

# Developing new policy relevant indicators on public funding of R&D

Jan C.G. van Steen

Ministry of Education, Culture and Science, Department for Research and Science Policy  
Rijnstraat 50, 2515 XP, The Hague, the Netherlands

## Background

---

Official S&T statistics and indicators are widely used. They play amongst others a role in a lot of national and international discussions on S&T policy and are used as accounting mechanisms. They emerged in the sixties of the last century as part of work at the Organisation for Economic Cooperation and Development - OECD (Godin, 2008), which work was based on earlier activities at the National Science Foundation in the US. The first OECD Frascati Manual (1963) acted as the starting point of data collection on R&D in the countries that are member of the OECD.<sup>1</sup> Nowadays an increasing number of countries around the world use the methodological guidelines of this manual. Presently, the Frascati Manual (edition 2002) experiences its sixth edition. The Frascati Manual presents guidelines for statistical data collection in the field of R&D: expenditures and personnel. Statistical data are collected in four different sectors: business enterprises, higher education, the government sector and the private non profit sector. Different classifications are used per sector, according to the specific character of the sector.

Over the years, the area of OECD data collection on R&D expanded beyond its borders. It also led to a number of other manuals. Some of them are part of the OECD R&D Family of manuals: a manual on the measurement of the Technological Balance of Payments, the Oslo manual for collecting data on innovation, a patent manual and the Canberra manual on the measurement of Human Resources in Science and Technology. But it also led to some handbooks (bibliometrics, productivity, globalisation).

In this paper we look more closely to one type of R&D indicators: indicators on public funding of R&D. We look at experimental work that is undertaken to develop new indicators in this area.<sup>2</sup> Our hypothesis is that a) it is possible to extend the indicators on public funding beyond the present ones even by using already existing data in the OECD countries and b) the results can eventually feed into official statistics and indicators in the forthcoming years. But first we will elaborate a bit on how statistics and indicators develop.

## How do new statistics and indicators originate?

---

Although the framework for measuring R&D activities hasn't changed essentially since the first Frascati Manual, that doesn't mean that there haven't been a lot of changes in the data collection on R&D and the emergence of new or improved statistics and indicators. Based on experiences in the different countries numerous improvements, refinements and a better detection of R&D performing units have taken place in order to reach a better data collection and more internationally comparable data. This also has led to different breaks in the statistical series. Besides the process of a better data collection, data collection and indicators development in new areas emerged because of better knowledge of aspects of science and technology. We will show this expansion beyond R&D indicators over time (Sirilli, 2005). Another impetus for new developments has been the scientific research and resulting insights outside the statistical system of OECD. For example the Oslo Manual on innovation was based on "a considerable body of work ... undertaken during the 1980s and 1990s to develop models and analytical frameworks for the study of innovation" (Oslo Manual, 2005). This manual became the basis for the European Community Innovation Survey (CIS) and a number of innovation surveys in non-European countries.

---

<sup>1</sup> R&D statistics and indicators are defined as part of S&T statistics and indicators.

<sup>2</sup> If we discuss OECD statistics and indicators this also reflects the activities of the statistical bureau of the European Commission, EUROSTAT. Both organisations work closely together in the development and collection of R&D statistics.

Based on proposals and discussions in the community of national experts on science and technology indicators new data collection will start, first on an experimental base, than on a more routine base.

### **Existing data collection on public funding of R&D**

---

One specific area of data collection which is part of the Frascati Manual is the area of statistics on government funding of R&D. These statistics cover the spending on R&D by governments. There are two ways of collecting data on government funded R&D. First, by asking performers of R&D on the sources of funds of their intramural R&D expenditure, being the government as one of the sources. Second, by asking governmental agencies on their budgets for R&D. A main disadvantage of the first method is that the resulting data do not become available until one or two years after the R&D has been carried out. A second disadvantage is that the information is very global and not directly related to governmental overall S&T policy (Frascati Manual 2002, par. 474 and 475). The second method of collecting data on governmental spending on R&D is looking at the data in the budgets of the government itself. These data can be linked to governmental objectives through the specific classification that is attached to the budget data, namely by socio-economic objectives. Another advantage of this type of data collection is given by the fact that the data are more recent and even can have R&D forecasts and therefore can be used in policy discussions on the development of government budgets on R&D (this is especially relevant in the context of the 3 percent ambition of the EU leaders, agreed upon in the Barcelona summit of 2003). The statistic based on the second type of data collection is called "Government Budget Appropriations or Outlays for R&D" and known under the acronym "GBAORD". The statistic is part of the Frascati Manual since the third edition (1976) and hasn't changed since the beginning of its existence.

### **Extending the data collection on public funding and first results**

---

Because S&T policy has evolved over the years, the GBAORD data by socio-economic objectives didn't fit any more in recent policy discussions. In a research project, coordinated by the EU Prime Network of Excellence, government funding or, in more general terms 'public funding' was examined in a number of different ways. The project looked amongst others at project funding in specific, as opposed to institutional funding (Lepori, 2007). The Netherlands was one of the participants of this Prime project 3, collected data on GBAORD for the period 1975 – 2005 and published a separate report on the Netherlands (Versleijen, 2007). In 2008 the Dutch delegation to the OECD group on science and technology indicators presented the Dutch part of the PRIME project and its results at its meeting. The conclusion of the presentation was that GBAORD data could be a possible rich source for collecting more policy oriented data on public funding regularly. The other countries represented in NESTI were asked to join exploratory work in line with the PRIME project. There was positive feedback from eleven volunteer countries to join, which led to the start of an OECD project on public funding indicators. The objectives of the project are threefold: a) to develop a methodology and methodological guidelines to derive internationally comparable indicators of different aspects of public funding; b) to tabulate such indicators for as much as possible countries; and c) to develop guidelines for structural implementation of this methodology in the international agrees indicators structure on S&T.

In a pilot phase (July 2008 – June 2009) the following activities were performed:

- Defining an outline of the project, which was sent to the participating countries, proposing the objective of the project and a project planning;
- Collecting data on the availability and characteristics of data on public funding with a short questionnaire;
- Developing a document with relevant indicators and a questionnaire for a first pilot data collection;

---

<sup>3</sup> The other countries were France, Italy, Switzerland, Norway and Austria.

- Collecting data mainly based on GBAORD data in six selected countries and first analysis of the data; and
- Presentation of the first results to the NESTI meeting of 2009.

The results of the pilot phase suggest that there are diverse patterns of national funding modes, but that it is too early to see patterns for groups of countries. More data - also descriptive - are needed to present robust results. The conclusion of the first data collection with regard to the feasibility of the exercise was that it seems possible to collect more dedicated GBAORD data, that are better suited for ongoing research policy discussions. There was positive response from NESTI delegates and it was concluded to adjust the questionnaire and to send the revised questionnaire to all countries participating in NESTI.

## **The new indicators to be constructed**

---

The revised version of the questionnaire is based on the data collection related to five new indicators on public funding. The indicators are:

- Total national public funding by funding mode (project versus institutional funding);
- Total public funding to national projects by funding agency;
- National public funding to national performers by institutional sector (enterprises, higher education, institutes, PNP);
- National public funding to national projects by type of instruments (academic, policy, innovation);
- Total international public funding by national institutional sector.

## **Forthcoming activities**

---

After the summer of 2009 this new broader data collection will start and – based on the positive response at NESTI 2009 - it is foreseen that a lot of countries will contribute to the project with national data. If enough data are provided it will be possible to publish new internationally comparable indicators on public funding in the near future.

It is expected that national data become available Autumn 2009. After analysis and discussions with the participating countries first results will probably become available early 2010. The paper will extend on the results of these results.

The comparability of the results is amongst others dependent on clear guidelines for the data collection, for example on borderline cases, but it is clear that more methodological work has to be done before the results can feed into the Frascati Manual. If that can be realized the present R&D indicators will be enriched with a number of policy relevant indicators. They can become part of the international indicators structure that has been built at OECD since the 1960s.

## **References**

---

- Godin, B., The making of Statistical Standards: The OECD and the Frascati Manual, 1962-2002, working paper no. 39 of the Project on the History and Sociology of STI Statistics, Montreal
- Lepori, B. (oth.) (2007), Comparing the evolution of national research policies: what pattern of change?, *Public and Science Policy*, 34(6) 372-388
- OECD, Frascati Manual, Proposed Standard Practice for Surveys on Research and Experimental Development, Paris, different editions
- OECD, The Measurement of Scientific and Technological, Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data, Paris, 2005 (A joint publication of OECD and EUROSTAT)
- Sirilli, G., Developing science and technology indicators at the OECD: the NESTI network, paper presented at the RICYT seminar "Knowledge networks as a new form of collaborative creation: their construction, dynamics and management" Buenos Aires, November 24 - 25, 2005
- Versleijen, A. (ed.) Dertig jaar publieke onderzoeksfinanciering in Nederland 1975-2005 (Thirty years of public research funding in the Netherlands 1975-2005), Rathenau Instituut SciSa rapport 0703 (report in Dutch)