

Department for Business, Innovation and Skills - Postgraduate Review**Response by the Wellcome Trust**

December 2009

1. The Wellcome Trust is the largest charity in the UK. It funds innovative biomedical research, in the UK and internationally, spending over £600 million each year to support the brightest scientists with the best ideas. The Wellcome Trust supports public debate about biomedical research and its impact on health and wellbeing.
2. We welcome the opportunity to respond to this consultation. The Trust is a strong advocate for the importance of talented individuals in advancing science, and we maintain a strong emphasis on career development and training across our various funding streams. Of particular relevance to this consultation is the Trust's 4-yr PhD Programme, which has been a key influence of recent improvements to the quality of PhD training within the UK. Additional information on the Trust's 4-year PhD Programmes is attached as an Annex.
3. It is clear that the review has a strong emphasis on the contribution postgraduates make to the UK economy, in particular through obtaining skilled employment. There is remarkably little acknowledgement of the important contribution of postgraduates to sustaining the research base. From the Trust's perspective, it is important that the review also gives adequate emphasis to this.

Theme 1: International

4. A significant proportion of PhD students funded by the Wellcome Trust come from non-UK nationalities - particularly from Europe. A number of these undertake their undergraduate degree in the UK prior to enrolling on their PhD, which suggests that policy interventions to maintain the attractiveness of UK postgraduate study should also consider the incentives that exist at the undergraduate level.
5. In general, the factors that make the UK an attractive place for postgraduate study are likely to be similar to those that make it an attractive environment to carry out research. Continued investment in our world-leading universities, and in high quality research infrastructure, is the best way to ensure that the UK continues to attract top postgraduate talent.
6. Other possible determinants of the relative attractiveness of the UK as a destination for postgraduate study include:
 - **Cost (including cost of living) and the availability of financial support** - the loss of the Overseas Research Students Awards Scheme (ORSA) has had a significant impact on many postgraduates of the highest quality. We suggest that a scheme to provide similar funding is reintroduced, although it should be modified to reflect the fact that many PhD training programmes last for four years rather than three and the mechanism for allocation of the awards may need to be reviewed.
 - **The relative ease of obtaining a student visa** - the Wellcome Trust is concerned that the introduction of the UK's new points-based immigration system has led to delays and significant increases in bureaucracy associated with processing visa applications. If this is not addressed, the UK's reputation as a destination for top international scientific talent may be harmed.

- **Access to high quality mentoring and career guidance**
- **The availability of English language tuition.**

7. While international postgraduates are clearly an important source of revenue for institutions, there are other compelling reasons for UK postgraduate education to have an international focus. For example, by providing study opportunities for students from developing countries, UK institutions play a vital role in building skills and research capacity in the developing world. Existing fee levels are already a barrier to many students from developing countries and institutions should not be encouraged to maximise fee revenue at the expense of limiting the UK's ability to fulfil its responsibilities in the areas of international development and support for global scientific advancement. Given the potential for competing drivers it is important that BIS works with DFID to ensure that government signals in this area are aligned.

Theme 2: Value of postgraduates

8. This section correctly identifies that postgraduates take up a wide range of careers, and have a catalytic role in growing innovative businesses. The link between economic growth and a highly skilled workforce is well recognised, and in the current economic climate it is likely to be a key argument for maintaining government investment in higher education. However, it is important to acknowledge that the contribution of postgraduate education to society is broader than just wealth creation and the contribution of skilled graduates to the public and charitable sectors is equally vital. This section could also acknowledge the valuable contribution of postgraduates to undergraduate teaching.

Theme 3: Business, Employment and Skills

9. One of the key questions identified in the review is how postgraduate provision in the UK can better respond to the needs of business. While it is clearly important that employers are able to access graduates with the right skills, there may be risks associated with aligning postgraduate education too closely with the needs of particular employers or industries.
10. As acknowledged under the previous theme heading, students undertaking postgraduate education move into a wide range of careers, which are not always closely related to the course of study. It is important that students have access to quality careers advice and are encouraged to keep an open mind with regard to the range of career possibilities open to them.
11. Many students who undertake PhD study will progress into a research career – the Wellcome Trust's reviews of our PhD Programmes have found that most final year PhD students want to stay within academia and around three-quarters of all Trust-funded PhD students take a first post in academic research. It is likely that such students will require a broad base of skills and knowledge rather than the more narrow set of vocational skills that may be favoured by industry employers.
12. Rather than attempting to change existing provision to align with specific employer needs, we suggest that employers could be more proactive in offering financial support and internships to attract students into relevant courses of study and enable them to gain relevant vocational skills and experience. This will be particularly important in the event that student fees increase.

Theme 4: Participation

13. The Trust agrees that there is a role for widening participation in postgraduate education and for alternative models of provision, while ensuring that excellence is maintained. We suggest that the emphasis should be on increasing appropriate participation in high quality postgraduate training rather than on increasing participation *per se*.
14. We agree that it would be useful to obtain more information about those undertaking postgraduate study, although this should draw on the body of evidence that already exists. The Trust has launched a career tracking survey to enable more systematic tracking of research and career outcomes for those we support through our fellowship schemes, although many of these extend beyond the postgraduate level. The Research Councils have also

Annex: Background information on Wellcome Trust 4-year PhD programmes

commissioned a study in partnership with the Higher Education Statistics Agency (HESA), which will explore the destinations and career choices of postdoctoral students and examine their contributions to our economy and society. There are plans to conduct follow-up case studies exploring issues such as usage of skills gained during their PhD, and a study of employers to ascertain the added value of an employee having a PhD.

Theme 5: Fees and funding

15. While we agree that it is important to ensure that the funding model for postgraduate provision is sustainable, the Trust does not have a view on the specific questions raised through this review. We consider that access to postgraduate education should be on the basis of merit and would not support moves to restrict access on the basis of ability to pay. As discussed above, there may be a role for greater financial support from employers, particularly where the course of study is closely aligned to a particular job.
16. Given the importance of training researchers with *in vivo* skills¹ it is important that research funders that support postgraduate training consider the provision of realistic costs to support the specific research to be undertaken.

Theme 6: The Student Experience

17. Through our Four-Year PhD Programme the Wellcome Trust has developed a model that we consider to be best practice in terms of delivering a high quality postgraduate student experience. A key innovation was the introduction of a first year of laboratory rotations and taught courses that enables students to gain exposure to a range of different research environments prior to selecting a research project. Additional key elements are the provision of more generous student stipends that are based on graduate research assistant salaries after tax, realistic research costs and placement in successful and well-funded research laboratories with access to high quality research training and mentorship. The high completion rates and high rates of retention of trained individuals within research suggest that this is a successful approach, and it has been widely adopted by other funders.
18. The *Concordat to support the career development of researchers* also identifies a number of factors that make for a positive and successful research career, many of which are also applicable at the postgraduate training stage. These include opportunities to develop transferable skills, access to independent career advice, support for mentoring and flexible working conditions that promote diversity and equal access.
19. We would be happy to discuss any of these issues in more detail if it would be helpful.

¹ For example see

http://www.bbsrc.ac.uk/organisation/policies/reviews/consultations/0905_bioscience_research_skills.pdf
http://randd.defra.gov.uk/Document.aspx?Document=CB0419_8185_FRP.pdf
<http://www.abpi.org.uk/Details.asp?ProductID=338> and <http://www.abpi.org.uk/Details.asp?ProductID=325>)

Wellcome Trust 4-year PhD programmes

1. The Wellcome Trust funds the largest number of PhD studentships among medical research charities in the UK. Reviews of Trust funding of PhD training have indicated that it has been highly successful, both in terms of providing a 'best practice' example to other funders, and in terms of the specific outcomes. Completion rates are high and a tracking study of the 1994-2002 cohort conducted in 2008 found that nearly two thirds of those trained had continued in academic research.
2. The Trust's aims in funding PhD studentships are:
 - to fund high quality researchers;
 - to equip students with both scientific knowledge and the practical research skills which will form an excellent basis for a career in research;
 - to develop highly-skilled researchers who can contribute to the UK research base; and
 - to provide the individual with a positive experience of research.
3. The first Four-Year PhD Programme was established in 1994 with the express purpose of improving the quality of PhD training for basic scientists in the UK. A key innovation was the inclusion of a first year of lab rotations and taught courses to enable students to develop experience and knowledge of different research areas prior to selecting a research project. At the end of the first year, students will make an informed choice about their three-year PhD research project.
4. The considerable success of the Four-Year PhD Programmes for basic science led to the establishment in 2006 of Clinical PhD Programmes, which aim to develop the next generation of clinical academics.

Funding provided

5. The Trust currently supports 27 Basic Science PhD Programmes based in centres of excellence throughout the UK, with specialised training provided in a range of important biomedical research areas:
 - developmental biology and cell biology
 - genetics, statistics and epidemiology
 - immunology and infectious disease
 - molecular and cellular biology
 - neuroscience
 - physiological sciences
 - structural biology and bioinformatics.

We also fund a four-year PhD programme at the Wellcome Trust Sanger Institute, and seven Clinical PhD Programmes/

6. Support is provided for four years and includes:
 - a stipend (or clinical salary for Clinical PhDs)
 - PhD registration fees at UK/EU student rate

- Contribution towards laboratory rotation expenses in the first year (Basic Science PhDs only)
- Research expenses for years two to four
- Contribution towards travel
- Contribution towards transferable-skills training.

Evaluation and Review

7. Evidence suggests that the Trust's 4-year PhD Programmes have had a significant policy impact and the Trust is seen as an 'innovator' in the UK PhD training landscape:
 - Following the Roberts' Review the Trust's four-year PhD programme model was adopted by other major medical research charities (CRUK and BHF) and is thought to have prompted the introduction of Doctoral Training Grants (DTGs) by the Research Councils.
 - A 2007 Association of Medical Research Charities (AMRC) briefing described the Trust's four-year studentships as an 'attractive initiative', and suggested that other AMRC members could consider similar initiatives, given the increasing emphasis on the importance of skills training and cross-disciplinary research. It also noted the importance of the provision of nationally competitive studentships with adequate support both in terms of the stipend and other costs in order to attract high-quality students.²
8. Over the last decade there have been a number of internal reviews of the different models of PhD training support provided by the Trust alongside support provided by other funders. Key findings include:
 - **Four-year PhD training programmes** are particularly valuable to **enable individuals to learn about new areas and methodologies, move between disciplines, conduct interdisciplinary work and make an informed choice of supervisor and project.** More experienced researchers and those who had a very clear idea what PhD project they wanted to pursue preferred the flexibility offered by the 'prize student'/3-year route to PhD training.
 - The 'terms and conditions' associated with the Trust's PhD training support – particularly **the stipend – has acted as a major attraction for prospective students.**
 - Indications that **PhD completion rates among Trust 4-year PhD students are higher** than for Trust students supported via other routes and compare favourably to data available from other UK funders.
 - The different studies show that **around three-quarters of all Trust-funded PhD students take a first post in academic research.** There is an indication that the proportion remaining in scientific research is higher among those supported via the 4-year programme compared to other Trust routes.

² AMRC Briefing on Postgraduate Studentships, 2007

- A preliminary study of the destination of 305 individuals funded through the Wellcome Trust 4-year PhD Programme from 1994-2002, conducted in 2008, found that:
 - Nearly two-thirds (61%) of traced awardees (n=187) were still in academic research, with 67% of these in the UK and 33% overseas. Of the 187 individuals who were still in academia, 12% (n=22) had received further funding from Wellcome Trust, MRC, BBSRC or the Royal Society as a Principal Applicant.
 - There was a small, gradual attrition from academic research over time. Only 55% of one of the earlier (1996) cohorts was still in academia, compared to 61% of the 2002 cohort. The rate of attrition for women was more marked, with 25% of the 1996 cohort remaining in academia, compared with 59% of the 2002 cohort'.
 - 7% of traced awardees were in pharmaceutical research (n=23). Other destinations outside of academia included scientific publishing and IT consultancy.
 - 21% per cent of awardees were working in academia overseas and most of those outside the UK were also outside of Europe.
 - Across all the studies, **the rate of attrition for women from academia is more marked than for men.**
9. There is also some evidence from a review of the UCL 4-year Programme in Neuroscience carried out by its Director David Attwell that 4-year students tended to have higher publication and citation rates over the short- and long-term (further information available if required).
10. While these reviews indicate a range of positive benefits to early career researchers in receipt of Wellcome Trust's PhD training support, we have identified a need for much better and consistent data on PhD research and career outcomes in general. The Trust is developing more comprehensive and systematic mechanisms to enable tracking of research and career outcomes of all those it supports.