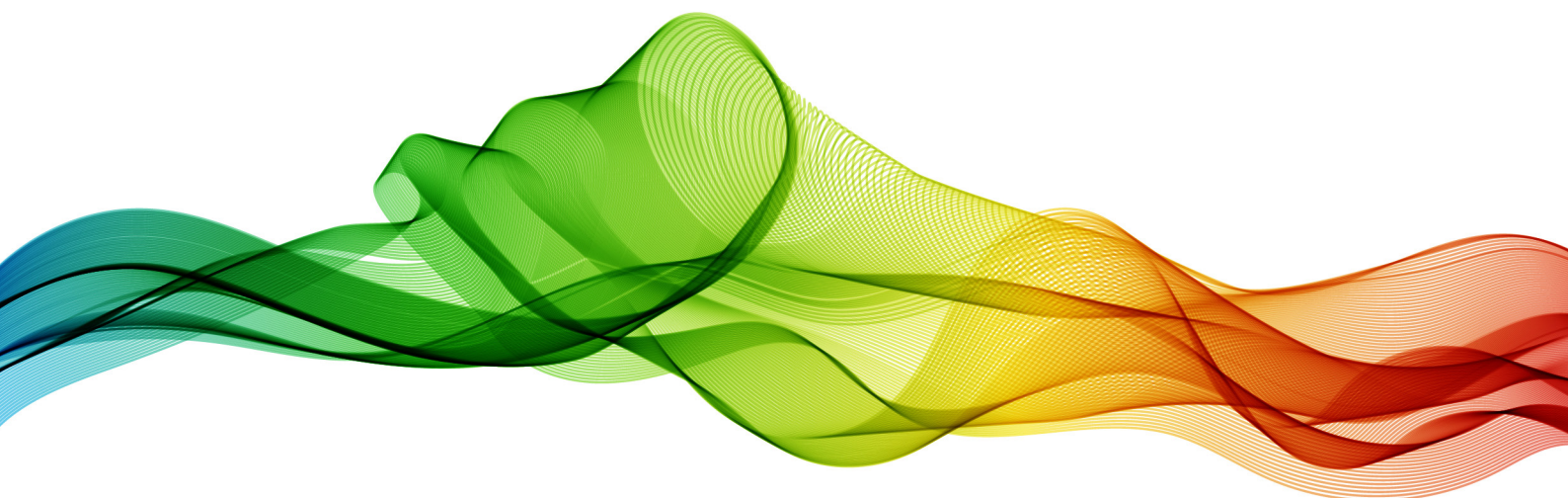


Collecting Research Impact Evidence

Best Practice Guidance for the Research Community



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Foreword

The UK is a world-leader in research and development, science and discovery. Our universities perform within an international context and the 2014 Research Evaluation Framework (REF2014) demonstrated the outstanding quality and impact of their research activities.

How do we define 'impact' in relation to research? Essentially, it is the evidence of the difference that research makes: for example, health improvements or economic growth.

Through REF2014, we undertook a systematic evaluation and assessment of the impact of publicly funded research across all disciplines. In preparing case studies, universities articulated the benefits arising from their research activities and demonstrated how the combination and integration of knowledge was central to the delivery of impact.

Large-scale national assessments, like REF2014, provide accountability for investment in research and a mechanism to reward and incentivise researchers and institutions. The ability to measure impact is an essential component of a research system that seeks to maximise the benefits from public investment. Measuring impact provides insights into delivery, which helps to maximise the benefits of research. A better understanding of what has worked well in the past, alongside robust assessment of progress in ongoing research projects, enables researchers and research units to make adjustments and improvements for greater impact in the future.

There has never been a greater need for evidence of impact. Yet, in gathering impact evidence, we must recognise the different types of impact, the disciplinary context and the purpose for which evidence is being gathered.

Delivering benefits to society must remain at the heart of the research endeavour. This report, which is based on experiences from the Higher Education sector, provides advice and guidance on the collection and analysis of impact evidence as an essential part of our aspirations for an effective UK research base for the future.

Dr Steven Hill

Head of Research Policy
Higher Education Funding Council For England

Definitions

The 2014 Research Excellence Framework (REF2014) was the most recent development of the UK's cyclical Research Assessment Exercise (RAE), first implemented across the higher education (HE) research base in 1986 and repeated in five subsequent exercises.

Each RAE/REF process requires HE Institutions (HEIs) to submit evidence of their research achievement over a census period as a set of subject-based portfolios describing staff, research training, income and outputs. The portfolios are reviewed by an expert panel for each subject, which assigns a grade. Grades are published and are used to formulate funding.

REF2014 was the first national assessment exercise to assess the wider, socio-economic impact of research. It defined impact as 'an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia'.

Descriptions of impact were captured in case studies authored within a prescribed template. Each case study included information about the research underpinning the described impact, the impact itself and a list of corroborating sources. Documents to corroborate specific claims of impact (an indicative maximum of 10 references) were required from sources external to the submitting HEI. Each **corroborating source** needed to be linked to a specific claim, not as a substitute for providing clear textual evidence of impact but for audit purposes. Sources could include, as appropriate to the case study, the following types of material:

- Reports, reviews, web links or other documented sources of information in the public domain.
- Confidential reports or documents (to be made available by the HEI if audited).
- Individual user/beneficiary names (those benefiting from or affected by research outputs, including those in society, industry, charities and government) who could be contacted to corroborate claims.

- Factual statements provided by users/beneficiaries that corroborate specific claims made in the case study (and made available by the HEI if audited).

Sector stakeholders: Researchers, research funders and policy makers.

Users/beneficiaries: Research users in government, industry, charities and the general public.

Impact activities: Activities, such as public engagement that translate research, making it accessible for users/beneficiaries to adopt.

Impact narrative: Impact case study or story describing the journey from research to impact.

Indicators: Empirical metrics demonstrating the impact that has occurred.

Introduction

Research evaluation, at the national level, has generally focussed on academic performance, but the UK's Research Excellence Framework 2014 (REF2014 – see side box) set a precedent by requiring higher education institutions (HEIs) to produce case studies describing the wider socio-economic impact of their research.¹

This was the first time that research impact beyond academia had been captured comprehensively across a national research base in case studies developed by the researchers themselves. Subsequent to the assessment, a database of case studies was developed which now provides a rich source of information, not only about impact in different contexts, but also about the way in which researchers perceive their research impact and then assemble and use the resultant evidence.²

Despite this significant national activity, there remains some confusion as to what constitutes effective evidence of impact. For example, the corroborating sources listed in REF2014 impact case studies are not evidence in themselves - they were requested specifically for audit purposes - but they do contain the required evidence. Within the case studies the body of the text described the impact, explained how it occurred and included references to sources that support these claims. Indeed, the nature and utility of sources will vary between disciplines and impact types. Some sources, such as testimonials from the beneficiaries of research or statistics, may be 'self-evident' whilst others, such as third-party reports, provide important, but less direct evidence.

As the number of pieces of evidence to support particular impact claims was limited, the choices made by researchers in drawing on different sources is of interest for the future of practical demonstration and assessment of research impact, especially for how feasible and useful particular evidence types are in differing research contexts/disciplines.

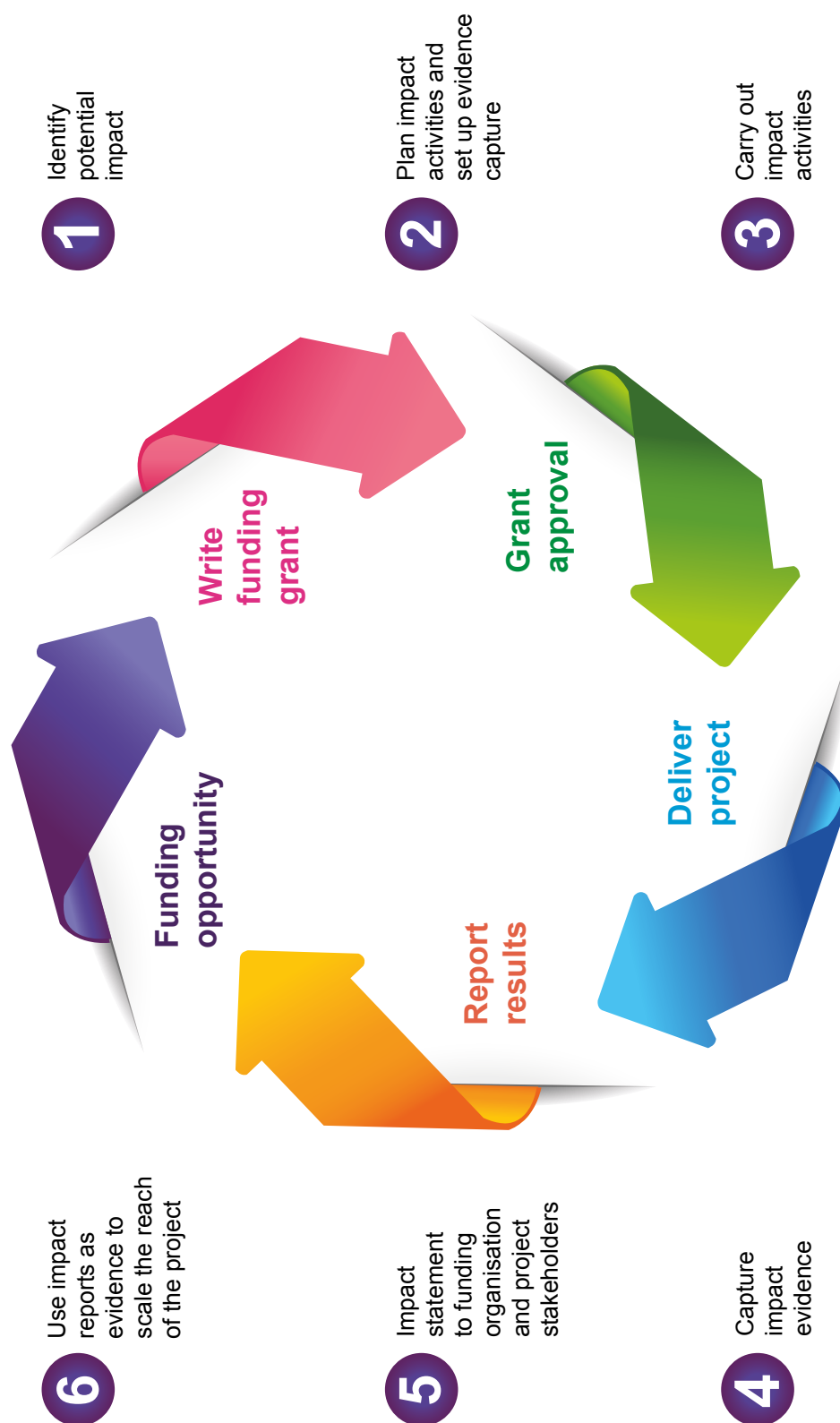
For the purposes of this report, the term 'impact evidence' is used colloquially to refer to these corroborating sources, since they are the substantive items held by researchers, referenced in the case studies, and potentially collectable for future use. In assessment, as the documentation for REF2014 describes, these sources are considered alongside the evidential narrative they underpin.

This guidance document is about the collection, management and use of sources of impact evidence and is a result of a HEFCE-commissioned activity to produce a guidance document for the sector. The development of this guidance document has been informed by discussions with representatives of a number of the UK's learned societies, REF2014 panel members and those working with impact case studies in HEIs. It includes an analysis of the corroborating sources of impact evidence submitted to REF2014 as well as an analysis of impact-evidencing behaviours within one of the commercially available evidence capture tools. ➤

¹ <http://www.ref.ac.uk/>

² <http://impact.ref.ac.uk/CaseStudies/search1.aspx>

Figure 1: Impact in the research life-cycle ©Vertigo Ventures 2013



- > This document summarises current practice in the collection, management and use of impact evidence as this is not only important to any future UK HE research assessment but is also relevant to the UK's Research Councils and the European Union's Horizon2020 (H2020) and is of increasing interest in Australia, Ireland and elsewhere. Communicating the difference that publicly funded research is making is key for national and international research funding organisations; similar pressures are faced by research-focussed charities who naturally want to demonstrate real outcomes to their donors. So, for the recipients of research funding, descriptions of research impact supported by appropriate and transparent evidence will be increasingly important. The increase in importance will drive the use of such evidence for internal analysis and management of research activity as well as for external assessment.

Impact assessment at the national level is complemented by assessment at the portfolio level as well as due consideration of enhancement at the project level. For example, the UK Research Councils require impact summaries and well planned/resourced impact pathways as part of their application process. Once a project is in progress evidence of actual impact is important to enable the developing, during and post project impact narrative to be appreciated

and evidenced easily. The Research Councils' interim and final reporting processes allow researchers to record emerging outcomes, and to capture evidence to demonstrate progress.

For the H2020, some bids allocate up to 30% of the marks to impact assessment. Key objectives of the H2020 strategy are to boost industrial competitiveness and contribute towards the resolution of key societal challenges. Being able to demonstrate how impact has been achieved in this respect can help applications for funding stand out.

Beyond funders, impact evidence is important to HEIs and research institutes as a means of internal performance management. It helps institutions differentiate themselves in attracting collaborative partnership in industry, the public and voluntary sectors. Furthermore, impact evidence can be re-purposed to help attract talented researchers and students. Similarly, impact evidence is important for researchers' professional profiles and institutions can draw on impact-related criteria when hiring or for career progression.

Impact can occur throughout the research cycle, not just at the end of a project. Impact implementation and the collection of material useful as a source of impact evidence should be a continuous part of the process.

REF2014 Impact Evidence

The REF2014 introduced the assessment of impact arising from excellent research, alongside the output and environment elements established in the previous RAE.

The assessment of impact was based on expert review of case studies, which could include any social, economic or cultural impact or benefit that had taken place during the assessment period. Whilst REF panels gave guidance about the various kinds of evidence considered appropriate, the onus was on individual HEIs to provide evidence to support the claims made in individual case studies. Weighting of 20% of the overall assessment outcomes in the REF2014 was assigned to the score for impact.

An analysis of Section 5 of the REF2014 impact case studies template (sources to corroborate the impact) shows the prevalence of particular corroborating evidence sources by main subject panel.

During the analysis phase of this project it became clear that impact evidence was deployed in multiple ways and multiple sections of the case studies: for example, it was included within the text of the impact case study as well as sources to corroborate impact. The broad analysis shown here reveals a perhaps unsurprising variation in the balance of documents and other source items; in all panels testimonials were frequently utilised, as were reports, although for Main Panel A reports (including clinical guidelines) were the most frequently utilised evidence source. Although testimonials and reports were very heavily used in submissions to Main Panel D, a higher proportion of cases used media sources and activities. The REF guidance specifically allowed for flexibility

in the way impact might be presented (case studies could cite any evidence that corroborated impact so long as it was auditable) with the expectation that case study authors could utilise the most effective form of evidence to support their claims. Through the analysis it can be seen that a disciplinary diversity in approach and content has indeed been realised. A simple browsing of the full set of case studies³ further supports the analysis; a huge variety and multiplicity of impact stories can easily be seen. Within the portfolio the case studies draw on an array of evidence including technical documentation on commercial websites,⁴ social media and audience responses to public activities⁵ and a vast number of URLs pointing to as yet unexplored resources.

For the sake of brevity all evidence types could not be represented in the aggregated data shown in Figure 2. In order to summarise the data in Figure 2 strings of text representing pieces of evidence were classified using a collection of keywords and patterns so as to group corroborating evidence into commonly occurring categories. This inevitably fails to highlight the less common source types and obscures some fine-grained diversity.

The next step in analysis to underpin this document was to investigate whether any correlation existed between the various types of evidence and the scores received by submissions.⁶ Naturally, this can only be indicative and very broad brush as the percentage of four-star, three-star, two-star

³ <http://impact.ref.ac.uk/CaseStudies/Search1.aspx>

⁴ <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=2010>.

⁵ <http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=4436>

⁶ <http://results.ref.ac.uk/Results>. This analysis is limited by the public availability of scores, which are at the Unit of Assessment/Institution level.

Figure 2: Main panel that contain categorised types of material corroborating evidence about impact.



Main Panel A: Biological Sciences and Medicine

Main Panel B: Physical Sciences and Engineering

Main Panel C: Social Sciences

Main Panel D: Arts and Humanities

and one-star case studies submitted by a particular HEI to a panel is known but not how individual case studies were scored. The correlation between the frequency of a given source type and the Grade Point Average (GPA) score for a set of case studies is shown in Table 1. This is only a glimpse of ‘average’ behaviour for a set of case studies and it obscures outliers (which might be more interesting than group trends) but there are evident differences across panels that reflect the flexibility in the REF case study system. The Arts and Humanities case studies were those most likely to include media as evidence of impact; however, the use of media as a source of corroboration does not correlate with the GPA associated with a set of

case studies in a significant way. By contrast, the reports (guidelines, technical reports, consultancy) used in nearly 40% of Medical and Health case studies do have a statistically significant positive correlation with GPA. This is also true across the entire portfolio when viewed as aggregated data i.e. the use of reports as evidence in all panels is positively correlated to GPA. Although obviously not a causal link, it does appear to indicate that use of reports as impact evidence is associated with higher scoring of impact case studies. The picture for testimonials is more mixed; they appear to be associated with higher scores in Arts and Humanities but negatively correlated to GPA in the Medical Sciences. >

- > However, it must be remembered that this analysis is at the aggregate level and whilst 50% of case studies in the Arts and Humanities utilised testimonials as a form of evidence only 30% of the Medical Sciences did so.

This correlation analysis tells us nothing about the way in which individual sub-panels and panels assessed the case studies and/or appreciated different evidence types. For example, from this analysis we do not know whether the case studies were assessed differently across research communities.⁷

There may have been different practices, perhaps in the weighting of value for different source types, across subjects. We know that there is great variety in the impact case study database, and that there are many other differences between individual case studies. This variety may point to the surprises and outliers among the impact case studies as having particular value and interest. Having said that, the analysis certainly supports the original intention of the REF in encouraging diversity in content, rather than applying a formulaic concept of what good impact or good impact evidence looks like.

Table 1: Spearman correlation between the indicative score and the amount of various types of evidence; there is a column for each subject panel.

	A: Biological Sciences & Medicine	B: Physical Sciences & Engineering	C: Social Sciences	D: Arts & Humanities
Activity	-0.03	-0.02	-0.04	-0.06
Article	0.19	0.09	0.02	-0.01
Award	-0.06	0.01	0.01	0
IP	0.05	0.05	-0.01	0
Legal	-0.03	0	0	0
Media	-0.01	0.07	-0.07	0
Report	0.19	0.11	0.15	0.08
Testimonial	-0.15	0.04	0.08	0.17

A value of 1 implies maximal positive correlation, 0 no correlation, and -1 a maximal inverse correlation. The values in bold are significant (p value < 0.05, where the null hypothesis is that the indicative score and the amount of a given evidence type are uncorrelated.)

⁷ <https://www.digital-science.com/blog/news/new-digital-research-report-global-research-impact-needs-evidential-support/>

Research Evaluator Views

As part of the REF2014 assessment, expert panels were established to evaluate the impact case studies according to discipline. Our in-depth interviews with the main panel chairs revealed that, overall, they were happy with the process of assessing research impact.

Whilst it was an onerous task, all had found the experience both valuable for the sector and personally rewarding. The key themes which emerged from the conversations as the panel chairs shared their experiences were:

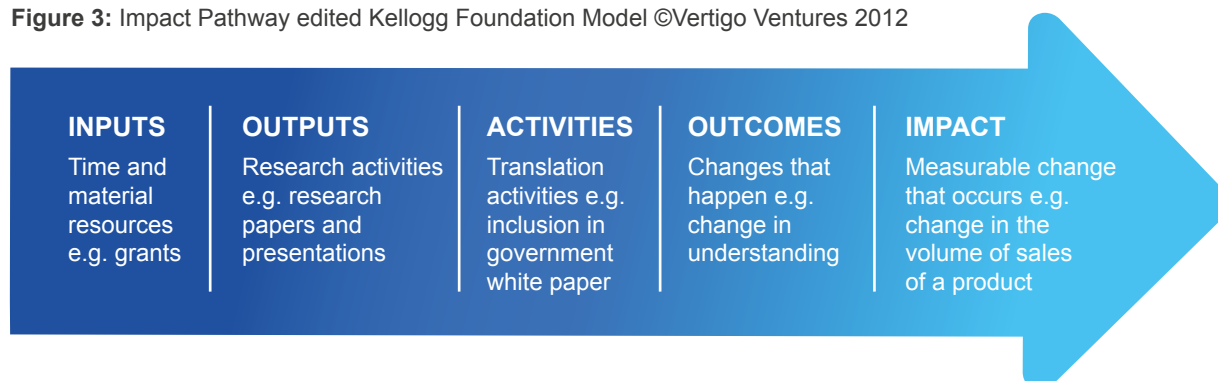
1. Attributing the research to the impact

The first theme encompassed the way impact evidence helped research assessors to understand how the research led to impact. Having acknowledged that the ability to directly attribute specific pieces of research to specific impacts is a serious challenge, the panel chairs all emphasised the importance of being able to follow a narrative describing the journey to impact. Since REF2014 best practice within the sector has been developing and some HEIs now gather both evidence of the impact itself and also indicators of translational activities, which itself can be used as evidence of the impact pathway followed and thereby more effectively link the impact with the original, underpinning research.

2. Distinguish activities, such as public engagement, from impact

A related challenge to emerge from the conversations is that of being able to distinguish activities from actual impact. Panel chairs frequently found that evidence of activities, outputs or outcomes was being mistaken for evidence of actual impact and as such they could not rate the impact itself highly as it was not evidenced; no credit was given for activities designed to create impact, but not in themselves actual impact. Panel chairs were clear that the narrative and the impact evidence needed to show distinctly the difference between the activities and impact. Doing this well helps with attribution and encourages behaviour that enables activities which create opportunities for impact such as industry outreach events. One panel chair commented that: *'the best ones had understood how to present the evidence so that somebody who hasn't been involved in the process would understand it easily and understand [the research's] relationship to impact.'* >

Figure 3: Impact Pathway edited Kellogg Foundation Model ©Vertigo Ventures 2012



> 3. Include simple narratives and empirical data where possible

Another key theme to emerge from the interviews was how varied the case studies and evidence were in quality. All the panel chairs agreed that the 'good' case studies were those where the impact evidence was clearly specific to the underpinning research and where the evidence was specific to the type of impact that had occurred. For example, the chair of Main Panel A felt that the best were usually quantitative and were easier to assess. This could include, for example, how many lives were improved by an intervention or the magnitude of cost savings, in monetary terms, by a particular outcome. In Panel A all agreed that where relevant, quantification was more illuminating than letters or general support statements from governments or charities.

In Main Panel B, quantitative impact evidence included commercial benefits such as revenue changes for a spin-out company. Meanwhile in Main Panels C and D quantitative impact evidence examples included audience figures reached.

Conversely, the impact case studies that were not persuasive were those that were not clear about how the impact had occurred. Case studies that had failed to integrate the evidence also fared badly as did those that had vague testimonials as evidence.

4. Allow easy access to the impact evidence

Whilst they did not rely solely on the impact evidence, all the panel chairs agreed that it was a very important element. There was some frustration that the links to websites did not always work and that the panel could not easily access the letters of support. Although they did not go through each piece of evidence, it was felt that it should be more accessible. As research institutions collect impact evidence it is worth keeping in mind how it will later be presented and made available.

Recommendations from the Main Panel Chairs are included in the best practice guidance in this report.

Sector Views

In order to build upon the analysis of REF2014's treatment of impact evidence, a publicly accessible online survey was launched together with a workshop of learned society representatives. The aim of both of these activities was to draw out current best practice in impact evidence capture and usage beyond the REF2014 experience.

Online Impact Evidence Survey

In addition to the case studies analysis and interviews with main panel chairs a research impact Evidence Survey was widely advertised and open to all interested parties in the sector. A total of 66 participants from over 30 organisations contributed their views. Participants in the survey came from various disciplines and had a variety of job roles. Four key themes emerged from survey responses:

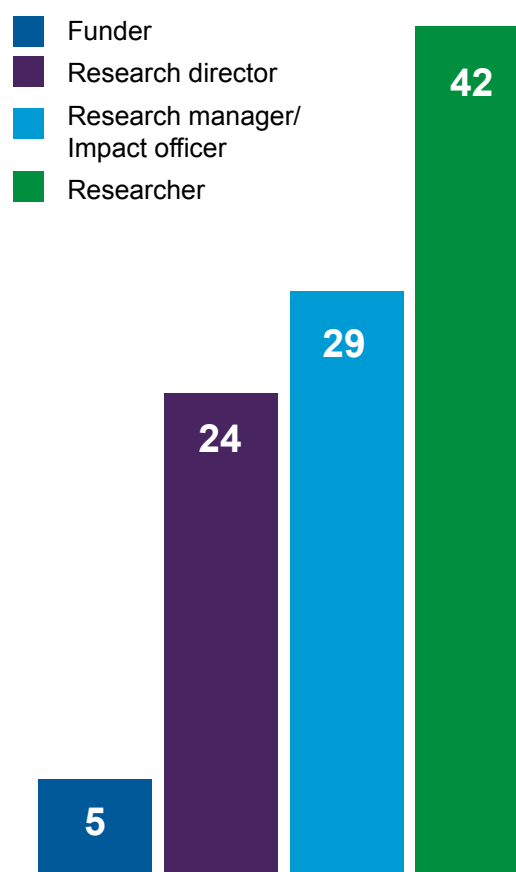
1. Using impact evidence to demonstrate the effects on stakeholders

Impact evidence provides a means of directly hearing from research users and stakeholders what they value about research and to what extent. As such, evidence is particularly valuable for all research funders and researchers themselves to gather throughout and beyond the project lifecycle, not only as a method of demonstrating worth but as a planning tool to understand how maximum value could be delivered to stakeholders. Independent evidence from those outside the supported research organisation itself is a tangible proof of impact, revealing who is using the research and how.

2. Tracing the pathway from research to impact using impact evidence

It was felt that not all the evidence offered within the REF2014 was specifically related to the underpinning research, suggesting that more work is still needed to support the research community to better articulate the pathway from a specific body of work to impact. This lack of clarity was an issue which affected all disciplines. >

Figure 4: Roles of Survey Participants (%)



> **3. Using empirical data as impact evidence**

Where possible and useful, assessors wanted to see quantitative impact evidence. However, quantification of impact is not suitable or practical in all cases and therefore there are challenges with an approach that would only utilise indicators, not least being able to clearly attribute the impact to a particular research output. Empirical impact evidence has been and is being used by researchers across the disciplines to show how their research is adopted by users/beneficiaries.

4. Prioritising types of impact evidence

Overall during REF2014 testimonials were the most popular type of impact evidence across all disciplines. This may be because these were the easiest to collect in retrospect. Additionally, during the online survey, respondents rated third-party testimonials as the most highly ranked form of evidence when asked “which types of impact evidence are most relevant to your discipline? (In order of relevance, where 1= most relevant and 6= least relevant) ”.

Testimonials are a flexible type of impact evidence, which all researchers can use, however survey respondents felt that it would be helpful to have more guidance on what constitutes robust evidence and therefore a useful testimonial.

Table 2: Evidence File Types Most Frequently Used by Researchers

Item	Overall Rank
Third party testimonials	1
Surveys from stakeholders	2
National or local statistics data	3
Web clipping	4
Financial/sales reports	5
Video clips	6

In addition to the publicly available online survey, views were also sought from the learned societies at a workshop held on 24 March 2016 at the Royal Institute of Great Britain. Delegates from over 30 learned societies reflected on what impact evidence might look like for different types of impact. Here we summarise the key workshop themes to consider when collecting impact evidence. Again these recommendations and guiding principles are coalesced with the overall key best practice messages in the summary guidance.

1. Collecting diverse types of research impact evidence

There was consensus that the diversity of approach was to be expected and encouraged. Indeed, various impact evidence types could be used to demonstrate changes or benefits to society, the economy and the environment. It is clear that an overall narrative is important and that evidence needs to be both specific to the research and create a compelling case. Being able to clearly follow the pathway/s to impact ensures that the facts are reported and discounts hyperbole.

2. Collecting robust research evidence

Delegates were keen to ensure that the reporting of impact was proportional and did not create an onerous burden on researchers and their teams. Delegates recognised that evidence would need to be robust in order to support the case for research funding at the project and national levels. Robust data could, if relevant, include proportional surveys of target audiences. The act of gathering this data was also seen as an opportunity to better engage with research users and amplify the scope of work. Overall, delegates were keen to stress the need to keep impact evidence gathering activities in proportion to the research itself and the need to demonstrate impact.

3. Explaining the difference between outcomes and impacts

The issue of mistaken use of output/outcome metrics in place of robust impact metrics also emerged during the workshop. Delegates were clear that evidence needed to show behaviour change as a result of research

and not just changes in policy; for example, how well manufacturing guidelines or standards were adopted in practice and the resultant efficiencies/costs/other benefits/negative impacts.

4. Using social media data as research impact evidence

The use of social media as a type of impact evidence was one which caused quite a debate during the workshop. Social media reach and sharing statistics are easily accessed and can be part of a persuasive narrative about public debate. However, there is a lack of clarity around using this information, nor was its significance well articulated. Social media statistics, in general, tend to relate to activity rather than actual impact and thus it is important that these are utilised very carefully and due consideration is given to whether they do in fact demonstrate actual impact e.g. changes in behaviour resulting from online activity; it is these changes which need to be demonstrated as the ultimate impacts of research.

5. Making research impact evidence accessible

There is also a case for the evidence to be more accessible for the research community. This evidence allows stakeholders to fully understand the foundations underpinning the claims of impact. Where evidence had been collected it was felt that this evidence should also be made available or presented in a way that would allow research users and funders alike to be able to use it to better understand best practice.

Current Research

A number of commercial systems are available for impact evidence capture. In this section we analyse aggregated and anonymised data from one of those, the VV-Impact Tracker, as a snapshot of the types of impact evidence being gathered today.

These anonymised and aggregated data help to show what researchers and institutions are collecting to corroborate their activities and impact claims. The type of information shown below is being used internally by research institutions to monitor where and how their research is utilised to create opportunities for impact.

This is serving two purposes, highlighting those activities which might best lead to impact and the resources that are needed to achieve this.

Analysis of VV-Impact Tracker Evidence Vault

The tool supports researchers to store all types of digitised impact evidence, from images and video to spreadsheets. This breadth of evidence types is important as the variety of activities and underpinning research that users are recording varies widely.

1. The breath of impact activities being undertaken by researchers is clear

The graph on the right shows instances where researchers have stored files (pdfs, documents or media) as evidence of impact activities. Storing evidence of impact activities supports with attributing the impact that may occur later.

Examples of files uploaded include pdfs of contracts with industry partners, presentation slides from conferences and Excel spreadsheets detailing delegates at an event.

2. The use of web links as evidence of activities

Web links were widely used in the REF exercise as shown previously. However, main panel chairs expressed frustration at a lack of functionality of many links and therefore their

inclusion value. It is therefore important that clear guidance is given as to how these can be best used in corroborating impact claims. For example, a question raised about web links is how we can determine whether a webpage adequately demonstrates the impact?

In addition, it is helpful to think about other information that might be helpful as well as the URL. For example, can the number of times a page was visited tell us more about the numbers reached with the communication and can the amount of time spent on the page tell us something of how those audiences engaged with the material and thus its significance? In addition, being able to see which pages viewers look into next, or which links they clicked within the page may tell us more about the impact of the page itself.

Figure 5: Activities corroborated by Digital File Evidence in VV-Impact Tracker

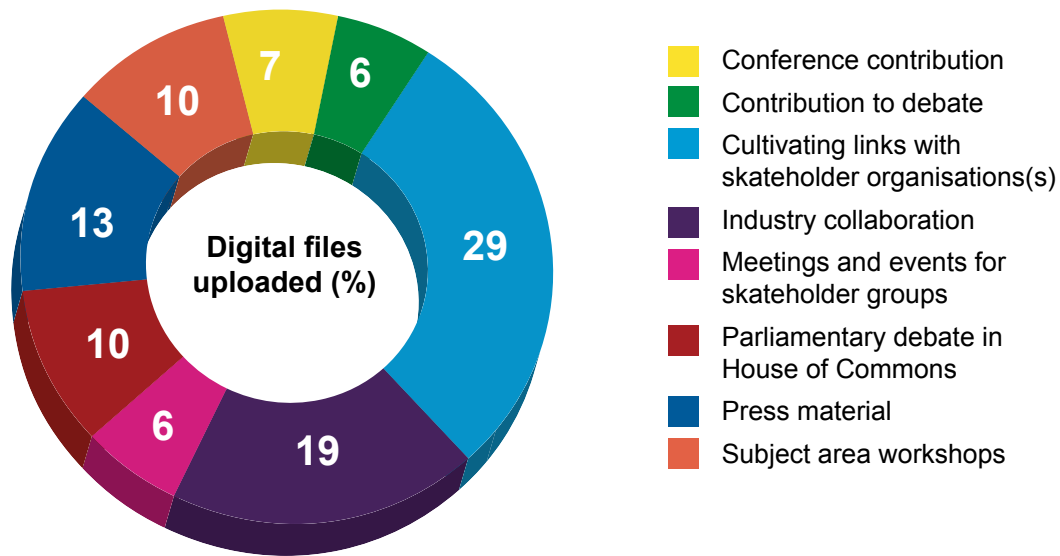
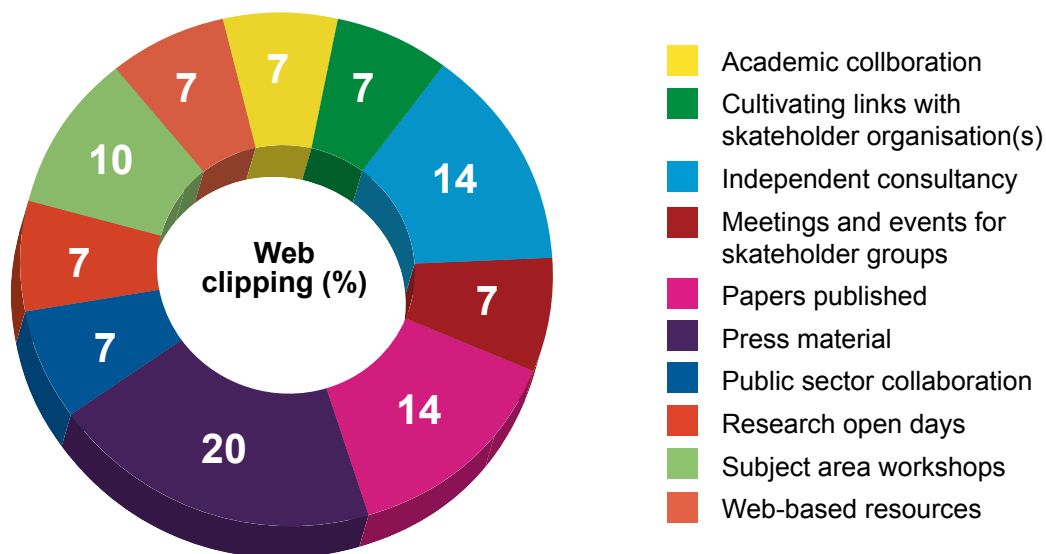


Figure 6: Activities corroborated by Web Link Evidence in VV-Impact Tracker



In summary, as we consider what evidence should be collected in the sector is it important to consider the format and how this can help provide a full story of impact.

Best Practice

Throughout the various steps in developing this guidance document it has been clear that impacts may begin to occur at all stages of the research cycle and therefore it is worth planning from the conception of the research project how impact activities will be carried out and how data from these will be captured. The following diagram suggests useful intervals where institutions can think about impact evidence.

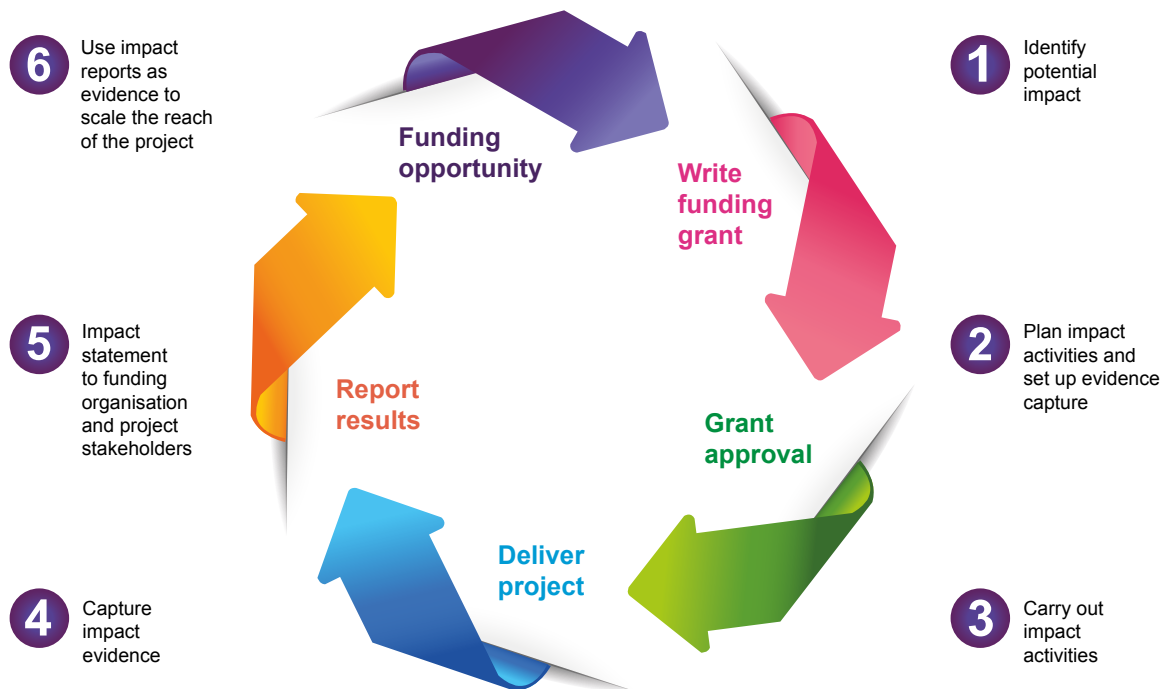
Collecting Impact Evidence throughout the Research Project

1. Identify potential impact

From the conception of the project it is valuable to consider what types of impacts may occur as a result of the research. This may be done explicitly, for example in Pathways to Impact Statements and when planning the activities to reach users/beneficiaries. A Pathways to Impact Statement is an essential component

of a research proposal and a condition of funding according to Research Councils UK. The statement encourages researchers to explore, from the outset and throughout the life of a project and beyond, who could potentially benefit from the research and what the researcher can do to help make this happen.⁸

Figure 1: Impact in the research life-cycle ©Vertigo Ventures 2013



⁸ Research Councils UK: <http://www.rcuk.ac.uk/innovation/impacts/>

⁹ Hansard: (the Official Report) is the edited verbatim report of proceedings of both the House of Commons and the House of Lords. <https://hansard.parliament.uk/>

¹⁰ Google Alerts monitor the web for interesting new content <https://www.google.co.uk/alerts>

2. Plan activities and set up evidence capture

Identify methods to collect data about these activities and introduce means to support with collecting the data over the long term. For example, this may be having an up-to-date database of industry contacts. These activities may also require funding and in-kind support; identifying these will allow researchers to apply for the appropriate resources to increase impact and be able to capture the data.

3. Carry out impact seeding activities

Collecting information such as the contact details of collaborators can help researchers to later provide impact evidence. This is also a good opportunity to gather quantitative impact evidence such as survey responses or to gather ex-ante data.

4. Capture impact evidence

Using the data gathered previously, record the difference that has been made. Online resources such as Hansard⁹ can help to show policy impacts. Google Alerts can support with monitoring the web for mentions of research both within and external to the academic community. The important factor is to collect the information in an ongoing way, keeping an open mind as impacts may occur in a variety of ways

and serendipitously rather than strictly to plan.

5. Provide impact statements to research funders and stakeholders

Use a compilation of the impact evidence gathered to share a narrative about the impact that has occurred.

6. Re-purpose the impact information for different audiences

The table below summarises examples of impact evidence as discussed by delegates at the Research Impact Evidence Workshop. It was clear that whilst some disciplines may have instances of certain types of impact, for example health impact occurring from clinical research, these are not the only impacts that may occur. Researchers do well to consider, as they did in REF2014, the many different stakeholders and potential impacts that may occur from one output or activity. For example, research outputs like musical compositions could have cultural impacts such as reinvigorating a specific type of musical practice as well as commercial impacts through the licensing of such music and concert ticket sales.

This list provides examples of impact types and corresponding examples of evidence; it is not exhaustive.

Table 3: Example Impact Types and associated example Impact Evidence

Impact Type	Example Impact Evidence
Health and wellbeing	<ul style="list-style-type: none">• Reports on changes in Quality Of Life Years (QOLYs).• Statistics reflecting changes to the number of admissions, presentations at hospital facilities over time.• Patient surveys.• Testimonials from clinical staff.
Commercial and economic	<ul style="list-style-type: none">• Company reports, e.g. annual reports.• Company websites.• Licence agreements.• Cost savings reports over time.• National government statistics showing changes over time.
Public policy	<ul style="list-style-type: none">• Policy documentation.• Regulation and standards documents.• Public meeting minutes.• Social media 'shares' over time.• Legal documentation.• International non-governmental organisation policy briefings.
Societal and cultural	<ul style="list-style-type: none">• Audience surveys.• Testimonials from influential cultural figures.• Media coverage statistics such as readership.
Environmental	<ul style="list-style-type: none">• Government reports.• Charity reports.• Independent reports or reviews on improved functionality of machines.

Guidance on the types of evidence that could be collected

In the following table we explore the advantages and disadvantages of different impact evidence types and provide the types of contextual evidence that may support each type. As we have mentioned previously each piece of impact evidence is only as strong as the narrative.

Evidence Types	Guidance	Advantages	Disadvantages	Related evidence
Awards	<ul style="list-style-type: none"> Include comments from competition judges and other experts demonstrating how the research led to recognition from stakeholders. 	<ul style="list-style-type: none"> Awards and other recognition show best performance following direct comparison with other similar projects. 	<ul style="list-style-type: none"> There needs to be clear evidence that the awards are as a result of the research. Additional information may be needed to show that the research improved standards to award-winning levels. 	<ul style="list-style-type: none"> Comments from awarding bodies Testimonials from those on the judging panels.
Commercial impact	<ul style="list-style-type: none"> These should be independent and within the relevant time frame. It should be clear how the research led to changes in valuations. Evidence about spin-outs should show that the companies are commercially active not only their registration, for example sales revenue, investment raised or numbers of employees. 	<ul style="list-style-type: none"> Demonstrates the value that the research has accumulated. Sales revenues or investment gains also show impact whereas the registration of companies and agreements to work with industry without actual sales should be considered outcomes. 	<ul style="list-style-type: none"> It may not be clear how this directly links to the research without additional testimonials or other qualitative evidence. 	<ul style="list-style-type: none"> Intellectual property records specifically that the research lead to the creation of the business. Testimonials from company founders. Changes in revenue or investment. Change in number of jobs. Investment gained. Reports about research projects undertaken and the results.
Numbers qualifying in new skills	<ul style="list-style-type: none"> Using the statistics about those gaining new qualifications can show impacts on professional ability or capability. 	<ul style="list-style-type: none"> It is relatively cheap collect this data for example one can survey alumni or use online tools such as LinkedIn. 	<ul style="list-style-type: none"> A survey will only give a sample of responses. It may be difficult to attribute changes to one research piece or training programme. 	<ul style="list-style-type: none"> Testimonials. Comparisons with control groups who did not have access to the training.
IP- Patent, licences	<ul style="list-style-type: none"> Patents can be used as proof of the innovative nature of research while licenses/ sales show the commercial viability of the offer. 	<ul style="list-style-type: none"> These may show how innovative the research is. 	<ul style="list-style-type: none"> They do not show whether the innovation has been exploited and therefore actually made a difference. Attribution may be difficult. 	<ul style="list-style-type: none"> Evidence of funding to support exploiting the research. Evidence of increases in sales.
Legal	<ul style="list-style-type: none"> Changes to legislation as a result of research or researchers' advice. 	<ul style="list-style-type: none"> Changes to the legal process or regulations can have a wide impact. 	<ul style="list-style-type: none"> Further evidence may be needed to show the difference made e.g. increase in prosecutions and/or fewer accidents. 	<ul style="list-style-type: none"> Further stakeholder reports about the impact of the legal changes. Testimonials relating the research to the changes.
Media	<ul style="list-style-type: none"> The best examples are those mentioning or directly linking the research to a change. Media coverage could also show how research has informed public debate. Focus on the beneficiary. 	<ul style="list-style-type: none"> This can show how awareness about a topic has been raised. Media coverage can also show how research has informed public debate. 	<ul style="list-style-type: none"> This does not show what has changed as a result of this awareness. Some stories may be seen as sensationalist. 	<ul style="list-style-type: none"> Quantitative reports e.g. market data showing increase in purchases of technology.

Evidence Types	Guidance	Advantages	Disadvantages	Related evidence
Public policy	<ul style="list-style-type: none"> Documentation directly mentioning research's contribution specifically or a series of documents showing a change as a result of researchers' advice. 	<ul style="list-style-type: none"> Public policy changes could have wide-reaching impacts for example on a wide geographical region or large population. 	<ul style="list-style-type: none"> It may be necessary to show how the policy changes are adopted and the difference this makes. Challenges in creating impact may be due to political environment. 	<ul style="list-style-type: none"> Further reports about the impact of the legal changes. Testimonials relating the research to the changes. Petitions data. Campaigns data.
Practice Guidelines	<ul style="list-style-type: none"> Provide a narrative that shows that research informed guidelines. 	<ul style="list-style-type: none"> The professional body offering the guidelines is often well respected and has a robust process e.g. National Institute for Clinical Excellence. This can also be a good way to show the prevention of risky activity or behaviour. 	<ul style="list-style-type: none"> The guidelines may not be followed in practice. 	<ul style="list-style-type: none"> Data showing the take up of the guidelines in practice.
Reports published by organisations e.g. company report, statistical report	<ul style="list-style-type: none"> These should be from an independent body, directly mentioning the research and how it has affected stakeholders. Where reports mention audience figures it is helpful to also have evidence showing the difference made to the audience. 	<ul style="list-style-type: none"> These are independent and may include useful quantitative descriptions. 	<ul style="list-style-type: none"> They may not specifically show what difference the specific research has made. 	<ul style="list-style-type: none"> Testimonials may be needed to describe the link between the reported impacts and the research.
Social media	<ul style="list-style-type: none"> Statistics on viral spread, followers, impressions or shares can help to show engagement with a particular topic with a specific audience. These should be from an independent, well-respected figure, directly mentioning the research work and how it has affected them. Where possible, the statement could include quantitative examples of impact. 	<ul style="list-style-type: none"> This can show how awareness about a topic has been raised or informed public debate. 	<ul style="list-style-type: none"> This does not show what has changed as a result of this awareness. Maybe seen as shallow. 	<ul style="list-style-type: none"> Quantitative reports e.g. market data showing increased purchases of technology.
Testimonials	<ul style="list-style-type: none"> The best examples of the use of web links are where they are independent, and there is meta-data showing their reach, for example in-page visits. 	<ul style="list-style-type: none"> These can show specifically how the research led to the impact. 	<ul style="list-style-type: none"> Ideally these should be from senior figures in organisations. These can be seen as inherently biased in favour of the researcher. 	<ul style="list-style-type: none"> Quantitative reports showing the difference made.
Web Links		<ul style="list-style-type: none"> Web links can show how effective public engagement has been. They may also be easy to find. 	<ul style="list-style-type: none"> They do not show what actions have been taken as a result of increased awareness. 	<ul style="list-style-type: none"> Meta-data about the numbers of views and potentially any purchasing data or data showing take up of specific activities.

Conclusion

Research impact evidence is an important aspect of any impact case study or statement. This report has taken lessons from the REF2014 collection of corroborating impact evidence, consultation with assessors and sector stakeholders to provide guidance for best practice in collecting this data.

- **It is important to consider impact throughout the research project**

In order to best achieve this, researchers need to plan to collect impact evidence at all relevant stages of research projects. Frequently the same evidence will relate to multiple projects as impact does not follow a neat one-to-one relationship.

- **It is beneficial to use mutually strengthening evidence and narrative**

There was consensus among survey respondents and interviewees that focussing on the whole case study, i.e. the combination of evidence and narrative, strengthens the appreciation of what has been achieved. There are advantages and disadvantages to using any one type of impact evidence but impact evidence is more compelling when it is from a third party, empirical and refers specifically to the research or researchers. Different impact evidence types can be used together in a complimentary way; variety is to be expected and flexibility in this type of reporting encouraged.

The guidance supports triangulating impact evidence to provide the most compelling impact narrative.

- **Researchers can do more to link their specific research with impact**

The best impact evidence is that which specifically demonstrates the difference that has been made, how the impact has occurred and explains the context in which it happened. Collecting impact evidence in this way also supports the understanding of and differentiation between activities leading to change and the impact itself. Demonstrating the pathway enables the most valuable routes to be recognised and correctly resourced.

- **Collecting impact evidence is valuable for internal purposes as well as funder assessment**

Early indicators from the workshop suggest that impact evidence is beginning to be used by internal management teams in research institutions in addition to offering funders useful insight into which users/beneficiaries are gaining value. Therefore, impact evidence needs to be collected and stored in a way which enables it to be presented for both audiences.

While the ways of reporting may change it is clear that impact and impact evidence will continue to be of importance to the research sector. As such, this guidance provides support for researchers collecting impact evidence to gather the most compelling information.

Appendix

Guidance Consultation Process

1. Analysis of the Impact Evidence in REF2014

Analysis of the existing body of impact evidence as submitted by UK research organisations helped to show the types of research evidence offered by the sector. The text analysis is provided by Digital Science.

2. Analysis of Impact Evidence as stored in VV-Impact Tracker

Vertigo Ventures contribute analysis from the VV-Impact Tracker tool which is supporting organisations to collect impact evidence information in real-time. These anonymised and aggregated data help to show what researchers and institutions are collecting to corroborate their activities and impact claims.

VV-Impact Tracker is an impact data capture system provided by Vertigo Ventures to several world-class universities and research institutes. It is used by researchers and research management support teams, working across all disciplines and provides a framework and taxonomy for structuring impact evidence. Researchers upload project information including links to underpinning research, information about translational activities such as public engagement and impact indicators as well as evidence.

The exports from the tool help us understand how researchers are storing impact evidence. The snapshot shows us what evidence researchers are prioritising. The researchers working across various disciplines are using

the tool to plan impact activities as well as retrospectively capturing impact information. This tells us how those at the forefront are conceptualising future impact and what evidence they are likely to collect as a result.

3. Survey of Impact Sector

The report was further enhanced by a survey completed by impact experts in over 30 research organisations.

The Research Impact Evidence Survey opened to all interested parties in the sector was completed by 66 participants from over 30 organisations. Participants in the survey came from various disciplines and had a variety of job roles.

4. Main Panel Chair Interviews

In-depth interviews with the Main Panel chairs that led the assessors in the REF process provided valuable insights about how research evaluators used impact evidence and what could improve future assessments.

5. Research Impact Evidence Workshop 24 March 2016

This guidance is also informed by a sector outreach through a facilitated workshop with representatives from a wide variety of nominees from learned societies, REF panel members and impact experts.

About the Authors

Vertigo Ventures provides cutting-edge impact reporting tools and services for research teams in government-funded research organisations who lack the ability to manage impact information, across the organisation, ahead of regular funding applications, quarterly internal reporting and periodic government quality reviews.

VV-Impact Tracker is a cutting-edge, online, Software-as-a-Service tool developed by Vertigo Ventures Ltd and launched in 2014 with UK institutions to help researchers and HEIs to identify, store, validate, and organise impact information and evidence from funded and non-funded projects.

Digital Science develops and supports technology that makes research more efficient. It designs next-generation tools and software to help various stakeholders in scientific research – from simplifying processes and sharing data more easily, to rethinking how we measure and evaluate a researcher's impact on their community.

Vertigo Ventures wishes to acknowledge **Digital Science's** analysis and contribution for the chapter titled 'REF2014 Impact Evidence'.

