

The nature, scale and beneficiaries of research impact

An initial analysis of Research Excellence Framework (REF) 2014 impact case studies

King's College London and Digital Science

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March 2015



Project aims:

1. To make the impact case studies freely available in a form and format to enable researchers to carry out analysis using a range of techniques and methods
2. Carry out a synthetic analysis of the impact case studies to provide evidence on the impact of research in HEIs





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Digital Humanities



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Search REF Impact Case Studies

Browse the index below or search all Case Studies using keywords [e.g. "NHS"].

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Browse the index

Submitting Institution	Unit of Assessment	Summary Impact Type	Research
Submitting Institution			
<input type="text" value="Type institution name"/>			
East (457)		East Midlands (459)	
Anglia Ruskin University (32)		Bishop Grosseteste University (6)	
University of Bedfordshire (26)		De Montfort University (24)	
University of Cambridge (227)		University of Derby (21)	
Cranfield University (24)		University of Leicester (86)	
University of East Anglia (64)		University of Lincoln (35)	
University of Essex (48)		Loughborough University (79)	
University of Hertfordshire (30)		University of Northampton (18)	
Norwich University of the Arts (2)		University of Nottingham (152)	
Writtle College (4)		Nottingham Trent University (38)	
London (1353)			
Birkbeck College (67)		Kingston University (22)	Royal College of Art (7)
Brunel University (76)		University of the Arts London (12)	Royal College of Music (2)
City University, London (49)		London Business School (11)	Royal Holloway, University of London (51)

<http://impact.ref.ac.uk/CaseStudies/>



Analysis of cases studies to inform policy



Topic modelling:

Identify hidden thematic structures or topics in corpus of documents



Keyword in context:

Identify keywords displayed within surrounding context



Information extraction:

Automate extraction of specific words (nouns) such as countries



Qualitative analysis:

Read and hand-code samples of case studies



Text mining 1.01

The demonstration by Warwick researchers that reduced dietary salt intake lowers BP in a dose-dependent manner (1) and in different geographic settings (3-4) across individuals with various baseline levels of BP (1) gave impetus to national and global health policy developments. Crucially, the prospective association of reduced salt intake with a lower risk of fatal and non-fatal CVD events underpinned the development of national salt reduction programmes in the UK (2008 - 2012) (a) and internationally (2010-2013) (b-e).

National and international recommendations on dietary salt intake. Dietary salt intake is high in almost all populations, and its reduction would lead to a reduction in strokes and heart attacks (2). Through the WHO Collaborating Centre at Warwick and Cappuccio's participation in various committees (Population Reduction in Salt Intake, WHO, Geneva [2006]; European Salt Initiative, WHO, Copenhagen [2007]; European Salt Action Network [2007; founding member and lead of a subgroup], Public Health Program Development Group for NICE Guidance on Prevention of Cardiovascular Disease [2008-2010] and Expert Testimony: Cardiovascular Disease Prevention through Dietary Salt Reduction, NICE, WHO, Washington DC [2009-2012; subgroup lead]; and Advisory Group on Nutrition, WHO Geneva [2012-2016]), we have influenced the adoption of policies leading to reduced salt intake and have written protocols, guidelines and recommendations on how to encourage lower salt intakes (a; b; d; g; j-l).

Policies to control salt intake are now recommended by the WHO and most governments, and have been endorsed at the United Nations High Level Meeting on the Prevention of Non-Communicable Disease (2011). In 2007, WHO re-stated recommendations of salt targets of 5g per day. Since then, it has developed policies in every continent for the implementation of population salt reduction programmes under the WHO Action Plan on Obesity, Diet and Physical Activity⁸. The WHO 65th World Health Assembly (2012) decided that population dietary salt should be reduced and should be a priority alongside tobacco control for the reduction of non-communicable disease worldwide. Examples of early adopters of these policies are Slovenia (monitoring and surveillance 2008-13), Argentina, Costa Rica and Chile (monitoring tools 2010-13) and South Africa (regulation 2012) (b; d; e).

Increased public awareness. In addition to scientific dissemination through publications, reviews, editorials and international meeting presentations on the findings of underpinning research, Warwick researchers have contributed to the three-pronged approach of salt reduction programmes: consumer awareness, food reformulation, monitoring and surveillance (Sutherland J *et al.*, *J Nutr* 2013;110:552-8 - Brinsden FC *et al.*, *BMJ Open* 2013;3:e002936). Since 2008, the WHO Collaborating Centre at Warwick has held the mandate to work within a global platform to increase research output and operational support to WHO offices (Geneva [Global], Copenhagen [Europe], Washington [Pan-American], and Cairo [Eastern Mediterranean]), and to lead and support monitoring and surveillance in individual countries. We have participated and contributed directly through the WHO Global Platform to all aspects of the three-pronged approach (b; d; e). We have engaged in additional dissemination activities through our website (www2.warwick.ac.uk/go/cappuccio/research_in_salt) and partnership with non-governmental organizations, such as Consensus Action on Salt and Health (CASH) (b) and the UK Health Forum (i).

Impact on public health and economy. Public health benefits have been achieved through an increased public awareness about the importance of lowering individual salt intake; through industry engagement for the reformulation of food with lowered salt content; and in the monitoring of salt intake nationally through repeated surveys (Millett C *et al.*, *PLoS ONE* 2012; 7(1): e29836 - Shankar B *et al.*, *Health Econ* 2013; 22:243-50). Crucially, in England and Wales the salt reduction programme has led to reduced salt intake from 9.5g per day in 2001 to 8.1g per day in 2010, a reduction of 1.4 g per day (or 15%). This reduction is estimated to have averted 20,000 CVD events in the UK, of which 8,500 would have been fatal (f) with ~131,000 Quality-Adjusted Life Years (QALY) gained. A gain in QALY indicates an extension of life free from illness. Our contribution is clearly listed in a salt reduction timeline published by CASH (h).

In addition to substantial health gains for the population, reduction of daily salt intake by 3g per day would lead to economic gains, an annual equivalent savings of at least £40M a year in the UK. Broadly, a 15% reduction of salt intake over 10 years could avert 6.5M deaths from CVD at a cost ranging between \$0.04 and \$0.2 per person (g).

Case study 'tagged' to three topics:

'Food and nutrition'
(*food product industri nutrit health crop agricultur uk seed*)

'Clinical guidance'
(*guidelin patient clinic treatment recommend stroke nice risk trial*)

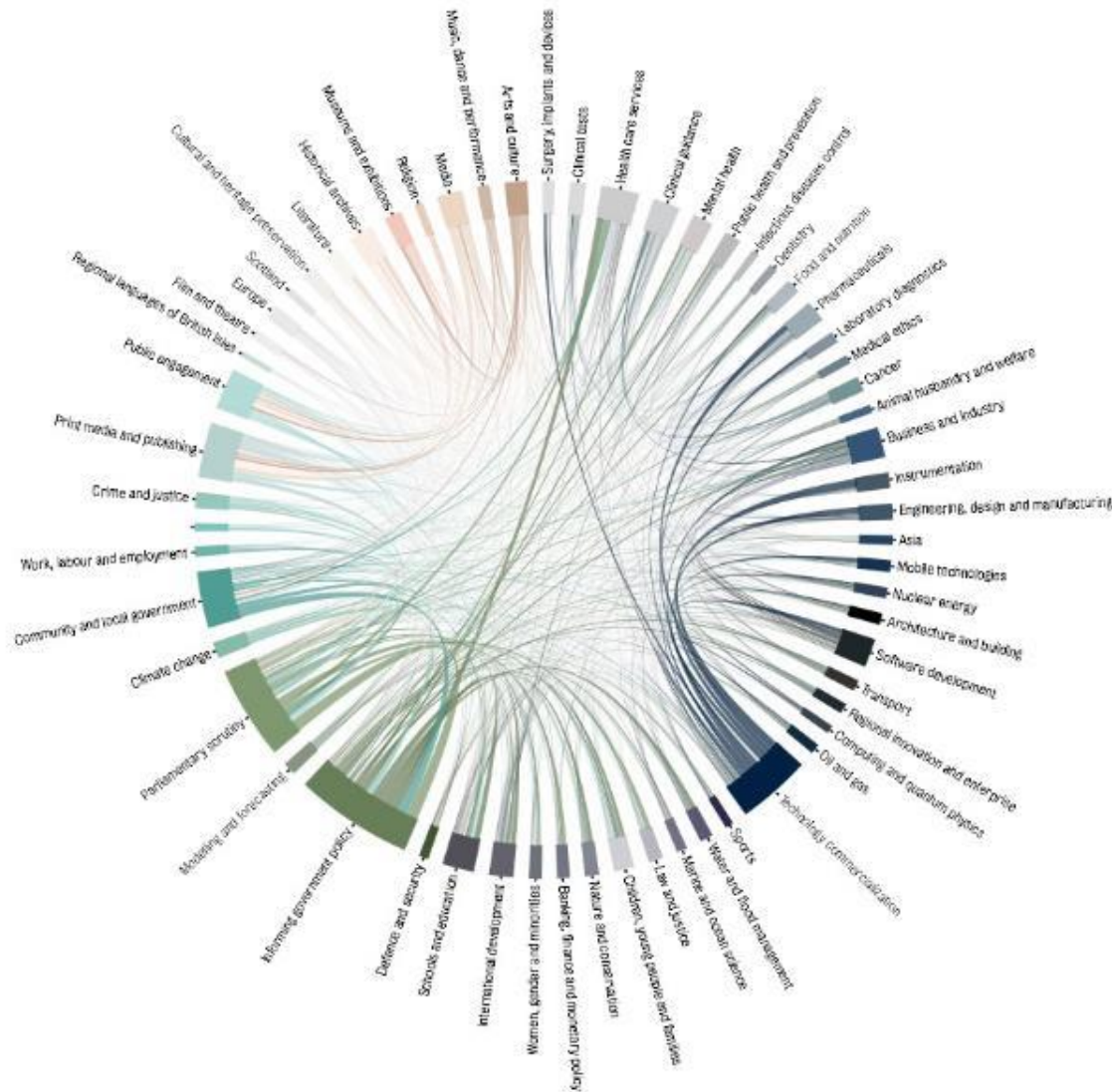
'International development'
(*develop countri intern world africa polici global govern African*)

Information extraction i.e. locations are 'geotagged'

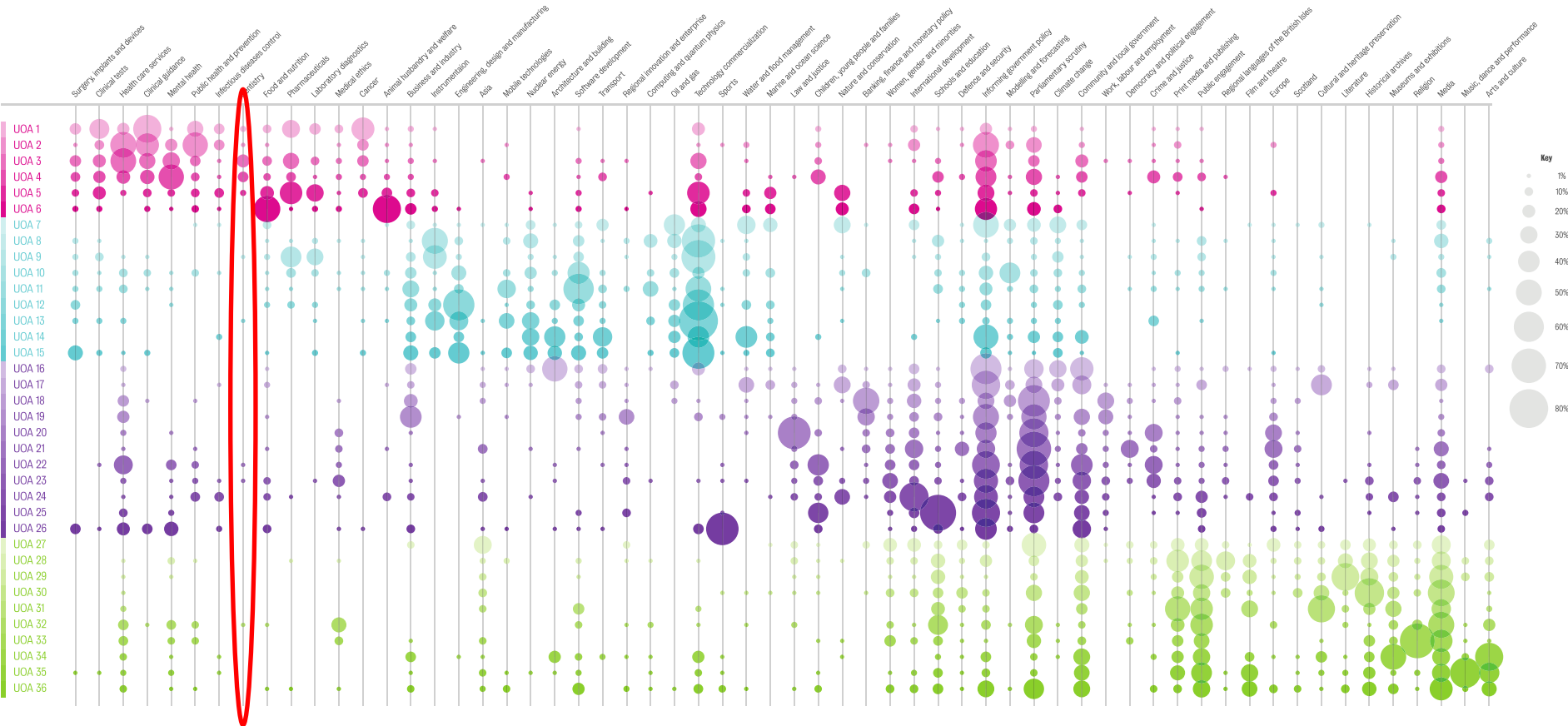
Keyword search for "QALY"



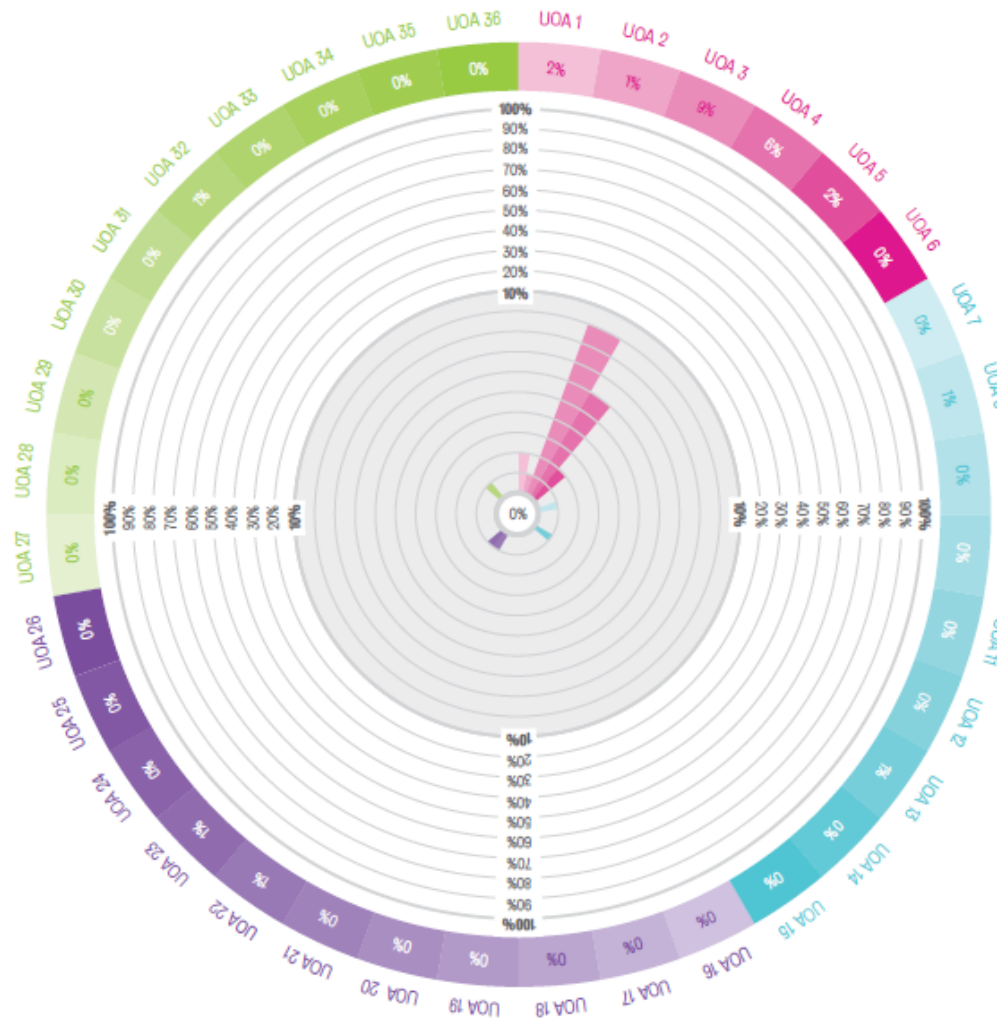
Multiple impact topics occur across the case studies



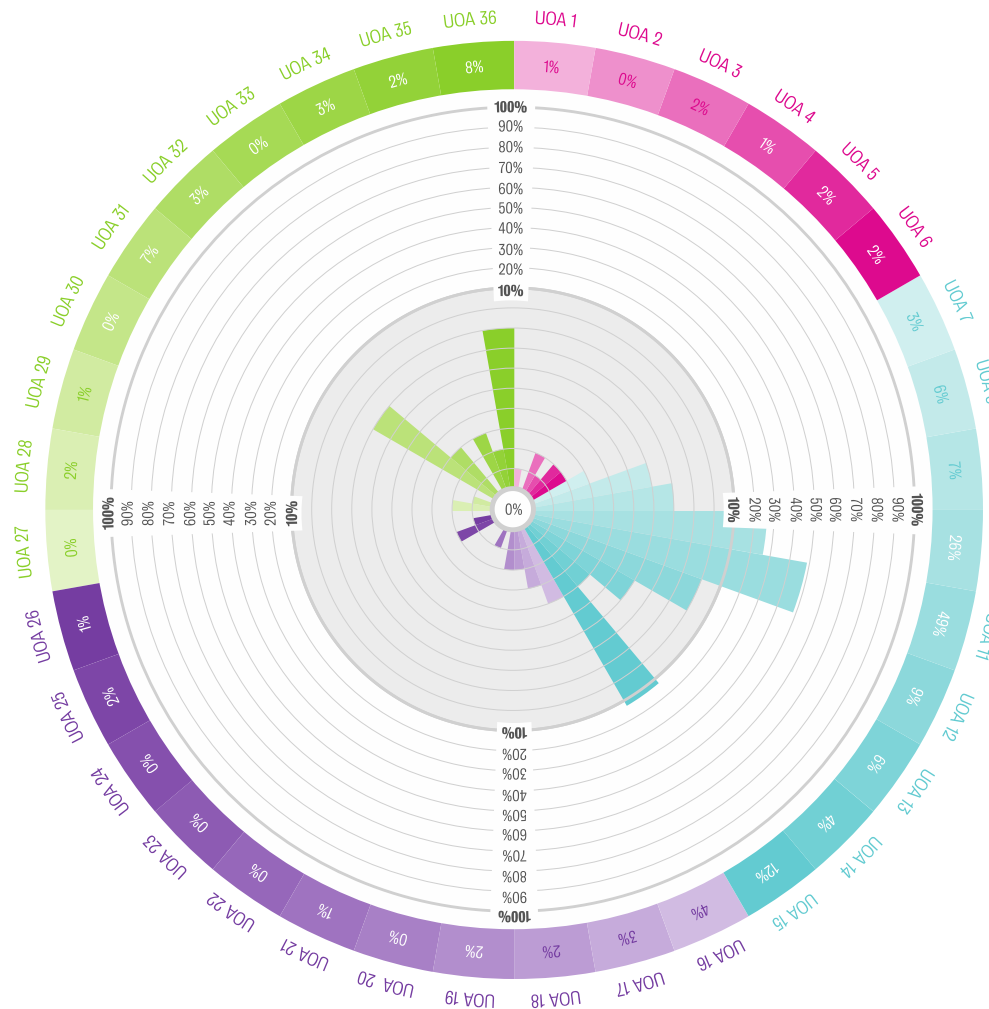
Different types of impact are more common in different disciplines



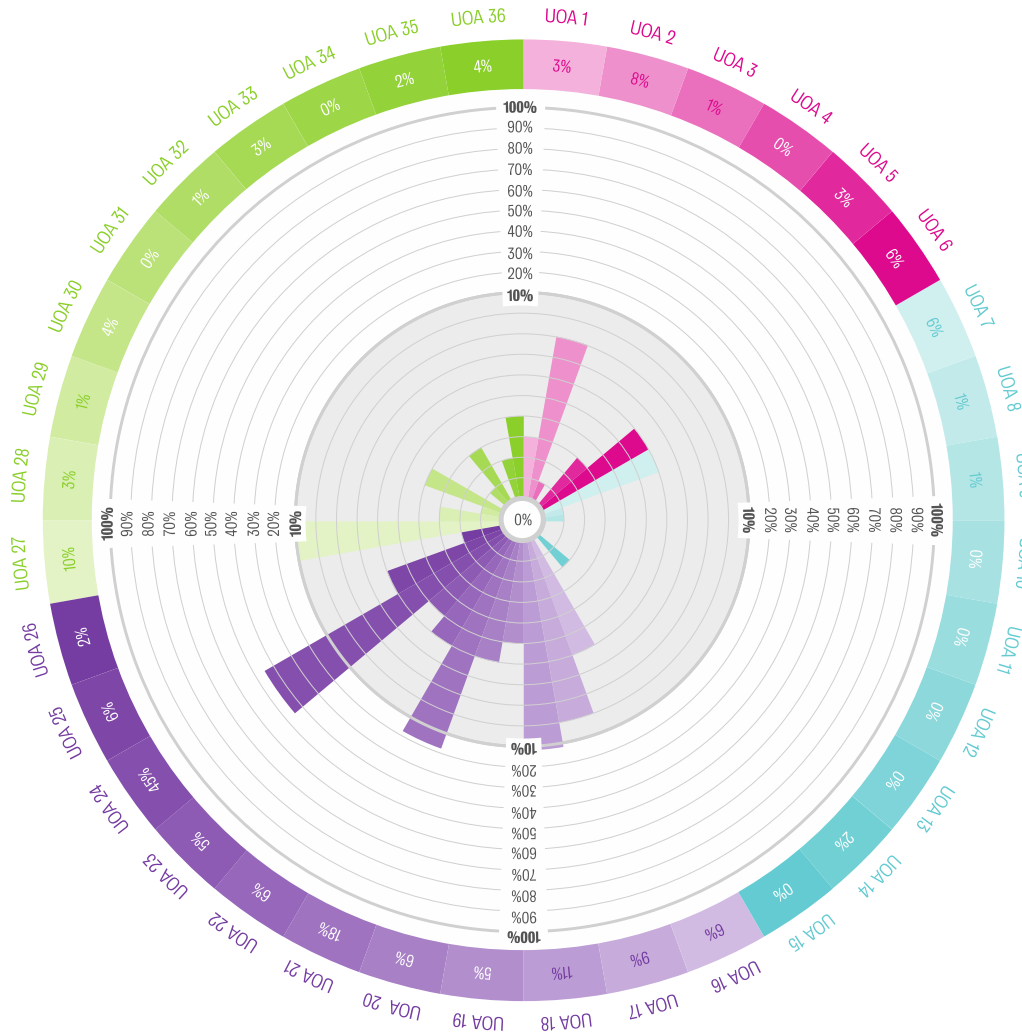
Impact wheel for 'Dentistry', n=72



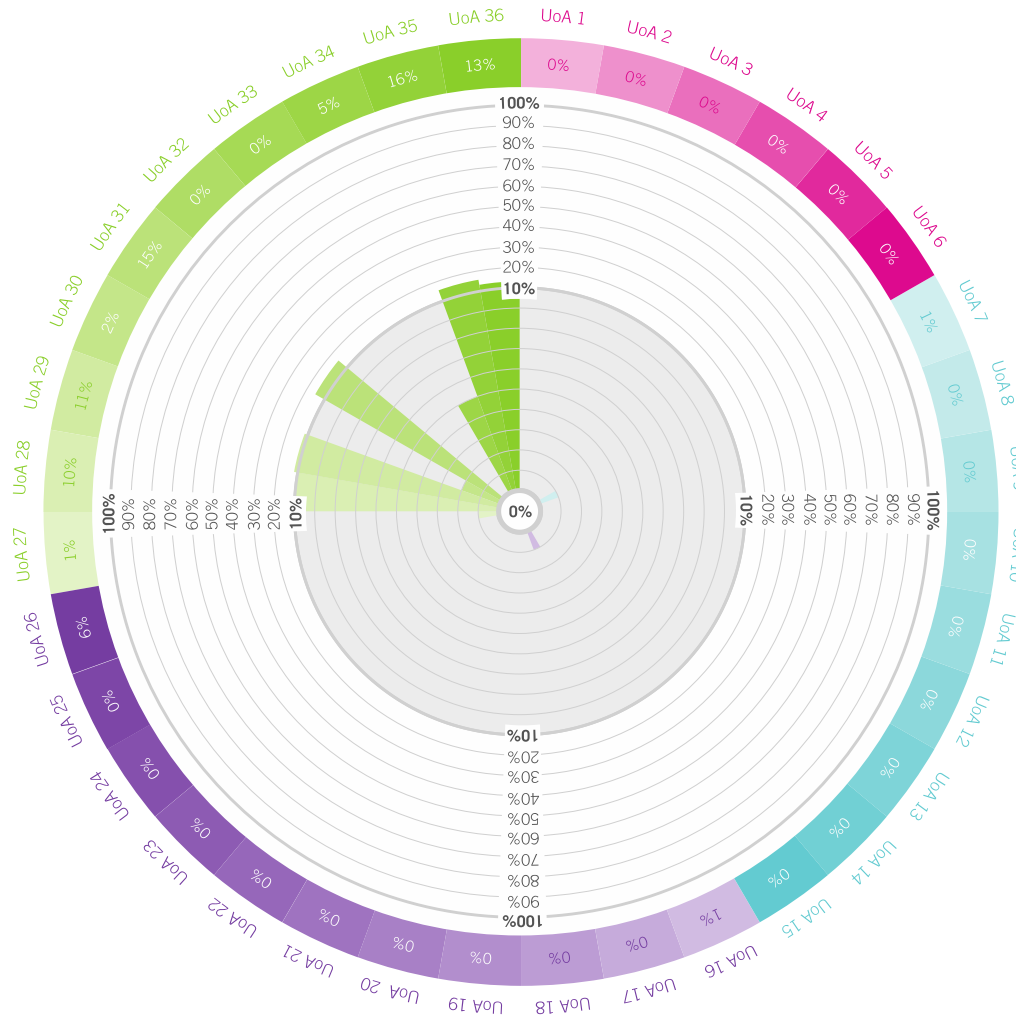
Impact wheel for 'Software development', n=347



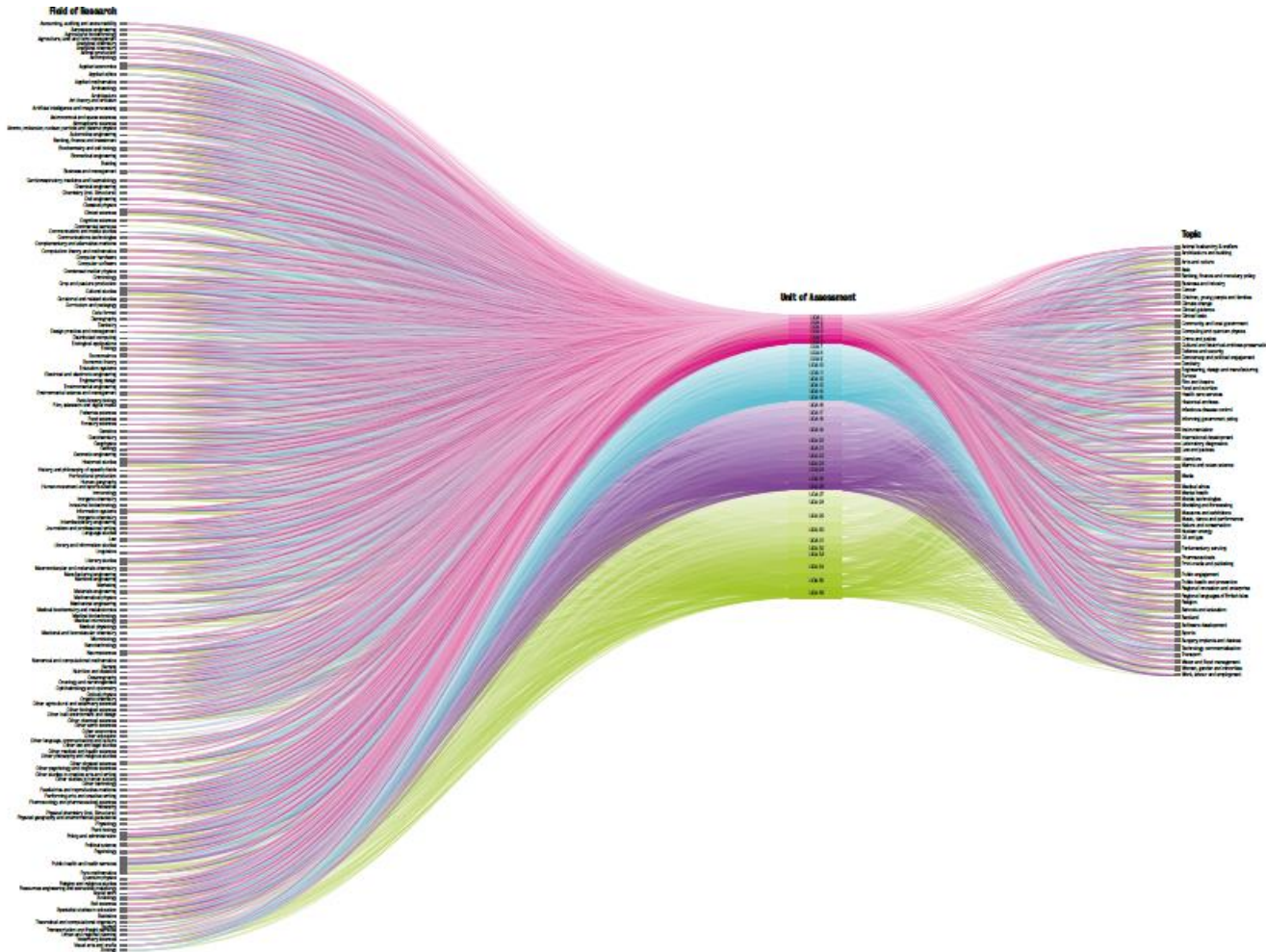
Impact wheel for 'International development', n=275



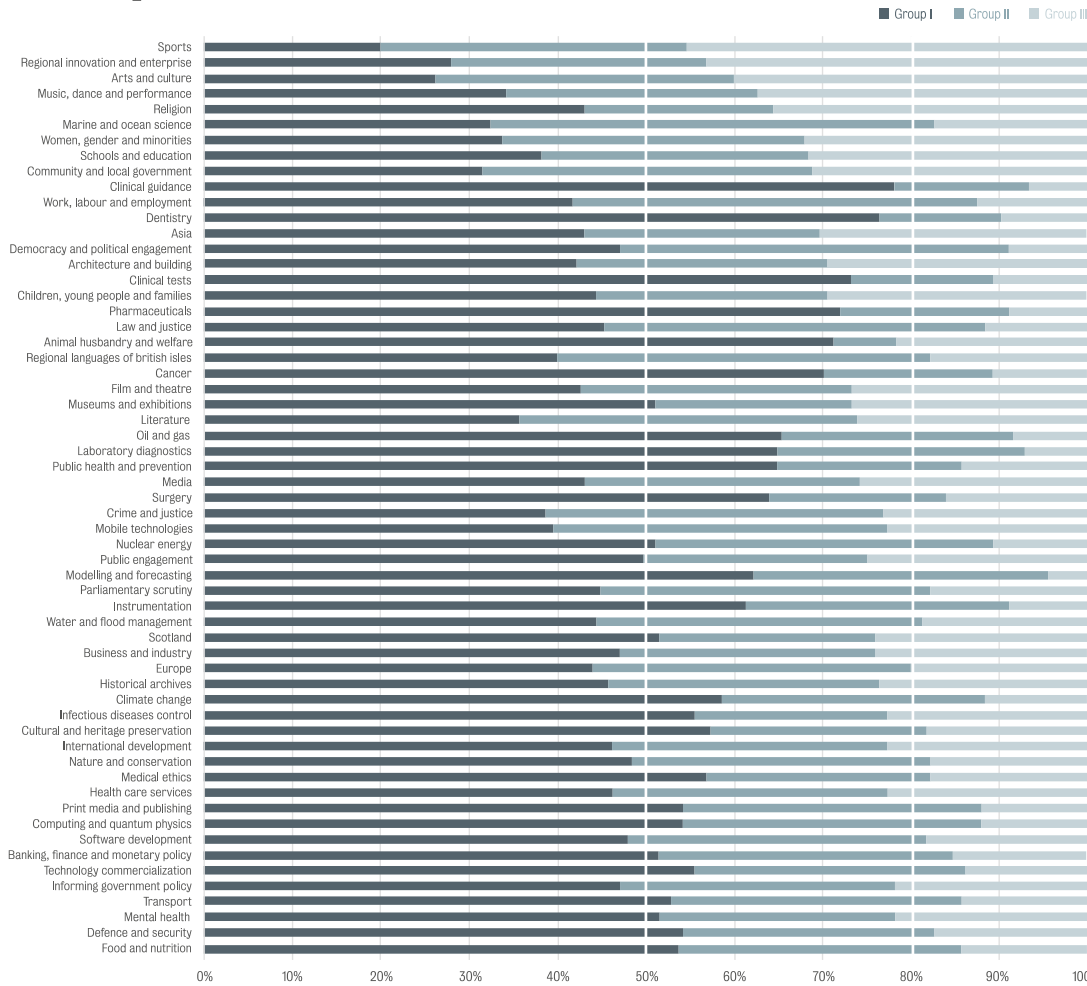
Impact wheel for 'Film and theatre', n = 139



There are a diverse range of impact pathways



Different types of HEIs specialise in different impact topics



Group I HEIs make a disproportionate contribution (ie 50% over expected) in ‘Clinical guidelines’ and ‘Dentistry’

Group II in ‘Marine and Ocean Science’ and ‘Work, Labour and Employment’

Group III make a disproportionate contribution in 9 topics:

Topic	Proportion of case studies from Group III HEIs (expected = 20%)
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Sports	45%
Innovation and business	43%
Arts and culture	40%
Music, dance and performance	37%
Religion (Christian faiths)	35%
Women, gender & minorities	32%
Schools and education	32%
Community and local government	31%
Asia (China and India)	30%



Assessing the scale of research impact through ‘deep mines’

Not possible to add up impacts

- There was a very large amount of numerical data (ie c170k, or c70k with dates removed) that was inconsistent in its use and would need converting into standard units
- Some numerical data was not related to the actual impact; it may be associated with background information or, crucially the potential impact

Six ‘deep mine’ questions to:

- Illustrate both the richness of that case studies, but also some of the challenges associated with their analysis
- Supplement the quantitative text mining analysis with a more nuanced qualitative assessment



The six selected 'deep mine' questions

1. What is the impact and value of research on clinical practice and health gain?

2. What has been the impact of research on industry in terms of spin out companies, patents, royalties or licenses?

3. What has been the impact of research on public policy and parliamentary debate?

4. What has been the impact of research on film and theatre?

5. What has been the influence of the Wellcome Trust and British Academy?

6. What has been the impact of research on the BRIC countries?

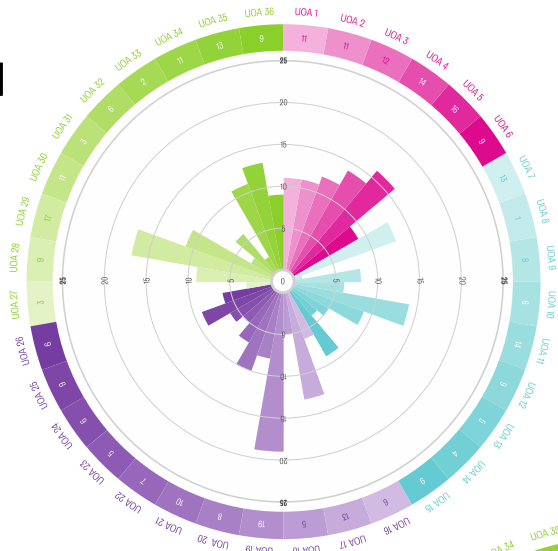
Deep mine 6: What has been the impact of research on the BRIC countries?

- Map shows that the research from UK HEIs has had a global impact in the past 20 years.
- Investigated the impacts of research on Brazil, Russia, India and China (commonly referred to BRIC countries)
- Of the 17,932 non-UK geotags, 1,640 (or c9%) were assigned to the BRIC countries: Brazil (n=320), China (n=619), India (n=492), and Russia (n=209)

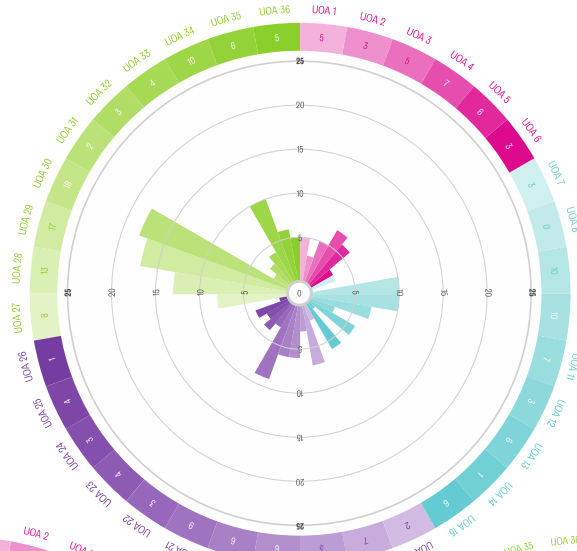


UK HEI research has had an impact on BRIC countries

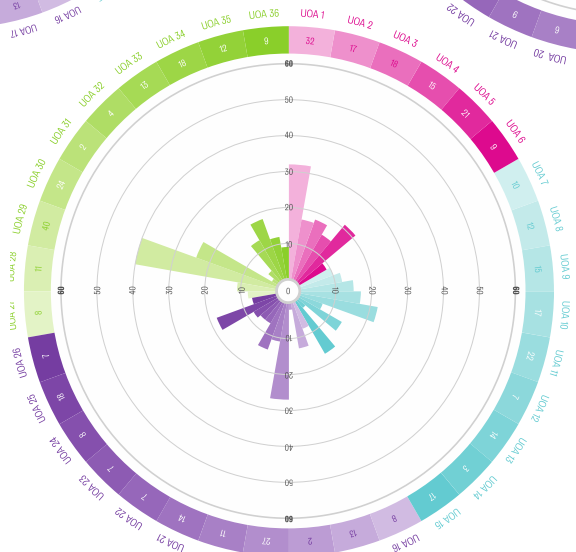
Brazil



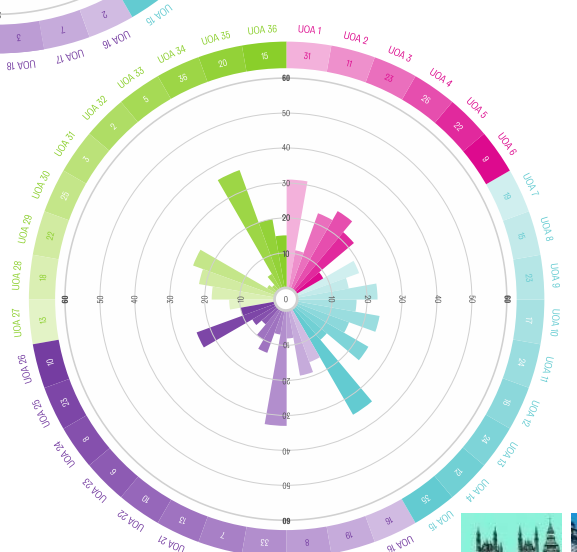
Russia



India



China



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Impact on BRIC countries was varied and comprehensive, sometimes strategic

- Selected a random sample of 50 case studies from each of the four BRIC countries (n=200 in total) for qualitative analysis
- Impacts were strategic (ie collaboration with an international partner organization was created to conduct the research) or as incidental (ie positive but not specified intended outcomes in the specified country as a result of the research)
- Examples of impacts include:
 - creation of spin-out companies and agreements of licenses
 - informing government policy in that country
 - the creation of new technologies to develop in that country
 - creation of online resources for wide public use



Caveats and limitations to REF analysis

Limitations of our analysis:

1. Limited time for undertaking the analysis
2. Lack of structure and standardised (meta) data in case studies

Limitations of the case studies as research material

3. The way impact is articulated and described
4. Selective, non representative, set of case studies
5. Double counting of case studies



What did we learn from both evaluations?

You can assess research impact on a national scale

Research impact is multidisciplinary, multi-impactful, and multinational

Assessing research impact drives behaviours

Differentiating impact is difficult (84% of case studies 3*/4*)

It is expensive but worthwhile (absolute costs high, proportionate costs low)



There are still many challenges to measuring the impact of research



Looking to the future

Impact assessment is here to stay

System will be similar in 2020, but with incremental changes

Re-submission of case studies likely

Use of impact metrics very unlikely

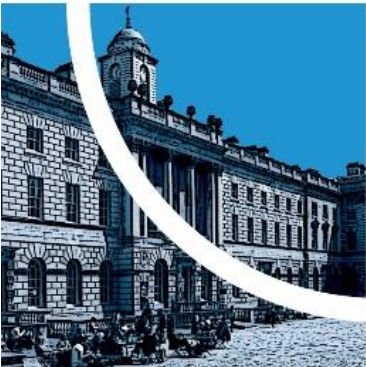
Increase in impact 'weight', possibly by getting rid of impact template







The
**Policy
Institute**
at King's



Email: Jonathan.Grant@kcl.ac.uk
Tel: 020 7848 1742



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