Institution: St George's, University of London

Unit of Assessment: A2 Public Health, Health Services and Primary Care

a. Overview

St George's, University of London is the UK's only dedicated medical and healthcare university, and occupies a single shared site with a 1000-bed, multi-specialty teaching hospital located in an area of south-west London characterized by high social and ethnic diversity. Serving a catchment area of 1.3 million, St George's has developed an extensive and highly effective series of networks that together provide access to a population of 3.4 million for tertiary care.

In RAE 2008 St George's returned 111 FTE staff in six Units of Assessment (UoA). An additional 20.7 FTE were returned in a joint submission with Kingston University in two UoAs. In that exercise St George's strategy was an inclusive return that reflected the broad range of research conducted in the organization, but which inevitably masked several areas of higher quality. Following the outcome of that exercise St George's has undertaken a comprehensive re-examination of its research strategy as described below.

The current return in REF 2014 differs significantly from that in 2008 in that we have focused upon areas in which St George's has an international reputation. In this exercise we are submitting 55.7 FTE in two UoAs and there is no joint return with Kingston University. This reflects a strategic development in the University that has recently culminated in the establishment of three research institutes – Cardiovascular and Cell Sciences, Infection and Immunity, and Population Health. The first two major groupings are returned in UoA1 while Population Health is returned in UoA2.

Central to the development of this research strategy has been the four themes of:-

1. Maximizing the interaction between the University and St George's NHS Trust
2. Enhancing interactions between clinicians, clinical academics and biomedical scientists
3. Providing an environment that nurtures and develops scientists throughout their career
4. Growing and developing our multiple academic, industrial and health-related partnerships at a local and global level

- all with the ultimate ambition of creating a highly focused, responsive and patient-centred translational research environment.

b. Research strategy

Following the last Research Assessment Exercise, St George's undertook a detailed review of its research strategy. This culminated in the 2010-2015 Research Strategy described in the 2010 Strategic Plan, which established a greater degree of research focus with the establishment of three administrative Divisions which hosted six Research Centres. Research activity that lacked critical mass was retained within the Divisional structure outside of Research Centres.

This plan called for the establishment of a new full-time post of Dean of Research and Enterprise, to which an external appointment was made in April 2012. Following a further review of research performance, a further iteration of the research strategy was introduced in 2013 with the creation of three Research Institutes and a single Education Institute. Each Institute holds administrative responsibility and will direct and develop research in the core areas of Cardiovascular and Cell Sciences, Infection and Immunity, and Population Health. The Education Institute facilitates greater professionalism and research in medical education and provides a mechanism to develop, recognize and reward excellence in education.

The UoA2 submission is based principally on members of the Population Health Research Centre (PHRC), one of the six research centres created in 2010. The PHRC is the major component of the new Institute of Population Health Research, constituted in mid-2013 as one of three research institutes in the School.

Research groupings and activities

St George's has a well-established tradition of epidemiological research, which was flagged for special mention ("starred") in RAE 2001 and was the most highly rated submission from the Institution in RAE 2008. The focus of activity over this longer timescale has been primarily on aetiological research, using observational methods rather than intervention studies. This balance is shifting with several grant awards during 2010-2012 for controlled trials and "natural experiment" evaluations of public health policy initiatives.

At the start of the assessment period, and in our RAE 2008 submission, four overlapping and closely integrated sub-themes were identified: cardiovascular epidemiology, respiratory & environmental epidemiology, primary care epidemiology, and lifecourse epidemiology. More recently, work has expanded into complementary areas including genetic epidemiology, ophthalmic epidemiology, and health care evaluation, as reflected in the submitted outputs. However, the research activity remains cohesive and many members contribute actively to several sub-themes.

External collaboration forms an important part of the group's work and their research strategy. Global impact and substantial added scientific value has been achieved through active participation in the International Study of Asthma and Allergies in Childhood (**Anderson, Strachan**), European and trans-Atlantic collaborations and meta-analyses of air pollution effects (**Anderson, Atkinson**) and genome-wide association studies (**Strachan**), and capacity-building partnerships for cardiovascular and diabetes research in Middle Eastern countries (**Critchley**).

There are formal links within London with the MRC Centre for Environment and Health at Imperial College and Kings College (**Atkinson, Anderson**) and with the British Regional Heart Study team at University College London (**Whincup** continues as clinical director of this study).

The two submitted impact statements demonstrate a continuity of policy-relevant research dating from the mid-1990s through to the present, in relation to health effects of outdoor and indoor air pollution. Systematic reviews and meta-analyses of observational studies have formed an important part of this work. This expertise complements the activities of the Cochrane Airways Group, which was initiated by **Jones,** and now led by **Cates**. This is one of the most active groups within the Cochrane Collaboration, responsible for maintaining over 250 Cochrane reviews related to respiratory diseases in the Cochrane library and preparing 15-20 new reviews of randomised controlled trials each year.

Environmental changes

The research environment has remained largely stable over the assessment period. Research centres were formally introduced at St George's early in 2010, but in the case of Population Health, the centre was built very closely around an established group, and it forms the focus of the recently created Institute of Population Health Research. During 2008-2009, new posts were appointed at the levels of professor (**Critchley**, in succession to **Anderson**), senior lecturer (**Atkinson**) and lecturer (Thomas, replaced in 2013 by **Barone-Adesi**). The group was diminished in 2010 by the departure of a full time senior lecturer (Kerry), who was not replaced. During 2010-2013, two members (**Critchley, Rudnicka**) took periods of maternity leave. **Anderson** formally retired in 2010 but has been re-engaged part-time and continues as an active member of the group.

Research plans

Grants raised during 2010-2012 have already established continuity and expansion in the fields of cardiovascular and lifecourse epidemiology, environmental and ophthalmic epidemiology, evidence-based health care, and extension of the use of primary care electronic databases to studies of bereavement and quality of care. Substantial new grants have also been raised in response to national policy initiatives (see below), which will create new momentum in evaluation of public health policies, both by experimental and "natural experimental" designs.

Although the productivity and impact of genetic epidemiology was high during the assessment period, we envisage that this element of the group's portfolio will become much less prominent over the next 3-5 years, as past investment in the British 1958 birth cohort as a national genetic and phenotypic resource runs its course.

During 2012-2013, new projects have been approved and funded to analyse UK Biobank with specific foci on respiratory disease and retinal vascular imaging. This will be an area of future expansion in research activity, building upon **Strachan**'s past involvement in the development of Biobank (some ten years ago) and his current membership of the Biobank Outcomes Working Group.

International initiatives, promotion and dissemination of research

New international links are developing with the appointment of **Critchley**, who has established research capacity building collaborations between Middle Eastern countries and Western partners. The International Study of Asthma and Allergies in Childhood (ISAAC: **Anderson and Strachan** as founders, **Strachan** as executive member) formally closed at the end of 2012, but its 300 participating centres worldwide form the basis of a new Global Asthma Network, in partnership with the International Union Against Tuberculosis and Lung Disease (IUATLD), to raise awareness of asthma and its undertreatment as a global policy issue following the 2011 UN summit on non-communicable diseases, for which ISAAC and IUATLD co-authored a Global Asthma Report. **Strachan** also led the epidemiological analyses of respiratory mortality and morbidity presented in the European Respiratory Society's "European Lung White Book", published in 2013.

Responsiveness to national policy initiatives

The group have successfully engaged with UK funding initiatives in relation to environmental health (MRC-NERC call 2009: two awards to St George's: **Anderson, Atkinson, Cook, Whincup**), the built environment (MRC-NPRI call 2010: one award to St George's: **Owen**) and promotion of physical activity in children and in adults (two NIHR awards plus one NIHR studentship: **Cook, Harris, Whincup**). This extends the group's portfolio of "g-local" projects (local studies of potential global significance), including evaluation of the London Congestion Charging Scheme and Low Emissions Zone pollution control policies (**Anderson, Atkinson, Cook**), the London Olympic Athletes' Village rehousing project (**Cook, Owen, Rudnicka, Whincup**), and the use of pedometers in primary care to encourage middle-aged and elderly adults to take more exercise (**Cook, Harris**).

Work not yet "visible", plus multi-disciplinary developments

Much of the work described in the previous section, which started in 2011 and 2012, will not produce published outputs until after the REF 2014 census date. These studies considerably broaden the inter-disciplinary nature of the group's research, through external collaboration with environmental scientists, exercise physiologists, architects and town planners, sociologists and other qualtitative researchers. The analysis of retinal vascular images in UK Biobank (**Owen, Rudnicka**) brings further inter-disciplinary links with computer scientists.

c. People, including staffing strategy and staff development

For the majority of this REF period St George's has categorised staff into Research (committed to up to 10% time teaching), Teaching & Research (committed to up to 40% time teaching) and Teaching & Scholarship. With the development of a more focussed research and educational strategy, staff in the research institutes will be able to devote significantly more time to research with a flexible teaching commitment.

The success and sustainability of such a policy depends on effective performance management of research staff combined with a supportive mentoring strategy. The institute structure provides an effective framework for this. St George's operates a comprehensive annual Personal Review

process that has excellent compliance.

Equality and diversity

St George's has developed a Single Equality Scheme three-year action plan for all protected groups. 94% of staff are accredited by our innovative experiential Equality & Diversity training programme which the GMC recently commended as an area of good practice in their institutional review. We have separate E&D web pages for each protected group, which supports inclusive practice in the workplace. We are a Stonewall Diversity Champion. We have an active Athena SWAN Action Group and are currently awaiting the outcome of our bronze status application. In line with Equality Challenge Unit advice, we have embedded consultation mechanisms to provide regular opportunities for the institution to consult with all sections of its staff. We provide a breast feeding room and a multi-faith and quiet contemplation room. Selected staff have been trained to identify and assess individuals at risk of domestic abuse, stalking and honour based violence.

Effective development and support of the research work of staff

Continuous staff development is a prominent feature of employment at St George's with a wide range of transferrable skill training opportunities available. A recent development has been the Emerging Leaders programme that has been developed with the help of Judith Evans, recent Chair of St George's Council and previously Corporate Personnel Director at Sainsbury's and HR Director of Homebase. This is an intensive individual and group-training programme that runs over a 12 month cycle that has been very well received by its participants who in several cases have demonstrated an enhanced career trajectory.

St George's is committed to the principles outlined in the Concordat to support the career development of researchers. Following the launch of the Concordat in 2008 three policy decisions were introduced:

1. Introduction of a part-time, portfolio-based Postgraduate Certificate in Research Skills bringing together various core and optional development opportunities and supported by an individual mentor. This course, now in its 4th year, has been commended by its external examiners and by Vitae as an example of excellent practice in researcher career development.
2. Appointment of an Associate Dean to focus on Career Development of Research Staff.
3. Implementation of a requirement that all staff with management responsibility for research engage positively with researcher's skills and career development. This includes holding regular probation, review and performance management meetings and allows opportunities for training and development.

St George's has recently been awarded the European HR Excellence in Research award.

Research career development

St George's gives high priority to developing its early career researchers. This is in recognition of the fact that many of our current mid-grade and senior academic staff were recruited as ECRs, and development of their careers has institutional as well as individual benefits.

Within the UoA2 submission there are several examples of "growing our own": **Atkinson, Owen** and **Rudnicka** all commenced their employment at St George's as research assistants or research fellows and were promoted to academic positions here in open competition. **Shah** studied at St George's as a masters student and returned to a senior lecturer position after a period in NHS service work in public health. **Critchley** is also a former St George's masters student who returned to take up a chair of epidemiology after a combination of academic and service public health work elsewhere.

Indicative of this successful in-house career development is the fact that all but one of the publications submitted as research outputs in UoA2 for REF 2014 were produced while the relevant author was working at St George's.

d. Income, infrastructure and facilities

Income

Funding for research is derived from a combination of Research Councils, medical research charities, government departments and the European Commission. These funds are managed through a Joint Research and Enterprise Office (JREO) (jointly supported with St George's Healthcare Trust) with separate departments of Research Grants, Governance and Enterprise.

Over the REF period 2008-13, the volume of research funding approximated £1 million per FTE staff included in this UoA2 submission. More than half of this was grants from UK government departments including NIHR.

Infrastructure

Research in St George's is managed through the **Research Strategy Committee** (RSC) chaired by the Dean of Research. This Committee reports directly to the primary executive committee (the Strategic Planning and Resources Committee chaired by the Principal) and to St George's Council.

The Joint Research and Enterprise Office is managed and funded jointly with St George's Healthcare NHS Trust and is divided into three main sections – Research Grants, Governance and Enterprise. This structure has evolved over this REF period and has received significant institutional investment to provide experienced high quality leadership in each section, reporting to a single JREO Director who reports to the Dean of Research and the Chief Operating Officer.

The Equipment Users Committee (budget £500-600K) considers strategic (institutional), multi-user and single-user bids in a process that is highly competitive wherein only the strongest bids can be funded. The Committee supports a mix of individual bids and major initiatives. The Committee enables the funding of equipment for new staff, arranges equipment repairs across the Institution's research portfolio and provides Pilot Project grants to pump-prime full-scale grant applications to the major funding bodies (especially useful for early career researchers and those embarking on new research topics).

The Institutional Strategic Support Group oversees expenditure of our Wellcome Strategic Support funds and matching institutional funds. This includes consideration of applications to the St George's Researcher Development support scheme (usually providing bridging funding for talented researchers) and the Technician infrastructure Strategic Support Scheme. This has proved a highly valuable and effective resource supporting important strategic developments in the organisation.

Facilities

The Population Health research group is accommodated in 326m² office space and has exclusive use of 50m² paper archive storage and 95m² air-conditioned rooms for freezers, which are fully utilised. St George's provides central computing facilities which are used regularly for statistical processing of large datasets (particularly in primary care epidemiology and genetic association studies). Research students are accommodated as equal members of the research teams within the group.

e. Collaboration and contribution to the discipline or research base

Peer-review panels and other "academic citizenship"

Throughout the REF census period, one or more members of the PHRC (**Anderson, Atkinson, Strachan**) have served on Department of Health Advisory Committees on air pollution (COMEAP, QUARK). **Anderson** also served as an independent reviewer of the US Health Effects Institute air pollution research programme (2008-2012) and both **Anderson** and **Atkinson** contributed to discussions of air pollution policy in Europe (REVIHAP and HRAPIE: 2013).

During 2009-2012, **Strachan** was a member of the NIHR RfPB grants panel for London, and during 2009-2010 he was a member of the HPA investigation of *E.coli* O157 in relation to recreational farms (the Griffin inquiry). **Strachan** currently serves as academic advisor to the National Review of Asthma Deaths (conducted by RCP, funded by DH). **Strachan** also served as chair of Part A examiners for the Faculty of Public Health (2006-2009) and continued, as immediate past chair, to oversee development of the FPH examination (2009-2013).

Research resources and mechanisms for collaborative research

The British Regional Heart Study (BRHS), located at University College London, is directed by **Whincup**, who is funded full time by St George's. This nationwide cohort study is now in its 35th year and has contributed to many collaborative meta-analyses of established and novel cardiovascular risk factors.

The British 1958 Birth Cohort genetic resource was established by **Strachan** during 2004-2008, in collaboration with the University of Bristol. It continues to provide a nationally representative set of high quality (cell-line-derived) DNA samples for use in genetic case-control studies. Major usages within the REF 2014 evaluation period include the second and third phases of the Wellcome Trust Case-Control Consortium, and the UK Exome Chip Consortium.

The International Study of Asthma and Allergies in Childhood (ISAAC), in which **Anderson** and **Strachan** were founder members, ran from 1990 to 2012 and achieved global coverage with 306 study centres in 105 countries. Almost two million children were included during three phases of fieldwork, leading to over 500 journal publications (http://isaac.auckland.ac.nz/story/). This major capacity-building initiative was extended in 2013 to form a Global Asthma Network (GAN), in collaboration with the International Union Against Tuberculosis and Lung Disease. GAN (http://www.globalasthmanetwork.org/) aims to raise the profile of asthma as a non-communicable disease and strives to ensure global access to quality-assured essential asthma medications, as recommended in recent WHO guidelines. **Strachan** is a member of the GAN steering committee.

Effective academic collaboration

Within London, close and productive collaborations are maintained with UCL (through **Whincup**'s direction of the BRHS – see above) and with KCL and Imperial (through links with the MRC Centre for Environment and Health: particularly **Atkinson** and **Anderson**).

Following the sudden death in 2007 of Stephan Weiland, the ISAAC principal investigator at the University of Ulm, Germany, **Strachan** took on the role of mentorship for his research group, which formed the ISAAC Phase Two data centre. Funding was provided from St George's to facilitate the completion of outstanding publications, pending the appointment of a successor to Prof Weiland's position in 2012.

Responsiveness to national and international initiatives

Through his work funded by the UK Care Quality Commission, **Shah** provides input to policy discussions about quality of care in care homes for elderly. As noted under the section on research strategy, several members of the group have successfully engaged with UK funding initiatives in relation to environmental health (MRC-NERC call 2009: two awards to St George's), the built environment (MRC-NPRI call 2010: one award to St George's) and promotion of physical activity in children and in adults (two NIHR awards plus one NIHR studentship awarded 2010-2011).

Anderson and **Strachan** have contributed to major international reviews and reports including the Global Asthma Report UN 2011 (**Strachan, Anderson**); the Global Burden of Disease report published in 2012 (**Anderson**) and the ERS Lung White Book published in 2013 (**Strachan**).