA PhD  
AR BRADY BSc MSc  
EG BROWN BMedSci MBBCh MRCCGP  
N DUNN MA DM MSc MRCCGP  
P LINCOLN BSc PGCE PGDipHEd PGDMS HonMFPHM  
WJM MARTENS MSc PhD  
C MARTINEZ MD MSc  
PC WALLER BMedSci MD FRCP FFPM MPH  
R WISEMAN MRCS DOBstRCOG DT&M&H PhD  
FFPHM FRCP  
B WOLFF MHS MA PhD

### Honorary Lecturers

P BABB BSc MSc PhD  
SCF BLACKBURN BA MBBS MA MSc FFPHM  
VCK DOKU MB ChB MRCPsych MSc  
F MASON MSc BSc  
A PETRIE BSc MSc  
M SCHOEMAKER MSc  
SJ SHARP MSc MA  
AE TEDSTONE BSc PhD  
B WOLFF MHS MA PhD

### Honorary Research Fellows

J SIMONS BA BSc

## Department of Infectious and Tropical Diseases

### Professor of Immunology and Head of Department

HM DOCKRELL BA PhD

### Professor of Postgraduate Education in Public Health

JP ACKERS MA DPhil

### Ross Professor of Tropical Hygiene

Emeritus

DJ BRADLEY MA DM FRCP FRCPath FFPHM FBBiol FMedSci HonFCTWEM

### Emeritus Professor of Tropical Medicine

ADM BRYCESON BA MD FRCP DT&M&H

### Professor of Environmental Health

AM CAIRNCROSS MA PhD MICE MCIWEM

### Emeritus Professor of Medical Entomology

AN CLEMENTS BSc PhD

### Professor of Epidemiology & Medical Statistics

SN COUSENS MA DipMathStats

### Professor of Parasitology

SL CROFT BSc PGCE PhD

### Professor of Medical Entomology

CF CURTIS BA DipAnimGenet PhD

### Emeritus Professor of Bacteriology

BS DRAŠAR BSc PhD DSc FRCPath CBiol FBBiol DCDHE

### Professor of Communicable Disease Epidemiology

PEM FINE AB VMD MSc PhD

### Professor of International Eye Health

A FOSTER OBE DO FRCS FRCOphth MBBCh

### Professor of Communicable Diseases

BM GREENWOOD CBE FRS BA MA MBBCh MD DT&M&H FRCP FWACP FFPHM

### Professor of Infectious Disease Epidemiology

AJ HALL MBBS FRCP MSc PhD FFPHM

### Professor of Epidemiology & International Health

RJ HAYES BSc MSc DSc

### Professor of Cellular Immunology

PM KAYE BSc ARCS PhD

### Professor of Communicable Diseases

DCW MABEY MA BM BCh DM FRCP

### Wellcome Professor of Clinical Tropical Medicine

KPWJ McADAM MA MB BChir FRCP

### Professor of Medical Protozoology

MA MILES BSc MSc PhD DSc FRCPath

### Professor of Public Health

ND NOAH MBBS FRCP FFPHM

### Professor of Infectious Disease Immunology

EM RILEY BSc BVSc MRCSvS PhD

### Professor of Infectious Disease Epidemiology

LC RODRIGUES MD MSc PhD

### Professor of Virology

P ROY MSc PhD

### Professor of Tropical Epidemiology

PG SMITH CBE BSc DSc HonMFPHM FMedSci

### Emeritus Professor of Immunology

MW STEWARD BSc PhD DSc FRCPath

### Emeritus Professor of Immunology of Protozoal Diseases

GAT TARGETT BSc PhD DSc

### Professor of Medical Helminthology

MG TAYLOR BSc MSc PhD DSc

### Emeritus Professor of Protozoan Chemotherapy

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### Professor of International Public Health

JAG WHITWORTH MB ChB MRCP DT&M&H MD

### Professor of Microbial Pathogenesis

BW WREN BSc PhD CChem

### Emeritus Professor of Medical Entomology

AN CLEMENTS BSc PhD

### Emeritus Professor of Medical Protozoology

W PETERS MD DSc MRCS DT&M&H FRCP Dthc (Paris)

### Emeritus Professor of Medical Entomology

MGR VARMA BSc PhD DSc CBiol FBBiol

### Reader in Tropical Medicine

R BAILEY BA BM PhD MRCP DT&M&H (on secondment)

### Reader in Immunology

GJ BANCROFT BSc PhD

### Reader in Parasite Immunology

QD BICKLE BA MSc PhD

### Reader in Infectious and Tropical Diseases

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### Reader in Epidemiology & International Health

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 M BORCHERT MD MSc  
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 SJ BROOKER BA DPhil  
 MM CAMERON BSc PhD  
 D CAMPBELL-LENDRUM BA DPhil  
 IA CARNEIRO BSc DPhil  
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 KL FELDING BSc MSc PhD  
 V FILIPPI DDoc DISP PhD  
 S FLOYD BSc MSc  
 MM GAUNT BSc PhD  
 SJ HAWKES BSc MBBS DTM&H PhD  
 MJ HOLLAND BSc MSc PhD  
 D HORN BSc PhD  
 MW JENKINS BS MS PhD  
 M JOFRE-BONET BA MS PhD  
 COH JONES BSc MSc PhD  
 A KARLYSHEV BSc PhD  
 H KAUR BSc PhD  
 HE KUPER BA PhD  
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 QL FIVELMAN BSc MSc  
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 T INGALL BScSci  
 A JAHN PhD MBBS MSc  
 G JOSHUA BSc MSc PhD  
 H KENDRICK BSc  
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 AK LECK BSc PhD  
 MSH LIEW MBBS MRCCOphth  
 K MAKOWIECKA BEd MSc  
 A MAROOF BSc PhD  
 I MAURICIO BSc PhD  
 CA MAXWELL BSc MSc  
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 E McMINN PhD  
 L McROBERT BSc MSc PhD  
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 R NOAD BSc PhD  
 SO OBADO BSc MSc  
 A OBASI MBBS MSc DTM&H MRCP DipGUM DFFP  
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 K ORROTH BSc MPH  
 S OWUSU-AYGEI MSc PhD  
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 D PATEL MD MMed MSc  
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 SD POLLEY BSc PhD  
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 PM PRONYK BSc MD FRCP MSc DTM&H  
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 AD RODRIGUES PhD  
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 S SCOTT BSc MSc  
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 D WATSON-JONES BA BM BCh MSc DTM&H MRCP  
 J WEBSTER BSc MSc  
 SH WEDNER DMed DrOphth  
 J WEHRFRITZ BSc MSc PhD  
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 V YARDLEY BSc MSc  
 M YEO BSc MSc  
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**Clinical Scientist**

JE WILLIAMS ClBiol MIBiol AIMLS

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 RJ DACOMBE BSc MSc  
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 D NOLDER BSc MSc PhD  
 C ROGERS MSc AIIBiol  
 C STANLEY  
 JM TUCKER BSc  
 CL WHITEHORN BSc MSc

**Honorary Professors**

WW ADDINGTON AB MD MS DSc  
 CLR BARTLETT MSc MBBS FRCP FFFHM LRCP MRCS  
 SF BLOOMFIELD PhD MRPharmS BPharm  
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*(jointly with Public Health & Policy)*  
 FT CUTTS MBChB MSc MD FFFHM MRCP  
 JH DARBYSHIRE OBE MBChB MRCP FRCP MSc  
 KM DE COCK MBChB FRCP MD DTM&H  
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 N GILL FFFHM MFCMI MSc DCH DObsr MB BCh BAO  
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 DR HILL BA MD DTM&H  
 RC HORTON BSc MBChB FRCP  
 AM JOHNSON MA MBBS MSc MFCM  
 CJ JOHNSON MA LRCP MBChC FRCS MD DCEH  
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 E MILLER BSc MBBS FFFHM FRCPath  
 RLJ MULLER DSc PhD BSc FIBiol ClBiol  
 AG NICOLL MA MB ChB MSc FRCP FFFHM FRCPH  
 EHO PARRY OBE MD FRCP FWACP  
 DU PFEIFFER DipTVM MACVSc PhD  
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 GR SERJEANT BA BChir MRCS MB MA MRCP MD FRCP  
 BG SPRATT BSc PhD  
 RW TITBALL BSc PhD  
 A TOMKINS MBBS FRCP FRCPCH FFFHM  
 RA WEISS BSc PhD FRCPath  
 HC WHITTLE BSc MBChB FRCP FWACP  
 JW WILESMITH BVSc

**Honorary Senior Lecturers**

RRA BOURNE BSc MBBS FRCCOphth  
 DH CRAWFORD DSc MD FRCPath PhD MBBS  
 D DROBNIEWSKI MA MBBS MSc DTM&H PhD FLS  
 D FELMINGHAM BSc MSc  
 VA GANT BSc MBBS FRCP PhD MSc MRCPath  
 NJ GAY BA MSc  
 RC GEORGE BSc MBBS MSc MRCPath  
 OPN GILL MB BCh BAO DObsr DCH MSc MFCM FFFHM  
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 JA JONES BA MSc MBBS DCH DRCOG MRCCGP DPH  
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 MP KELLY MA MD MRCP  
 M KOBLINSKY BSc DPhil  
 SB LUCAS BA MA FRCPath FRCP  
 PT LUKEY DSc MSc BSc  
 AS MALIN BSc MB ChB FRCP DTM&H PhD  
 D MORGAN MB ChB DTM&H MSc MRCCGP  
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 AJ NUNN BSc MSc  
 N O'FARRELL MB ChB MD MSc MRCP MRCCGP DTM&H  
 TL PITT BSc PhD  
 M RAMSAY MBBS MRCP MSc MFFHM  
 MH REACHER MD DPH MPH MBBS MFFPHM  
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 GL RIDGWAY MD FRCP FRCPath HonDipHHC  
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 GM SCOTT MD FRCP FRCPath DTM&H  
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 F VEGA-LOPEZ MD MSc PhD  
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 APR WILSON MA MD MRCP FRCPath

RPL WORMALD MBChC FRCS MSc  
 SG WRIGHT BM BS MRCP FRCS DCMT

**Honorary Lecturers**

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 RJC BOWMAN MA MD FRCCOphth  
 DJ CARRUCCI MD MSc PhD  
 DC CHAVASSE BSc PhD  
 G CHURCHYARD MBChC FCP MMed  
 TF CLASEN BA JD MSc  
 DAO COURTENAY BSc PhD  
 J DAY MBBS MRCP DTM&H  
 CJJ EASMON MBBS MRCP MPH DTM&H DipOecMed  
 CAW EVANS MBBS BSc MRCP  
 M FELTON MSc MRCP MB ChB DTM&H  
 KL FLANAGAN BM BA MBBS MRCP PhD  
 GI GIBSON BA PhD  
 IR HAMBLETON BA MSc  
 MP HAWKEN BSc MBChB DTM&H FRACP MSc  
 PC HILL MBChB MPH FRACP  
 P KALEEBU PhD MSc ChB  
 AB KAMALI BM BS MSc  
 DW KELLY BSc MSc PhD  
 JH KOLACZINSKI BSc PhD  
 SD LAWN BMedSc MBBS MRCP  
 C LIENHARDT MD DTM MSc  
 ED MAGBITA BSc MSc PhD  
 NTM MARBIAH MD MSc PhD  
 D McCORMICK MB ChB DTM&H MSc  
 P MILLIGAN BSc MSc PhD  
 PL OSEWE MD MPH  
 HA PICKERING BA MA PhD  
 R PITROFF  
 R POOL BA MA PhD  
 A RODGER MBChB MSc MRCP MFFHM  
 A ROSS BA MSc  
 D SONNENBERG MBChC DTM&H DPH PhD  
 M VAN DER SANDE MD MA PhD  
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**Honorary Senior Research Fellow**

DS ELLIS MA MD BMBCh

**Honorary Research Fellows**

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 M LYONS MA PhD  
 NJ ROBINSON BSc MSc PhD  
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**Professor of Health Impact Analysis**

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**Reader in Epidemiological Statistics**

BG ARMSTRONG BA MSc PhD

**Reader in Psychology**

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**Reader in Health Services Research**

CFB SANDERSON MA MSc PhD HonMFFHM



### Senior Lecturers

SC ANDERSON BSc MA MRPharmS MCPP  
 RF BRUGHHA MB MSc MD DCH MFPHM  
 K BUSE BA MSc PhD  
 AE CLARKE BA DCH MRCPG MSc MFPHM MD  
 R COKER MBBS DGM MSc DFPHM FRCP  
 AC FLETCHER MA MSc PhD  
 JA FOX-RUSHBY BSc PhD  
 NJ FULOP MPH PhD  
 WP GEISSLER MA MPhil PhD  
 LJ GILSON BA MA PhD  
 M GORSKY BA PGCE PhD  
 J GREEN BSc MSc PhD  
 S HAGARD MA MBChB PhD FFPHM FRSA  
 DK LEE-GILMORE BA MPA MA DPhil  
 L LUSH MA MSc  
 BI McPAKE BA PhD  
 R POOL BA MA PhD  
 R RAINE MSc MBBS MFPHM  
 BC REEVES Hon MFPHM  
 E SONDRUP MD MPH  
 C STEPHENS MA MSc PhD  
 N THOROGOOD BA PhD  
 M TRAYNOR BA MA PhD RGN RNV  
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 CH WATTS BA MSc PhD  
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 DC BALABANOVA MSc PhD  
 G BARRETT BA MSc PhD  
 SC BENNETT BA MPhil  
 JP BROWNE BA PhD  
 SD CARTER BA PhD  
 Z CHALABI BSc PhD DIC  
 JD COLLIN BA MA (Econ) PhD  
 H DOUGLAS BA MSc  
 CA GOODMAN BA MSc CdiAF  
 R GRIEVE MSc BA  
 CA GRUNDY BEng MSc  
 S HAJAT BSc MSc PhD  
 KG HANSON BA MPhil MA  
 C HONGORO BSc PhD  
 AD HUTCHINGS BSc MSc  
 S JAN BEcon MEcon  
 K KIELMANN BA MA PhD  
 S KOVATS MSc  
 L KUMARANAYAKE BA MA PhD  
 SA LEWIN BSc (Med) MSc MBChB  
 J LEWSEY BSc PhD  
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 K LOUGHLIN MA PhD  
 KB NANCHAHAL BA MSc  
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 V VALDMANIS BA MPP PhD NCHSR  
 P VICKERMAN BSc DPhil  
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G HOARE

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 C RIVETT-CARNAC

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 D BURT  
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 HK PAXTON BA  
 KM THOMAS MSc BSc  
 D BYRNE

### Honorary Professors

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 M KELLY BA MPhil PhD HonMFPHM  
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 RSW SMITH BSc MB ChB MSc

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 PL TROOP CBE MA MSc MRCM MB ChB

### Honorary Senior Lecturers

IN BASNETT MBBS MRCP MSc MFPHM  
 J DIXON MBChB DCh MSc MFPHM  
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 G HUNDT PhD  
 V ILES BPharm MSc  
 RK JEWKES MD MFPHM MSc MBBS  
 K KAHN MBChB MPH  
 AS KESSEL BSc MBBS MPhil DFFP MSc MFPHM CCST PhD  
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 VS RALEIGH BA MSc PhD  
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 KM ROWAN BSc MSc DPhil  
 D SETHI MBChB MSc MD MFPHM MRCP  
 R STANWELL-SMITH MBChCh MSc FRCOG FFPHM  
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### Honorary Lecturers

SE BECKERLEG PhD  
 AR BRITTON BA MSc PhD  
 YJ COOMBES PhD  
 G DJURIC MD MSc MFPHM  
 JJ DUTCHAK BA MA PhD  
 D FLORIN BA MA MBBS MSc MRCPG  
 ADH LAKHANI MA FFPHM  
 S LANGHAM BSc MPhil PhD  
 DJ LAWRENCE BA MA MPhil HonMFPHM  
 E MOSSIALOS BSc PhD MD  
 A MOZUMDER MSc  
 S SCHROTER BA MSc PhD  
 JM STANTON BA PGCE MA PhD  
 W STEVENS BA MSc PhD  
 H WHENT BA PGDipLIS MSc

## Dean's Office

PA to the Dean  
 PC ROOME

Press Officer  
 LJ WRIGHT BA

## Administrative Services and Academic Services

### Secretary & Registrar

W SURRIDGE BA MA ACIS

### Deputy Secretary (Planning & Resources)

KJ HARRISON BA

### Budget Manager

B FENELON BSc CIMA

### Management Information Systems Officer

JK GIBBS BSc

## FINANCE

### Chief Accountant

G CALDERBANK MA ICAS

### Financial Accountant

E ANSONG ACMA

### Purchasing Officer

KI FLANDERS

### Assistant Management Accountant

P PILCHER MAAT

## PERSONNEL & PAY OFFICE

### Personnel Officer

HMJ ABBOTT BA MCIPD

### Deputy Personnel Officer

M HOURIGAN

### Assistant Personnel Officer

A LACEY GradCIPD

### Payroll Officer

N DHEERMOJEE

## REGISTRY

### Deputy Registrar

P SHANLEY BSc ARCS

### Assistant Registrar

N ABEL BA

### Student Adviser

EHI FLEET BA

### Student Disability Co-ordinator

D GIBBERD BA

## DISTANCE LEARNING PROGRAMME

### Project Manager

SE HORRILL BSc

### Computer Support Officer

S LEVY BA MSc

## RESEARCH GRANTS & CONTRACTS

### Research Finance Officer

CS ANDREWS BA

### Research Contracts Officer

P IRELAND BA

## BUILDING SERVICES

### Assistant Secretary (Safety & Building Services)

MD SMITH BSc MIOSH

### Building Contracts Manager

PD BOWLES

### Building Project Liaison Officer

C O'CONNOR BA Dip

### Catering Manager

R LOVESEY AHFCIMA

## GATES MALARIA PROGRAMME

### Manager

CH BOWLER MSc

### Assistant Manager

A BHASIN BSc PhD

## ACADEMIC SERVICES

### Librarian & Director of Information Services

RB FURNER BA MSc

## LIBRARY

### Deputy Librarian

JE EYERS BA MLS

### Serials Services Librarian

DS ARCHER BA MA

### Technical Services Librarian

RP LAMBERT SINGER BA MA DipLib

### Archivist

VM KILLICK MArchd

## NETWORK SUPPORT TEAM

### Network Support Manager

SA WAKEFIELD BA DipComp CNE

### Computing Officers

PD BATES BTEC BSc

M CHANDLER

JP ENDERSBY BSc

D JOHNSON BSc MSc

J METTIVIER

PA ROGERS

P SODHI BSc

### Web Development Officer

K HERMANSEN BSc MSc

*Academic, academic-related, computing and senior technical staff are listed here as at 1 October 2003. Other staff numbering approximately 255 are not shown.*



## COURT OF GOVERNORS

(At 1 November 2003)

Chair: S Atkinson CBE BSc MBChir MA FFPHM

**Appointed by the British Medical Association**  
Sir ALEXANDER MACARA FRCP FRCGP FFPHM DPH

**Appointed by the Council of the University of London**

Professor JH DARBYSHIRE OBE MBChB MSc FRCP FFPHM  
Professor E FERLIE MA MSc PhD  
Professor D LATCHMAN MA PhD DSc FRCPath

**Appointed by the Home Secretary**  
CMJ MARSHALL

**Appointed by the Medical Research Council**  
D DUNSTAN OBE PhD

**Appointed by the Royal Institute of Public Health and Hygiene and the Society of Public Health**  
HEA CARSON MBBS DPH SM (Harvard) MD FFPHM FRIPHH

**Appointed by The Royal Society**  
Professor RM ANDERSON FRS PhD DIC CBiol FIBiol FSS

**Appointed by the Royal Society for the Promotion of Health**  
(Vacancy)

**Appointed by the Royal Society of Tropical Medicine and Hygiene**  
Professor AM TOMKINS MBBS FRCP FRCPath FFPHM

**Appointed by the School Council**  
Professor SC CROFT BSc PGCE PhD  
Professor D ELBOURNE BSc MSc PhD CStat  
CFB SANDERSON MA MSc PhD HonMFPHM

**Appointed by the Seamen's Hospital Society**  
Professor PL CHIODINI BSc MBBS PhD FRCP

**Appointed by the Secretary of State for Defence**  
Surgeon Rear-Admiral IL JENKINS CVO QHS FRCS  
Major-General LP LILLYWHITE MBE QHS  
Air Vice-Marshal WJ PIKE QHP MSc MBBS MRCCGP MFOM MRCS LRCP DRCOG DA&Med RAF

**Appointed by the Secretary of State for Environment, Food and Rural Areas**  
S EDWARDS DVM&S MSc MA VetMB MRCVS

**Appointed by the Secretary of State for Foreign and Commonwealth Affairs**  
C DOW MBBS MRCP AFOM DTM&H

**Appointed by the Secretary of State for Health**  
S ATKINSON CBE BSc MBChir MA FFPHM  
JT CARTER MBChir MSc FRCP FCOM RCP DIH DHMSA  
(Vacancy)

**Appointed by the Secretary of State for International Development**  
Dame BRIDGET OGLIVIE DBE ScD

**Appointed by the Secretary of State for Scotland**  
EM ARMSTRONG BSc FRCPed FRCP(Glas)

**Appointed by the Society of Occupational Medicine**  
DH WRIGHT CBE MSc MBBS FCOM

**Co-opted Members**  
S BARCLAY MA  
RP BEASLEY MD  
JMT COCHRANE  
JS PETHICK

**Observer**  
The Rt Hon the BARONESS CHALKER OF WALLASEY PC

**Secretary**  
WS SURRIDGE BA MA ACIS (Secretary & Registrar)

## BOARD OF MANAGEMENT

(At 1 November 2003)

Chairman: The Rt Hon the Baroness Chalker of Wallasey PC

**Appointed by the Council of the University of London**  
Professor E FERLIE MA MSc PhD  
Professor D LATCHMAN MA PhD DSc FRCPath

**Appointed by the Court of Governors**  
S ATKINSON CBE BSc MBChir MA FFPHM  
S BARCLAY MA  
JMT COCHRANE

**Appointed by The Royal Society**  
Professor MP VESSEY CBE FRS MA MD FRCP(Lond)  
FRCPed FRCOG FRCGP FFPHM FFP FMedSci

**Appointed by the Secretary of State for Health**  
Professor P TROOP CBE  
(Vacancy)

**Representing the Secretary of State for International Development**  
J LOB-LEVYT MBChB MSc

**Co-opted Members**  
The Rt Hon the BARONESS CHALKER OF WALLASEY PC  
J GODFREY MA FCA FIAB (Honorary Treasurer)  
AG McCLELLAN BA  
DH NELSON BSc ACA  
Professor D WAKELIN PhD DSc FIBiol FRCPath  
(Deputy Chairman)

**Dean**  
Professor AP HAINES MBBS MD FRCP FFPHM FRCP FMedSc

**Formal Members appointed by School Council**  
E BREEZE BA MSc CStat PhD  
Professor AJ HALL MBBS FRCP MSc PhD FFPHM

**Informal Staff Members**  
Professor V BERRIDGE BA PhD HonMFPHM FRHistS  
TJ HURST MSc  
S JAFFAR MSc PhD  
R RAINE BSc MBBS MSc MFPHM PhD  
L SMEETH MBChB MRCCGP DCH DRCOG MSc  
DM WRIGHT BSc MSc

**Secretary**  
WS SURRIDGE BA MA ACIS (Secretary & Registrar)



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