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RAND EUROPE

Analysis of research and education indicators to support designation of Academic Health Science Centres in England

Salil Gunashekar, Petal Jean Hackett, Sophie Castle-Clarke,
Ros Rouse, Jonathan Grant

Prepared for the Department of Health (England)

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1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
Westbrook Centre, Milton Road, Cambridge CB4 1YG, United Kingdom
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Preface

In April 2013, the Department of Health (DH) announced an open competition to designate Academic Health Science Centres (AHSCs) in England. To support the current competition, the DH commissioned RAND Europe to compile and analyse various types of publicly available data and quality assessments in the domains of medical research and health education.

This report presents the results of the analysis in the form of summary 'tables of excellence'. An original bibliometric analysis of health-related research publications has also been carried out and is presented. In addition, the report provides an overview of the publicly available data and outlines the significant caveats to using the data to produce education and research rankings for institutions. The appendices describe the source data in more detail, along with the strengths and weaknesses of each particular indicator.

This report is intended to assist potential applicants in deciding whether to submit a pre-qualifying questionnaire as part of the procurement process as well as to inform the deliberations of the selection panel for the AHSCs.

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For more information about RAND Europe or this document, please contact:

Jonathan Grant
RAND Europe
Westbrook Centre
Milton Road
Cambridge CB4 1YG
United Kingdom
Tel. +44 (1223) 353 329
jgrant@rand.org

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Executive summary

The Department of Health (DH) announced an open competition in April 2013 to designate Academic Health Science Centres (AHSCs) in England. The DH awarded AHSC status to institutions in England for the first time in March 2009. To support the current competition the DH commissioned RAND Europe to compile and analyse various types of publicly available data and quality assessments in the domains of medical research and health education. This report primarily focuses on medical schools/academic partners likely to seek AHSC status but, where available, an analysis of research and education quality metrics has also been presented for NHS institutions in England.

This report presents the results of the analysis in the form of summary 'tables of excellence'. A consolidated table showing the research and education domain ranking lists is presented below (Table ES-1). To provide an impression of the relative performance of the listed institutions across the research and educations domains, a colour code is applied to each indicator ranking list in the table.

A detailed bibliometric analysis of health-related research publications has also been carried out and is presented. To support consideration of the tables, the report provides an overview of the publicly available data and outlines the significant caveats to using the data to produce education and research ranking lists for candidate institutions. The appendices describe the source data in more detail, and also list some of the strengths and weaknesses of each particular indicator.

It should be noted that the analysis is not intended to provide a definitive shortlist of institutions. There are a series of caveats about the methods we have used that should be borne in mind when reviewing the results presented. Our analysis is perhaps overly selective in that we have only examined the performance of universities with medical schools, whereas partnerships of any NHS provider/university in England that judge themselves able to demonstrate characteristics for AHSCs and to meet the published designation criteria may submit a pre-qualifying questionnaire. A more serious concern is that most of the indicators are proxies for quality. Because we are depending on pre-existing indicators, the unit of analysis for which the indicator is compiled is sometimes not the same as our unit of analysis. Furthermore, some of the indicators that have been used as quality measures in either the education or research domains are actually basket indicators that span both domains. Related is the issue of multiple counting of indicators across the research and education domains. Another key issue that must be noted while interpreting the results is that using rankings emphasises the differences between institutions that are similar in performance and vice versa.

Possibly the most significant weakness of the approach is where we have had to combine sub-indicators for each institution to provide a single institutional indicator for ranking. In these instances, we have had to generate our own rankings by devising a way to combine an institution's scores into one indicator. Because there is no accepted way of combining an institution's scores, this leaves us open to the criticism that we have used an arbitrary or inappropriate method of combination. Furthermore, university ranking lists that are compiled on a rolling basis are subject to temporal fluctuations (in part due to changes in the methodologies that have been applied to arrive at the rankings). We have not carried out any time series analysis of the ranking data and have restricted our analysis to the most recently available data. Finally, we also note that there are a number of well-known limitations to bibliometric analyses and our results need to be considered within that context.

Given the various caveats and the requirements to balance two domains of activity (research and education), the ranking methodology presented in this report can be used in an 'advisory' capacity to provide a general indication of the quality of the candidate AHSC institutions. The analysis is intended to assist potential applicants in deciding whether to submit a pre-qualifying questionnaire as part of the procurement process, and subsequently to inform the deliberations of the selection panel for the AHSCs.

Table ES-1: An indicative alphabetical institutional ranking list for the research and education indicators (rank 1–5: green cell; rank 6–10: yellow cell; rank 11–20: blue cell)

University / Institution (abbreviated)	University / Institution	Medical School	RESEARCH QUALITY INDICATORS									EDUCATION QUALITY INDICATORS						University / Institution (abbreviated)
			Total number of HCPs (2002–11)	RAE 2008 average 4* ratings (UOAs 1–13)	QR mainstream funding 2012-13 (UOAs 1–13)	Income from research grants and contracts (2011–12)	Number of PhDs (2011–12)	Number of patents granted (2011–12)	ARWU in Clinical Medicine and Pharmacy (2012)	Webometrics World University Rankings (2013)	QS World University Rankings for Medicine (2012)	Times Good University Guide – Medicine Rankings (2013)	Guardian University Guide – Medicine Rankings (2013)	Complete University Guide (Daily Mail) – Medicine Rankings (2013)	THE World University Rankings for Clinical, Pre–Clinical and Health (2012–13)	National Student Survey (2012)	National Training Survey (2012)	
Birmingham	University of Birmingham	College of Medical and Dental Sciences	9	14	8	10	8	11	11	13	11	13	22	7	-	6	5	Birmingham
Brighton	University of Brighton	Brighton and Sussex Medical School	28	24	23	26	27	21	-	26	-	21	18	25	-	25	16	Brighton
Bristol	University of Bristol	Faculty of Medicine and Dentistry	7	18	16	12	12	8	7	11	7	20	25	14	-	11	13	Bristol
Cambridge	University of Cambridge	School of Clinical Medicine	4	5	5	4	4	5	1	1	2	2	1	1	2	3	25	Cambridge
East Anglia	University of East Anglia	Norwich Medical School	21	25	20	23	17	21	-	21	-	25	20	22	-	9	14	East Anglia
Exeter	University of Exeter	Exeter Medical School (formerly part of Peninsula College of Medicine and Dentistry)	20	26	25	19	18	15	-	22	19	11	10	11	-	17	1	Exeter
Hull	University of Hull	Hull York Medical School	25	8	22	25	22	8	-	25	-	6	7	8	-	6	3	Hull
Imperial College	Imperial College London	Faculty of Medicine	3	2	2	3	2	2	4	14	3	4	9	4	3	20	18	Imperial College
Keele	Keele University	School of Medicine	26	23	27	24	28	21	-	27	-	26	23	24	-	2	N/A	Keele
King's College	King's College London	School of Medicine	5	6	3	5	5	4	6	10	5	15	15	18	5	23	24	King's College
Lancaster	Lancaster University	Lancaster Medical School	27	15	26	28	24	15	-	16	-	N/A	N/A	N/A	-	21	N/A	Lancaster
Leeds	University of Leeds	School of Medicine	14	16	15	9	10	11	16	7	9	10	13	11	-	17	21	Leeds
Leicester	University of Leicester	Department of Medical and Social Care Education	16	22	17	17	14	15	-	17	20	14	5	14	-	1	12	Leicester
Liverpool	University of Liverpool	School of Medicine	11	13	13	7	13	15	9	18	12	23	24	21	-	22	10	Liverpool
LSHTM	London School of Hygiene and Tropical Medicine	London School of Hygiene and Tropical Medicine (postgraduate medical school)	8	1	7	8	19	21	14	24	18	N/A	N/A	N/A	N/A	N/A	N/A	LSHTM
Manchester	The University of Manchester	Manchester Medical School	6	7	6	6	3	5	8	5	6	18	17	14	6	24	20	Manchester
Newcastle	Newcastle University	Newcastle University Medical School	10	12	9	13	10	15	15	12	15	5	4	5	-	5	9	Newcastle
Nottingham	The University of Nottingham	Faculty of Medicine and Health Sciences	12	17	12	14	6	8	5	8	10	17	14	19	-	6	8	Nottingham
Oxford	The University of Oxford	Medical Sciences Divison	2	4	4	1	7	1	3	2	1	1	2	2	1	11	22	Oxford
Plymouth	Plymouth University	Peninsula Schools of Medicine and Dentistry (formerly part of Peninsula College of Medicine and Dentistry)	23	28	24	27	22	21	-	23	-	11	10	11	-	14	1	Plymouth
Queen Mary	Queen Mary, University of London	Barts and The London School of Medicine and Dentistry	19	11	11	11	16	11	12	19	14	8	5	6	-	16	7	Queen Mary
Sheffield	The University of Sheffield	The Medical School	13	19	10	15	9	21	10	9	8	9	16	10	-	4	6	Sheffield
Southampton	University of Southampton	Faculty of Medicine	15	10	14	16	15	5	13	4	13	15	21	20	-	19	15	Southampton
St George's	St George's, University of London	St George's, University of London	24	27	21	21	24	21	-	28	-	24	26	22	-	27	11	St George's
Sussex	University of Sussex	Brighton and Sussex Medical School	22	21	28	22	24	15	-	20	-	21	18	25	-	13	16	Sussex
UCL	University College London	UCL Medical School	1	3	1	2	1	3	2	3	4	3	3	3	4	15	23	UCL
Warwick	The University of Warwick	Warwick Medical School	18	20	19	18	20	11	-	6	17	19	12	17	-	25	19	Warwick
York	The University of York	Hull York Medical School	17	9	18	20	20	21	-	15	15	6	7	8	-	9	3	York

Acknowledgements

RAND Europe would like to thank the Centre for Science and Technology Studies (CWTS) at Leiden University for carrying out the bibliometric analysis. We are also grateful to the Higher Education Statistics Agency (HESA) for providing us with some of the data analysed in this report.

We thank our Quality Assurance reviewers Saba Hinrichs and Steve Wooding for their helpful comments on the report.

CHAPTER 1 Introduction

1.1 The origins and aims of the report

In April 2013, the Department of Health announced an open, competitive process to designate Academic Health Science Centres (AHSCs) in England. To support the competition, the DH commissioned RAND Europe to compile and analyse various types of publicly available data and quality assessments in the domains of research and education, as well as to carry out an original bibliometric analysis of health-related research publications. We will carry out an analysis of healthcare quality metrics following the submission of pre-qualification questionnaires, when it is clear which candidate NHS institutions are involved in the AHSC applications.

This report primarily focuses on medical schools/academic partners likely to seek AHSC status but, where available, an analysis of research and education quality metrics is also presented for NHS institutions in England. The report outlines the significant caveats to using this data to produce education and research quality ranking lists for candidate institutions. It should be noted that this analysis is not intended to provide a definitive shortlist of institutions but rather to assist potential applicants in deciding whether to submit a pre-qualifying questionnaire as part of the procurement process, and subsequently to inform the deliberations of the selection panel for the AHSCs.

1.2 Background

AHSCs are partnerships that align NHS provider and university strategic objectives to allow them to harness and integrate world-class research, excellence in health education, and excellence in patient care. This strategic alignment should lead to improved health and healthcare delivery, including through increased translation of discoveries from basic science into benefits for patients. AHSCs provide an important contribution to economic growth through their impacts on health outcomes and through research collaborations with the life sciences industry.

The Department of Health awarded AHSC status in England for the first time in March 2009. This was the result of an open competition in which five AHSCs were designated with the plan that these would be subject to review after five years.

According to the DH, the characteristics of AHSCs in the current competition will include[1]:

- Strategic alignment of NHS provider and university objectives;
- The highest volume, critical mass and world-class excellence in basic medical research;
- The ability to translate findings from basic research into excellent translational, clinical and applied research across a range of interests;
- The ability to translate scientific advances into patient benefit, in order to improve patient care and healthcare delivery;
- Excellence in patient care;
- Excellence in health education;
- Strong partnership governance;
- Strong clinical informatics platform to underpin the delivery of AHSC objectives;
- Strong track record of and capacity for productive research collaborations with the life sciences industry and contribution to economic growth;
- Strong patient and public involvement and engagement.

AHSCs are distinct from Academic Health Science Networks (AHSNs). The NHS Chief Executive's report *Innovation Health and Wealth, Accelerating Adoption and Diffusion in the NHS*[2] published in December 2011 outlined a strategic approach to innovation in the NHS. This report announced the intention to set up AHSNs. AHSNs are a means of aiding local NHS, universities, public health and social care to work with industry in order to "transform the identification, adoption and spread of proven innovations and best practice".[3] AHSNs are expected to provide full geographical coverage in England. It is not the intention that together the designated AHSCs will provide full national geographical coverage. Successful AHSCs will need to be nested within AHSNs, demonstrating active engagement and synergistic working with the relevant local AHSN, as well as other AHSNs nationally.

1.3 Structure of the report

In Chapter 2, we outline our conceptual approach, and in Chapters 3 and 4, we synthesise various research and education quality data sources, respectively, to come up with consolidated 'tables of excellence'. Chapter 3 also presents the results of the bibliometric analysis in more detail. In Chapter 5, we identify and discuss a number of caveats that need to be borne in mind while interpreting the results. In the Appendices, we describe the

[1] http://www.ccf.nihr.ac.uk/Pages/AHSCCompetition.aspx (accessed on 26 April 2013)

[2] http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_131299 (accessed on 26 April 2013)

[3] https://www.gov.uk/government/publications/academic-health-science-networks-request-for-expressions-of-interest-to-create-ahsns--2 (accessed on 26 April 2013)

indicators and data sources in more detail, and present further results from the bibliometric analysis.

CHAPTER 2 Approach

Taking the requirement for an AHSC to "harness and integrate world-class research, excellence in health education, and excellence in patient care",[4] we have reviewed a number of public domain data resources and undertaken an original bibliometric analysis to rank academic organisations using various metrics. This report only presents data related to research and education quality metrics. The analysis of data relating to research quality indicators is presented in Chapter 3 while Chapter 4 covers the analysis of education-related indicators. We will undertake an analysis of healthcare quality metrics following the submission of pre-qualification questionnaires, when it is clear which candidate NHS institutions are involved in the AHSC applications. In this report we have not made any judgements with regard to the identification of potential academic-healthcare partnerships that are likely to seek AHSC status.

It should be noted from the outset that being at or near the top of an English rank-list does not necessarily mean that an institution is world class. We assume that the expert panel will be best placed to make that judgement – although where international comparative data exists we do present a comparison of the English and global rankings (see Appendix F).

We have tried to use sources where the unit of analysis corresponds most closely to the academic institution's medical school. For example, the Times Good University Guide publishes an overall ranking for higher education institutions within the UK, but for our analysis we have used the Times Good University Guide 'Medicine' rankings that focus only on data from medical schools in the UK. Unfortunately, there are some indicators (such as the number of patents granted and the Webometrics World University Rankings) for which we have only been able to obtain data at the academic institution level. Although this is not ideal, such indicators still provide an indication of the overall quality of education and/or research within the higher education institutions being considered.

It is also important to note that some of the indicators (in particular, some of the education indicators) that have been included are 'basket' indicators that cover both the research and education domains. For example, the Times Good University Guide and the Complete University Guide generate overall scores (which determine the rankings) that are

[4] http://www.ccf.nihr.ac.uk/Documents/Guidance%20AHSCs-Invitation%20to%20submit%20PQQ.pdf (accessed on 26 April 2013)

based on both education inputs (e.g. student satisfaction, entry standards and graduate prospects) and research inputs (research quality/assessment). Related is the issue of multiple counting of some of the indicators, which results in some of the indicator measures being captured in multiple indicator ranking lists (for example, RAE 2008 performance drives QR funding). Another important caveat that should be noted while interpreting the results is that using rankings has a tendency to emphasise the differences between institutions that perform similarly and vice versa. This is discussed in more detail in Chapter 5, along with some other caveats.

In the appendices, we provide details of the data sources for each indicator, including who published the data, units of measurement, the type of indicators (e.g. qualitative, quantitative, basket), whether the indicator measures inputs or outputs, whether its focus lies on research, education, or a combination, and an assessment of its strengths and weaknesses.

The research quality indicators used in the analysis were[5]:

- Research Assessment Exercise 2008 (RAE 2008)
- Higher Education Funding Council for England (HEFCE) Quality Related (QR) funding figures 2012–13
- Income from research grants and contracts 2011–12 (data supplied by HESA[6])
- Number of qualifiers who obtained Doctorate degrees that meet the criteria for a research-based higher degree or New Route PhDs that meet the criteria for a research-based higher degree 2011–12 (data supplied by HESA)
- Number of patents granted 2011–12 (data supplied by HESA)
- Academic Ranking of World Universities (ARWU) in Clinical Medicine and Pharmacy 2012
- Webometrics Ranking of World Universities January 2013
- Quacquarelli Symonds (QS) World University Rankings by Subject 2012 – Medicine
- Original bibliometric analysis of the number of Highly Cited Publications (HCPs) for English universities and NHS trusts

The education quality indicators used in the analysis were:

- The Complete University Guide 2013 – Medicine
- The Times Good University Guide 2013 – Medicine

[5] Although this report does not present any ranking analysis related to the healthcare quality indicators, for completeness the following is the list of indicators published in the AHSC competition 2013 guidance document: Dr Foster reports, CHKS reports, Care Quality Commission inspection, National Survey of Adult Inpatients, Monitor Governance Risk Ratings (including service quality) and information relating to breaches of Terms of Authorisation for NHS Foundation Trusts, the NHS Health and Social Care Information Centre Outcomes Framework data, the Guardian's Health Research Zone NHS Trust research activity performance tables from the NIHR Clinical Research Network, and appropriate patient reported outcomes measures (PROMs).

[6] Note that with regard to all HESA-supplied data analysed in this report "HESA cannot accept responsibility for any inferences or conclusions derived from the data by third parties."

- The Guardian University Guide 2013 – Medicine
- The Times Higher Education World University Rankings for Clinical, Pre-Clinical and Health 2012–13
- National Student Survey data 2012
- National Training Survey data 2012

Table 2-1 provides a summary of the indicators that have been investigated. Table 2-2 lists (alphabetically) the English medical schools and corresponding academic partners that were included in the analysis, compiled from the Medical Schools Council website[7] and after discussions with the Department of Health. (On reviewing nursing schools, we concluded that in total this would be too large a sample to be feasible for the present analysis.)

The individual methodologies used to draw up the rankings for the research and education indicators are described in Chapters 3 and 4, respectively. The main tables of results of this consolidated rankings analyses have also been presented in Chapters 3 and 4.

[7] http://www.medschools.ac.uk/Students/UKMedicalSchools/MedicalSchoolsbyRegion/Pages/England.aspx (accessed on 26 April 2013)

Table 2-1: Summary of research and education indicators

Indicator	Brief Description
Research Assessment Exercise 2008 (RAE 2008)	A peer-review derived indicator of research quality. Various sub-indicators feed into deriving the final score awarded to an institution.These include staff data, student data, research income data, research environment data, research esteem data, degrees awarded data and research output data.
HEFCE Quality-Related (QR) Funding Figures (2012–13)	The amount of quality-related research funding from HEFCE that a higher education institution receives annually. The figures are calculated by taking into account factors like the quality of research (measured in the RAE), the volume of research (using the number of research-active staff), and relative costs (e.g. laboratory based research versus library based research).
Total Income from Research Grants and Contracts (2011–12)	An indicator of research quality that describes the total value of income from research grants and contracts awarded annually to an institution (data supplied by HESA for specific subject areas).
Number of qualifiers who obtained Doctorate degrees or New Route PhD degrees that meet the criteria for research-based higher degrees (2011–12)	The total number of PhD / New Route PhD degrees awarded by a higher education institution annually. It is an indicator of research outputs (data supplied by HESA for specific subject areas).
Number of patents granted (2011–12)	The total number of patents granted annually to a higher education institution. This is an indicator of research outputs (data supplied by HESA).
Academic Ranking of World Universities (ARWU) in Clinical Medicine and Pharmacy 2012	A basket indicator with various measures of research outputs feeding into the overall score (Nobel Laureate alumni, Nobel Laureate staff, highly cited researchers, number of papers indexed by Science Citation Index Expanded and Social Science Citation Index).
Webometrics Ranking of World Universities – January 2013	A basket indicator that ranks universities based on their web presence and impact. Impact-related and activity-related (presence, openness and excellence) variables contribute equally towards building the composite indicator.
QS World University Rankings by Subject 2012 – Medicine	A basket indicator with measures of research and education quality feeding into the overall score. Academic reputation and citations per paper contribute to the research measures while education measures include employer reputation.
Total Highly Cited Publications (HCPs) (2002–11)	An indicator of research quality and volume. This is the total number of publications from an institution which appear in the top 20% most cited publications in a field, globally. (Source data from the Science Citation Index and associated indexes of the Web of Science. Analysis performed by CWTS and RAND Europe.)
The Complete University Guide 2013 – Medicine	A basket indicator with measures of education and research quality feeding into the overall score for an institution (entry standards, research assessment, student satisfaction survey and graduate prospects).
The Times Good University Guide 2013 – Medicine	A basket indicator of education and research quality with various measures feeding into the overal score for an institution (student satisfaction, research quality, entry standards and graduate prospects).
The Guardian University Guide 2013 – Medicine	A basket indicator of education quality with various measures feeding into the overal score for an institution (satisfaction with teaching and feedback, overall satisfaction, expenditure per student, student-staff ratio, career prospects, average entry tariff and a value-added score that show the effectiveness of the teaching).
The Times Higher Education World University Rankings for Clinical, Pre-Clinical and Health 2012–13	A basket indicator of education and research quality with various measures feeding into the overal score for an institution (teaching, research, citations, industry Income and international outlook).
National Student Survey data (NSS) 2012	Annual survey that is carried out to assess students' (primarily final year undergraduates) opinions of the quality of their courses. The NSS questionnaire asks students to provide feedback about teaching, assessment and feedback, academic support, organisation and management, learning resources, personal development as well as overall satisfaction.
National Training Survey data 2012	An annual survey (of trainee doctors) conducted by the General Medical Council to monitor the quality of medical education and training in the UK.

Table 2-2: List of institutions included in the analysis (medical schools and corresponding academic partners)

University / Institution (abbreviated)	University / Institution	Medical School
Birmingham	University of Birmingham	College of Medical and Dental Sciences
Brighton	University of Brighton	Brighton and Sussex Medical School
Bristol	University of Bristol	Faculty of Medicine and Dentistry
Cambridge	University of Cambridge	School of Clinical Medicine
East Anglia	University of East Anglia	Norwich Medical School
Exeter	University of Exeter	Exeter Medical School (formerly part of Peninsula College of Medicine and Dentistry with Plymouth University)
Hull	University of Hull	Hull York Medical School
Imperial College	Imperial College London	Faculty of Medicine
Keele	Keele University	School of Medicine
King's College	King's College London (University of London)	School of Medicine
Lancaster	Lancaster University	Lancaster Medical School
Leeds	University of Leeds	School of Medicine
Leicester	University of Leicester	Department of Medical and Social Care Education (within the College of Medicine, Biological Sciences and Psychology)
Liverpool	University of Liverpool	School of Medicine
LSHTM	London School of Hygiene and Tropical Medicine (University of London)	London School of Hygiene and Tropical Medicine (postgraduate medical school)
Manchester	The University of Manchester	Manchester Medical School
Newcastle	Newcastle University	Newcastle University Medical School
Nottingham	The University of Nottingham	Faculty of Medicine and Health Sciences
Oxford	University of Oxford	Medical Sciences Divison
Plymouth	Plymouth University	Peninsula Schools of Medicine and Dentistry (formerly part of Peninsula College of Medicine and Dentistry with the University of Exeter)
Queen Mary	Queen Mary, University of London	Barts and The London School of Medicine and Dentistry
Sheffield	The University of Sheffield	The Medical School
Southampton	University of Southampton	Faculty of Medicine
St George's	St George's, University of London	St George's, University of London
Sussex	University of Sussex	Brighton and Sussex Medical School
UCL	University College London (University of London)	UCL Medical School
Warwick	The University of Warwick	Warwick Medical School
York	The University of York	Hull York Medical School

It should be noted that the analysis presented in this report also incorporates data related to 'joint' medical schools that are run as partnerships between two institutions. Specifically, the Brighton and Sussex Medical School (BSMS) is a partnership between the Universities of Brighton and Sussex, the Hull York Medical School (HYMS) is a partnership between the Universities of Hull and York, and the former Peninsula College of Medicine and Dentistry (PCMD) was a partnership between Plymouth University and the University of

Exeter. The latter two universities have recently set up independent medical schools[8] called the Plymouth University Peninsula Schools of Medicine and Dentistry and the University of Exeter Medical School, respectively.

If a particular indicator provides only one ranking for a joint medical school then this ranking has been used for both institutions (for example, the Times Good University Guide Medicine rankings for 2013 and the Complete University Guide Medicine rankings for 2013). If separate rankings are provided they have been used.

[8] http://www.pcmd.ac.uk/ (accessed on 26 April 2013)

CHAPTER 3 Research excellence rankings

This chapter focuses on the various data related to the research quality indicators. The AHSC competition 2013 guidance document[9] suggests AHSCs should have:

Excellence in basic medical research and the ability to translate discoveries from basic science into excellent translational, clinical and applied research across a range of interests.

We considered the following indicators:

- Research Assessment Exercise 2008 (RAE 2008)
- Higher Education Funding Council for England (HEFCE) Quality Related (QR) funding figures 2012–13
- Income from research grants and contracts 2011–12 (data supplied by HESA)
- Number of qualifiers who obtained Doctorate degrees that meet the criteria for a research-based higher degree or New Route PhDs that meet the criteria for a research-based higher degree 2011–12 (data supplied by HESA)
- Number of patents granted 2011–12 (data supplied by HESA)
- Academic Ranking of World Universities (ARWU) in Clinical Medicine and Pharmacy 2012
- Webometrics Ranking of World Universities January 2013
- QS World University Rankings by Subject 2012 – Medicine
- Original bibliometric analysis of the number of Highly Cited Publications (HCPs) for English universities and NHS trusts.

The consolidated 'table of excellence' for the research indicators is presented in Section 3.1. The methodologies used to arrive at the rankings are outlined in Section 3.2 and Section 3.3 provides a more in-depth discussion of the bibliometric analysis.

3.1 Ranking results

The main results table shown in Table 3-1 presents institutional ranking lists for the various indicators for research quality (this table forms half of the overall results table shown in the executive summary as Table ES-1). The institutions have been listed alphabetically, and for ease of reference the institution names have also been abbreviated.

[9] http://www.ccf.nihr.ac.uk/Documents/Guidance%20AHSCs-Invitation%20to%20submit%20PQQ.pdf (accessed on 26 April 2013)

Institutions for which rankings have been omitted are those for which data are unavailable (indicated by "N/A" in Table 3-1), or which did not make it into the source ranking lists (indicated by "-" in Table 3-1). In general, where data were available for global or UK rankings, the relevant English candidates appearing on the list were extracted and then ranked in relation to each other.

To provide an impression of the relative performance of the listed institutions across the research domain, a colour code is applied to each indicator ranking list in Table 3-1. The top five institutions in each ranking list are highlighted in green while the next five institutions (6–10) are highlighted in yellow. Institutions with a rank between 11 and 20 are highlighted in blue.

Table 3-1: An indicative alphabetical institutional ranking list for the research indicators (rank 1–5: green cell; rank 6–10: yellow cell; rank 11–20: blue cell)

University / Institution (abbreviated)	University / Institution	Medical School	Total number of HCPs (2002–11)	RAE 2008 average 4* ratings (UOAs 1–13)	QR mainstream funding 2012-13 (UOAs 1–13)	Income from research grants and contracts (2011–12)	Number of PhDs (2011–12)	Number of patents granted (2011–12)	ARWU in Clinical Medicine and Pharmacy (2012)	Webometrics World University Rankings (2013)	QS World University Rankings for Medicine (2012)	University / Institution (abbreviated)
Birmingham	University of Birmingham	College of Medical and Dental Sciences	9	14	8	10	8	11	11	13	11	Birmingham
Brighton	University of Brighton	Brighton and Sussex Medical School	28	24	23	26	27	21	-	26	-	Brighton
Bristol	University of Bristol	Faculty of Medicine and Dentistry	7	18	16	12	12	8	7	11	7	Bristol
Cambridge	University of Cambridge	School of Clinical Medicine	4	5	5	4	4	5	1	1	2	Cambridge
East Anglia	University of East Anglia	Norwich Medical School	21	25	20	23	17	21	-	21	-	East Anglia
Exeter	University of Exeter	Exeter Medical School (formerly part of Peninsula College of Medicine and Dentistry)	20	26	25	19	18	15	-	22	19	Exeter
Hull	University of Hull	Hull York Medical School	25	8	22	25	22	8	-	25	-	Hull
Imperial College	Imperial College London	Faculty of Medicine	3	2	2	3	2	2	4	14	3	Imperial College
Keele	Keele University	School of Medicine	26	23	27	24	28	21	-	27	-	Keele
King's College	King's College London	School of Medicine	5	6	3	5	5	4	6	10	5	King's College
Lancaster	Lancaster University	Lancaster Medical School	27	15	26	28	24	15	-	16	-	Lancaster
Leeds	University of Leeds	School of Medicine	14	16	15	9	10	11	16	7	9	Leeds
Leicester	University of Leicester	Department of Medical and Social Care Education	16	22	17	17	14	15	-	17	20	Leicester
Liverpool	University of Liverpool	School of Medicine	11	13	13	7	13	15	9	18	12	Liverpool
LSHTM	London School of Hygiene and Tropical Medicine	London School of Hygiene and Tropical Medicine (postgraduate medical school)	8	1	7	8	19	21	14	24	18	LSHTM
Manchester	The University of Manchester	Manchester Medical School	6	7	6	6	3	5	8	5	6	Manchester
Newcastle	Newcastle University	Newcastle University Medical School	10	12	9	13	10	15	15	12	15	Newcastle
Nottingham	The University of Nottingham	Faculty of Medicine and Health Sciences	12	17	12	14	6	8	5	8	10	Nottingham
Oxford	The University of Oxford	Medical Sciences Division	2	4	4	1	7	1	3	2	1	Oxford
Plymouth	Plymouth University	Peninsula Schools of Medicine and Dentistry (formerly part of Peninsula College of Medicine and Dentistry)	23	28	24	27	22	21	-	23	-	Plymouth
Queen Mary	Queen Mary, University of London	Barts and The London School of Medicine and Dentistry	19	11	11	11	16	11	12	19	14	Queen Mary
Sheffield	The University of Sheffield	The Medical School	13	19	10	15	9	21	10	9	8	Sheffield
Southampton	University of Southampton	Faculty of Medicine	15	10	14	16	15	5	13	4	13	Southampton
St George's	St George's, University of London	St George's, University of London	24	27	21	21	24	21	-	28	-	St George's
Sussex	University of Sussex	Brighton and Sussex Medical School	22	21	28	22	24	15	-	20	-	Sussex
UCL	University College London	UCL Medical School	1	3	1	2	1	3	2	3	4	UCL
Warwick	The University of Warwick	Warwick Medical School	18	20	19	18	20	11	-	6	17	Warwick
York	The University of York	Hull York Medical School	17	9	18	20	20	21	-	15	15	York

3.2 Descriptions of ranking methodologies for each research indicator

In some instances, the format of rankings provided by source organisations needed to be modified to arrive at the final rankings. The methods by which we derived the final ranking for each research indicator are described below. Further specific details about each indicator have been included in Appendix A.

- **The Research Assessment Exercise 2008 (RAE 2008):** RAE 2008 produced overall quality profiles for a number of Units of Assessment (UOAs).[10] The quality profiles indicated the percentage of research activity at each 'quality level' (see Appendix A). Each institution could submit to more than one Unit of Assessment, and therefore be awarded more than one 'rating' in the RAE. For this analysis, we used UOAs 1–13 (see Appendix A). To rank the institutions, we calculated how many Category A full-time equivalent (FTE) staff out of those who submitted research to the RAE) were awarded 4* ratings ("quality that is world leading") in each UOA, since one of the requirements of candidate AHSC institutions is to "harness and integrate world class research". We then averaged these values across all UOAs for each institution to give a final value, which was used to rank the institutions.
- **HEFCE Quality Research (QR) funding (2012–13 figures):** QR funding is allocated based on the quality of research, the volume of research and the relative costs of research per subject. We took the total amount of mainstream QR funding for UOAs 1–13 for each institution in order to obtain an overall figure per institution. These figures were used to rank the institutions.
- **The Academic Ranking of World Universities (ARWU) in Clinical Medicine and Pharmacy:** these rankings are derived from the ARWU 2012 'MED' league table. This ranks the top 200 universities in the field, globally. The English universities appearing on the list were extracted and ranked on the basis of the weighting scheme outlined on the ARWU ranking methodology web page.[11] This is 10% for 'Alumni' (the total number of the alumni of an institution winning Nobel Prizes in physics, chemistry, medicine and economics and Fields Medals in mathematics), 15% for 'Award' (the total number of staff winning Nobel Prizes in physics, chemistry, medicine and economics and Fields Medals in mathematics), 25% for 'HiCi' (the number of highly cited researchers in 20 subject categories defined and provided by highlycited.com), 25% for 'PUB' (the total number of papers indexed by Science Citation Index-Expanded and Social Science Citation Index in 2010 and 2011), and 25% for 'TOP' (the percentage of papers published in the top 20% journals of each broad subject field).
- **Webometrics Ranking of World Universities:** these rankings do not exist specifically for the field of medicine and are overall rankings of an institution across subject categories. The rankings are derived from the Webometrics Ranking

[10] http://www.rae.ac.uk/results/selectUOA.aspx (accessed on 26 April 2013)

[11] http://www.shanghairanking.com/ARWU-FIELD-Methodology-2012.html# (accessed on 26 April 2013)

of World Universities January 2013 table. An overall rank is awarded to each institution, determined by a weighted combination of the ranks they obtain within two sub-categories (visibility/impact: 50% weighting; and activity: 50% weighting). The English institutions were extracted from the global ranking list (as per data availability).

- **The QS World University Rankings for Medicine:** these rankings are derived from the QS league table for the world's top 202 universities in medicine (2012).[12] A composite score is awarded to each institution based on three criteria (academic reputation: 40% weighting, employer reputation: 10% weighting, and citations per paper: 50% weighting), which determines the overall world ranking of each institution. In the data displayed on the website, the overall scores and rankings for only the top 50 institutions were provided (beyond the top 50, only the ranking range was provided, i.e. 51–100, 101–150, and so on). The scores that each university received for the three component criteria were, however, provided and these were used in combination (as per the weightings specified above and as per data availability) to generate an overall score. These scores were used to rank the English institutions.
- **Income from research grants and contracts:** these data were supplied by HESA at the institutional level and specified cost centres (see Appendix A) for the year 2011/12 (these were the most up-to-date data that were available from HESA at the time of writing). The aggregate income from research grants and contracts was calculated for each institution. These figures were used to rank the institutions.
- **Number of qualifiers who obtained Doctorate degrees that meet the criteria for a research-based higher degree or New Route PhDs that meet the criteria for a research-based higher degree:** these data were supplied by HESA at the institutional level and specified subject areas (see Appendix A) for the year 2011/12 (these were the most up-to-date data that were available from HESA at the time of writing). The aggregate number of PhD/New Route PhD qualifiers was calculated for each institution. These figures were used to rank the institutions.
- **Number of patents granted:** these data were supplied by HESA at the institutional level and correspond to data collected during the 2011/12 Higher Education Business and Community Interaction Survey (HE-BCI) (these were the most up-to-date data that were available from HESA at the time of writing). Data

[12] It should be pointed out that the QS World University Rankings for Medicine (2012) only lists the University of York in their 'Top 202' list and not the University of Hull. The information page for the University of York on the QS website mentions the Hull York Medical School as one of their Departments. Since it cannot be confirmed whether the Hull York Medical school was used in the determination of the QS World University Ranking for Medicine, an overall 'English' rank has only been included in Table 3-1 for the University of York. Similarly, the QS World University Rankings for Medicine only lists the University of Exeter in their 'Top 202' list and not Plymouth University. The information page for the University of Exeter on the QS rankings website includes the Peninsula College of Medicine and Dentistry as one of their Departments. Since it cannot be confirmed whether the Peninsula College of Medicine and Dentistry was used in the determination of the QS World University Ranking for Medicine, an overall 'English' rank has only been included in Table 3-1 for the University of Exeter.

were not available at the subject level. The figures for the number of patents in 2011/12 were used to rank the institutions.

- **Total number of Highly Cited Publications (HCP) for universities and NHS institutions:** RAND Europe, in collaboration with CWTS Leiden, conducted a bibliometric analysis of health research in England (2002–11). Publications are considered only if they appear in one of the 71 biomedical and health research Journal Subject Categories (JSCs) listed in Appendix C. The citation distribution of all publications in those fields, irrespective of country of authorship, is determined and we ascertain the top 20% most highly cited papers in the same field, published in the same year, and of the same document type. We then identify the papers with an author address in England in this select group. Organisations with more than 30 HCPs were selected for the analysis. Details of how the rankings were constructed are given in Section 3.3.

3.3 Bibliometric analysis

3.3.1 Methodology

CWTS maintains a comprehensive database of scientific publications for the period 1981 to 2012, based on the journals and serials processed for the Web of Science (the Internet) version of the Citation Index(es) maintained and published by Thomson Reuters. This dataset includes the Science Citation Index (SCI), the Social Science Citation Index (SSCI) and the Arts & Humanities Citation Index (A&HCI), and is extended with six so-called specialty Citation Indexes (Chemistry, CompuMath, Materials Science, Biotechnology, Biochemistry & Biophysics, and Neuroscience). The construction of this database, and the indicators derived from it, are described in various scientific publications.[13]

Box 1 summarises the data collection process for the analysis. As is explained above, publications are classed as biomedical and health research if they appear in any of the 71 associated Journal Subject Categories (JSCs) listed in Appendix C. Only articles, letters and reviews (the standard publication types considered appropriate for bibliometric analysis) with the country name 'ENGLAND' (i.e., written by an author with an English address) are selected.

In the next step, the citation distribution of all publications in those fields, irrespective of country of authorship, is determined. For each publication, the number of citations is counted only for a specified period (the 'citation window') which in this analysis includes the period up to and including the fourth year after publication. Only those English publications that belong to the top 20% most highly cited publications (HCPs) in every selected field, for the same year of publication and of the same type are retained. Note that this definition of HCPs excludes self-citations.[14]

[13] Moed et al. 1995; van Leeuwen et al. 2001; van Leeuwen et al. 2003.

[14] Self-citations occur if one of the authors of a citing paper also appears in the cited paper. Typically, between 20% and 40% of all citations are self-citations, depending on the field. Self-citations are removed from the analysis because otherwise they may inflate the assessment of an author's 'impact'.

To clarify, we do not focus on the top 20% of England's publications in those fields; what we do is to examine the top 20% most highly cited papers per field worldwide, and then analyse the contribution of England to this select group. By taking this approach we are controlling for known differences in citation behaviour between fields.

In the analysis, we restrict our attention to papers published between 01 January 2002 and 31 December 2011, and consider citations made until 31 December 2012. Note that this would imply that papers published after 2009 have a citation window which is narrower than four years. By explicitly considering year of publication in our selection of HCPs, we correct for this difference.

Box 1 Summary of the data collection process

- Delineate biomedical research and clinical medicine by selecting 71 fields (the so-called JSCs).
- Select all publications from England from the Citation Indexes.
- Focus on the top 20% most highly cited publications in their respective field(s), publication years and document types over the years 2002–11.
- Examine the addresses related to the top 20% most highly cited publications.
- Use address information on the level of main organisations as well as the underlying 'departmental/institutional' level to identify the institutions and organisations that contribute to England's share of top biomedical research and clinical medicine worldwide.
- The final selection (112,428 publications) contained 68 NHS institutions and 28 universities within the top 20% most highly cited publications.

After identifying 112,428 highly cited publications in the fields of biomedical and health research from NHS institutions and universities in England, we undertook three sets of analyses on:

- The **number of HCPs** between 2002 and 2011 by institution as an indicator of critical mass and quality. This was based on whole counting of the contributions of each institution to a paper.[15]
- The **concentration of HCP papers by JSCs** to identify world-class biomedical research in specific research fields. To do this we examined each field and allocated the share of HCPs to the institutions.[16]

[15] In bibliometrics, two methods of counting articles may be used for attribution to authors: fractional and whole counts. For fractional counting, credit for the paper (or citation) is divided among the collaborating authors or institutions. For whole counting, each author or institution receives one credit for its participation in the article. We use whole counting to determine the total number of HCPs by institution for all papers within the threshold. However, in the determination of which papers belong to the top 20%, papers are fractionalised based on the extent to which they belong to the upper 20% of the impact distribution. (Due to discrete citation scores, several papers may be 'tied' at a given threshold number of citations. In this case, each will be credited as belonging to the top 20% with a fraction which depends on the number of papers 'tied' at the threshold.)

- **Co-publication** between universities and NHS institutions as an indicator of collaboration. These results are presented in Appendix D.

3.3.2 Results

Number of Highly Cited Papers

In Figure 3-1 below, we show the volume of HCPs published between 2002 and 2011 for institutions that have, on average, more than 30 highly cited papers per year. On this measure, University College London, the University of Oxford, Imperial College London, the University of Cambridge and Kings College London lead the field. Table 3-2 and Table 3-3 present the annual numbers of HCPs per year for the selected NHS institutions and universities, respectively, over the same period. As is the case for citations in other contexts, the distribution of HCPs across these organisations is highly skewed, with relatively few organisations responsible for a significant number of HCPs: the 5 leading NHS institutions together account for 36.7% of NHS organisation HCPs, while the 5 leading universities together account for 51% of university HCPs.

Concentration of Papers by Journal Subject Category (JSC)

We record the share of HCPs by field of research (as determined by JSC) and by university in Table 3-4. Each cell indicates the share of HCPs in the research field that may be attributed to a given university. For example, the first cell in the first row, for the University of Birmingham and Allergy, records 1%. This means that 1% of global HCPs with an English address classified within the Allergy field have an address associated with Birmingham. Note that we have performed a similar analysis for NHS institutions and present the analogous table in Appendix D.

In Table 3-5, we list all those field/university combinations that have more than a 10% share of papers published in a specific JSC. To limit the number of field/organisation combinations, and to ensure critical mass within a field, we have restricted this list to fields with more than 100 HCPs.

[16] Papers are fractionalised based on the extent to which they belong to the selected fields: some papers may be considered as belonging to more than one field; in this case credit is divided among the fields.

Figure 3-1: Total number of HCPs for English institutions with annual average number of HCPs greater than 30, 2002–11 (universities are shown in blue and NHS institutions are shown in red)

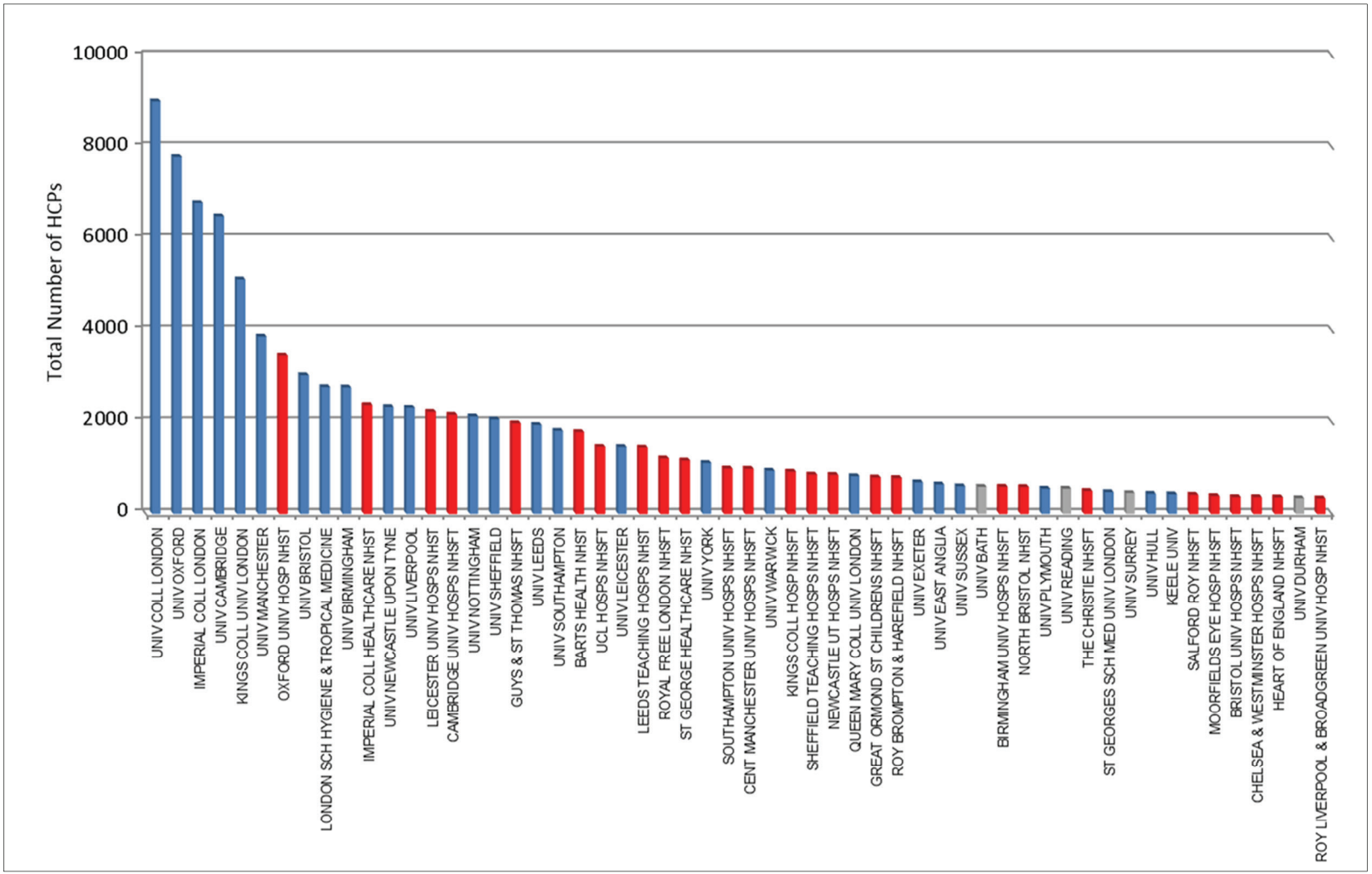

Table 3-2: Annual numbers of HCPs for selected NHS institutions, 2002–11

Institution	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total	Average
Barts Health NHS Trust	152	127	157	142	143	166	192	220	235	249	1783	178
Cambridge University Hospitals NHS Foundation Trust	153	145	173	202	216	205	230	233	302	307	2163	216
Central Manchester University Hospitals NHS Foundation Trust	68	83	88	97	97	84	106	111	127	124	985	98
Chelsea & Westminster Hospitals NHS Foundation Trust	36	25	38	40	38	31	34	32	45	41	361	36
Great Ormond Street Hospital for Children NHS Foundation Trust	63	64	57	73	61	80	96	83	112	103	790	79
Guy's & St Thomas' NHS Foundation Trust	164	178	133	174	183	206	212	194	264	267	1975	197
Heart Of England NHS Foundation Trust	34	27	46	36	30	33	38	32	41	42	358	36
Imperial College Healthcare NHS Trust	225	222	206	214	244	248	259	229	269	257	2372	237
Kings College Hospitals NHS Foundation Trust	66	66	71	66	90	79	108	100	144	129	920	92
Leeds Teaching Hospitals NHS Trust	112	128	125	125	118	170	151	168	170	179	1445	145
Moorfields Eye Hospital NHS Foundation Trust	27	35	35	38	32	40	44	40	48	48	387	39
Newcastle upon Tyne Hospitals NHS Foundation Trust	78	68	84	90	86	82	89	88	97	86	849	85
North Bristol NHS Trust	56	46	54	54	54	50	63	53	78	72	582	58
Oxford University Hospitals NHS Trust	307	281	337	351	290	355	363	353	411	405	3452	345
Royal Brompton & Harefield NHS Foundation Trust	75	62	68	71	74	81	83	76	93	99	781	78
Royal Free London NHS Foundation Trust	99	109	114	103	132	118	128	138	127	142	1208	121
Royal Liverpool and Broadgreen University Hospitals NHS Trust	23	26	29	35	26	32	32	40	40	50	334	33
Salford Royal NHS Foundation Trust	44	40	37	47	46	42	39	43	36	39	414	41
Sheffield Teaching Hospitals NHS Foundation Trust	72	71	92	88	84	96	94	79	79	101	857	86
St George's Healthcare NHS Trust	174	180	174	140	83	94	85	78	71	86	1166	117
The Christie NHS Foundation Trust	47	37	41	54	50	48	48	45	59	66	495	49
UCL Hospitals NHS Foundation Trust	104	109	136	127	122	146	149	153	212	205	1463	146
University Hospital Southampton NHS Foundation Trust	91	96	109	97	79	91	94	85	119	128	989	99
University Hospitals Birmingham NHS Foundation Trust	66	42	55	56	70	48	75	56	62	60	589	59
University Hospitals Bristol NHS Foundation Trust	24	27	28	35	31	31	37	42	52	57	365	36
University Hospitals of Leicester NHS Trust	211	228	196	191	172	224	225	229	262	290	2226	223

Table 3-3: Annual numbers of HCPs for selected universities, 2002–11

Institution	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total	Average
University of Birmingham	221.5	187.5	246.3	236.2	266.9	298.2	323.7	269.2	342.0	366.9	2758.5	275.9
University of Brighton	7.7	9.8	16.3	23.6	23.1	27.7	31.2	22.0	41.5	30.5	233.5	23.3
University of Bristol	240.3	229.7	266.1	275.4	258.4	357.7	377.1	290.9	352.2	376.6	3024.3	302.4
University of Cambridge	474.9	481.1	561.5	560.0	575.4	669.2	753.6	650.4	842.5	918.2	6486.6	648.7
University of East Anglia	51.9	45.2	33.8	45.6	50.5	78.0	89.3	51.6	89.3	105.9	641.1	64.1
University of Exeter	33.5	32.6	41.8	36.5	45.7	84.7	90.3	75.8	121.3	125.2	687.4	68.7
University of Hull	26.6	22.9	28.8	31.5	45.8	41.9	63.0	52.2	61.7	62.5	436.9	43.7
Imperial College London	477.9	520.1	517.9	537.7	623.9	779.6	805.1	672.7	905.9	940.4	6781.4	678.1
Keele University	28.1	34.0	31.6	26.9	45.2	61.6	50.7	42.4	57.9	50.2	428.5	42.8
Kings College University of London	350.7	349.2	382.4	418.5	438.2	561.5	653.4	508.4	685.5	767.5	5115.3	511.5
Lancaster University	15.0	19.8	29.6	16.5	26.8	22.5	33.3	26.9	31.4	30.7	252.5	25.3
University of Leeds	126.6	157.8	166.3	154.9	162.6	203.5	221.4	185.9	271.8	288.7	1939.4	193.9
University of Leicester	121.1	137.5	142.2	127.6	126.6	145.7	169.3	122.0	169.4	199.8	1461.2	146.1
University of Liverpool	166.8	179.7	195.8	215.3	195.9	238.4	276.4	237.8	294.3	315.1	2315.4	231.5
London School of Hygiene and Tropical Medicine	143.5	141.5	218.9	220.7	265.4	357.9	336.4	283.9	394.8	404.0	2767.0	276.7
University of Manchester	260.8	282.9	299.0	308.8	365.7	420.8	472.6	420.2	493.7	544.0	3868.4	386.8
Newcastle University	177.4	156.0	193.8	169.7	219.8	260.8	264.4	220.9	338.8	330.7	2332.3	233.2
The University of Nottingham	127.5	134.6	151.8	191.7	162.7	269.2	254.5	224.2	308.0	304.8	2129.1	212.9
University of Oxford	573.8	546.8	630.6	633.5	685.3	901.7	936.4	771.8	1002.2	1107.1	7789.2	778.9
University of Plymouth	17.2	31.1	33.3	41.4	43.8	74.6	76.2	60.9	87.0	85.8	551.3	55.1
Queen Mary, University of London	38.1	38.9	33.0	51.6	72.0	61.4	108.7	63.7	162.4	194.6	824.3	82.4
The University of Sheffield	149.5	153.9	189.9	185.6	207.1	235.9	219.5	215.2	248.0	260.5	2065.2	206.5
University of Southampton	128.2	138.9	142.6	171.2	157.3	199.1	195.9	217.4	226.1	236.6	1813.2	181.3
St George's, University of London	8.0	1.1	6.9	11.6	39.8	71.7	67.3	58.8	110.1	99.9	475.2	47.5
University of Sussex	45.4	47.9	45.3	58.6	65.7	52.3	72.1	59.3	79.0	77.6	603.2	60.3
University College London	668.8	711.3	750.1	798.8	831.7	1002.2	1031.1	853.4	1181.4	1171.8	9000.6	900.1
The Univeristy of Warwick	46.0	62.4	53.0	60.9	66.4	133.0	143.0	83.7	141.1	154.6	944.0	94.4
University of York	77.2	79.9	97.8	97.6	113.6	126.4	122.3	108.4	148.0	140.7	1111.9	111.2

Table 3-4: Cross-tabulation of share of HCPs by field and universities (cells with share of 10–20% highlighted in blue, share greater than 20% highlighted in yellow)

UNIVERSITY	Allergy	Anatomy Morphology	Andrology	Anesthesiology	Audiology Speech Language Path.	Biochemical Research Methods	Biochemistry Molecular Biology	Biophysics	Biotechnology Applied Microbio.	Cardiac Cardiovascular Systems	Cell Tissue Engineering	Cell Biology	Chemistry Medicinal	Clinical Neurology	Critical Care Medicine	Dentistry Oral Surgery Medicine	Dermatology	Developmental Biology	Emergency Medicine	Endocrinology Metabolism	Engineering Biomedical	Food Science Technology	Gastroenterology Hepatology	Genetics Heredity	Geriatrics Gerontology	Gerontology	Health Care Sciences Services	Health Policy Services	Hematology	Immunology	Infectious Diseases	Integrative Complementary Medicine	Materials Science Biomaterials	Medical Informatics	Medical Laboratory Technology	Medicine General Internal	Medicine Research Experimental
University of Birmingham	1	2	4	1	1	3	2	1	4	3	1	2	2	1	2	5	0	1	2	3	2	2	3	2	2	1	4	2	4	5	2	2	4	3	3	3	4
University of Brighton	0	1		0		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0
University of Bristol	2	4	4	1	4	1	3	2	2	2	2	3	2	1	1	5	0	1	2	4	2	10	1	2	1	1	2	3	2	2	3	5	3	3	1	4	2
University of Cambridge	2	5	5	1	14	11	13	15	10	3	14	15	5	5	4	0	1	20	1	8	6	2	2	10	6	6	2	2	4	5	2	1	7	5	2	4	6
University of East Anglia		1		0	0	1	1	1	1	0		1	1	0	0	0	0	1	0	0	0	3	1	0	1	1	2	1	0	0	0	1	0	0	1	1	0
University of Exeter		1	0	1	1	1	1	0	1	0		0	1	0	0	0	0	0		2	1	0	0	1	2	3	2	1	0	0	0	12		1	0	1	0
University of Hull		4			1	1	0	0	0	3		0	1	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	1	0	1	1	1	0
Imperial College London	18	3	4	5	4	12	8	7	9	10	9	8	7	4	11	1	2	4	1	6	11	2	7	5	3	2	3	3	7	11	10	3	10	5	3	5	10
Keele University	0	0		1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	0	0	0	2	1	2	0	1	0
Kings College London	6	7	4	2	2	3	4	4	2	3	5	4	3	7	2	13	6	10	1	3	3	1	4	5	9	10	3	2	4	4	1	2	2	2	3	3	4
Lancaster University	0	0		1	0	0	0	0	1	0	0	0		0	0		0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1		0	0
University of Leeds	0	2	2	2	0	2	3	4	3	1	1	2	2	1	1	2	2	1	3	1	4	7	2	2	1	0	4	3	1	1	2	2	3	1	0	1	1
University of Leicester	2	1		1	1	1	2	1	1	2	0	3	1	1	2	0	1	1	2	1	0	1	1	2	1	1	2	1	1	1	1	0	0	3	1	2	2
University of Liverpool	1	5	1	2	0	3	2	1	2	1	1	2	4	2	2	3	1	1	0	1	3	1	3	1	1	1	3	3	1	2	5	0	5	2	2	2	1
London School of Hygiene and Tropical Medicine	1	0	3	0	0	0	1	0	1	2	0	0	5	1	2	1	1	0	1	0		1	1	1	2	2	5	10	0	4	12	1		3	1	7	3
University of Manchester	3	6	7	1	6	7	5	4	6	2	4	6	5	2	2	8	10	5	4	4	4	2	2	3	4	4	5	5	2	2	2	3	8	5	2	3	3
Newcastle University	1	4	0	0	1	2	2	2	4	1	6	2	5	3	1	6	3	2		2	2	4	4	3	5	4	4	3	2	1	0	4	2	1	1	2	2
University of Nottingham	3	5		2	3	2	2	2	3	0	3	2	6	1	1	0	2	3	0	1	2	9	2	1	1	1	2	2	1	1	2	1	4	2	0	1	1
University of Oxford	2	4	4	5	6	10	12	16	9	4	5	10	12	7	2	0	2	8	3	5	6	2	4	11	3	3	5	5	5	13	7	4	3	5	7	8	10
University of Plymouth		0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	1	2	0	2	0	1	2	2	2	2	0	0	0	10		1	0	1	0
Queen Mary, University of London	0	0		0	0	1	1	1	1	0	1	1	0	0	1	2	1	0	0	1	4	0	1	1	0	0	0	1	1	1	0	0	5	0	1	1	1
University of Sheffield	1	1	18	1	4	3	3	2	3	1	6	2	2	1	1	5	2	4	7	5	2	0	1	2	2	2	7	6	1	1	1	3	3	6	1	1	1
University of Southampton	8	2		1	5	2	2	2	2	0	1	1	4	1	2	0	1	1	0	3	3	2	2	1	4	4	2	2	2	3	0	7	3	1	2	2	1
St George's, University of London	1	1		1	0	0	0	0	0	1		0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	1		0	0	1	0	0
University of Sussex	0	2			2	1	1	1	1	0	0	2	0	0	1	0	0	2		0	0	1	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0
University College London	3	10	1	5	13	6	8	8	8	7	7	11	5	18	6	12	2	14	1	5	10	1	5	8	9	12	4	4	7	7	9	1	9	6	7	7	9
University of Warwick	0	0		1	1	2	1	2	2	1	0	1	3	0	1	0	0	1	4	2	1	2	0	1	1	2	2	2	0	0	0	0	0	4	0	1	0
University of York	0	4		0	4	4	2	3	2	0	1	1	1	0	0	0	0	1	0	1	1	6	0	1	1	1	6	9	0	0	1	9	1	7	1	2	1

UNIVERSITY	Microbiology	Neuroimaging	Neurosciences	Nursing	Nutrition Dietetics	Obstetrics Gynecology	Oncology	Ophthalmology	Orthopedics	Otorhinolaryngology	Parasitology	Pathology	Pediatrics	Peripheral Vascular Disease	Pharmacology Pharmacy	Physiology	Primary Health Care	Psychiatry	Public Environmental Occupational	Radiology Nuclear Medicine	Rehabilitation	Reproductive Biology	Respiratory System	Rheumatology	Social Work	Sport Sciences	Substance Abuse	Surgery	Toxicology	Transplantation	Tropical Medicine	Urology Nephrology	Veterinary Sciences	Virology
University of Birmingham	5	1	1	2	2	3	3	1	1	1	1	3	1	3	2	4	6	2	2	1	4	3	1	4	2	6	3	1	6	3	0	2	0	4
University of Brighton	0	0	0	1	0	0	1		0	0	0	0	0	0	0	0	1	0	0	1	1		0	0	0	1		0	0	0	0	0	0	0
University of Bristol	3	0	3	0	5	2	1	2	3	2	4	3	5	3	3	4	7	3	7	0	1	1	2	2	3	2	7	1	1	1	1	2	17	1
University of Cambridge	3	5	11	0	6	3	6	2	1	3	5	6	3	6	6	6	3	7	4	3	2	6	2	2	1	2	3	2	1	3	2	2	12	8
University of East Anglia	2		0	1	2	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	1	0	0	1	4	0	0	1	0	0	0	0	0	1
University of Exeter	1	0	0	0	1	1	0	0	1	0	1	0	1	0	0	2	2	0	1	0	1	1	0	0	1	5	0	0	4	0		0	1	0
University of Hull	0	0	0	3	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	1	0	1	2	0	1	0	0	0	0	0	0
Imperial College London	8	6	4	1	4	4	6	2	6	1	10	4	5	7	7	5	2	4	5	7	2	4	15	5	0	3	3	8	8	4	6	5	2	11
Keele University	0	0	0	1	0	1	0	0	4	0	1	0	1	0	0	1	5	0	0	0	4	0	0	2	2	2	0	0	0	0	0	0	0	0
Kings College London	2	9	8	8	5	3	2	2	1	1	1	4	3	5	6	3	6	25	3	5	7	3	3	5	4	2	13	2	5	4	0	3	0	4
Lancaster University	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0		0	1	0	2		0	0	4	0	1	0	1	0	0	0	0	0
University of Leeds	2	0	1	3	2	1	2	0	5	0	3	2	1	1	2	4	1	1	2	1	2	2	0	9	1	2	1	2	2	0	1	1	1	1
University of Leicester	1	0	1	1	0	1	2	1	0	1	0	1	2	3	2	1	3	1	1	0	1	1	2	0	0	1	0	1	4	1	0	1	0	0
University of Liverpool	3	1	1	2	3	2	2	2	1	2	12	1	2	0	3	3	3	1	3	1	1	2	2	1	1	1	2	1	4	0	14	0	17	3
London School of Hygiene and Tropical Medicine	5	1	0	1	3	2	1	4	0	0	19	0	2	1	1	0	0	1	14	0	0	0	2	0	0	0	5	1	0	1	36	0	1	4
University of Manchester	4	3	3	6	1	2	3	4	2	4	2	4	2	3	6	5	11	5	3	4	4	3	2	9	3	1	1	2	5	1	0	1	1	1
Newcastle University	4	1	2	1	2	1	2	1	1	4	0	2	2	1	2	2	1	2	2	1	3	3	1	2	0	1	2	2	3	2	0	2	2	0
University of Nottingham	4	3	2	2	2	2	2	2	2	2	3	3	2	1	4	3	3	2	2	2	3	5	2	2	4	3	3	1	1	1	1	1	4	3
University of Oxford	10	12	11	1	6	5	7	4	8	2	12	4	5	5	5	8	5	6	7	6	3	6	2	4	2	2	3	3	4	5	14	3	2	17
University of Plymouth	0	0	0	3	1	1	0	0	0	0	0	0	1	0	0	0	2	0	1	0	1	0	0	0	3	0	1	0	5	0		0	0	0
Queen Mary, University of London	1	0	0	0	0	0	2	0	1	0	0	1	0	1	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
University of Sheffield	3	1	1	6	1	1	2	0	1	0	1	3	1	1	2	2	2	1	1	2	2	3	1	2	2	0	2	1	2	1	0	2	0	0
University of Southampton	1	1	1	4	8	1	1	1	2	1	0	2	3	1	1	1	4	2	2	0	5	2	3	1	3	1	1	0	3	1	1	1	1	0
St George's, University of London	1	0	0	1	0	1	0	0	0	0	0	0	0	1	1	1	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1
University of Sussex	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	2	0	3	0	0	0	0	0
University College London	3	27	23	2	8	5	5	17	2	6	2	8	10	7	6	11	3	8	10	11	5	6	5	5	1	3	11	4	2	3	2	9	1	11
University of Warwick	4	1	0	1	0	1	0	0	1	0	0	0	1	1	0	1	3	1	1	0	1	1	0	0	2	0	1	0	0	0	0	1	3	2
University of York	2	1	1	3	0	1	1	0	0	1	3	0	0	0	0	1	3	1	2	0	1	2	0	0	8	0	1	0	3	0	1	0	1	0

Table 3-5: Organisations with more than 10% of HCPs by field (in fields with more than 100 HCPs)

THOMSON ISI FIELD (JSC)	ORGANISATION	Share of HCPs in 2002–2011 (%)
Allergy	Imperial College London	18
Audiology & Speech-Language Pathology	University of Cambridge	14
	University College London	13
Biochemical Research Methods	Imperial College London	12
	University of Cambridge	11
	University of Oxford	10
Biochemistry & Molecular Biology	University of Cambridge	13
	University of Oxford	12
Biophysics	University of Oxford	16
	University of Cambridge	15
Biotechnology & Applied Microbiology	University of Cambridge	10
Cardiac & Cardiovascular Systems	Imperial College London	10
Cell Biology	University of Cambridge	15
	University College London	11
Chemistry, Medicinal	University of Oxford	12
Clinical Neurology	University College London	18
Critical Care Medicine	Imperial College London	11
Dentistry/Oral Surgery & Medicine	Kings College London	13
	University College London	12
	UCL Hospitals NHS Foundation Trust	12
Dermatology	Guy's & St Thomas' NHS Foundation Trust	11
Developmental Biology	University of Cambridge	20
	University College London	14
Engineering, Biomedical	Imperial College London	11
	University College London	10
Food Science & Technology	University of Reading	15
	University of Bristol	10
Genetics & Heredity	University of Oxford	11
Immunology	University of Oxford	13
	Imperial College London	11
Infectious Diseases	London School of Hygiene & Tropical Medicine	12

Table 3.5 continued

THOMSON ISI FIELD (JSC)	ORGANISATION	Share of HCPs in 2002–2011 (%)
Materials Science, Biomaterials	Imperial College London	10
Neuroimaging	University College London	27
	University of Oxford	12
Neurosciences	University College London	23
	University of Oxford	11
	University of Cambridge	11
Ophthalmology	Moorfields Eye Hospital NHS Foundation Trust	18
	University College London	17
Parasitology	London School of Hygiene & Tropical Medicine	19
	University of Oxford	12
	University of Liverpool	12
	Imperial College London	10
Pediatrics	University College London	10
Physiology	University College London	11
Psychiatry	Kings College London	25
Public, Environmental & Occupational Health	London School of Hygiene & Tropical Medicine	14
	University College London	10
Radiology, Nuclear Medicine & Medical Imaging	University College London	11
Respiratory System	Imperial College London	15
Substance Abuse	Kings College London	13
	University College London	11
Tropical Medicine	London School of Hygiene & Tropical Medicine	36
	University of Liverpool	14
	University of Oxford	14
Veterinary Sciences	Royal Vet Coll Univ London	22
	University of Liverpool	17
	University of Bristol	17
	University of Cambridge	12
Virology	University of Oxford	17
	University College London	11
	Imperial College London	11

CHAPTER 4 Education excellence rankings

This chapter focuses on the various data related to the education quality indicators. The AHSC competition 2013 guidance document[17] suggests AHSCs should demonstrate:

Excellence in undergraduate and postgraduate health education.

We considered the following indicators:

- The Complete University Guide 2013 – Medicine
- The Times Good University Guide 2013 – Medicine
- The Guardian University Guide 2013 – Medicine
- The Times Higher Education World University Rankings for Clinical, Pre-Clinical and Health 2012–13
- National Student Survey data 2012
- National Training Survey data 2012.

The consolidated 'table of excellence' for the education indicators is presented in Section 4.1 and the methodologies used to arrive at the rankings are outlined in Section 4.2.

4.1 Ranking results

Table 4-1 presents institutional ranking lists for the various indicators for education quality (this table forms half of the overall results table shown in the executive summary as Table ES-1). Institutions have been listed alphabetically, and for ease of reference, the institution names have also been abbreviated. Institutions for which rankings have been omitted are those for which data are unavailable (indicated by "N/A" in Table 4-1), or which did not make it into the source ranking lists (indicated by "-" in Table 4-1). In general, where data were available for global or UK rankings, the relevant English candidates appearing on the list were extracted and then ranked in relation to each other. The individual methodologies used to draw up the rankings are described in Section 4.2.

As was done for the research indicators, to provide an impression of the relative performance of the listed institutions across the education domain, a colour code has been

[17] http://www.ccf.nihr.ac.uk/Documents/Guidance%20AHSCs-Invitation%20to%20submit%20PQQ.pdf (accessed on 26 April 2013)

applied to each indicator ranking list in Table 4-1. The top five institutions in each ranking list are highlighted in green while the next five institutions (6–10) are highlighted in yellow. Institutions with a rank between 11 and 20 are highlighted in blue.

It is important to note the London School of Hygiene and Tropical Medicine, which focuses on postgraduate education, was not ranked in any of the indicator ranking lists (which primarily focus on undergraduate education) due to a lack of data. Similarly, the Lancaster Medical School appears only in the NSS 2012 rankings (it was only recently approved by the General Medical Council[18] to deliver its own medical degrees and no other information is available).

[18] http://www.lancs.ac.uk/shm/med/cme/medicine_mbchb/ (accessed on 26 April 2013)

Table 4-1: An indicative alphabetical institutional ranking list for the education indicators (rank 1–5: green cell; rank 6–10: yellow cell; rank 11–20: blue cell)

University / Institution (abbreviated)	University / Institution	Medical School	Times Good University Guide – Medicine Rankings (2013)	Guardian University Guide – Medicine Rankings (2013)	Complete University Guide (Daily Mail) – Medicine Rankings (2013)	THE World University Rankings for Clinical, Pre-Clinical and Health (2012–13)	National Student Survey (2012)	National Training Survey (2012)	University / Institution (abbreviated)
Birmingham	University of Birmingham	College of Medical and Dental Sciences	13	22	7	-	6	5	Birmingham
Brighton	University of Brighton	Brighton and Sussex Medical School	21	18	25	-	25	16	Brighton
Bristol	University of Bristol	Faculty of Medicine and Dentistry	20	25	14	-	11	13	Bristol
Cambridge	University of Cambridge	School of Clinical Medicine	2	1	1	2	3	25	Cambridge
East Anglia	University of East Anglia	Norwich Medical School	25	20	22	-	9	14	East Anglia
Exeter	University of Exeter	Exeter Medical School (formerly part of Peninsula College of Medicine and Dentistry)	11	10	11	-	17	1	Exeter
Hull	University of Hull	Hull York Medical School	6	7	8	-	6	3	Hull
Imperial College	Imperial College London	Faculty of Medicine	4	9	4	3	20	18	Imperial College
Keele	Keele University	School of Medicine	26	23	24	-	2	N/A	Keele
King's College	King's College London	School of Medicine	15	15	18	5	23	24	King's College
Lancaster	Lancaster University	Lancaster Medical School	N/A	N/A	N/A	-	21	N/A	Lancaster
Leeds	University of Leeds	School of Medicine	10	13	11	-	17	21	Leeds
Leicester	University of Leicester	Department of Medical and Social Care Education	14	5	14	-	1	12	Leicester
Liverpool	University of Liverpool	School of Medicine	23	24	21	-	22	10	Liverpool
LSHTM	London School of Hygiene and Tropical Medicine	London School of Hygiene and Tropical Medicine (postgraduate medical school)	N/A	N/A	N/A	N/A	N/A	N/A	LSHTM
Manchester	The University of Manchester	Manchester Medical School	18	17	14	6	24	20	Manchester
Newcastle	Newcastle University	Newcastle University Medical School	5	4	5	-	5	9	Newcastle
Nottingham	The University of Nottingham	Faculty of Medicine and Health Sciences	17	14	19	-	6	8	Nottingham
Oxford	The University of Oxford	Medical Sciences Division	1	2	2	1	11	22	Oxford
Plymouth	Plymouth University	Peninsula Schools of Medicine and Dentistry (formerly part of Peninsula College of Medicine and Dentistry)	11	10	11	-	14	1	Plymouth
Queen Mary	Queen Mary, University of London	Barts and The London School of Medicine and Dentistry	8	5	6	-	16	7	Queen Mary
Sheffield	The University of Sheffield	The Medical School	9	16	10	-	4	6	Sheffield
Southampton	University of Southampton	Faculty of Medicine	15	21	20	-	19	15	Southampton
St George's	St George's, University of London	St George's, University of London	24	26	22	-	27	11	St George's
Sussex	University of Sussex	Brighton and Sussex Medical School	21	18	25	-	13	16	Sussex
UCL	University College London	UCL Medical School	3	3	3	4	15	23	UCL
Warwick	The University of Warwick	Warwick Medical School	19	12	17	-	25	19	Warwick
York	The University of York	Hull York Medical School	6	7	8	-	9	3	York

4.2 Descriptions of ranking methodologies for each education indicator

In some instances, the format of rankings provided by source organisations needed to be modified to arrive at the final rankings. The methods by which we derived the final ranking for each education indicator are described below. Further specific details about each indicator have been included in Appendix B.

- **The Guardian University Guide:** these rankings were obtained from the 2013 league table rankings for medicine. These are UK-only rankings and hence do not provide an indication of the "world-class" nature of the institutions. An overall score is awarded to each institution, which is determined by a weighted combination of eight criteria (student satisfaction related to the course, the teaching and feedback, student-staff ratio, spend per student, average entry tariff, a career score and a value-added score that reflects the effectiveness of the teaching). These composite scores determine the overall rankings. To obtain the rankings in Table 4-1, the English institutions were extracted (as per data availability).
- **The Complete University Guide rankings:** these rankings were obtained from the 2013 subject table rankings for medicine. These are UK-only rankings and hence do not provide an indication of the "world-class" nature of the institutions. An overall score and ranking is awarded to each institution, which is determined by a weighted combination of four criteria (student satisfaction, entry standards, research assessment[19] and graduate prospects). To obtain the rankings in Table 4-1, the English institutions were extracted (as per data availability) and the overall scores ranked in relation to each other.
- **The Times Good University Guide**: these rankings were obtained from the 2013 subject table rankings for medicine[20]. These are UK-only rankings and hence do not provide an indication of the "world-class" nature of the institutions. An overall score is awarded to each institution, which is determined by a weighted combination of four criteria (student satisfaction, research quality[21], entry standards and graduate prospects). These composite scores determine the overall rankings. To obtain the rankings in Table 4-1, the English institutions were extracted (as per data availability).
- **The Times Higher Education (THE) top 50 clinical, pre-clinical and health universities:** these rankings (for 2012–13) list the world's top 50 universities for clinical and health related subjects. As this this a global top 50 list, there are only 6 English institutions that feature in the rankings. An overall score is awarded to each institution, which is determined by a weighted combination of 13 performance indicators grouped into five main categories (teaching, research, citations, international outlook and industry income). These composite scores

[19] This presence of this criterion makes this an education/research indicator.

[20] The website lists St George's, University of London as Kingston/St George's.

[21] This presence of this criterion makes this an education/research indicator.

determine the overall rankings. To obtain the rankings in Table 4-1, the English institutions were extracted from the global list (as per data availability).

- **The National Student Survey (NSS):** Data pertaining to the responses received for statement 22 ("Overall, I am satisfied with quality of the course") of the 2012 National Student Survey were included in the analysis. Specifically, the percentage of students at the institutional level who answered "mostly agree" or "definitely agree" with statement 22 have been included. The data were filtered further to select only responses to this question covering the subject levels of medicine and dentistry, subjects allied to medicine and biological sciences. A final 'average' percentage of students across the three subject areas was calculated and these values were used to rank the institutions (as per data availability).
- **The National Training Survey (NTS):** this survey is carried out by the General Medical Council to monitor the quality of medical education and training in the UK. It asks trainees questions in the areas of overall satisfaction, access to educational resources, adequate experience, clinical supervision, educational supervision, feedback, handover, induction, local teaching, regional teaching, study leave, undermining and work load. For the 2012 data, we took the mean score for the "overall satisfaction" criterion by medical school and NHS trust/board to separately rank the medical schools and trusts/boards. The "overall satisfaction" indicator consists of five aspects: how trainees rate the quality of teaching, clinical supervision and experience, whether they would recommend the post to a friend and how useful the post will be for their future career. To obtain the rankings of the institutions in Table 4-1, the English institutions were extracted from the UK list (as per data availability). It should be noted that data at the medical school level were obtained through surveying trainees at foundation level 1, whereas data at the trust/board level was obtained through surveying all UK trainees. The rankings of the NHS trusts/boards in England are listed in Appendix E.

CHAPTER 5 Concluding remarks

With a vast array of 'league tables' available, each having their own methodologies, university ranking lists have often been the topic of heated debate in the higher education sector. There are a series of caveats about the methods we have used that should be borne in mind when reviewing the results presented in this report. Our ranking tables are perhaps overly selective in that we have only examined the performance of universities with medical schools, whereas partnerships of any NHS provider/university in England which judge themselves able to demonstrate characteristics for AHSCs and to meet the published designation criteria may submit a pre-qualifying questionnaire.

A more serious concern is that most of the indicators are proxies for quality. Because we are depending on pre-existing indicators, the unit of analysis for which the indicator is compiled is sometimes not the same as our unit of analysis. Of the 15 indicators considered, two were at the institutional level while 13 were 'medicine-related' indicators (though to varying degrees). For example, the Webometrics World University Rankings provides a ranking for universities as a whole, not just the medical or biomedical sciences schools separately. Similarly, the rankings related to the number of patents awarded are provided at the institutional level rather than the medical school level, which would have been a more appropriate measure of research quality in the context of the AHSC competition.

Furthermore, some of the indicators that have been used as quality measures in either the education or research domains are actually basket indicators that span both domains (for example, the Times Good University Guide for Medicine rankings and the Complete University Guide rankings for Medicine). Other indicators blend input and output proxies. For example, the Complete University Guide rankings for medicine integrate input (entry standards) and output measures (graduate prospects, research assessment, and student satisfaction survey). Related is the issue of multiple counting of indicators across the research and education domains. For example, RAE 2008 performance drives QR funding and some of the basket indicators such as the Times Good University Guide and the Complete University Guide rankings for Medicine also utilise data from RAE 2008. Data related to RAE 2008 are therefore being captured (to varying degrees) in multiple indicator ranking lists.

Another key issue that must be noted while interpreting the results is that using rankings emphasises the differences between institutions that are similar in performance and vice versa. Using the number of patents granted as an example, the fourth-ranked institution was granted 40 patents in 2011/12 with the fifth-ranked institutions obtaining 35

patents[22]. Despite there being relatively little difference between how these institutions performed, in the ranking list it is as significant as the difference between the top-ranked (175 patents granted) and second-ranked (60 patents granted) institutions. Thus, even though there is a significant difference between how the top two institutions perform on the basis of this metric, it still corresponds to only one place in the rankings.

The ranking indicators also differ in whether they compare English institutions only, or whether they compare English institutions with the rest of the world. The first approach does not provide information on whether an English institution is "world class", a characteristic seen as important by the Department of Health in the context of AHSCs – it is possible that none of the English institutions is world class, or it is possible that many of them are. In terms of research indicators used in the analysis, some of the English rankings can be compared to the global rankings, but this is not possible for the majority of the education indicators.

Possibly the most significant weakness of the approach is where we have had to combine multiple sub-indicators for each institution to provide a single institutional indicator for ranking. For indicators that provide institutional rankings from a number of sub-indicators (for example, the Times Good University Guide and the Guardian University Guide), we have used the published ranking and simply extracted the English institutions and ranked them relative to each other. However, there are some indicators, such as RAE 2008 and NSS 2012, that do not provide a single institutional ranking. Here we have had to generate our own rankings by devising a way to combine an institution's 'scores' into one indicator. Because there is no accepted way of combining an institution's scores (and indeed there have been numerous attempts to devise overall RAE 2008 performance indicators[23]), this leaves us open to the criticism that we have used an arbitrary or inappropriate method of combination. Although we have not examined this in detail, it is likely that changes in the method of combination could affect overall rankings. The effect of different methods of combination could be examined as part of further work, but there will always be the possibility of challenging the methods used.

For some of the indicators (particularly global subject rankings such as the ARWU and THE rankings) data are not available for all the English institutions being considered – often only the top 200 or top 50 in the world are included in the publically available tables. If these rankings are to be used, it will be important to determine why institutions were not covered; currently it is not always clear whether some institutions in our table were excluded from consideration, or whether they simply fell outside the top group. It is also worth noting that due to the lack of available data in the education domain, an institution such as the London School of Hygiene and Tropical Medicine (which focuses on postgraduate education and research and which performs relatively well in the research domain) does not feature in any of the education quality rankings (which primarily concentrate on undergraduate education); similarly, the recently formed Lancaster Medical School did not appear in the majority of the education quality ranking lists.

[22] Keeping in line with the HESA Services Standard Rounding Methodology.

[23] http://www.timeshighereducation.co.uk/news/rae-2008-results-prompt-a-flurry-of-analysis/404789.article (accessed on 26 April 2013)

Moreover, university ranking lists that are compiled on a rolling basis are subject to temporal fluctuations (in part due to changes in the methodologies that have been applied to arrive at the rankings). We have not carried out any time series analyses of the ranking data and have restricted our analysis to the most recently available data.

We also note that there are a number of well-known limitations to bibliometric analyses[24] and our results need to be considered within that context. Citation analysis is predicated on the notion that the reference practices of researchers can reveal high-performing scientists, papers and institutions, as well as popular and influential areas of research. Although this is widely accepted, there is no agreed theory to explain why authors cite in the way that they do.[25] Moreover, differences between research fields exert important influences over the kind of analysis that can be performed. Despite these limitations, citation analysis, when used in combination with other methods of assessment, can be a very effective tool for performance and impact evaluations, and for informing funding decisions.

Given the caveats detailed above and the requirements to balance two domains of activity (research and education), our opinion is that the ranking methodology presented in this report can be used in an 'advisory' capacity to provide a general indication of the rankings of candidate AHSC institutions within research and education domains. This information will be made available to the AHSC Panel as part of overall information on AHSC applications, when making recommendations on the designation process to the Department of Health.

[24] Moed, H.F. 2005.

[25] Vinkler 2002; Hanney et al. 2005.

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http://www.ccf.nihr.ac.uk/Documents/Guidance%20AHSCs-Invitation%20to%20submit%20PQQ.pdf (accessed on 26 April 2013)

http://www.medschools.ac.uk/Students/UKMedicalSchools/MedicalSchoolsbyRegion/Pages/England.aspx (accessed on 26 April 2013)

http://www.pcmd.ac.uk/ (accessed on 26 April 2013)

http://www.rae.ac.uk/results/selectUOA.aspx (accessed on 26 April 2013)

http://www.shanghairanking.com/ARWU-FIELD-Methodology-2012.html# (accessed on 26 April 2013)

http://www.lancs.ac.uk/shm/med/cme/medicine_mbchb/ (accessed on 26 April 2013)

http://www.timeshighereducation.co.uk/news/rae-2008-results-prompt-a-flurry-of-analysis/404789.article (accessed on 26 April 2013)

APPENDICES

Appendix A: Summary information about the research indicators

This appendix contains summary information about the various research indicators that were used in the analysis presented in this report.

Research Assessment Exercise 2008	
Brief Description	This is the Research Assessment Exercise (RAE) score for the research quality of UK Higher Education Institutions (HEIs).
Source	RAE 2008 website (http://www.rae.ac.uk/). RAE 2008 was conducted jointly by the various Higher Education Funding Councils (HEFCE, HEFCW, SFC and DEL). The sources of raw data for the assessment are supplied by HEIs.
Measurement Units	A numerical score with a qualitative description accompanying it. RAE 2008 used a 4-point graded profile: 4* = Quality that is world-leading in terms of originality, significance and rigour. 3* = Quality that is internationally excellent in terms of originality, significance and rigour, but nevertheless falls short of the highest standards of excellence. 2* = Quality that is recognized internationally in terms of originality, significance and rigour. 1* = Quality that is recognized nationally in terms of originality, significance and rigour. Unclassified = Quality that falls below the standards of nationally recognized work. Or work that does not meet the published definition of research for the purposes of this assessment.
Type of Indicator (Qualitative, Quantitative, Basket)	A peer-review derived ranking. Various sub-indicators feed into deriving the final score, and these are described quantitatively and qualitatively. The indicator categories are: • Overall staff summary including summary information on research active staff (FTE and headcount) and related academic support staff (FTE) • Detailed information on research active individuals • Research output data such as numbers and types of publications (e.g. peer reviewed articles, conference proceedings, book chapters) • Research students (numbers of full-time and part-time postgraduate research students and degrees awarded) • Research studentships (numbers of postgraduate research studentships and the sources of funding for them) • External research income data (amounts and sources of external funding) • Research environment data (such as strategic investments in supportive infrastructure for research, in collaborations, in developing new programs) • Research esteem data (such as recognitions of research quality for the department and its individuals, prizes, awards).

Type of Indicator (Input, Output)	The final score is an output indicator. However, input and output sub-indicators feed into deriving the final ranking: Input: staff data, student data, research environment data Output: research esteem data, degrees awarded, research income data, research outputs.
Type of Indicator (Research, Education)	Research indicator.
Strengths	This is a widely used indicator for research quality. There is very good nationwide coverage of data. Data are available at the level of the institution, and by subject/discipline categories (i.e. at the UOA level).
Weaknesses/Limitations	There is scope for inconsistency in the ranking approaches across multiple peer-reviewers who conduct the assessments (it is not entirely clear how consistency in the rankings is ensured across different assessors). It is not clear how the different categories of information provided by the HEIs for the assessments (i.e. the input and output sub-indicators) are incorporated into a final research quality score. Data on their relative ratings are not freely accessible. The most recent RAE scores are based on the 2008 RAE exercise.
Additional Commentary	The RAE process is essentially a peer-review. Universities supply various information for the assessments. The submissions are assessed by an expert panel, which performs the analysis. Panel members are nominated by subject associations and other stakeholders, and appointed by UK funding bodies. They are selected based on their standing in the academic and wider research community, their experience and understanding of the needs of research users and research commissioners from public and private sectors. UOAs 1 to 13 are, respectively: (1) Cardiovascular Medicine, (2) Cancer Studies, (3) Infection and Immunology, (4) Other Hospital Based Clinical Subjects, (5) Other Laboratory Based Clinical Subjects, (6) Epidemiology and Public Health, (7) Health Services Research, (8) Primary Care and Other Community-based Clinical Subjects, (9) Psychiatry, Neuroscience and Clinical Psychology, (10) Dentistry, (11) Nursing and Midwifery, (12) Allied Health Professions and Studies, and (13) Pharmacy.

Mainstream Quality Related (QR) Research Funding 2012–13	
Brief description	This indicator describes the amount of quality related funding from the Higher Education Funding Councils that an HEI receives.
Source	Higher Education Funding Council for England.
Measurement Units	Mainstream QR allocation.
Type of Indicator (Qualitative, Quantitative, Basket)	Quantitative (the mainstream QR funding uses data from RAE 2008).
Type of Indicator (Input, Output)	Output indicator: mainstream QR funding is based on the RAE and in the future it will be based on the Research Excellence Framework (REF).
Type of Indicator (Research, Education)	Research indicator.
Strengths	Data are readily available from HEFCE with good nationwide coverage.
Weaknesses/Limitations	The fact that mainstream QR funding takes relative costs into account when allocating the budget (recognizing that laboratory-based research is more expensive than library-based research) may mean that medical schools that encompass areas such as mental health which do not rely so heavily on laboratory research receive a smaller amount of QR funding. However, this may not necessarily reflect a difference in quality.
Additional Commentary	The HEFCE website states that their calculations for funding take the following factors into account: • "The quality of research, measured in the Research Assessment Exercise • The volume of research using research-active staff numbers • Relative costs, reflecting, for example, that laboratory-based research is more expensive than library-based research." http://www.hefce.ac.uk/whatwedo/rsrch/howfundr/mainstreamqrresearchfunding/ (accessed on 26 April 2013)

Academic Ranking of World Universities (ARWU) in Clinical Medicine and Pharmacy 2012	
Brief Description	A global ranking list of universities (published annually).
Source	The ARWU is published by Shanghai Ranking Consultancy. Available online at: http://www.shanghairanking.com/FieldMED2012.html (accessed on 26 April 2013)
Measurement Units	The overall ranking is a numerical score. Weighted averages across various measures feed into the overall score.
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator with various measures for research outputs feeding into the overall score.
Type of Indicator (Input, Output)	Output indicator. Indicators are derived from: *Alumni*: The total number of the alumni of an institution winning Nobel Prizes in physics, chemistry, medicine and economics and Fields Medals in mathematics *Award*: The total number of staff winning Nobel Prizes in physics, chemistry, medicine and economics and Fields Medals in mathematics *HiCi*: The number of highly cited researchers in 20 subject categories defined and provided by highlycited.com *PUB*: The total number of papers indexed by Science Citation Index-Expanded and Social Science Citation Index in 2010 and 2011 *TOP*: The percentage of papers published in the top 20% journals of each broad subject field. http://www.shanghairanking.com/ARWU-FIELD-Methodology-2012.html#2 (accessed on 26 April 2013)
Type of Indicator (Research, Education)	Research indicator.
Strengths	Combines diverse measures for research performance. Data for clinical medicine and pharmacy (as a subject category) are available according to indicator, and at a global level (for the top 200 globally).
Weaknesses/Limitations	For some indicators such as Nobel alumni, timelines are not considered. This can compromise the validity of the indicator for research quality.
Additional Commentary	The weights for the five indicators that contribute to the ARWU Clinical Medicine and Pharmacy rankings are as follows: Alumni: 10%, Award: 15%, HiCi: 25%, PUB: 25% and TOP: 25%.

Webometrics Ranking of World Universities January 2013	
Brief description	A global ranking list of universities based on their web presence and impact.
Source	The rankings are produced by the Cybermetrics Lab, which belongs to the Consejo Superior de Investigaciones Científicas (CSIC), the largest public research body in Spain. Available online: http://www.webometrics.info/en/world (accessed on 26 April 2013)
Measurement Units	Composite indicator. Various criteria (Impact, Presence, Openness and Excellence) feed into the composite indicator.
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator. Impact-related and activity-related variables contribute equally towards building the composite indicator. *Impact*: This is the visibility indicator and contributes to 50% of the composite indicator. "The quality of the contents is evaluated through a 'virtual referendum', counting all the external inlinks that the University web domain receives from third parties. Those links are recognizing the institutional prestige, the academic performance, the value of the information, and the usefulness of the services as introduced in the web pages according to the criteria of millions of web editors from all over the world." http://www.webometrics.info/en/Methodology (accessed on 26 April 2013) The *activity*-related group of indicators contributes to 50% of the composite indicator. This group includes the following individual variables (each contributing to one-third of the weighting for the group): Presence: "The total number of webpages hosted in the main webdomain (including all the subdomains and directories) of the university as indexed by the largest commercial search engine (Google)." http://www.webometrics.info/en/Methodology (accessed on 26 April 2013) Openness: This indicator uses Google Scholar to estimate the number of rich files published on dedicated websites. The following file formats are considered: Adobe Acrobat (.pdf), Microsoft Word (.doc and .docx) and Microsoft PowerPoint (.ppt). Excellence: This is an indicator of the number of academic papers published in high-quality international journals. According to Webometrics, "...we are restricting the indicator to only those excellent publications, i.e. the university scientific output being part of the 10% most cited papers in their respective scientific fields." http://www.webometrics.info/en/Methodology (accessed on 26 April 2013)
Type of Indicator (Input, Output)	Output indicator.

Type of Indicator (Research, Education)	Research indicator.
Strengths	A unique indicator that considers web presence in order to rank various institutions and, in turn, indirectly evaluate the "commitment of the scholars with their students" http://www.webometrics.info/en/Methodology (accessed on 26 April 2013) The rankings are published every 6 months. This is a global ranking list.
Weaknesses/Limitations	The Webometrics database provides rankings for the web presence of research outputs. These do not necessarily indicate research quality. Data are not available for the medical field specifically. Also, the rankings do not classify on the basis of institution type, meaning that "research-intensive universities are listed together with community colleges or theological seminaries." (http://www.webometrics.info/en/Methodology)
Additional Commentary	The original aim of the Webometrics database was to promote web publication, not to rank institutions. The move into rankings was based on the assumption that web presence can indicate institutional performance. Perhaps most relevant for research quality indications in the Webometrics database is the Google Scholar score. Google Scholar provides the number of papers and citations for each academic domain.

The QS World University Rankings by Subject 2012 – Medicine	
Brief description	A global ranking list of universities (published annually).
Source	Published by Quacquarelli Symonds (QS). Available online: http://www.topuniversities.com/university-rankings/university-subject-rankings/2012/medicine (accessed on 26 April 2013)
Measurement Units	The overall ranking is a numerical score. Weighted averages across various measures feed into the overall score.
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator with measures for research and education quality feeding into the overall score. Academic reputation (40% weighting) and citations per paper (50% weighting) contribute to the research measures while education measures include employer reputation (10% weighting). http://www.iu.qs.com/university-rankings/subject-tables/? (accessed on 26 April 2013)
Type of Indicator (Input, Output)	Output indicator. Includes output measures (citations per paper, employer reputation, and academic reputation) to evaluate the overall score.
Type of Indicator (Research, Education)	Research indicator in this analysis (note: overall score based on research and education measures).
Strengths	Combines research and education measures into a final quality score for an institution. Data are available for 'medicine' at a global level. Research quality rankings (based on two measures: citations per paper and academic reputation) are available at a global level. Users are able to view individual scores for the different measures (academic reputation, employer reputation and citations per paper) that contribute towards the overall score.
Weaknesses/Limitations	The overall score for medicine is calculated using three of the six indicators (that are used to calculate the world university rankings). As only the top 202 medical schools are ranked, some of the English medical schools being considered for this report are excluded.
Additional Commentary	For the academic reputation survey, for each faculty area, "respondents are asked to list up to ten domestic and thirty international institutions that they consider excellent for research in the given area", and for the employer survey (10% weighting), "employers are asked to identify up to ten domestic and thirty international institutions they consider excellent for the recruitment of graduates." http://www.iu.qs.com/university-rankings/subject-tables/? (accessed on 26 April 2013)

Income from Research Grants and Contracts 2011–12	
Brief Description	The value of grants and contracts held by a Higher Education Institution (HEI).
Source	Data were obtained from the Higher Education Statistics Agency.
Measurement Units	An absolute number for the year under assessment.
Type of Indicator (Qualitative, Quantitative, Basket)	Quantitative indicator.
Type of Indicator (Input, Output)	Output indicator.
Type of Indicator (Research, Education)	Research indicator.
Strengths	Data are readily available from HESA (at the cost centre level) with good nationwide coverage.
Weaknesses/Limitations	Data are expressed as an absolute amount. They are not normalised by the size of an institution.
Additional Commentary	For the analysis presented in this report, the rankings were generated using data at the following cost centre groups: clinical medicine, clinical dentistry, anatomy and physiology, nursing and paramedical studies, health and community studies, psychology and behavioural sciences, pharmacy and pharmacology, and biosciences. Caution is advised in interpreting this measure as an indicator of research quality. Although it is likely that the ability to attract funding depends on the institutions reputation for research quality and/or the quality of a funding proposal, there may be other reasons influencing success in attracting funding (e.g. capacity building incentives of donors, low levels of competition for funding in a specific research area).

Number of qualifiers who obtained Doctorate degrees or New Route PhDs that meet the criteria for a research-based higher degree 2011–12	
Brief Description	This refers to the total number of PhD degrees awarded annually.
Source	Data were obtained from the Higher Education Statistics Agency.
Measurement Units	An absolute number for the year under assessment.
Type of Indicator (Qualitative, Quantitative, Basket)	Quantitative indicator.
Type of Indicator (Input, Output)	Output indicator.
Type of Indicator (Research, Education)	Research indicator.
Strengths	Data are readily available from HESA (at the subject area level) with good nationwide coverage.
Weaknesses/Limitations	This is more a measure of research outputs than of research quality. It is not normalised by the size of an institution.
Additional Commentary	For the analysis presented in this report, the rankings were generated using data from the following subject areas: medicine and dentistry, subjects allied to medicine, and biological sciences. This indicator provides a measure of the "vitality of the institution in educating new researchers." (http://www.hesa.ac.uk/index.php?option=com_content&task=view&id=2070&Itemid=141)

Number of patents granted 2011–12	
Brief Description	This refers to all individual patents and any individual national patents granted in a given year.
Source	Data were obtained from the Higher Education Statistics Agency.
Measurement Units	An absolute number for the year under assessment.
Type of Indicator (Qualitative, Quantitative, Basket)	Quantitative indicator.
Type of Indicator (Input, Output)	Output indicator.
Type of Indicator (Research, Education)	Research indicator.
Strengths	Data are readily available from HESA with good nationwide coverage.
Weaknesses/Limitations	Data are only available at the academic institutional level. This is, therefore, an indicator of the overall research quality of an institution and not of the medical school.
Additional Commentary	Data are gathered through the Higher Education Business and Community Interaction (HE-BCI).

Highly Cited Publications (HCPs) 2002–11	
Brief Description	The number of publications from an institution that are in the top 20% of publications, by citations, in a field globally.
Source	CWTS and RAND Europe. Source data stem from the Science Citation Index and associated indexes of the Web of Science.
Measurement Units	Total numbers and percentages of highly cited publications (HCPs). The share of HCPs of an institution within a pool of institutions.
Type of Indicator (Qualitative, Quantitative, Basket)	Quantitative indicator.
Type of Indicator (Input, Output)	Output indicator.
Type of Indicator (Research, Education)	Research indicator.
Strengths	This is a bibliometric indicator that can be used across fields, institutions and geographies. It is an indicator that provides a ranking of research quality compared to the performance of others in a field. The number of HCPs by institution is an indicator of critical mass and quality. The concentration of HCPs in the field identifies world-class pockets of research in an institution, and in a specific field. RAND Europe has performed analyses for the medical research field.
Weaknesses/Limitations	Analysis generally emphasises citations from peer-reviewed journal publications. Citations from other sources, such as clinical guidelines, non-indexed literature, etc., may be omitted, even though such citations may still be important indications of research quality and dissemination. Analysis is based on coverage in the bibliometric databases. Recently submitted articles may not yet be indexed, and they also need time to accrue citations.
Additional Commentary	RAND Europe has used this indicator to perform analysis for the DH, to inform Biomedical Research Unit and Biomedical Research Centre performance assessments, and to inform selection processes for NIHR Senior Faculty applications.

Appendix B: Summary information about the education indicators

This appendix contains summary information about the various education quality indicators that were used in the analysis presented in this report.

The Complete University Guide 2013 – Medicine	
Brief description	A university ranking table published annually and representing education and research quality.
Source	The Complete University Guide, in association with the Daily Mail. Available online: http://www.thecompleteuniversityguide.co.uk/league-tables/rankings?s=Medicine (accessed on 26 April 2013)
Measurement Units	The overall ranking is based on a numerical score (out of 100). Weighted scores across various measures (entry standards, research assessment, student satisfaction survey, and graduate prospects) feed into the overall score. http://www.thecompleteuniversityguide.co.uk/league-tables/key (accessed on 26 April 2013)
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator with measures for research and education quality feeding into the overall score.
Type of Indicator (Input, Output)	Output indicator [integrates input (entry standards) and output measures (graduate prospects, research assessment, and student satisfaction survey) to evaluate the overall score].
Type of Indicator (Research, Education)	Education indicator in this analysis (note: overall score is based on education and research inputs).
Strengths	Data are available at the medical school level. Users are able to view the different measures (entry standards, research assessment, student satisfaction survey and graduate prospects) that contribute towards the overall score. Medical schools can be ranked based on any one of these four criteria.
Weaknesses/Limitations	The table provides ranking for the different medical schools only within the UK. The focus is on the full-time undergraduate student experience.
Additional Commentary	League tables are generally aimed at students considering applications to an institution and at recruiters.

Times Good University Guide 2013 – Medicine	
Brief Description	A league table of university rankings, published annually.
Source	The Times. Available online: http://extras.thetimes.co.uk/public/good_university_guide_landing/subjects/medicine (accessed on 26 April 2013)
Measurement Units	The overall ranking is based on a numerical score (out of 100). Four measures (sub-indicators) of performance contribute to the overall score. These are student satisfaction, research quality, entry standards and graduate prospects). http://extras.thetimes.co.uk/public/good_university_guide_landing/about
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator with measures for education and research quality feeding into the overall score.
Type of Indicator (Input, Output)	Output indicator [a combination of input (entry standards) and output (student satisfaction, research quality and graduate prospects) sub-indicators feed into the overall score].
Type of Indicator (Research, Education)	Education indicator in this analysis (note: overall score is based on education and research inputs).
Strengths	Data are available at the medical school level. Users are able to view the different measures that contribute to the overall score. Medical schools can be ranked based on any one of the four criteria mentioned above.
Weaknesses/Limitations	The table provides ranking for the different medical schools only within the UK. The focus is on the full-time undergraduate student experience.
Additional Commentary	League tables are generally aimed at students considering applications to an institution and at recruiters.

The Guardian University Guide 2013 – Medicine	
Brief Description	A university ranking table published annually and representing education quality.
Source	Available online from the Guardian website. The website mentions that they source data from HESA, the National Student Survey and Intelligent Metrix Ltd. http://www.guardian.co.uk/education/table/2012/may/22/university-guide-medicine (accessed on 26 April 2013)
Measurement Units	The overall ranking is based on a numerical score (out of 100) that is generated based on a combination of eight factors (see the Additional Commentary section).
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator.
Type of Indicator (Input, Output)	Output indicator.
Type of Indicator (Research, Education)	Education indicator.
Strengths	Data are available at the medical school level. The Guardian's league table for medicine uses eight different criteria (see Additional Commentary), for which the constituent data are provided. The Guardian website provides the facility to sort the table by any of the criteria.
Weaknesses/Limitations	The table provides ranking for the different medical schools only within the UK. The focus is on the full-time undergraduate student experience.
Additional Commentary	The criteria used to generate the overall Guardian excellence rating are as follows: • % satisfied with teaching • % satisfied with feedback • % satisfied overall with course • Spend per student (FTE) • Student-staff ratio • Career after 6 months • Average entry tariff • Value added score (comparing students' degree results with their entry qualifications).

Times Higher Education (THE) World University Rankings: Top 50 Clinical, Pre-Clinical and Health Universities 2012–13	
Brief Description	A league table of world university rankings, published annually.
Source	Times Higher Education and Thomson Reuters Global Institutional Profiles project. Available online: http://www.timeshighereducation.co.uk/world-university-rankings/2012-13/subject-ranking/subject/clinical-pre-clinical-health (accessed on 26 April 2013)
Measurement Units	The overall ranking is based on a numerical score that is generated using multiple calibrated performance indicators (see Additional Commentary section).
Type of Indicator (Qualitative, Quantitative, Basket)	Basket indicator.
Type of Indicator (Input, Output)	Output indicator.
Type of Indicator (Research, Education)	Education indicator in this analysis (note: overall score is based on education and research inputs).
Strengths	Combines diverse measures for evaluating research and teaching performance of Clinical, Pre-Clinical and Health World Universities. Data are available at medical school level.
Weaknesses/Limitations	Individual contributions from the thirteen performance indicators are not available. Rankings are available at a global level only for the 'top 50' institutions. Therefore, a number of English institutions (that are being considered in this report) are excluded.
Additional Commentary	Thirteen performance indicators with different weightings contribute to the overall score. These indicators are grouped into the following five broad areas whose weightings are adjusted based on subject area: teaching, research, citations, industry income and international outlook. http://www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking/methodology (accessed on 26 April 2013)

The National Student Survey 2012	
Brief Description	Annual survey conducted on behalf of HEFCE to gather students' opinions of the quality of their courses.
Source	HEFCE website (Ipsos MORI ran the survey in 2012). Available online: http://www.hefce.ac.uk/whatwedo/lt/publicinfo/nationalstudentsurvey/nationalstudentsurveydata/2012/ (accessed on 26 April 2013)
Measurement Units	The survey consists of 23 core statements for which students can select one of the following responses: 'definitely agree', 'mostly agree', 'neither agree nor disagree' 'mostly disagree', 'definitely disagree' and 'not applicable' (see Additional Commentary section). The results in files on the HEFCE website are presented as the percentage of students who either 'definitely agree' or 'mostly agree' with each of the statements in the survey.
Type of Indicator (Qualitative, Quantitative, Basket)	Basket output indicator based on the various responses relating to the student learning experience.
Type of Indicator (Input, Output)	Output indicator (based on students' opinions of the quality of courses they have attended).
Type of Indicator (Research, Education)	Education indicator.
Strengths	Data are readily available with good nationwide coverage. The results of the survey offer a valuable insight into the experiences of students, and can be used to improve the quality of education they receive at universities.
Weaknesses/Limitations	Varied response rates across all institutions surveyed.
Additional Commentary	For the analysis presented in this report, the rankings were generated using data at the following subject levels: medicine and dentistry, subjects allied to medicine, and biological sciences. The survey covers 23 core questions, relating to the following areas of the student learning experience: 1. Teaching on my Course 2. Assessment and Feedback 3. Academic Support 4. Organisation and Management 5. Learning Resources 6. Personal Development 7. Overall Satisfaction 8. Satisfaction with the Students' Union (Association or Guild). http://www.thestudentsurvey.com/faqs/faqs_1.html#.UWqaJqJwqd5 (accessed on 26 April 2013)

The National Training Survey 2012	
Brief Description	Annual survey conducted by the General Medical Council to monitor the quality of medical training and education in the UK.
Source	General Medical Council. Available online: http://www.gmc-uk.org/education/national_summary_reports.asp (accessed on 26 April 2013)
Measurement Units	Mean 'overall satisfaction' score by medical school and trust/board.
Type of Indicator (Qualitative, Quantitative, Basket)	Quantitative indicator (mean scores are used for overall satisfaction).
Type of Indicator (Input, Output)	Output indicator (based on students' assessment of the training they have received).
Type of Indicator (Research, Education)	Education indicator.
Strengths	Data are readily available with good nationwide coverage. The mean scores are benchmarked against national mean and median averages (average results for the EEA and the rest of the world are also included).
Weaknesses/Limitations	It is worthy of note that results by medical school only represent the views of foundation year 1 trainees, whereas results by trust/board represent all UK trainees. Not all medical schools are included in the survey (Keele University, Lancaster University and the London School of Hygiene and Tropical Medicine are not included).
Additional Commentary	The survey asks trainees questions in the areas of overall satisfaction, access to educational resources, adequate experience, clinical supervision, educational supervision, feedback, handover, induction, local teaching, regional teaching, study leave, undermining and work load. http://www.gmc-uk.org/National_training_survey_2012_key_findings___final.pdf_49303306.pdf (accessed on 26 April 2013)

Appendix C: Journal Subject Category fields used in the bibliometric analysis

Allergy
Anatomy & Morphology
Andrology
Anesthesiology
Audiology & Speech Language Pathology
Biochemical Research Methods
Biochemistry & Molecular Biology
Biophysics
Biotechnology & Applied Microbiology
Cardiac & Cardiovascular Systems
Cell & Tissue Engineering
Cell Biology
Chemistry, Medicinal
Clinical Neurology
Critical Care Medicine
Dentistry, Oral Surgery & Medicine
Dermatology
Developmental Biology
Emergency Medicine
Endocrinology & Metabolism
Engineering, Biomedical
Food Science & Technology
Gastroenterology & Hepatology
Genetics & Heredity
Geriatrics & Gerontology
Gerontology
Health Care Sciences & Services
Health Policy & Services
Hematology
Immunology
Infectious Diseases
Integrative & Complementary Medicine
Materials Science, Biomaterials
Medical Informatics
Medical Laboratory Technology
Medicine, General & Internal
Medicine, Research & Experimental
Microbiology
Neuroimaging
Neurosciences
Nursing
Nutrition & Dietetics
Obstetrics & Gynaecology
Oncology
Ophthalmology
Orthopaedics
Otorhinolaryngology
Parasitology
Pathology
Paediatrics
Peripheral Vascular Disease
Pharmacology & Pharmacy
Physiology
Primary Health Care
Psychiatry
Public, Environmental & Occupational Health
Radiology, Nuclear Medicine & Medical Imaging
Rehabilitation
Reproductive Biology
Respiratory System
Rheumatology
Social Work
Sport Sciences
Substance Abuse
Surgery
Toxicology
Transplantation
Tropical Medicine
Urology & Nephrology
Veterinary Sciences
Virology

Appendix D: Further results from the bibliometric analysis

For comparability with our other analyses, in Chapter 3 we focused attention on the bibliometric performance of universities, and have reserved presenting indicators focused on the performance of NHS institutions and on collaborations among universities and NHS institutions for this Appendix.

Co-publication activity between institutions

In the table below (Table D-1), we list the top 20 collaborative partnerships between NHS institutions ranked in the top 25 (by volume of HCPs) and universities. As one might expect, there is a high level of collaboration between co-located institutions. For example, 57% of HCPs produced by researchers from the Salford Royal NHS Trust are jointly authored with researchers who have a University of Manchester address. Table D-2 cross-tabulates the share of HCPs by field and NHS institution.

Table D-1: Summary of the top 20 collaborative partnerships between top 25 NHS institutions (by volume of HCPs) and a university

NHS Institution	University	Number of collaborative publications	Proportion of NHS institution publications sharing a university address (%)
Royal Brompton & Harefield NHS Foundation Trust	Imperial College London	344	60
Salford Royal NHS Foundation Trust	University of Manchester	260	57
Oxford University Hospitals NHS Trust	University of Oxford	2112	57
Imperial College Healthcare NHS Trust	Imperial College London	1344	57
Moorfields Eye Hospital NHS Foundation Trust	University College London	235	57
UCL Hospitals NHS Foundation Trust	University College London	745	55
Great Ormond Street Hospital for Children NHS Foundation Trust	University College London	418	55
Royal Free London NHS Foundation Trust	University College London	596	54
Chelsea & Westminster Hospitals NHS Foundation Trust	Imperial College London	109	54
Royal Liverpool and Broadgreen University Hospitals NHS Trust	University of Liverpool	130	53
University Hospitals Birmingham NHS Foundation Trust	University of Birmingham	262.5	50
Sheffield Teaching Hospitals NHS Foundation Trust	University of Sheffield	388.9	49
The Christie NHS Foundation Trust	University of Manchester	188.3	49
University Hospital Southampton NHS Foundation Trust	University of Southampton	515.6	48
Central Manchester University Hospitals NHS Foundation Trust	University of Manchester	452.7	44
Heart Of England NHS Foundation Trust	University of Birmingham	143.6	44
North Bristol NHS Trust	University of Bristol	226.5	43
Newcastle upon Tyne Hospitals NHS Foundation Trust	University of Newcastle upon Tyne	341.9	43
Guy's & St Thomas' NHS Foundation Trust	Kings College London	743.0	42
Leeds Teaching Hospitals NHS Trust	University of Leeds	478.1	41

Table D-2: Cross-tabulation of share of HCPs by field and NHS institutions (cells with share of 10–20% highlighted in yellow, share greater than 20% highlighted in blue)

NHS INSTITUTION	Allergy	Anatomy Morphology	Andrology	Anesthesiology	Audiology Speech Language Path.	Biochemical Research Methods	Biochemistry Molecular Biology	Biophysics	Biotechnology Applied Microbio.	Cardiac Cardiovascular Systems	Cell Tissue Engineering	Cell Biology	Chemistry Medicinal	Clinical Neurology	Critical Care Medicine	Dentistry Oral Surgery Medicine	Dermatology	Developmental Biology	Emergency Medicine	Endocrinology Metabolism	Engineering Biomedical	Food Science Technology	Gastroenterology Hepatology	Genetics Heredity	Geriatrics Gerontology	Gerontology	Health Care Sciences Services	Health Policy Services	Hematology	Immunology	Infectious Diseases	Integrative Complementary Medicine	Materials Science Biomaterials	Medical Informatics	Medical Laboratory Technology	Medicine General Internal	Medicine Research Experimental
AINTREE UNIV HOSPS NHSFT	0		4	1			0		0	0		0		0	1	1			0	0	0		0	0	0		0	0		0	0			0	1	0	0
BARTS HEALTH NHST	1	0		2	1	1	1	0	1	2	2	1	1	1	4	3	3	0	2	3	1	0	4	2	1		1	1	4	2	1		1	0	3	2	1
BIRMINGHAM CHILDRENS HOSP NHSFT		0		0			0	0	0	0		0		0	0	0	1		0	0			0	0			0		1	0	0				0	0	0
BIRMINGHAM UNIV HOSPS NHSFT	0			0	1	0	0	0	0	1	0	0	0	0	2	0	1		2	1	0		2	0	1	1	0	0	1	0	1	1		1	1	1	0
BIRMINGHAM WOMENS HOSP NHSFT		0		0		0	0	0	0	0		0		0				0		0			0	1			0		0	0					0	0	0
BLACKPOOL TEACHING HOSPS NHSFT										0									0											0	0					0	
BRIGHTON & SUSSEX UNIV HOSPS NHST	1		3	0						1				0	0		0		0	0			0	0	0		0	0	0	0	1	0			0	0	0
BRISTOL UNIV HOSPS NHSFT	0	0		3	0	0	0	0	0	0		0		0	0	0	1	0	1	0	0		0	0	0		0	0	1	0	0	2	0	0	0	0	0
CAMBRIDGE UNIV HOSPS NHSFT	2	0	0	3	1	1	2	1	1	1	1	3	0	3	3	0	1	1	2	5	1	0	2	3	2	1	1	0	2	2	1		1	1	1	2	3
CAMBRIDGESHIRE & PETERBOROUGH NHSFT						0	0	0	0			0		0										0	0											0	
CENT MANCHESTER UNIV HOSPS NHSFT	1	1	7	2	1	0	0	0	0	1	0	0		1	1	2	1	1	3	2	0	0	1	2	0	1	1	0	2	1	1		0	0	2	1	1
CHELSEA & WESTMINSTER HOSPS NHSFT		0		4		0	0	0	0	0		0		0	1		0	0	0	0	0		0	0	0	0	0	0	0	1	4	0	0	0	0	0	0
COMMUNITY HEALTHCARE TRUST																0																					
CTY DURHAM & DARLINGTON NHSFT				0						0							0						0				0									0	
DERBY HOSPS NHSFT				0			0	0				0		0			0		0	0			0	0	0		0		0		0					0	
EALING HOSP NHST							0			0		0			0		0		0	0			0	0											0	0	
GREAT ORMOND ST CHILDRENS NHSFT	1	0		2	0	0	0	0	0	1	1	0		2	1	0	2	0	0	0	0		0	1	0		0	0	2	1	1		0	0	0	1	2
GUYS & ST THOMAS NHSFT	5	3	3	2	1	1	1	0	1	3	1	1	0	2	4	4	11	2	4	1	2	0	2	2	3	1	1	1	3	3	2		1	1	3	2	2
HEART OF ENGLAND NHSFT	0			1		0	0		0	0		0	0	0	1		0	0	2	1	0		0	0	0		0	0	1	0	1			0	1	1	0
HILLINGDON HOSPS NHSFT										0																											
HULL & E YORKSHIRE HOSPS NHST				0			0	0		2		0		0	0	0			0	0			0	0	0		0		0	0	0				1	0	
IMPERIAL COLL HEALTHCARE NHST	2	1	7	2	1	1	2	1	1	3	2	2	3	3	2	0	1	1	3	3	2	0	3	2	1	0	2	1	6	2	2	0		1	2	2	3
JAMES PAGET UNIV HOSPS NHSFT				0													0						0														
KINGS COLL HOSP NHSFT	1	0		1		0	0	0	0	1	1	0		1	1	1	1	0	1	0	0		4	1	2	1	0	0	2	1	1		0	0	3	1	1
LEEDS TEACHING HOSPS NHST	0	0		3	0	1	0	0	0	1		1		1	1	4	4	1	4	0	1	0	3	2	0		1	1	3	0	1	0	1	0	4	1	1
LEICESTER UNIV HOSPS NHST	4	2		6	1	0	1	0	1	2	1	1	0	2	3	0	4	2	4	1	1	0	5	2	2	2	1	0	2	1	2	1	1	1	2	2	2
MANCHESTER MENT HLTH & SOC CARE TRST	1	0		1		0	0	0	0	0	0	0		0	1	0	0	0	0	0	0		0	0	1	1	0		0	0	1		0		1	0	0
MID STAFFORDSHIRE NHSFT									0														0						0							0	
MOORFIELDS EYE NHSFT	0	0		0		0	0	0	0	0	1	0		0			0	0			0			0			0	0	0	0	0		0	0		0	0
N LINCOLNSHIRE & GOOLE HOSPS NHSFT	0																										0			0				0	0	0	
N STAFFORDSHIRE COMBINED HLTHCARE NHST																																					
N-W LONDON HOSPS NHST	0			0	0		0			0		0		0	0	0	0	0		0	0		2	0	0		0		0	0	0		0		1	0	0
NEWCASTLE UT HOSPS NHSFT	1	0	0	0	0	0	0	0	0	1	2	0	0	2	1	0	2	0	2	1	1	0	1	1	3	3	0	0	2	0	0			1	1	1	1

NHS INSTITUTION	Microbiology	Neuroimaging	Neurosciences	Nursing	Nutrition Dietetics	Obstetrics Gynecology	Oncology	Ophthalmology	Orthopedics	Otorhinolaryngology	Parasitology	Pathology	Pediatrics	Peripheral Vascular Disease	Pharmacology Pharmacy	Physiology	Primary Health Care	Psychiatry	Public Environmental Occupational	Radiology Nuclear Medicine	Rehabilitation	Reproductive Biology	Respiratory System	Rheumatology	Social Work	Sport Sciences	Substance Abuse	Surgery	Toxicology	Transplantation	Tropical Medicine	Urology Nephrology	Veterinary Sciences	Virology
AINTREE UNIV HOSPS NHSFT	0		0	0	0		0	0	0	3				0	0	0	0	0	0		0		2	1		0		1		0		0		
BARTS HEALTH NHST	1		1	1	1	2	4	1	1	1	0	3	1	2	2	1	0	1	1	2	1	1	3	1	0	1	1	2	0	3	0	2	0	1
BIRMINGHAM CHILDRENS HOSP NHSFT	0		0		0	0	0	0	0	1		0	2	0	0	0		0	0	0	0		0	0		0		0		1		0		
BIRMINGHAM UNIV HOSPS NHSFT	0	0	0	0		0	1		0	4		0	0	0	0	0		0	0	1	0		2	1	0	0	0	2	0	5		1		0
BIRMINGHAM WOMENS HOSP NHSFT	0		0	0		2	0	0	0	0		0	0	0	0	0			0	0	0	2	0			0		0		0		0	0	
BLACKPOOL TEACHING HOSPS NHSFT				0			0		0	1									0				0					0						
BRIGHTON & SUSSEX UNIV HOSPS NHST	0		0			0	0	0	0	2	0		0	0	0		0	0	0	0	0		0	0				0		0	0	0		0
BRISTOL UNIV HOSPS NHSFT	0		0	0	0	0	1	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0		1	0	1	0	0	0	
CAMBRIDGE UNIV HOSPS NHSFT	1	3	2	0	3	1	2	0	1	2	0	3	2	5	2	2	0	2	1	3	0	1	1	2		1	0	2	0	4	0	3	0	2
CAMBRIDGESHIRE & PETERBOROUGH NHSFT		0	0				0					0			0	0		0		0	0							0						
CENT MANCHESTER UNIV HOSPS NHSFT	1	0	0	1	0	2	1	2	1	4	0	1	3	1	0	0	0	0	0	1	1	3	1	1		0		1	0	2	0	2	0	0
CHELSEA & WESTMINSTER HOSPS NHSFT	0	0	0		0	2	0		1	0	0	0	0	0	0	0		0	0	0		1	0	0		0		1	0	0	0	0	0	2
COMMUNITY HEALTHCARE TRUST																								0				0						
CTY DURHAM & DARLINGTON NHSFT				0			0		0				0		0		0				0					0	0	0				0		
DERBY HOSPS NHSFT			0	0	0	0	0			1			0	0	0	0	0	0	0		0	0		0		0		0		1		1		0
EALING HOSP NHST														0	0								0					0	0			0		
GREAT ORMOND ST CHILDRENS NHSFT	0	0	0	1	0	0	0	1	0	3		0	5	1	0	0		0	0	1	0	0	1	1	0	0		1	0	2		1	0	0
GUYS & ST THOMAS NHSFT	1		1	0	1	4	2	4	1	2	1	2	2	3	1	0	1	1	0	3	2	3	1	4	0	0	0	2	1	5	0	5	0	1
HEART OF ENGLAND NHSFT	1		0	0		0	0	1	0	1	0	1	0	0	0		1	0	0	0		0	1	0		0		1	0	1		1	0	0
HILLINGDON HOSPS NHSFT							0	0												0								0				0		
HULL & E YORKSHIRE HOSPS NHST	0		0	0	0	0	0	0	0	1		0	0	0	0		0			1	0	0	1	0		0		1		0		0		
IMPERIAL COLL HEALTHCARE NHST	1	3	2	0	1	5	3	2	2	3	0	3	3	4	2	1	1	1	0	6	1	4	2	2		1	1	6	1	3	0	4	0	1
JAMES PAGET UNIV HOSPS NHSFT									0	1				0										0				0						
KINGS COLL HOSP NHSFT	0	0	0	0	0	7	0	1	0	0	0	1	1	1	0	0	1	0	0	3	0	1	1	1	0	0	0	2	0	6	0	3	0	0
LEEDS TEACHING HOSPS NHST	1	0	0	1	0	2	4	1	4	1	0	3	2	1	1	0	0	0	0	3	1	3	1	5		0		4	0	2		3	0	0
LEICESTER UNIV HOSPS NHST	2	1	1	1	1	2	4	2	4	7	0	5	3	3	3	1	3	1	1	2	1	3	5	2	0	1	1	5	1	2	0	2	0	2
MANCHESTER MENT HLTH & SOC CARE TRST	0		0		0	0	0	0	0	0		0	0	0	0	0	0	0	0		0		2		0	0	0	0	0	0			0	
MID STAFFORDSHIRE NHSFT															0									0					0					
MOORFIELDS EYE NHSFT	0	0	0		0		0	18		0		0	0	0	0	0		0	0	0				0				0		0		0		
N LINCOLNSHIRE & GOOLE HOSPS NHSFT																								0				0						
N STAFFORDSHIRE COMBINED HLTHCARE NHST				0		0												0									0							
N-W LONDON HOSPS NHST	0		0	0	0	0	0	0	0			0	0	0	0			0	0	1	0	0	0	0	0	0		0	0	0		1		0
NEWCASTLE UT HOSPS NHSFT	0	0	1	0	0	1	1	1	2	5	0	1	3	1	0	0	1	1	0	1	0	0	1	1		0	0	2	0	2	0	1	0	0

Table D-2 continued

NHS INSTITUTION	Allergy	Anatomy Morphology	Andrology	Anesthesiology	Audiology Speech Language Path.	Biochemical Research Methods	Biochemistry Molecular Biology	Biophysics	Biotechnology Applied Microbio.	Cardiac Cardiovascular Systems	Cell Tissue Engineering	Cell Biology	Chemistry Medicinal	Clinical Neurology	Critical Care Medicine	Dentistry Oral Surgery Medicine	Dermatology	Developmental Biology	Emergency Medicine	Endocrinology Metabolism	Engineering Biomedical	Food Science Technology	Gastroenterology Hepatology	Genetics Heredity	Geriatrics Gerontology	Gerontology	Health Care Sciences Services	Health Policy Services	Hematology	Immunology	Infectious Diseases	Integrative Complementary Medicine	Materials Science Biomaterials	Medical Informatics	Medical Laboratory Technology	Medicine General Internal	Medicine Research Experimental	Microbiology	Neuroimaging	Neurosciences	Nursing	Nutrition Dietetics	Obstetrics Gynecology	Oncology	Ophthalmology	Orthopedics	Otorhinolaryngology	Parasitology	Pathology	Pediatrics	Peripheral Vascular Disease	Pharmacology Pharmacy	Physiology	Primary Health Care	Psychiatry	Public Environmental Occupational	Radiology Nuclear Medicine	Rehabilitation	Reproductive Biology	Respiratory System	Rheumatology	Social Work	Sport Sciences	Substance Abuse	Surgery	Toxicology	Transplantation	Tropical Medicine	Urology Nephrology	Veterinary Sciences	Virology
NORFOLK & NORWICH UNIV HOSP NHSFT	1	0		1		0	0	0	0	0		0		0	0	0	1		1	0	0	0	0	0	0	0	0		0	0	0			0	1	0	0	0		0		0	0	0	1	2	0		0	0	0	0	0	0	0	0	0		0	0	1		0		1	0	0		0		0
NORTH BRISTOL NHST			2	2	0	0	0	0	0	0	0	0		1	1	0	0	0	4	0	0	0	0	0	1	0	1	0	0	0	1		0		1	0	0	1	0	0	0	0	2	0	0	3	2		1	1	0	1	1	0	0	0	0	0	1	0	0	0	0		2	0	2		5		0
OXFORD HLTH NHSFT					0	0	0	0	0			0		0	0				0	0	0			0	0	1	0	0	0	0						0	0		1	1	0	0	0	0		0			0	0		0	0	0	4	0	0	1	0			0	0	1	0	0			0		
OXFORD UNIV HOSP NHST	1	2	3	6	0	1	2	1	2	4	4	2	1	5	2	0	3	2	3	4	1	0	5	4	2	2	1	1	6	6	4		1	1	2	4	6	4	5	3	1	1	3	4	2	7	1	5	5	3	5	2	2	0	1	1	4	1	4	2	2		1		5	1	6	10	3	1	4
PAPWORTH NHSFT	0			1		0	0		0	1		0		0	1			0		0	0			0			0	0	0	0	0				0	0	0	0	0	0			0	0	0				0	0	1	0	0		0	0	0			2	0		0		0	0	1			0	
PLYMOUTH HOSPS NHST				1			0			0		0		0	0	0	0		1	0			0	0					0	0	0	1			1	0	0	0	0	0	0	0	1	0		0	0		0	0	0	0	0	0	0	0	0	0		0	0		0		1		0		0		0
ROY BROMPTON & HAREFIELD NHSFT	2	0		1		0	0	0	0	7	0	0		0	5	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0		0	0	0	1	0	0		0	0	0	0	0			1	0	1	1	2	0	0	0		0	2	0		9	0		0	0	1	0	3	0	0	0	0
ROY CORNWALL HOSPS NHST				0	0				0	0				0			0			0			0	0		0	0	0		0	0			0		0		0		0		0	0	0		0	0		0	0	0	0	0		0	0	0	0			0		0		0	0				0	0
ROY DEVON & EXETER NHSFT		0	3	0		0	0	0	0	0		0		0	0		0	0	1	0			0	0	0	0	0		0	0	0					0	0	0		0	0		0	0	0	2	0		0	0	0	0		1	0	0	0			0	0		0		1	0	1		0	0	
ROY LIVERPOOL & BROADGREEN UNIV HOSP NHST	1			1	0	0	0	0	0	0		0	0	0	1	0	1		1	0	0		1	0	0	0	0		1	0	0	0	0		1	0	0	0	0	0	0	0	0	1	3	1	1	0	1	0	0	0	0	0	0	0	0		0	0	0		0		1	0	0	0	0		0
ROY ORTHOPAEDIC NHSFT		0												0							0		0	0												0								0		2			1								0	0			0		0		1						
ROYAL FREE LONDON NHSFT	1	0		2	0	0	0	0	1	1	1	1	0	1	2	0	2	0	1	1	1		4	0	1	1	0	0	3	2	4		1	1	1	1	2	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	2	0	0	1	2	0	4	0	3	0	3
S DEVON NHS HEALTHCARE NHSFT				0			0			0		0								0			0	0			0			0	0					0	0	0					0	0	0		0					0					0	0	0		0				0	0			0		
S MANCHESTER UNIV HOSP NHSFT	1	0		2		0	0	0	0	0	0	0		0	1	0	0	0	1	0	0		1	0	0	0	0	0	0	0	0		0		1	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0		0	0	0	0		1			0		0	0	0		0	0	
S STAFFORDSHIRE & SHROPSHIRE NHSFT																																				0																			0																
SALFORD ROY NHSFT	0	0		2	0	0	0	0	0	0	0	0		1	1		6	0	2	0	0	0	1	0	0	0	0	1	0	0	0			0	1	0	0	0	0	1	0	0	0	0		1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0		1	0	1		1	0	
SANDWELL & W-BIRMINGHAM NHST				1		0	0	0	0	2	0	0	0	0	0		0			0	0		0	0	0		0		1	0	0	1	0		0	1	0	0		0			0	0	1	0	1		0	0	2	0	0		0	0	0			0	1		0		0	1				0	
SHEFFIELD CHILDRENS HOSP NHSFT	0		3	0			0	0	0		0	0		0	0		0		0	0			0	0	0	0	0		0	0					0	0	0	0	0	0		0	0	0		0	0		0	1		0	0	0	0	0	0		0	0					0	0	0		0		
SHEFFIELD TEACHING HOSPS NHSFT	1	0	4	2	0	0	0	0	0	0	1	0	0	1	1	0	3	0	3	2	0		2	0	1	0	1	0	1	0	1		0	1	3	1	0	0	1	0	2	0	2	2	0	2	1		1	1	1	1	0	1	0	0	2	1	2	1	1	0	0	0	2	0	1		4	0	0
SHREWSBURY & TELFORD NHST										0				0		0							0	0			0		0	0	0				0	0		0						0	0					0		0		0		0	0								0				0		
SOUTH LONDON & MAUDSLEY NHSFT						0	0		0	0		0		0		0		0	0	0	0			0	1	1	0	0		0	0				0	0	0		0	0	0	0		0	0					0	0	0		0	3	0	0	0				0		10	0	0					
SOUTHAMPTON UNIV HOSPS NHSFT	7	0		1	0	0	0	0	0	1	1	0	1	1	2	0	1	1	2	2	1	0	2	1	1	1	0	0	1	2	0	1	1	0	2	1	1	0	0	0	1	3	1	1	1	1	0	0	2	2	1	1	1	1	0	1	0	0	1	2	1		0	0	1	0	1	0	1	0	0
ST GEORGE HEALTHCARE NHST	1	1		2	0	0	0	0	0	4	0	0	0	1	3	0	1	0	2	1	0	0	1	1	0	1	1	0	1	1	1			1	4	1	1	1	0	0	1	0	3	2	0	1	1	1	1	1	4	1	1	1	1	1	2	1	2	2	0	0	1	1	2	0	1	1	2	0	1
ST HELEN & KNOWSLEY NHST																0				0											0					0		0														0					0								0						
SUSSEX PARTNERSHIP NHSFT						0			0	0				0										0															0	0												0					0														
SW LONDON & ST GEORGE MENTAL HLTH NHST							0					0		0										0		1										0			0	0	0		0												0	0	0				0	0									
THE CHRISTIE NHSFT				0	0	1	0	0	0	0	1	0	0	0	0	0	0	0		1	1		0	0	0		0	0	1	0		2		0	1	0	1	0	0	0	0		0	4		0	0		1	0		0	0		0	0	2	0	0	0	0				0	0	0		0		0
UCL HOSPS NHSFT	1	0		2	2	0	0	1	0	4		0	0	4	2	12	0	0	1	1	4		2	1	0	0	0	0	2	1	1	3	5	1	2	1	1	1	3	2	0	0	3	1	0	2	6	0	1	1	1	1	1	0	1	0	4	1	2	1	1		0		2	0	1	1	3	0	0
UNIV HOSP N STAFFORDSHIRE NHST	0						0			0		0		0	0		0		0	0	0			0						0			0	0		0				0			0	0		0	0			0	0	0	0		0	0		1		0	0		0		0	0	0	0	0		
UNIV HOSPS COVENTRY & WARWICKSHIRE NHST	0	0		0		0	0	0	0	0		0		0	0	0	0	0	2	1	0	0	0	0			0	0	0	0	0	1			0	0	0	0		0		0	0	0	0	1	1	0	0	0	0	0	0		0	0	0	0	0	0	0		0		0		0		0		
UNIV HOSPS MORECAMBE BAY NHSFT				1			0										0		1	0							0									0	0						0	0		0	0			0						0			0						0						
W LONDON MENTAL HLTH NHST							0	0	0			0												0												0				0															0																
W MIDDLESEX UNIV HOSP NHST																							0											0			0						0	0												0									0						
WALTON CTR NHSFT				0			0		0			0	0	1	0			0	0	0	0	0	0	0	0		0	0	0	0	0				0	0	0		0	0				0					0	0	0	0	0		0	0	0	0					0		0	0					0
YORK TEACHING HOSPS NHSFT				0					0	0		0		0	0	0	0			0		0	0	0	0		0		0		0				1	0	0	0		0		0		0	0	0	1		0	0	0	0		0	0	0					0		0		0	0	0		0		

Appendix E: National Training Survey 2012: Rankings of NHS trusts/boards in England

The following table (Table E-1) presents a ranking of the results of the National Training Survey 2012 for NHS trusts/boards in England. The ranking was generated on the basis of the mean score for the "overall satisfaction" criterion in the survey.

Table E-1: Ranking of NHS trusts/boards in England based on results of the National Training Survey 2012

NHS Trust / Board	Rank
Portsmouth City Teaching PCT	1
The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust	2
Cumbria Teaching PCT	3
North Lincolnshire PCT	4
Dorset PCT	5
Darlington PCT	6
Calderdale PCT	7
Richmond and Twickenham PCT	8
Hartlepool PCT	9
Sheffield PCT	10
Bournemouth and Poole Teaching PCT	11
Warrington PCT	12
Northumberland Care Trust	13
Health Protection Agency - Central Office	14
Bromley PCT	15
Coventry Teaching PCT	16
North Tyneside PCT	16
Torbay Care Trust	16
Peterborough PCT	16
Buckinghamshire PCT	20
Barnsley PCT	21
Cornwall and Isles of Scilly PCT	22
Middlesbrough PCT	23
Hammersmith and Fulham PCT	23
Redcar and Cleveland PCT	25
Somerset PCT	26
Doncaster PCT	27
Trafford PCT	27
Stockton-On-Tees Teaching PCT	29
North Staffordshire PCT	30
Wirral PCT	31

Gateshead PCT	31
West Kent PCT	33
Barnet PCT	34
North East Lincolnshire Care Trust Plus	35
North Somerset PCT	36
Bristol PCT	37
Hampshire PCT	38
Wakefield District PCT	39
Newcastle PCT	40
Devon PCT	41
Wiltshire PCT	42
Norfolk PCT	43
Stockport PCT	44
Leeds PCT	45
North Lancashire Teaching PCT	46
Hounslow PCT	47
Derby City PCT	48
Bradford and Airedale Teaching PCT	49
Nottingham City PCT	50
Gloucestershire PCT	51
Camden PCT	51
Bexley Care Trust	53
Salford PCT	54
Lewisham PCT	55
Bolton PCT	56
Shropshire County PCT	57
Hillingdon PCT	58
North Yorkshire and York PCT	59
Bedfordshire PCT	60
Queen Victoria Hospital NHS Foundation Trust	61
Hertfordshire PCT	62
Ealing PCT	63
Suffolk PCT	64
Tavistock and Portman NHS Foundation Trust	65
Lambeth PCT	65
Nottinghamshire County Teaching PCT	67
Manchester PCT	68
Kingston PCT	69
Derbyshire County PCT	69
Brent Teaching PCT	71
Herefordshire PCT	72
Moorfields Eye Hospital NHS Foundation Trust	73
Tower Hamlets PCT	73
Enfield PCT	75
Medway PCT	76
Berkshire West PCT	77
North East Essex PCT	78
Plymouth Teaching PCT	79
Rotherham PCT	79
Liverpool Women's NHS Foundation Trust	81
Haringey Teaching PCT	82
Westminster PCT	83
Lincolnshire Teaching PCT	84
West Essex PCT	85

Lancashire Care NHS Foundation Trust	86
Warwickshire PCT	87
South East Essex PCT	88
South Staffordshire PCT	89
Croydon PCT	90
Mersey Care NHS Trust	91
Wandsworth PCT	92
East Lancashire Teaching PCT	93
Birmingham East and North PCT	94
Cambridgeshire PCT	95
Harrow PCT	96
Sunderland Teaching PCT	97
Central and Eastern Cheshire PCT	98
2gether NHS Foundation Trust	99
Oxfordshire PCT	99
Solent NHS Trust	101
Western Cheshire PCT	102
Havering PCT	103
Heywood, Middleton and Rochdale PCT	104
Berkshire East PCT	105
Ashton, Leigh and Wigan PCT	106
Eastern and Coastal Kent PCT	107
Leeds and York Partnership NHS Foundation Trust	107
South West Yorkshire Partnership NHS Foundation Trust	107
West Sussex PCT	110
Bath and North East Somerset PCT	111
Avon and Wiltshire Mental Health Partnership NHS Trust	112
Hastings and Rother PCT	113
Kirklees PCT	114
Bury PCT	115
Worcestershire PCT	116
Leicestershire County and Rutland PCT	117
Knowsley PCT	118
Redbridge PCT	119
Halton and St Helens PCT	120
Royal National Orthopaedic Hospital NHS Trust	121
City and Hackney Teaching PCT	122
East Sussex Downs and Weald PCT	123
Sefton PCT	124
South Staffordshire and Shropshire Healthcare NHS Foundation Trust	125
Camden and Islington NHS Foundation Trust	125
East Riding of Yorkshire PCT	127
Surrey and Borders Partnership NHS Foundation Trust	128
Surrey PCT	129
Blackpool PCT	130
Islington PCT	130
Isle of Wight NHS PCT	130
North Staffordshire Combined Healthcare NHS Trust	133
Sussex Community NHS Trust	134
Dudley PCT	135
Northamptonshire Teaching PCT	136
Greenwich Teaching PCT	137
Southwark PCT	138
Pennine Care NHS Foundation Trust	139

Swindon PCT	139
The Christie NHS Foundation Trust	141
Manchester Mental Health and Social Care Trust	142
Milton Keynes PCT	143
Sutton and Merton PCT	144
Kensington and Chelsea PCT	145
Liverpool PCT	146
Birmingham Women's NHS Foundation Trust	147
Newham PCT	148
Waltham Forest PCT	149
Rotherham, Doncaster and South Humber NHS Foundation Trust	150
County Durham PCT	151
Cheshire and Wirral Partnership NHS Foundation Trust	152
Suffolk Mental Health Partnership NHS Trust	153
Central and North West London NHS Foundation Trust	154
Cambridgeshire and Peterborough NHS Foundation Trust	155
Brighton and Hove City PCT	156
South Gloucestershire PCT	156
Southampton City PCT	156
South West London and St George's Mental Health NHS Trust	159
Birmingham and Solihull Mental Health NHS Foundation Trust	160
South Birmingham PCT	161
Alder Hey Children's NHS Foundation Trust	162
Wye Valley NHS Trust	163
South London and Maudsley NHS Foundation Trust	163
Oldham PCT	165
Royal Brompton and Harefield NHS Foundation Trust	165
Central Lancashire PCT	167
Royal Berkshire NHS Foundation Trust	168
Berkshire Healthcare NHS Foundation Trust	168
Norfolk and Suffolk NHS Foundation Trust	170
Gateshead Health NHS Foundation Trust	171
Oxfordshire Learning Disability NHS Trust	172
North Tees and Hartlepool NHS Foundation Trust	173
The Royal Wolverhampton Hospitals NHS Trust	174
East London NHS Foundation Trust	175
Humber NHS Foundation Trust	176
Coventry and Warwickshire Partnership NHS Trust	177
Frimley Park Hospital NHS Foundation Trust	178
Countess of Chester Hospital NHS Foundation Trust	178
Greater Manchester West Mental Health NHS Foundation Trust	180
Great Ormond Street Hospital for Children NHS Foundation Trust	181
Oxford Health NHS Foundation Trust	182
Royal United Hospital Bath NHS Trust	183
Dudley and Walsall Mental Health Partnership NHS Trust	184
Northumbria Healthcare NHS Foundation Trust	185
Walsall Teaching PCT	186
Nottinghamshire Healthcare NHS Trust	187
Great Yarmouth and Waveney PCT	188
University Hospitals Bristol NHS Foundation Trust	189
Sheffield Children's NHS Foundation Trust	190
Hertfordshire Partnership NHS Foundation Trust	191
Homerton University Hospital NHS Foundation Trust	192
Bedfordshire and Luton Mental Health and Social Care Partnership NHS Trust	193

The Whittington Hospital NHS Trust	194
Devon Partnership NHS Trust	195
Liverpool Heart and Chest NHS Foundation Trust	196
The Dudley Group NHS Foundation Trust	197
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	198
Blackburn With Darwen Teaching Care Trust Plus	199
Dorset County Hospital NHS Foundation Trust	200
Poole Hospital NHS Foundation Trust	201
Mid Essex PCT	202
South Devon Healthcare NHS Foundation Trust	203
Sheffield Teaching Hospitals NHS Foundation Trust	204
St George's Healthcare NHS Trust	205
Tees, Esk and Wear Valleys NHS Foundation Trust	206
South Tyneside PCT	207
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	208
Cambridgeshire Community Services NHS Trust	209
North Essex Partnership NHS Foundation Trust	210
Southern Health NHS Foundation Trust	210
South West Essex PCT	212
Hywel Dda Lhb	213
Croydon Health Services NHS Trust	213
Hull Teaching PCT	215
Royal National Hospital for Rheumatic Diseases NHS Foundation Trust	215
Cambridge University Hospitals NHS Foundation Trust	217
Oxleas NHS Foundation Trust	217
Somerset Partnership NHS Foundation Trust	219
South Tees Hospitals NHS Foundation Trust	220
King's College Hospital NHS Foundation Trust	221
Luton PCT	222
Norfolk and Norwich University Hospitals NHS Foundation Trust	223
Sussex Partnership NHS Foundation Trust	224
Sandwell and West Birmingham Hospitals NHS Trust	225
Worcestershire Mental Health Partnership NHS Trust	226
West London Mental Health NHS Trust	226
Barnet, Enfield and Haringey Mental Health NHS Trust	228
Bolton NHS Foundation Trust	229
North East London NHS Foundation Trust	230
Bassetlaw PCT	231
Northumberland, Tyne and Wear NHS Foundation Trust	232
Portsmouth Hospitals NHS Trust	233
Taunton and Somerset NHS Foundation Trust	234
Royal Liverpool and Broadgreen University Hospitals NHS Trust	234
Lincolnshire Partnership NHS Foundation Trust	236
Wolverhampton City PCT	236
Heart of Birmingham Teaching PCT	236
University Hospital of South Manchester NHS Foundation Trust	239
Stockport NHS Foundation Trust	240
Oxford University Hospitals NHS Trust	241
Cornwall Partnership NHS Foundation Trust	242
Birmingham Children's Hospital NHS Foundation Trust	243
University Hospital Southampton NHS Foundation Trust	244
Sheffield Health and Social Care NHS Foundation Trust	245
St Helens and Knowsley Hospitals NHS Trust	246
Derby Hospitals NHS Foundation Trust	247

Royal Devon and Exeter NHS Foundation Trust	247
The Rotherham NHS Foundation Trust	249
Lancashire Teaching Hospitals NHS Foundation Trust	250
Bradford District Care Trust	251
Western Sussex Hospitals NHS Trust	251
Black Country Partnership NHS Foundation Trust	253
Great Western Hospitals NHS Foundation Trust	253
South Tyneside NHS Foundation Trust	253
Kent and Medway NHS and Social Care Partnership Trust	253
Birmingham Community Healthcare NHS Trust	253
City Hospitals Sunderland NHS Foundation Trust	258
North Bristol NHS Trust	259
Sherwood Forest Hospitals NHS Foundation Trust	260
5 Boroughs Partnership NHS Foundation Trust	261
Bradford Teaching Hospitals NHS Foundation Trust	262
Chesterfield Royal Hospital NHS Foundation Trust	263
Guy's and St Thomas' NHS Foundation Trust	263
Tameside and Glossop PCT	265
Aintree University Hospital NHS Foundation Trust	266
Chelsea and Westminster Hospital NHS Foundation Trust	267
Central Manchester University Hospitals NHS Foundation Trust	267
Buckinghamshire Healthcare NHS Trust	267
University Hospital of North Staffordshire NHS Trust	270
Mid Essex Hospital Services NHS Trust	271
Derbyshire Healthcare NHS Foundation Trust	271
Blackpool Teaching Hospitals NHS Foundation Trust	273
Yeovil District Hospital NHS Foundation Trust	274
Gloucestershire Hospitals NHS Foundation Trust	275
The Clatterbridge Cancer Centre NHS Foundation Trust	276
West Suffolk NHS Foundation Trust	277
University College London Hospitals NHS Foundation Trust	278
Nottingham University Hospitals NHS Trust	279
University Hospitals Coventry and Warwickshire NHS Trust	279
University Hospitals Birmingham NHS Foundation Trust	281
South Essex Partnership University NHS Foundation Trust	282
County Durham and Darlington NHS Foundation Trust	283
Mid Cheshire Hospitals NHS Foundation Trust	284
Royal Cornwall Hospitals NHS Trust	285
York Teaching Hospital NHS Foundation Trust	286
Cumbria Partnership NHS Foundation Trust	287
Salisbury NHS Foundation Trust	288
North West London Hospitals NHS Trust	289
Southend University Hospital NHS Foundation Trust	290
Leicestershire Partnership NHS Trust	291
Wirral University Teaching Hospital NHS Foundation Trust	291
Heart of England NHS Foundation Trust	293
Brighton and Sussex University Hospitals NHS Trust	294
Barts Health NHS Trust	295
Plymouth Hospitals NHS Trust	296
Surrey and Sussex Healthcare NHS Trust	297
Wrightington, Wigan and Leigh NHS Foundation Trust	297
Maidstone and Tunbridge Wells NHS Trust	299
Shrewsbury and Telford Hospital NHS Trust	300
The Royal Marsden NHS Foundation Trust	301

Sandwell PCT	302
Isle of Wight NHS Trust	303
Hampshire Hospitals NHS Foundation Trust	304
Papworth Hospital NHS Foundation Trust	305
Barking and Dagenham PCT	306
East Lancashire Hospitals NHS Trust	307
Imperial College Healthcare NHS Trust	308
Royal Free London NHS Foundation Trust	309
Mid Yorkshire Hospitals NHS Trust	310
East Cheshire NHS Trust	311
East Sussex Healthcare NHS Trust	312
Calderdale and Huddersfield NHS Foundation Trust	313
Basildon and Thurrock University Hospitals NHS Foundation Trust	314
The Hillingdon Hospitals NHS Foundation Trust	315
Luton and Dunstable Hospital NHS Foundation Trust	315
Tameside Hospital NHS Foundation Trust	315
Northamptonshire Healthcare NHS Foundation Trust	318
Royal Surrey County Hospital NHS Foundation Trust	318
Barnet and Chase Farm Hospitals NHS Trust	320
Worcestershire Acute Hospitals NHS Trust	321
Northampton General Hospital NHS Trust	322
Hull and East Yorkshire Hospitals NHS Trust	323
East Kent Hospitals University NHS Foundation Trust	324
Salford Royal NHS Foundation Trust	325
Dartford and Gravesham NHS Trust	326
Leeds Teaching Hospitals NHS Trust	327
Lewisham Healthcare NHS Trust	328
Kingston Hospital NHS Trust	329
The Royal Orthopaedic Hospital NHS Foundation Trust	329
Colchester Hospital University NHS Foundation Trust	331
Burton Hospitals NHS Foundation Trust	332
Peterborough and Stamford Hospitals NHS Foundation Trust	333
Southport and Ormskirk Hospital NHS Trust	334
Harrogate and District NHS Foundation Trust	335
Ipswich Hospital NHS Trust	336
Hinchingbrooke Health Care NHS Trust	337
Worcestershire Health and Care NHS Trust	338
Leicester City PCT	338
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	340
Pennine Acute Hospitals NHS Trust	341
University Hospitals of Leicester NHS Trust	342
Airedale NHS Foundation Trust	343
Kettering General Hospital NHS Foundation Trust	344
Dorset Healthcare University NHS Foundation Trust	345
Epsom and St Helier University Hospitals NHS Trust	346
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	347
Trafford Healthcare NHS Trust	348
Ashford and St Peter's Hospitals NHS Foundation Trust	349
West Middlesex University Hospital NHS Trust	350
Warrington and Halton Hospitals NHS Foundation Trust	351
Walsall Healthcare NHS Trust	352
Northern Devon Healthcare NHS Trust	353
North Cumbria University Hospitals NHS Trust	354
Medway NHS Foundation Trust	355

James Paget University Hospitals NHS Foundation Trust	356
Heatherwood and Wexham Park Hospitals NHS Foundation Trust	357
North Middlesex University Hospital NHS Trust	358
United Lincolnshire Hospitals NHS Trust	359
Barking, Havering and Redbridge University Hospitals NHS Trust	360
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	361
Scarborough and North East Yorkshire Health Care NHS Trust	362
The Princess Alexandra Hospital NHS Trust	363
University Hospitals of Morecambe Bay NHS Foundation Trust	364
West Hertfordshire Hospitals NHS Trust	365
South Warwickshire NHS Foundation Trust	366
George Eliot Hospital NHS Trust	367
Mid Staffordshire NHS Foundation Trust	368
The Walton Centre NHS Foundation Trust	369
East and North Hertfordshire NHS Trust	370
South London Healthcare NHS Trust	371
Milton Keynes Hospital NHS Foundation Trust	372
Ealing Hospital NHS Trust	373
Barnsley Hospital NHS Foundation Trust	374
Weston Area Health NHS Trust	375
Bedford Hospital NHS Trust	376
Shetland	377

Appendix F: Comparison of English rankings with global rankings

The following table provides a comparison of the English rankings with the corresponding global rankings.

Table F-1: Comparison of English rankings with global rankings for a selection of the research and education indicators

University / Institution (abbreviated)	University / Institution	Medical School	ARWU in Clinical Medicine and Pharmacy (2012)		Webometrics World University Rankings (2013)		QS World University Rankings for Medicine (2012)		THE World University Rankings for Clinical, Pre-Clinical and Health Rankings (2012–13)		University / Institution (abbreviated)
			World Ranking	English Ranking	World Ranking	English Ranking	World Ranking	English Ranking	World Ranking	English Ranking	
Birmingham	University of Birmingham	College of Medical and Dental Sciences	101-150	11	254	13	51-100	11	-	-	Birmingham
Brighton	University of Brighton	Brighton and Sussex Medical School	-	-	986	26	-	-	-	-	Brighton
Bristol	University of Bristol	Faculty of Medicine and Dentistry	50	7	252	11	51-100	7	-	-	Bristol
Cambridge	University of Cambridge	School of Clinical Medicine	8	1	14	1	3	2	3	2	Cambridge
East Anglia	University of East Anglia	Norwich Medical School	-	-	504	21	-	-	-	-	East Anglia
Exeter	University of Exeter	Exeter Medical School (formerly part of Peninsula College of Medicine and Dentistry)	-	-	569	22	151-200	19	-	-	Exeter
Hull	University of Hull	Hull York Medical School	-	-	856	25	-	-	-	-	Hull
Imperial College	Imperial College London	Faculty of Medicine	21	4	261	14	9	3	5	3	Imperial College
Keele	Keele University	School of Medicine	-	-	1108	27	-	-	-	-	Keele
King's College	King's College London	School of Medicine	29	6	240	10	24	5	20	5	King's College
Lancaster	Lancaster University	Lancaster Medical School	-	-	360	16	-	-	-	-	Lancaster
Leeds	University of Leeds	School of Medicine	151-200	16	163	7	51-100	9	-	-	Leeds
Leicester	University of Leicester	Department of Medical and Social Care Education	-	-	371	17	151-200	20	-	-	Leicester
Liverpool	University of Liverpool	School of Medicine	76-100	9	381	18	51-100	12	-	-	Liverpool
LSHTM	London School of Hygiene and Tropical Medicine	London School of Hygiene and Tropical Medicine (postgraduate medical school)	151-200	14	851	24	101-150	18	-	-	LSHTM
Manchester	The University of Manchester	Manchester Medical School	51-75	8	114	5	34	6	50	6	Manchester
Newcastle	Newcastle University	Newcastle University Medical School	151-200	15	253	12	101-150	15	-	-	Newcastle
Nottingham	The University of Nottingham	Faculty of Medicine and Health Sciences	26	5	188	8	51-100	10	-	-	Nottingham
Oxford	The University of Oxford	Medical Sciences Divison	18	3	16	2	2	1	1	1	Oxford
Plymouth	Plymouth University	Peninsula Schools of Medicine and Dentistry (formerly part of Peninsula College of Medicine and Dentistry)	-	-	758	23	-	-	-	-	Plymouth
Queen Mary	Queen Mary, University of London	Barts and The London School of Medicine and Dentistry	101-150	12	397	19	101-150	14	-	-	Queen Mary
Sheffield	The University of Sheffield	The Medical School	76-100	10	207	9	51-100	8	-	-	Sheffield
Southampton	University of Southampton	Faculty of Medicine	101-150	13	92	4	101-150	13	-	-	Southampton
St George's	St George's, University of London	St George's, University of London	-	-	1613	28	-	-	-	-	St George's
Sussex	University of Sussex	Brighton and Sussex Medical School	-	-	475	20	-	-	-	-	Sussex
UCL	University College London	UCL Medical School	15	2	41	3	14	4	6	4	UCL
Warwick	The University of Warwick	Warwick Medical School	-	-	151	6	101-150	17	-	-	Warwick
York	The University of York	Hull York Medical School	-	-	328	15	101-150	15	-	-	York