

An international review on Governments' research procurement strategies

A paper in support of Getting the evidence: Using research in policy making



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executive summary

- 1 This report presents the results of an international review of how the governments of five countries in North America and Europe procure and manage research to improve service delivery and policy development. It complements the National Audit Office report, "Getting the evidence: Using research in policy making", which provides an assessment of the research activities of UK government departments and examines how research is used to improve service delivery and inform policy making in this country.
- 2 The main objectives of this paper are twofold. First, it aims to describe how research and development is commissioned, managed and used in a number of different countries. Second, it provides a basis for examining the research and development activities of the UK within an international context and for learning if and how innovative elements from other countries may be incorporated into or modified to suit the UK research and development model. Unlike "Getting the evidence: Using research in policy making", the international review covers science based activities as well as research commissioned by Government departments for policy making. This is because these two elements of publicly funded research are not always as easily distinguishable as they are in the UK.
- 3 Countries were selected according to several criteria. First, only countries with sizeable investments in research and development (at least exceeding 1.75% of GDP) were considered. Second, in order to examine the effects of institutional context on research and development activities and outcomes, countries were selected with a range of government structures. Finally, in order to present comparisons relevant to the UK context, selected countries did not differ fundamentally from the UK on any of the previous criteria.
- 4 Application of the selection criteria led to a comparative examination of the following five countries: Canada, Finland, Germany, the Netherlands and the United States (US). Information gathering mainly comprised desk research supplemented by additional, targeted interviews. The organisation and analysis of the information was based on a conceptual framework and issues that emerged during the course of the overall study.
- 5 The executive summary first presents the main findings from the international review. It then briefly reviews the significant similarities and differences in research and development practices among the selected countries and between the countries and the UK. First, research and development investment level is summarised, then priority setting and coordinating processes are compared, followed by selecting and commissioning practices and, finally, evaluation approaches and research transfer are examined. More details on the practices of each individual country are provided according to the same structure in the subsequent chapters.

Main findings

- 6 The main findings from the international review are as follows:
- Government departments in the selected countries struggle with the complexity of how best to determine research priorities and set appropriate research strategies. New organisations and structures emerge to cope with these complexities, some moving towards centralisation and concentration, some towards decentralisation. Either way, these changes aim to stimulate new ways for departments to think about research and development and policymaking, to prioritise research decisions and to set research strategies.
 - The need for more and improved information systems to provide comprehensive overviews of diverse research and development commissioning practices and options is apparent in the selected countries. Ideally, such information systems could serve several important objectives by maintaining and sharing information for analysis, thus improving coordination activities and increasing transparency.
 - Evaluation of the quality of the research process is well established. However, there is a strong and developing emphasis on evaluation to encompass research relevance and value for money, as the link between research results and policy formulation increasingly becomes the focus of attention. As yet, obvious models or practices that support the link are not readily available. Similar findings emerged from the UK-based study of research and development transfer into practice.
 - As in the UK, government departments and research organisations in the selected countries strive to provide value for money in terms of research output. However, there is widespread understanding of the need for "blue-sky" research that brings no, or little, short-term return on research investments, but is essential for long-term development. Balancing these often competing demands proves difficult.
 - In Canada, the "Linkage and Exchange" model provides an interesting example of research implementation in the health services policy arena. It proposes that involving eventual end users at all stages of the research process will result in an increased impact of research on policymaking.

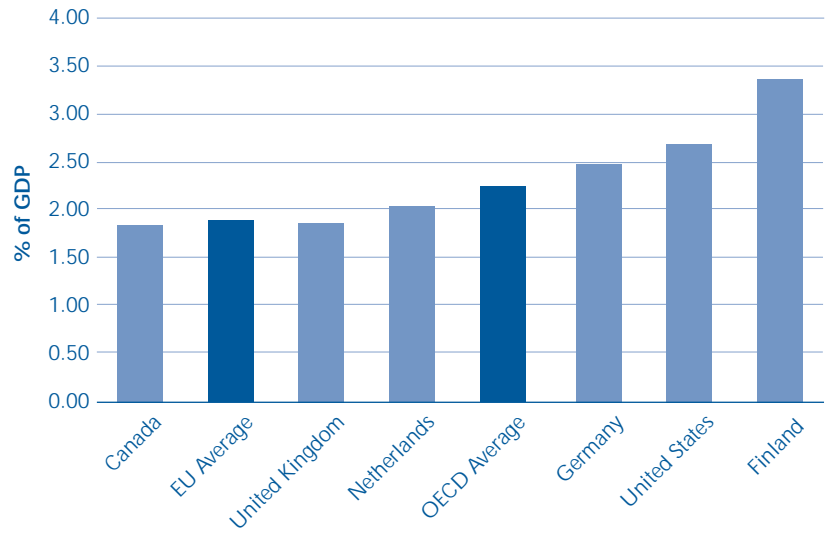
International expenditure on research and development

- 7 While there is a considerable range in levels of investment in research and development among the selected countries and the UK, two distinct groups can be distinguished. Group one, Finland, the US and Germany, all spend close to or more than 2.5% of Gross Domestic Product (GDP) on research and development, and thus invest more than the Organisation for Economic Cooperation and Development (OECD) average of 2.24%. Group two, the Netherlands, UK and Canada invest less than the OECD average, ranging from between 1.84% (Canada) to 2.02% (the Netherlands). The gross expenditures on research and development (GERD) are shown in **Figure 1**. GERD is the standard expenditure measure which covers all research and development carried out on national territory.
- 8 **Figure 2** shows the amount of government budget appropriations for research and development (GBAORD), as a percentage of GDP. GBAORD presents information about research and development financed by government based on budget data and is more up-to-date than actual expenditures. Defence spending in the UK and US accounts for more than 50% of total GBAORD. However, when considering civil government spending on research and development (civil GBAORD), it becomes clear that the UK and the US are the lowest investors in civil research and development, dropping even below the civil research and development average expenditure for OECD member countries. In contrast, the importance of civilian research and development spending to the Netherlands, which spends relatively little on defence, becomes clearer and the leading position of Finland, with its marginal defence spending, is even more accentuated.

Similarities and differences in practice among selected countries

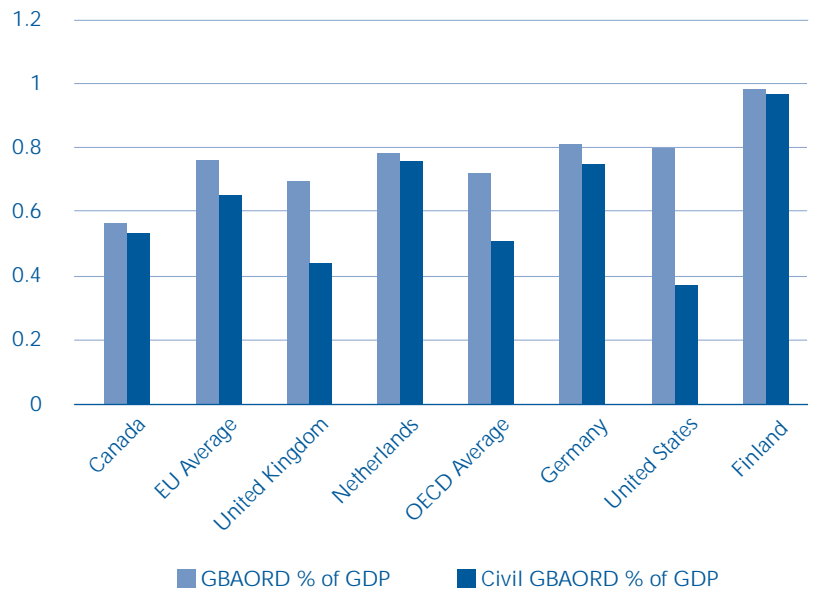
- 9 **On priority setting and coordinating processes.** Two main issues relating to priority setting and research coordination emerged from the review of government departments and research bodies in the selected countries: first, how best to translate policy needs into research priorities, and second, how to coordinate research priorities across, and, to a lesser extent, within ministries.
- 10 Aiming to address the first issue, a number of different practices can be distinguished across the countries selected. The most important differences relate to the level of concentration or centralisation at which priority setting takes place. In Canada and the US, the decisions are made within a highly decentralised environment predominantly via external boards that advise the respective departments and agencies. In Canada, the process is formalised through Science Advisory Boards (SABs). In the US, each agency tends to rely on its own iterative, and often complex, decision making process despite the fact that goals, priorities and budget allocation are all part of the research and development budgeting system.

1 Gross Domestic Expenditure on R&D (GERD) as % of GDP, 2000



Source: Main Science and Technology Indicators, OECD, Paris, 2002

2 Difference between total GBAORD and GBAORD on civil R&D, 2000



Source: Main Science and Technology Indicators, OECD, Paris, 2002

- 11 In Germany and the Netherlands, traditional science policy advisory boards provide high level expertise and input to the government as a whole. Their role is strictly advisory. The Netherlands also has a wide net of sector councils to support specific policy areas. In principle, the sector councils are not advisory bodies, but are intended to inform policymaking processes, often through foresight studies. Finally, in Finland the ultimate authority for determining basic science policy and the allocation of government research grants resides with Parliament and the Cabinet of Ministers (CoM). The CoM relies heavily on the scientific expertise provided by the Science and Technology Policy Council (STPC) headed by the Prime Minister. The STPC takes a prominent role in determining research strategies for the Finnish government.
- 12 With respect to the issue of coordinating research priorities across, and to a lesser extent within, ministries, this takes place mainly at the policy level rather than through external advisory boards. Individual ministries or policy implementation agencies are usually responsible for coordination efforts. Finland is the exception, as the STPC has a visible role in the coordination of innovation policy activities at a national level in addition to its priority setting powers.
- 13 **On selecting, commissioning and monitoring research.** Selecting the best research to inform policymaking is the major focus of research procurement and monitoring activities among the countries reviewed. The link between policymakers' needs and research decisions is also strong in the UK (see "Getting the evidence: Using research in policy making" for detailed discussion of this point). Research providers all understand the importance of external advice as a basis for objective, unbiased research and realise that procurement approaches ought to be determined by the strategic aims specific to each organisation. Examples of approaches to optimise the link between research and policymaking that show the importance accorded to such efforts include: the establishment of independent, intermediary organisations to manage the selection and implementation of research based on expertise and dedicated capacity; the formation of research programmes to bring together research providers and create networks or centres of excellence; and the distribution of guidelines and/or handbooks to operationalise procurement principles.
- 14 In Canada, a number of advisory reports highlighted the enormous range of approaches used to access and formulate the need for science to inform decision making. The review found that in the majority of cases, the preferred way of seeking advice was through in-house analyses and working groups rather than by seeking independent reviews. A report by the Council of Science and Technology Advisors (CSTA) resulted in the Canadian government publishing a "Framework for Science and Technology Advice: Principles and guidelines for the effective use of Science and Technology advice in government decision making"¹ to make preferred practice guidelines specific.
- 15 The US General Accounting Office (GAO) Report "Federal Research: Peer Review at Federal Science Agencies Vary" (March 1999) looked at how federal agencies conducted peer reviews of research products and concluded there was no uniform federal peer review policy. There is general agreement that peer review practices should not be dictated uniformly for every agency or for all types of federally funded research. Rather, the practices should be tailored to agency missions and type of research.

1 This report drew heavily on OST guidance in the UK.

- 16 In Finland, cluster, technology and research programmes are increasingly used as strategic mechanisms for funding research and pursuing science policy objectives. They are multidisciplinary, usually exist for a fixed period and ideally involve consortia that combine several research projects. Programmes have proved to be an effective form for selecting and involving various research-related organisations and stimulating cooperation and networking opportunities between private companies and the research sector.
- 17 The acquisition, planning, implementation, administration and evaluation of individual projects in Germany are not the responsibility of ministries, but rather of appointed research management organisations (Projektträger) outside of government. Often these organisations are research institutes themselves. Their project management responsibilities are of both a scientific/technical and administrative nature. The need for intermediary organisations is a result of the growth of sponsoring activities by the federal ministries beyond their capacity to manage. The agencies are typically sponsored by federal money. The Projektträger often also functions as an international point of contact.
- 18 In the Netherlands, intermediary organisations, such as Senter and Novem, coordinate and commission the research activities of several ministries. For programmes that have been set up by various ministries and that are of significant size, some independent or temporary programme offices have been established that are responsible for implementing strategies and commissioning research.
- 19 **On evaluation and research transfer:** The international review uncovered a large range of long existing research evaluation practices. Evaluations increasingly take place throughout the research base leading to structural changes within the national research systems and the resulting research bodies. Evaluations are also conducted throughout the various stages of the research projects. The practice of ex-ante evaluation to examine the connection between proposed research and government policy needs is also increasing, as is the monitoring of ongoing research and re-evaluating its links to ongoing or upcoming policy.
- 20 Examples of well developed evaluation practices are found in Finland and Germany. For a long time, evaluation has played a steady role in the formulation of policy in Finland. The effectiveness of government action is assessed at different levels. External and international teams evaluate all major organisations and the major policy players regularly have their programmes evaluated externally.
- 21 Evaluations in Germany have led to many improvements in the research system. First of all, funding for under-performing institutes was completely stopped. Second, a concentration of certain research institutes took place to eliminate the fragmentation of the research base. Finally, evaluations have encouraged international cooperation in Germany.
- 22 Generally speaking, evaluation tools and approaches have become more diverse and sophisticated. Where peer review used to be the default process, standardised performance measures and impact analyses are now preferred and have become more common. In Canada, the research and development Impact Network and the Programme of Energy Research and Development (PERD) have implemented results-based performance measurement. They are two examples of federal science-based department and agency efforts to use impact analysis to assess the outcomes and results of federal research and development and to ensure relevance and value for money.

- 23 The increased importance of evaluation has led to the need for more reliable, comprehensive and timely data sets about government funded research and development and improved information systems to support policymaking are being developed. The Netherlands Observatory of Science and Technology (NOWT) collects and analyses data about the Dutch research system in a broad sense. RaDiUS, which stands for "Research and Development in the United States", is the first information system that systematically connects highly aggregated budget data on federal research and development with the disaggregated information on individual research and development tasks and awards to provide a complete picture of all federal research and development activities in the US.
- 24 With the establishment of the 1993 Government Performance and Results Act (GPRA) in the US, federal agencies, including those that fund research, were formally required to set strategic goals and to use performance measures for management and budgeting. The objective of the GPRA is to encourage greater efficiency, effectiveness and accountability in federal programmes and spending. A report by the US Committee on Science, Engineering and Public Policy (COSEPUP) considered the most effective ways to assess the results of research, in light of the GPRA. COSEPUP drew a number of conclusions, including:
- Both basic research and applied research programmes can be meaningfully evaluated on a regular basis;
 - Agencies must evaluate research programmes by using measurements that match the character of the research;
 - The most effective means of evaluating federally funded research programmes is expert review. Expert review - which includes peer review (judging the quality), relevance review (judging whether an agency's research activities are relevant to its mission), and benchmarking (judging the relative standing in an international perspective) - should be used to assess both basic research and applied research programmes; and
 - The development of effective methods for evaluating and reporting performance requires the participation of the scientific and engineering community.
- 25 In addition to the increasing emphasis on research evaluation in the international arena, more and more attention is being focused on how to promote its transfer into policy. In Canada, the "Linkage and Exchange" model provides an interesting example of research implementation in the health services policy arena. It proposes that specific issues and bottlenecks arise in communication between researchers and policymakers that often prevent effective transfer of research findings into policy decisions. It proposes that involving eventual end users at all stages of the research process will result in an increased impact of research on policymaking.
- 26 In parallel, several efforts of the CSTA have focused on establishing principles and guidelines to incorporate science advice in government decision making. These principles and guidelines address how science advice should be sought and applied to enhance the ability of government decision makers to make informed decisions.