WORKING
PAPER

Bibliometric analysis of highly cited publications of health research in England, 1995-2004

Thed van Leeuwen and Jonathan Grant

WR-368-DH

August 2007

Prepared for the Department of Health

RAND EUROPE

Centre for Science & Technology Studies (CWTS)
Leiden University
The Netherlands

Preface

This memorandum describes a bibliometric analysis to support the process of identifying candidate Biomedical Research Centres, as part of the Department of Health's new R&D strategy, *Best Research for Best Health*. It is intended to inform the potential candidates in deciding whether to submit a prequalification questionnaire as part of the Biomedical Research Centre procurement process and inform the deliberations of the selection panel for the Biomedical Research Centres. The work presented in this paper was a collaboration between the Centre for Science and Technology studies in the Netherlands, and RAND Europe.

The Centre for Science and Technology Studies (CWTS) is an interdisciplinary research institute housed within the Faculty of Social Sciences of Leiden University, the Netherlands. The CWTS participates in the Netherlands Graduate School on Science, Technology, and Modern Culture. CWTS specialises in advanced quantitative analysis of science and technology performance and the cognitive and organisational structure of science and technology[1]. Research in short- and long-term programmes is carried out for governments, European Union (EU), national and international research organisations, universities and companies.

RAND Europe is an independent private, not-for-profit, research institution that helps improve policy and decision-making through research and analysis[2]. Our offices are in Cambridge, Leiden and Berlin; we are affiliated with the US RAND Corporation. Our office in Europe was opened 1992 and since then we have engaged in research for governmental and private sector clients, principally in the areas of R&D policy, transportation and infrastructure, health policy, information and communications technology, and defence and security.

---

[1] For more information on CWTS please see www.cwts.nl

[2] For more information on RAND Europe please see www.randeurope.org

Introduction

This paper presents the findings of a bibliometric analysis of biomedical and health research in England. The purpose of the exercise is to support the selection of Biomedical Research Centres as part of the Department of Health's new National Institute for Health Research, as described in *Best Research for Best Health*. The paper is published along side the Department of Health's *Invitation to Submit a Pre-qualifying Questionnaire* that sets out the aims, key characteristics and selection criteria of the Biomedical Research Centres. Below we describe the bibliometric approach adopted and the key results. We would like to stress at the outset that there are a number of well-known limitations to bibliometric analyses[3], and that the results need to be used within that context[4]. Moreover, candidate institutions are being invited to highlight the list of publications attributed to their organisations. In addition, in developing a short list of candidate Centres, the Department of Health is adopting a process of 'triangulation', and will be using other secondary inputs including data on research capacity (ie, the number of people who are engaged in research) and the volume and source of external research funding received by the NHS/University partnership.

Methodology

CWTS maintains a bibliometric database of all scientific publications (including health and biomedical research) for the period 1981 to 2004. This dataset is based on the journals and serials processed for the CD-ROM versions of the Science Citation Index and associated citation indices (CI): the Science Citation Index (SCI), the Social Science Citation Index (SSCI), and the Arts & Humanities Citation Index (A&HCI), extended with six so-called specialty Citation Indices (Chemistry, Compumath, Materials Science, Biotechnology, Biochemistry & Biophysics, and Neuroscience). Currently, CWTS is changing its database towards the Web of Science version (the internet version) of the

---

3 Moed, H.F., Citation analysis in research evaluation, 2005, Springer, and more in particular Part I of the book, pages 1-69.

4 www.studies.cwts.nl/verif/eng_biomed

Citation Index(es), which covers the period 1981 to 2005, and has a somewhat different journal set coverage. The construction of this database, and the indicators operating on it, are described in various scientific publications[5].

To identify publications in the fields of health and biomedical research within the citation indexes of Thomson Scientific (the former ISI, which stands for the Institute for Scientific Information) we used the Journal Subject Categories (JSC). We selected the 74 fields listed in Annex A and identified all articles, letters, and reviews (as is the norm in bibliometric analysis) with the country name 'ENGLAND'. This resulted in 312,914 publications in the period 1995-2004.

We then determined the citation distribution of all publications in those fields and selected those publications that belong to the top 20% most highly cited publications (HCP) in every selected field, excluding self-citations[6]. In Annex A, we list the number of citations needed for each field to appear in the top 20%. Note that we are *not* focusing on the top 20% of England's publications in those fields, but the contribution of England to the worldwide top 20% most highly cited publications per field.

In the selection of the HCP's, we were restricted to the period 1995-2001, since we want all publications to have the same citation window, which is set at a standard length of four years[7]. This requirement makes that the last year of publication that can be analyzed is 2001, with 2001, 2002, 2003, and 2004 as citation years.

This process resulted in 45,572 publications. For these publications, we cleaned-up the address information available for addresses attached to scientific publication in the citation

---

[5] Moed et al (1995). New Bibliometric Tools for the Assessment of National Research Performance: Database Description Overview of Indicators and First Applications. Scientometrics, 33, 381-425; van Leeuwen et al (2001). Language biases in the coverage of the science Citation Index and its consequences for international comparisons of national research performance, Scientometrics, 51, 335-346; van Leeuwen et al (2003). The Holy Grail of Science Policy: Exploring and Combining Bibliometric Tools in Search of Scientific Excellence, Scientometrics, 2003, 257-280.

[6] Self-citations occur if one of the authors of a citing paper also appears in the cited paper. Typically self-citations account for between 20 and 40% of all citations are self citations, depending on the field.

[5] A further limitation was that we had to focus on articles and reviews, given that letters appear in a much lesser quantity in the serial literature (thereby causing problems in the statistical reliability of the analysis), letters do have a different citation pattern (in general, a much shorter one), and letters do appear

indexes. The resulting lists of publications for universities, hospitals and other publicly funded research organizations were checked and improved by the Department of Health.

Box 1 summarises that data collection process.

Once we identified the 45,572 highly cited publications in the fields of health and biomedical research from NHS organisations and Universities in England, we undertook three analyses:

- We looked at the **number of HCP** between 1995 and 2001 by institution as an indicator of critical mass and quality for general Biomedical Research Centres. This was based on whole counting of the contributions of each institution to a journal, and as it is attributed to the various JSC's, to each field equally.
- We undertook a **network analysis** to examine co-publications as in indicator of collaboration[8]. We focused this analysis on all institutes with 20 or more co-publications. The network analysis uses the Spring Embedded Algorithm, that causes institutes to be distributed over the available space fairly evenly, but links institutes with co-publications.
- We looked at the **concentration of HCP papers in the field** to identify world-class biomedical research in a specific field. To do this we examined each field and allocated the share of HCP to the institutions. Because there are collaborations between institutions the total share of HCP by field adds up to more than 100%. To identify potential areas of concentration, we filtered the results looking for institutions with more than 10% of a field (and coded this as red) and for between 5 and 10% of a field (and coded this grey).

[8] The Ucinet network-analysis was used to analysis the co-occurrences of addresses of the various institutions on research publications. This method is described in more detail in Borgatti et al 2002. Ucinet 6 for Windows. Harvard: Analytic Technologies. Available: http://www.analytictech.com, and Wasserman and Faust, 1994, *Social Network Analysis*. Cambridge University Press, Cambridge.

Box 1: Summary of data collection process

Delineate biomedical research and clinical medicine by selecting 72 fields (the so-called Journal Subject Categories).

Select all publications from England from the Citation Indexes.

Focus on top-20% most highly cited publications in their respective field(s) over the years 1995-2001.

Select the addresses related to the top 20% most highly cited publications.

Address information on the level of main organizations as well as the underlying 'departmental/institutional' level was used to identify the institutes and organizations that contribute to England's share of top biomedical research and clinical medicine worldwide.

The addresses of the organizations found were cleaned and unified by adding information on the origin of NHS funds.

The final selection (45,572 publications) contained all NHS organisations (n=56) and universities (N=37) within the top 20% most highly cited publications.

Results

Number of highly cited papers published between 1995 and 2001

In Figure 1, the volume of highly cited papers (HCP) published between 1995 and 2001 is presented for institutions that have on average more than 30 highly cited papers per year. The NHS institutions are indicated in red, the Universities in blue, and the other publicly funded research institutes in green. Table 1 presents the annual number of HCP per year for the NHS organisations, Universities and other institutes

The dominant role of the institutes of the academic sector, and more in particular the London universities (University College, King's College, and Imperial College) and Oxford and Cambridge, is apparent. The top-5 NHS organizations, in terms of number of HCP, include: Oxford Radcliffe, Guy's and St Thomas's, Hammersmith, Royal Free and Barts.

Co-publication activity between institutions

In Figure 2, the network of collaboration resulting in co-publications is shown. In this figure, all institutes with 20 or more co-publications are selected. The nodes shown are institutes in the analysis. The size of the nodes relates to the number of HCP's in the period 1995-2001, while the colour indicates the type of institute (red=NHS, blue is

university, and green is other). The links, and more in particular the thickness of the links, indicate the strength of the co-publication network.

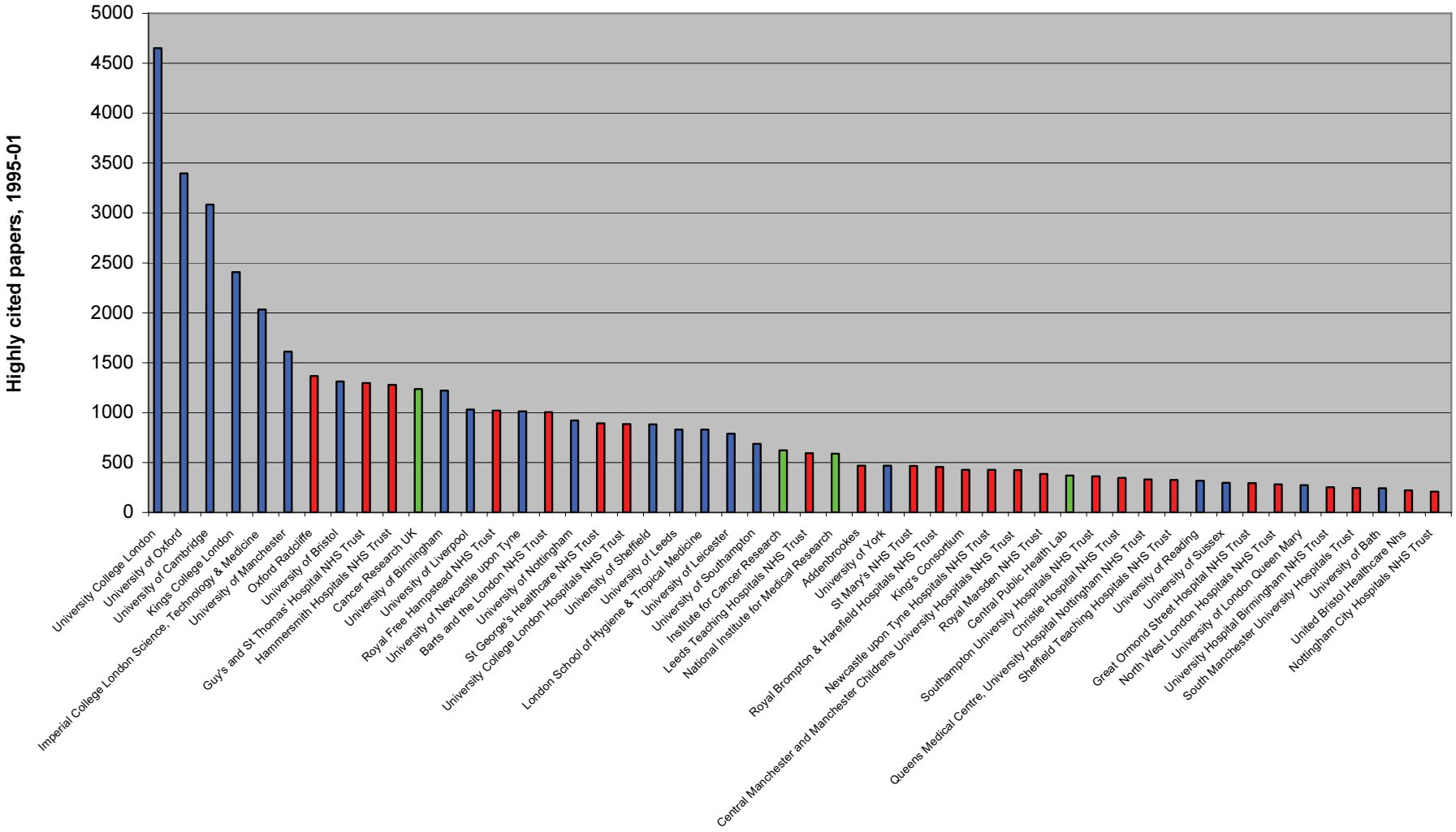
In the middle of the network, the large universities in London (University College, Imperial College, and King's College) and those of Oxford and Cambridge become visible. These five are drawn to the center of the network due to their many links (highly cited co-publications) with other institutes. The remaining part(s) of the network has face validity from two perspectives, one being the geographical distribution over England, and the existing co-publication activity (e.g., the position of the University of Nottingham and the Queens Medical Centre, University Hospital Nottingham Trust), and second, through the background of the institutes involved (e.g., the position of Royal Marsden NHS Trust which is strongly linked with the Institute for Cancer Research).

Distribution of HCP papers in a field

In Figure 3 the share of HCP by field and institution is shown. Those cells highlighted in red had more than 10% of the fields share, and those in grey between 5 and 10%. By means of illustration, the first red cell is for *Gerontology/Newcastle upon Tyne Hospitals Trust with a value of 11%[9]. This means that 11% of HCP classified within the *Gerontology field have an address associated with Newcastle upon Tyne Hospitals Trust. To simplify reading of Figure 3, in Table 2 we have listed all those field/institution combinations that have more than a 10% share of a fields HCPs.

[9] The * preceding Gerontology indicates that this is a Journal Subject Category or field from the Social Science Citation Index.

Figure 1: Total number of HCP for selected[10] organisations, 1995-2001



[10] Selected on the basis of more than an average of 30 HCP per year.

Table 1: Annual number of HCP's for selected[11] organisation, 1995-2001

	1995	1996	1997	1998	1999	2000	2001	Total
NHS organizations								
Oxford Radcliffe	203	198	220	165	199	192	190	1367
Guy's and St Thomas' Hospital NHS Trust	107	109	164	214	249	228	226	1297
Hammersmith Hospitals NHS Trust	227	223	221	178	145	142	145	1281
Royal Free Hampstead NHS Trust	95	109	123	158	149	180	208	1022
Barts and the London NHS Trust	160	138	160	116	152	135	144	1005
St George's Healthcare NHS Trust	127	113	131	126	153	122	123	895
University College London Hospitals NHS Trust	164	154	146	107	99	99	115	884
Leeds Teaching Hospitals NHS Trust	67	68	94	91	114	76	86	596
Addenbrookes	67	63	57	79	60	58	86	470
St Mary's NHS Trust	95	77	79	70	61	39	46	467
Royal Brompton & Harefield Hospitals NHS Trust	66	57	59	68	73	75	60	458
King's Consortium	65	50	50	70	55	69	70	429
Newcastle upon Tyne Hospitals NHS Trust	46	71	58	44	56	74	79	428
Central Manchester and Manchester Childrens University Hospitals NHS Trust	33	45	64	68	73	67	75	425
Royal Marsden NHS Trust	53	50	70	54	47	61	53	388
Southampton University Hospitals NHS Trust	42	49	46	61	47	55	64	364
Christie Hospital NHS Trust	53	45	52	56	47	41	54	348
Queens Medical Centre, University Hospital Nottingham NHS Trust	37	48	66	57	41	39	45	333
Sheffield Teaching Hospitals NHS Trust	31	51	43	46	44	47	63	325
Great Ormond Street Hospital NHS Trust	27	47	47	46	38	41	49	295
North West London Hospitals NHS Trust	43	45	30	39	40	48	37	282
University Hospital Birmingham NHS Trust	49	33	30	28	43	33	37	253
South Manchester University Hospitals Trust	34	24	41	35	36	37	40	247
United Bristol Healthcare NHS	24	35	27	34	29	46	27	222
Nottingham City Hospitals NHS Trust	28	31	32	24	32	36	27	210
Universities								
University College London	559	648	694	693	676	709	671	4650
University of Oxford	409	423	490	478	500	568	530	3398
University of Cambridge	417	428	389	411	460	481	498	3084
Kings College London	368	403	371	312	319	293	341	2407
Imperial College London Science, Technology & Medicine	204	212	215	310	317	365	410	2033
University of Manchester	192	191	215	229	266	247	272	1612
University of Bristol	146	169	185	214	190	188	222	1314
University of Birmingham	139	137	143	186	203	198	216	1222
University of Liverpool	127	139	135	162	167	148	154	1032
University of Newcastle upon Tyne	132	141	117	142	144	164	172	1012
University of Nottingham	100	103	116	129	153	172	151	924
University of Sheffield	93	104	126	135	128	145	151	882
University of Leeds	86	104	122	114	134	128	143	831
London School of Hygiene & Tropical Medicine	84	119	120	128	130	126	122	829
University of Leicester	102	104	98	122	113	128	123	790
University of Southampton	72	88	100	104	115	102	107	688
University of York	43	59	54	79	76	68	90	469
University of Reading	42	34	36	39	58	53	56	318
University of Sussex	48	37	43	50	43	38	40	299
University of London Queen Mary	37	26	34	34	39	57	47	274
University of Bath	31	30	37	37	41	32	35	243
Other institutions								
Cancer Research UK	214	188	201	175	160	172	127	1237
Institute for Cancer Research	88	89	107	90	95	77	76	622
National Institute for Medical Research	86	96	96	85	93	73	59	588
Central Public Health Lab	42	41	43	59	49	66	71	372

[11] Selected on the basis of more than an average of 30 HCP per year.

Figure 2: Network of collaboration resulting in highly cited co-publications

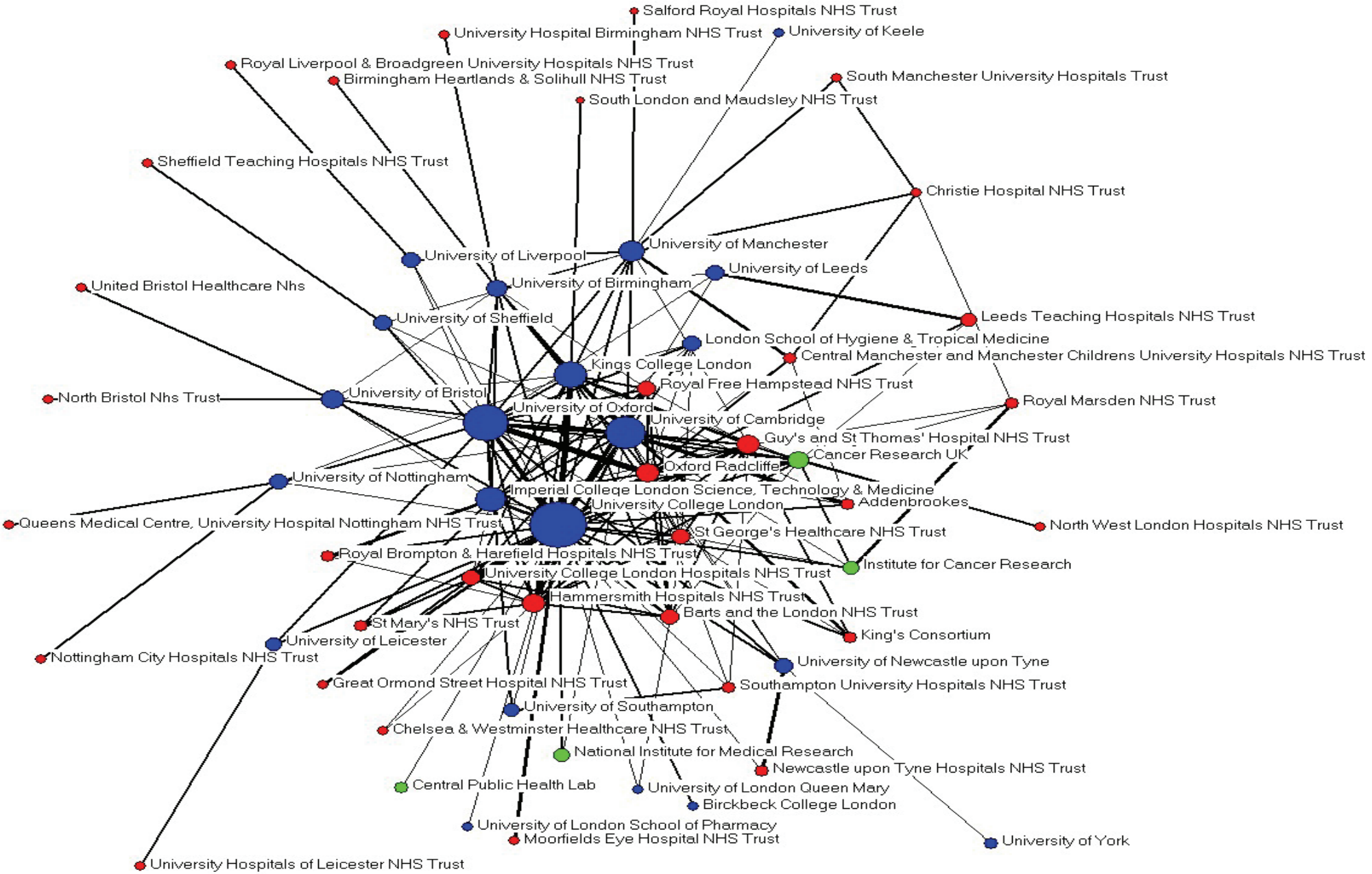


Figure 3: Cross tabulation of share of HCP by field and institution

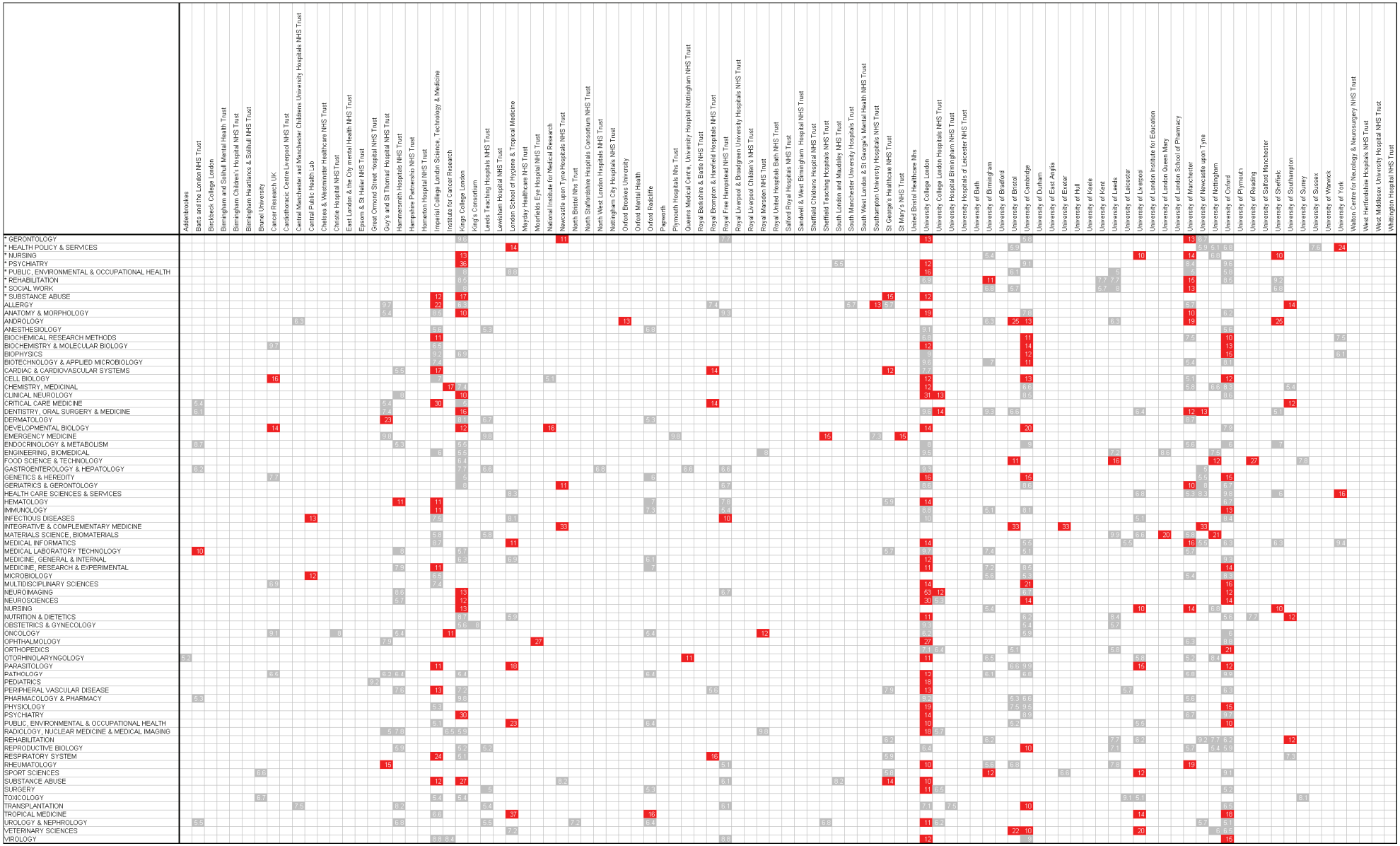


Table 2: Institutions with more than 10% of HCPs by field

Field	Institution	(%)
* Gerontology	Newcastle upon Tyne Hospitals NHS Trust	11
	University College London	13
	University of Manchester	13
* Health Policy & Services	London School of Hygiene & Tropical Medicine	14
	University of York	24
* Nursing	King's College London	13
	University of Liverpool	10
	University of Manchester	14
	University of Sheffield	10
* Psychiatry	King's College London	36
	University College London	12
* Public, Environmental & Occupational Health	University College London	16
* Rehabilitation	University of Birmingham	11
	University of Manchester	15
* Social Work	University of Manchester	13
* Substance Abuse	Imperial College London Science, Technology and Medicine	12
	King's College London	17
	St George's Healthcare NHS Trust	15
	University College London	12
Allergy	Imperial College London Science, Technology and Medicine	22
	Southampton University Hospitals NHS Trust	13
	University of Southampton	14
Anatomy & Morphology	King's College London	10
	University College London	19
	University of Manchester	10
Andrology	Oxford Brookes University	13
	University of Bristol	25
	University of Cambridge	13
	University of Manchester	19
	University of Sheffield	25
Biochemical Research Methods	Imperial College London Science, Technology and Medicine	11
	University of Cambridge	11
	University of Oxford	10
Biochemistry & Molecular Biology	University College London	12
	University of Cambridge	14
	University of Oxford	13
Biophysics	University of Cambridge	12
	University of Oxford	15
Biotechnology & Applied Microbiology	University of Cambridge	11
Cardiac and Cardiovascular	Imperial College London Science, Technology and Medicine	17

Systems	Royal Brompton & Harefield Hospitals NHS Trust	14
	St George's Healthcare NHS Trust	12
Cell Biology	Cancer Research UK	16
	University College London	12
	University of Cambridge	13
	University of Oxford	12
Chemistry, Medicinal	Institute for Cancer Research	17
	University College London	12
Clinical Neurology	King's College London	10
	University College London	31
	University College London Hospitals NHS Trust	13
Critical Care Medicine	Imperial College London Science, Technology and Medicine	30
	Royal Brompton & Harefield Hospitals NHS Trust	14
	University of Southampton	12
Dentistry, Oral Surgery & Medicine	King's College London	16
	University College London Hospitals NHS Trust	14
	University of Manchester	12
	University of Newcastle upon Tyne	13
Dermatology	Guy's and St Thomas' Hospital NHS Trust	23
Developmental Biology	Cancer Research UK	14
	King's College London	12
	National Institute for Medical Research	16
	University College London	12
	University of Cambridge	13
Emergency Medicine	Sheffield Teaching Hospitals NHS Trust	15
	St Mary's NHS Trust	15
Food Science & Technology	University of Bristol	11
	University of Leeds	16
	University of Nottingham	12
	University of Newcastle upon Tyne	13
Genetics & Heredity	University College London	16
	University of Cambridge	15
	University of Oxford	15
Geriatrics & Gerontology	Newcastle upon Tyne Hospitals NHS Trust	11
	University of Manchester	10
Health Care Sciences & Services	University of York	16
Hematology	Hammersmith Hospitals NHS Trust	11
	Imperial College London Science, Technology & Medicine	11
	University College London	14
Immunology	Imperial College London Science, Technology & Medicine	11
	University of Oxford	13
Infectious Diseases	Central Public Health Lab	13
	Royal Free Hampstead NHS Trust	10
Integrative & Complementary	Newcastle upon Tyne Hospitals NHS Trust	33

Medicine	University of Bristol	33
	University of Exeter	33
	University of Newcastle upon Tyne	33
Materials Science, Biomaterials	University of London Queen Mary	20
	University of Nottingham	21
Medical Informatics	London School of Hygiene & Tropical Medicine	11
	University College London	14
	University of Manchester	16
Medical Laboratory Technology	Barts and the London NHS Trust	10
Medicine, General & Internal	University College London	12
Medicine, Research & Experimental	Imperial College London Science, Technology & Medicine	11
	University College London	11
	University of Oxford	14
Microbiology	Central Public Health Lab	12
Multidisciplinary Sciences	University College London	14
	University of Cambridge	21
	University of Oxford	16
Neuroimaging	Kings College London	13
	University College London	53
	University College London Hospitals NHS Trust	12
	University of Oxford	12
Neurosciences	Kings College London	12
	University College London	30
	University of Cambridge	14
	University of Oxford	14
Nursing	Kings College London	13
	University of Liverpool	10
	University of Manchester	14
	University of Sheffield	10
Nutrition & Dietetics	University College London	11
	University of Southampton	12
Oncology	Institute for Cancer Research	11
	Royal Marsden NHS Trust	12
Ophthalmology	Moorfields Eye Hospital NHS Trust	27
	University College London	27
Orthopedics	University of Oxford	21
Otorhinolaryngology	Queens Medical Centre, University Hospital Nottingham NHS Trust	11
	University College London	11
Parasitology	Imperial College London Science, Technology & Medicine	11
	London School of Hygiene & Tropical Medicine	18
	University of Liverpool	15
	University of Oxford	12
Pathology	University College London	12

Pediatrics	University College London	18
Peripheral Vascular Disease	Imperial College London Science, Technology & Medicine	13
	University College London	13
Pharmacology & Pharmacy		
Physiology	University College London	19
	University of Oxford	15
Psychiatry	King's College London	30
	University College London	14
Public, Environmental & Occupational Health	London School of Hygiene & Tropical Medicine	23
	University College London	10
	University of Oxford	10
Radiology, Nuclear Medicine & Medical Imaging	University College London	18
Rehabilitation	University of Southampton	12
Reproductive Biology	University of Cambridge	10
Respiratory System	Imperial College London Science, Technology & Medicine	24
	Royal Brompton & Harefield Hospitals NHS Trust	16
Rheumatology	Guy's and St Thomas' Hospital NHS Trust	15
	University College London	10
	University of Manchester	19
Sport Sciences	University of Birmingham	12
	University of Liverpool	16
Substance Abuse	Imperial College London Science, Technology & Medicine	12
	King's College London	27
	St George's Healthcare NHS Trust	14
	University College London	10
Surgery	University College London	11
Toxicology		
Transplantation	University of Cambridge	10
Tropical Medicine	London School of Hygiene & Tropical Medicine	37
	Oxford Radcliffe	16
	University of Liverpool	14
	University of Oxford	18
Urology & Nephrology	University College London	11
Veterinary Sciences	University of Bristol	22
	University of Cambridge	10
	University of Liverpool	20
Virology	University College London	12
	University of Oxford	15

Annex A: Fields of analysis and number of citations needed to be in the 20% of cited papers, excluding self citations

	1995	1996	1997	1998	1999	2000	2001
* GERONTOLOGY	6	4	5	5	5	6	7
* HEALTH POLICY & SERVICES	5	4	5	5	6	5	5
* NURSING	3	3	3	3	3	4	4
* PSYCHIATRY	7	5	5	6	6	6	6
* PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH	4	4	3	3	4	4	4
* REHABILITATION	4	3	3	3	3	3	3
* SOCIAL WORK	3	3	3	3	3	3	3
* SUBSTANCE ABUSE	8	5	4	5	5	7	6
ALLERGY	6	6	11	7	8	7	9
ANATOMY & MORPHOLOGY	4	4	4	4	4	5	6
ANDROLOGY	.	5	6	7	5	5	5
ANESTHESIOLOGY	7	7	7	6	7	7	7
BIOCHEMICAL RESEARCH METHODS	7	6	7	5	6	5	6
BIOCHEMISTRY & MOLECULAR BIOLOGY	9	8	8	9	9	9	9
BIOPHYSICS	7	6	7	7	7	7	8
BIOTECHNOLOGY & APPLIED MICROBIOLOGY	4	4	4	4	4	5	5
CARDIAC & CARDIOVASCULAR SYSTEMS	8	7	6	8	9	9	9
CELL BIOLOGY	13	13	13	15	13	11	14
CHEMISTRY, MEDICINAL	6	6	5	6	7	7	8
CLINICAL NEUROLOGY	7	7	8	8	8	7	8
CRITICAL CARE MEDICINE	9	6	10	10	10	11	8
DENTISTRY, ORAL SURGERY & MEDICINE	4	4	4	5	4	5	5
DERMATOLOGY	5	5	5	6	6	6	6
DEVELOPMENTAL BIOLOGY	14	12	21	21	15	13	12
EMERGENCY MEDICINE	3	3	4	4	4	4	5
ENDOCRINOLOGY & METABOLISM	9	9	9	10	10	11	11
ENGINEERING, BIOMEDICAL	3	3	4	4	4	4	5
FOOD SCIENCE & TECHNOLOGY	4	4	4	4	4	4	5
GASTROENTEROLOGY & HEPATOLOGY	8	7	8	8	8	10	8
GENETICS & HEREDITY	6	6	6	7	7	7	7
GERIATRICS & GERONTOLOGY	6	5	7	6	6	7	9
HEALTH CARE SCIENCES & SERVICES	5	4	4	4	4	5	4
HEMATOLOGY	11	11	12	12	12	13	13
IMMUNOLOGY	9	8	9	7	9	10	9
INFECTIOUS DISEASES	9	9	9	9	9	9	10
INTEGRATIVE & COMPLEMENTARY MEDICINE	.	.	.	.	.	13	8
MATERIALS SCIENCE, BIOMATERIALS	5	5	5	6	6	7	7
MEDICAL INFORMATICS	3	3	4	3	4	4	5
MEDICAL LABORATORY TECHNOLOGY	6	6	6	7	7	7	7
MEDICINE, GENERAL & INTERNAL	8	8	8	9	9	8	8
MEDICINE, RESEARCH & EXPERIMENTAL	7	7	8	7	6	7	7
MICROBIOLOGY	7	7	6	6	7	7	8
MULTIDISCIPLINARY SCIENCES	26	14	28	26	29	29	34
NEUROIMAGING	9	7	8	9	8	9	9
NEUROSCIENCES	7	7	7	7	6	8	8
NURSING	3	3	3	3	3	4	4
NUTRITION & DIETETICS	5	4	5	5	6	6	6
OBSTETRICS & GYNECOLOGY	6	6	6	5	5	6	6
ONCOLOGY	9	7	9	7	10	11	8
OPHTHALMOLOGY	6	5	6	6	7	7	7
ORTHOPEDICS	4	5	5	5	5	5	6
OTORHINOLARYNGOLOGY	4	4	4	4	4	4	4
PARASITOLOGY	5	4	4	4	4	4	5
PATHOLOGY	6	7	6	7	6	9	8
PEDIATRICS	6	5	6	5	5	7	7
PERIPHERAL VASCULAR DISEASE	10	9	11	10	9	10	10
PHARMACOLOGY & PHARMACY	6	6	6	6	5	7	5
PHYSIOLOGY	6	5	6	6	7	7	7
PSYCHIATRY	7	6	7	8	8	8	9

PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH	5	4	6	5	5	6	4
RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING	5	5	4	5	5	6	6
REHABILITATION	4	5	4	4	5	4	5
REPRODUCTIVE BIOLOGY	7	6	8	6	8	7	7
RESPIRATORY SYSTEM	8	7	9	8	9	9	8
RHEUMATOLOGY	8	8	8	9	9	9	8
SPORT SCIENCES	5	4	5	4	5	6	6
SUBSTANCE ABUSE	7	7	10	8	8	8	9
SURGERY	5	5	5	5	5	5	5
TOXICOLOGY	4	4	5	4	7	5	6
TRANSPLANTATION	6	6	7	6	8	7	8
TROPICAL MEDICINE	6	5	5	6	6	5	5
UROLOGY & NEPHROLOGY	7	6	7	7	8	9	9
VETERINARY SCIENCES	3	3	3	3	3	3	4
VIROLOGY	9	10	10	9	11	11	11