Reviewer’s report

Title: Mapping global health research investments, time for new thinking - A Babel Fish for research data.

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Reviewer: Ian Viney

Reviewer’s report:

Thank you for the opportunity to review the paper by Robert Terry and colleagues. I entirely agree with the thrust of the paper. Worldwide there is significant funding channelled into medical research, but relatively little joined up effort to maximise this investment. A first step to greater co-ordination has to be a common understanding of current and past investment that will allow analysis of research by scientific field/disease area and by stage of development/technology readiness. At the highest strategic level funders need to understand the scale of investment along these dimensions to support the debate about the appropriate balance of funding across their portfolios. In medical research we have the advantage of multiple funding sources for research across public, charitable and private sectors, but this means that it is challenging to set any single portfolio in the context of work done at a national and international level. This is an argument that the European Medical Research Council has already recently made at the European level, as referenced in the paper (reference 4).

This is not to imply at all that financial measures are best to assess the volume of research underway, and greater investment in any particular area will mean more progress in that area. Obviously the cost of supporting research in different areas varies significantly, and progress from research is highly uncertain, some areas are more tractable etc. It should be noted that significant efforts are being made to capture information about the progress, productivity and quality of research output. This is an area which is even more complex than portfolio analysis, and at an earlier stage of development across major international funders. The capture and analysis of output information would also benefit from greater co-ordination and harmonisation across funding agencies and research performing organisations, if there is ever to be a shared view of the impact from research investments. It is also timely to think about this now, before many diverse approaches to defining output become entrenched. I would suggest that ultimately research organisations should be more concerned about what research is actually delivering and how they can find ways to maximise impact and overcome barriers to progress, rather than analysing their commitments to support work in various areas. However, having just one common and robust measure internationally (even an input measure) would be a start.

There was one paragraph that I took issue with, in this otherwise excellent paper (third para under Main text “A kaleidoscope of R & D classification systems”). The paragraph starts with the statement that UK funders have “tried” to classify their research portfolios against the HRCS. This approach has actually been
routinely used by several funding agencies across Europe and internationally (e.g. in Singapore) to track changes in their health research portfolios since 2005. This is also a good example of a system of classification where its use has helped to underpin a significant number of new strategic initiatives under the auspices of the UK Clinical Research Collaboration. As noted in the paper research organisations in the UK have just completed an analysis of more than 10,000 awards across the 12 main public and charitable funders of health research in the UK, that spent more than £2bn on health research in 2009/10. This analysis will make comparisons with the extensive analysis conducted in 2004/05 in the UK (http://www.ukcrc.org/researchcoordination/healthresearchanalysis/ukanalysis/). So I think that there has been considerable success in using the HRCS to analyse health research portfolios across multiple funders, and this is why there was some support from the EMRC to endorse the HRCS as a leading approach for categorising health research. The use of the HRCS is also treading the path taken by an already successful international initiative in cancer research (the International Cancer Research Partnership ICRP https://www.icrpartnership.org/) which uses a very similar categorisation (the common scientific outline, CSO) to analyse over $12bn of funding from 55 organisations across the USA, Canada, the UK, France and the Netherlands. Information coded using the CSO can, and has been mapped to the HRCS. The comment at the end of the paragraph about implementation of the HRCS requiring “considerable manual coding” and “integration into multiple funder grant systems not being a simple process” is poor in its imprecision. Any categorisation that cannot currently be automated to an acceptable level of quality requires manual coding, and the care and attention taken to consistently apply that coding will determine the quality of the results that can be obtained from subsequent analysis. The Medical Research Council for example maintains at least three categorisation schemes including the HRCS and MeSH, which are required for the range of strategic policy and routine reporting tasks we have to perform. HRCS is not any more complex than many other categorisation schemes in use across funding organisations worldwide. The integration of any additional data, or processes into multiple systems will of course “not be a simple process”, but if the ICRP is used as an example of a successful shared resource in operation then it can be seen that solutions need not be prohibitively expensive or resource intensive. It may be possible to develop shared datasets of portfolio information which are coded, and then information made accessible or returned to funders. It may not be necessary to amend each and every funder’s management information systems to include processes to code awards.

The paper is right to highlight the need for automated approaches to categorise research portfolios, and this is also a call made in the EMRC policy brief published last November. Current automated approaches still require a large amount of human intervention to quality control the output, or to teach coding rules to the system. However we hope to see these approaches improve as more effort is put into this area. For example in the UK the 12 largest public and charitable funders of health research are discussing a collaboration which we hope will advance the use of automated approaches to code awards using the
HRCS. I am sceptical that in the short term such approaches will replace manual coding where organisations are committed to routinely using a particular coding system unless these systems can be offered at significantly lower cost and deliver much greater accuracy. However I think that automated approaches do promise to offer the ability to quickly and roughly code portfolios with large numbers of projects that need to be separately categorised, from scratch – where it would not be possible or a sensible use of resources to do so manually. This will effectively provide the “translation” function required, not mapping one categorisation to another, but going back to the source data and applying a new coding to it.

There does seem to be a revolution in searching and classification approaches used on the internet. However it is a concern that there seem to be very few suppliers addressing the issue of automated coding, and this lack of competition means that research organisations are worried about future costs to access this technology.

The principles outlined briefly in the paper are very sensible. In particular I would emphasise the benefits that reliable data about portfolios can bring to research organisations; opportunities to collaborate, the ability to avoid duplication and to spot research gaps and opportunities, and support for strategy development. I would agree that the benefits should easily justify an investment to better co-ordinate health research, but of course budgets for the administration of research have never been under greater pressure than they are now.

Lastly the paper tailed off somewhat. Clearly it would be stronger if there were concrete plans to start on the first steps outlined, but maybe this article is to encourage others to pursue this? The EMRC policy brief will be re-visited later this year to see what progress has been made against the recommendations, and a follow up paper is currently with the EMRC standing committee for approval. The participation and enthusiastic support to shape this work from the organisations represented by the authors would be extremely welcome.

Summary
The paper addresses an important and timely issue

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Declaration of competing interests:
The following are non-financial interests, and not necessarily competing, but I’m declaring them anyway.

I served as chair of the EMRC expert committee on the classification of research portfolios in 2011, which drafted the Science Policy Briefing 43 on “Health Research Classification Systems – Current Approaches and Future
Recommendations”. Two authors of the paper contributed to the EMRC discussions.

I am current chair of the UKCRC Health Research Advisory Forum, which is responsible for co-ordinating the new analysis of UK health research portfolios using the HRCS. One author is also a member of this group.

I am head of strategic evaluation at the Medical Research Council which spends more than £700m a year to improve human health through world-class medical research. To achieve this, we support research across the biomedical spectrum, from fundamental lab-based science to clinical trials, and in all major disease areas. We work closely with the NHS and the UK Health Departments to deliver our mission, and give a high priority to research that is likely to make a real difference to clinical practice and the health of the population.