



# Reviewing the returns of research

## Capturing payback from funding by the Arthritis Research Campaign

Over 100 million people in Europe have some form of arthritis. More people in Europe suffer from arthritis than any other chronic medical condition. The disease not only diminishes sufferers' quality of life but also has significant economical consequences. Arthritis is the second most common cause of time off work among men and women in the UK. In 2001, an estimated 206 million working days were lost due to arthritis (equivalent to £18 billion), while direct costs to health and social services amounted to £5.5 billion. An urgent need exists to improve our knowledge of the complex processes underlying the disease, in order to deliver more effective treatment and, ideally, prevent its onset.

The Arthritis Research Campaign (**arc**), founded in 1936, is the only major medical research charity in the UK investigating arthritis in all of its forms. As the UK's fourth largest medical research charity, arc invests £20 million annually in project and programme grants, fellowships and institutes.

To mark its 65th anniversary, **arc** undertook a strategic review of research activities and impacts. The review was informed by consultations with **arc**'s stakeholders and found an apparent gap between the aspirations of people affected by arthritis and the ability of science and academia to meet those aspirations. To address this gap, **arc** identified the need to develop an evidence-led strategy on which to base future research funding decisions. Its aim was to improve the translation of new scientific knowledge into benefit for sufferers. To do this, **arc** needed to understand how its previous research had been translated into patient benefit. Accordingly, **arc** commissioned RAND Europe to review and document the long-term outcomes of research grants it awarded in the early 1990s, with the aims of capturing outcomes, informing future funding strategy and identifying success factors in translating research into practice.

The research was led by RAND Europe in collaboration with the Health Economics Research Group at Brunel University. The team conducted case studies of 16 research grants awarded in the

### Abstract

Biomedical research produces a range of outputs that can lead to a variety of outcomes, and only some these paybacks are captured by traditional evaluation tools. For people depending on scientific advances for improved treatment, the translation of new knowledge into practice is the most important of these paybacks. Research charities, as funders closely linked to patient stakeholders, have a particular interest in scrutinising the paybacks from funded research, and promoting investment that leads to effective translation. Detailed retrospective analysis of outputs and outcomes of funded projects provides the evidence required to achieve an optimum balance of investment, as well as giving funders a more precise idea of the return on their investment in research.

This REsource outlines a novel evaluation of the 10–15 year paybacks of research grants by the Arthritis Research Campaign (**arc**). This evaluation used a multi-dimensional payback framework with the aim of informing funding and governance decisions by comparing the value for money of different types of grants, and identifying success factors in the translation of research into practice.

early 1990s. These grants were selected to mirror the variety of **arc** funding including project, programme, fellowship and institute funding as well as basic clinical and allied health professional (AHP) research.

The research was structured around the Buxton-Hanney Payback Framework, which consists of a logic model of the research process and a five- category classification system for the benefits of research. These categories are: knowledge production; capacity building; informing policy and product developments; health benefits; and broader economic benefits.

Methods used to gather information on the selected case studies included interviews with principal investigators and their teams, and review and analysis of relevant publications and **arc** archive material. In the final phase of the project, the case

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studies were compared in a cross-case analysis based on individual qualitative assessment and consensus-scoring on the five-payback categories.

The insights gained in the course of the evaluation work led to the following six conclusions:

### **Individuals translate research**

Human interaction, rather than funding mode or publication impact, is the key factor in driving effective translation of research into practice. Translating findings from the 'bench to the bedside' is largely due to the conviction, effort and personal networks of the principal investigator. This conclusion reinforces earlier studies that have shown the value of encouraging partnership among researchers, practitioners and industrialists in achieving successful translation. Hence, research funders concerned with improvements at the front line of patient care have an interest in investing in networking activities as well as scientific research itself.

### **Short, focused project grants seem to provide value for money**

There is a widespread view in science policy that long-term stable funding is preferential. The **arc** study, however, indicated that smaller project grants could offer similar payback to that identified for larger programme grants. The resulting significant value for money of these projects illustrates that **arc** should continue to include smaller, focused grants as part of its wider research funding portfolio. The comparison of grant outputs by funding type is shown in Figure 1.

### **There is a diversity of research payback**

The broad definition of research benefits used by the payback model revealed that each of the research projects examined yielded a much richer range of outputs and outcomes than expected. As shown by the examples listed in Table 1, relevant benefits generated include research training, advances in methods for clinical testing, as well as improved health outcomes and wider economic returns.

### **Intended or unintended flexibility in funding is used advantageously**

Examination of the case studies suggested that flexibility in the scientific and administrative management of grants, for example, allowing flexible use of funds for exploration of new research avenues, has an often positive, and at worst a neutral, effect on the outputs and outcomes of the research sponsored. Therefore, a

case can be made for building a degree of flexibility into scientific funding.

### **Referees' contributions to the peer-review process are of variable benefit**

The opinions of referees on proposed research projects are an established and central element in grant allocation. They represent a potentially valuable source of expertise and advice. However, only in a minority of the case studies examined—four out of twelve—did referees' comments have any influence on the design of the work subsequently undertaken. In the two cases that subsequently delivered the highest payback, grants were allocated only after the referees' unfavourable comments had been overruled by the assessing panel. Hence, despite the large amount of energy committed to the peer review process, the constructive contribution of referees' comments proved to be limited.

### **The payback framework could be operationalised and embedded by arc**

The payback framework proved to be effective in capturing the diverse range of **arc**'s research outputs and outcomes, and in identifying the cases where the research had been translated to benefit people with arthritis. Given the appropriate management information, there is good evidence, therefore, that the payback framework developed for **arc** could be operationalised to prospectively monitor the returns from arthritis research. If applied prospectively, the framework could be used to inform the granting of the recommended translation and partnership awards.

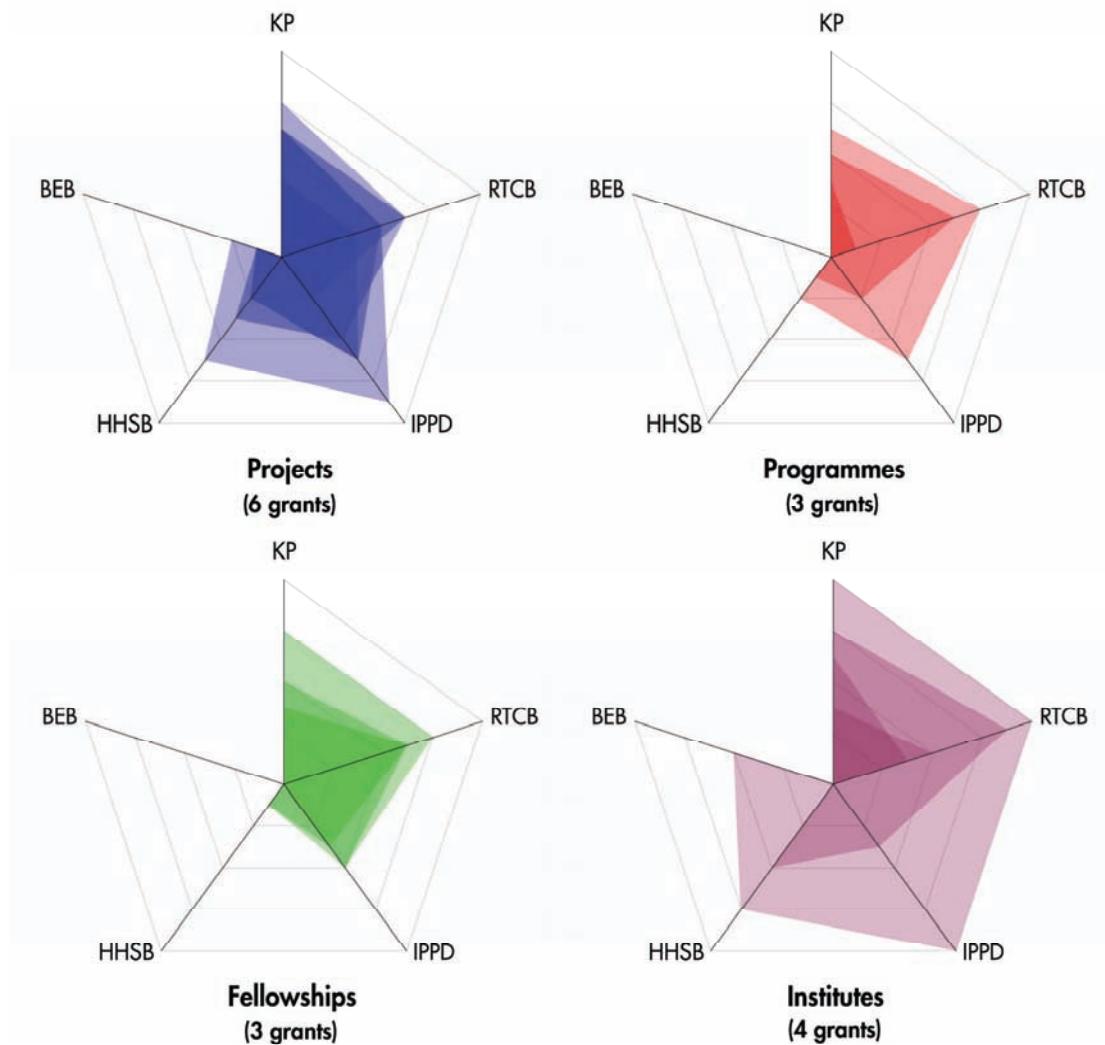
### **Concluding observations**

The retrospective evaluation of grants proved an innovative way to produce a wide-ranging catalogue of the benefits stemming from **arc**-funded research. The evaluation also provided other valuable insights including highlighting the value of project grants and funding flexibility.

The systematic and prospective use of the payback categories should enable **arc** to establish continuous monitoring of the diverse benefits arising from its investments. The information gathered could be used both for decision-making processes and for informing its stakeholders.

In a wider context, the successful adaptation of the Payback Model to assess the long-term benefits of biomedical research shows its potential for generating novel strategic insights in other research and organisational contexts.

**Figure 1: Value for money of different funding modes**



For every project, the payback in each category was scored on a scale of 1–9. The scores were produced using a consensus-scoring system based on the RAND/UCLA Appropriateness Method. These scores provide a payback profile.

The case studies were then grouped by funding mode and the profiles overlaid to produce the figure above. More intense colour indicates the overlap of more case studies. For example, the three case studies for programme grants can be clearly distinguishable by areas of varying intensity.

**Table 1: Diversity of payback in arc case studies**

Payback category	Payback	Example
Knowledge production	<ul style="list-style-type: none"> <li>Peer-reviewed publications in the serial literature</li> </ul>	<ul style="list-style-type: none"> <li>302 papers receiving a total of 975 citations per year attributable to case studies</li> </ul>
Research targeting and research capacity	<ul style="list-style-type: none"> <li>Postgraduate research training</li> <li>Subsequent career development of PIs and research assistants</li> <li>The transfer of technical know-how</li> <li>Inform future research studies</li> </ul>	<ul style="list-style-type: none"> <li>28 PhD/MDs from work on the case studies</li> <li>Development of technological know-how in genetic mapping</li> <li>Informed &gt;£2 million Medical Research Council (MRC) randomised controlled trial</li> <li>Use of biologicals as therapeutic targets</li> </ul>
Inform policy and product development	<ul style="list-style-type: none"> <li>Inform recommendations in clinical guidelines and other policy advice</li> <li>Inform development of clinical tests</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation in Royal College of Obstetricians and Gynaecologists (RCOG) guideline on the use of aspirin and heparin for women with antiphospholipid syndrome (APS)</li> <li>Recommendation in Industrial Injury Advisory Council (IIAC) assessment for hip osteoarthritis (hip OA) in farmers to be a prescribed disease</li> <li>Clinical test for a rare type of systemic lupus erythematosus (SLE) and chondrodysplasia type Schmidt</li> </ul>
Health and health sector benefits	<ul style="list-style-type: none"> <li>Improve the quality of life for people with rheumatoid arthritis (RA)</li> <li>Reduce the likelihood of recurrent miscarriages for women with APS</li> </ul>	<ul style="list-style-type: none"> <li>Hundreds of thousands of patients treated with anti-TNF, of whom 70% experience a significant improvement in health</li> <li>Use of aspirin and heparin for women with APS increases live birth rate by 40% compared to the use of aspirin alone, and by 60% compared to no treatment at all</li> </ul>
Wider economic benefits	<ul style="list-style-type: none"> <li>Unquantified economic returns</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in days off work and sales of licensed drugs</li> </ul>

### Further reading

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