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# 17 Measuring innovation in the public sector

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## 1. INTRODUCTION

There is now a vast amount of experience on the measurement of innovation in businesses, as is clear from this handbook. However, public sector organizations, and for that matter also public services in general, have been neglected in these efforts. This has gradually begun to change in recent years with the growing perception that public sector innovation is vital for meeting many of the social and economic challenges faced today. As a result, there is a need for tools to measure public sector innovation.

Based on these needs, there has been an increase in work within public sector innovation measurement. This work has had to grapple with difficult issues concerning both the nature of public sector innovation and statistical measurement. These recent studies have made significant progress both in identifying what can be measured and in shedding more light on the challenges that lie ahead towards the development of internationally comparable indicators.

To set the stage, this chapter briefly examines related literature and key factors that have influenced measurement, focusing on what distinguishes the public sector from businesses. It then reviews measurement work within the area. Earlier work consists mainly of a relatively small number of individualized studies, many of which were structured as innovation competitions. However, recent efforts to develop indicators of public sector innovation on a more systematic basis have added significantly to the stock of experience in this area. The chapter examines what types of indicators have been developed, identifying which measures appear to have worked well and what challenges remain for future work.

## 2. WHY MEASURE INNOVATION IN THE PUBLIC SECTOR?

The increased interest in public sector innovation measurement stems from an increased recognition of the importance of public sector innovation itself. This is probably due to a number of factors. One is necessity. The public sector is under increasing pressure from a number of sides – rising

costs, increasing demands from citizens and businesses, demographic changes, environmental issues and globalization pressures – that can increase the difficulty of maintaining high levels of welfare services. The need for change to adapt to these pressures has only become more visible following the recent financial crisis and subsequent worsening of government budget deficits. The basic message from all this is that the public sector must do more for less. Another factor is opportunity. An effective and innovative public sector can contribute greatly to the performance of businesses. At the same time it constitutes an important market for businesses – one that may be used as a tool to promote business innovation through procurement. In addition, recent theoretical and qualitative studies have helped raise attention in the public sector and its potential contribution to innovation and growth. Most noteworthy among these is the EU-funded PUBLIN project (Koch et al. 2005; Koch and Hauknes 2005). Other works include papers from the UK Cabinet Strategy Unit (Mulgan and Albury 2003; Kelly et al. 2002) and from Nesta (Mulgan 2007; Harris and Albury 2009).

From the increased interest in innovation follows naturally the need for data. In order to be able to improve knowledge and understanding of the rate and degree of innovation in the public sector, as well as its incentives, processes and impact, there is a need for systematic and comparable data. This was one of the key recommendations of the above-mentioned PUBLIN project (Koch et al. 2005) and has been stressed in a number of countries and in international organizations such as the OECD and the supranational EU.<sup>1</sup>

Establishing that there is a need for data is, however, the easy part. Determining which specific types of indicators will be most useful is more difficult, and requires careful examination of user needs. A number of questions are relevant here, and the answers may vary across countries. For example, which topics dominate national discussions concerning public innovation? Value for money and user satisfaction? The role of the public sector as an enabler of business innovation and public–private cooperation? Issues of transparency and trust in government? Need for new solutions that can help maintain or improve levels of service in the face of cost cuts and demographic changes? Better quantitative measures of public sector performance? Identifying main obstacles and drivers of public sector innovation? Which parts of the public sector have the greatest interest? An understanding of which topics are most important will help guide indicator development. This is, however, an ongoing process that cannot simply be completed up front; both trial and error in actual use of initial indicators and the quality of the data collected will be important for indicator development and understanding user needs.

### 3. A CONCEPTUAL BACKGROUND – HOW DOES INNOVATION IN THE PUBLIC SECTOR DIFFER FROM THAT IN THE BUSINESS SECTOR?

An initial step in developing measures of public sector innovation is addressing conceptual issues such as what an innovation is in the public sector and how to characterize innovation processes. An additional and equally important step concerns statistical issues, such as populations and statistical units. These are outlined in the next section. This section addresses conceptual issues concerning the nature of public sector innovation.<sup>2</sup>

One possible approach in conceptualizing public sector innovation would be to see it in complete isolation from the business sector, essentially starting from scratch in considering how to go about measuring it. However, this would ignore both the extensive amount of experience that has been gained from measuring innovation in the business sector and the fact that some degree of comparison of public and private sector innovation is inevitable. Hence an alternative approach is to take business sector innovation as a reference point and consider how the public sector might differ from the business sector and how this might influence measurement.

A fundamental feature that is typically first to be pointed out when comparing the public and private sector is that most public sector organizations lack a market and thus also market incentives to innovate. Connected to this, public sector objectives are broad and often go beyond improving the direct performance or output of the organization itself. For example, objectives may also include improving the ‘performance’ of others; that is, enabling innovation among citizens, business suppliers or other public sector institutions. Public sector objectives may also be conflicting. For example, public sector organizations are under pressure to cut costs and at the same time improve or provide new services or reach new users. Given limited resources, aims to target specific groups or to comply with regulations may come at the expense of other stakeholders.

The nature of public services is also important here in a number of respects. A number of features of services in general also apply to public service providers, such as intangibility, simultaneity of production and consumption,<sup>3</sup> and the central role of worker competences and user interaction. At the same time, there are also differences between services provided by private businesses and by public sector organizations. This is particularly the case for collective or ‘public-good’ services that have to do with administration, monitoring and policy/regulation development.

Public sector organizations are typically part of a complex organizational structure that affects, both directly and indirectly, how organizations

operate and innovate. Individual organizations thus typically do not have full autonomy over their decision making. A potential implication of this is that external actors (in particular policy and other public organizations) will play a larger role in enabling innovation in individual public sector organizations than for a business.

An additional feature that is relevant here is the heterogeneity of public sector organizations, across different levels of both government and sectors (each with different types of outputs). In terms of level of government, or types of institutions, there will be differences in kinds of activities or services they provide. Policy-making institutions (ministries) are arguably very distinct from other institutions, as are their main 'products', that is, policies. Agencies and the administrations of regional and local governments will, for the most part, be less involved with the provision of services, but will have a large amount of process and organizationally oriented activities. However, there are probably many agencies or other entities in central government that provide services directly to users, be they citizens, businesses or other public sector organizations. And, finally, there is the group of frontline delivery institutions (e.g. schools and hospitals) that are directly involved in the provision of public services to users. In terms of sectors, the greatest differences here are in terms of objectives and measures of outputs, where both will have some elements that are specific to individual sectors. However, there may also be a number of other aspects that vary across sectors, such as effects of innovations, barriers, specific organizational issues or types of collaboration.

#### 4. STATISTICAL ISSUES

In order to collect data on innovation among public sector organizations, a number of standard statistical issues need to be addressed, such as determining the target population, statistical units, and methods of classification of units.<sup>4</sup> To a large degree, the establishment of a survey methodology for data collection of this type among public sector organizations is uncharted territory. There are few examples of other types of surveys on which innovation surveys can draw.<sup>5</sup> This section outlines the main issues, which will then be revisited below when reviewing recent work.

As its title indicates, the primary focus of this chapter is the public sector as opposed to public services, although much of the discussion here could be considered relevant for both. While there are no commonly accepted definitions of the public sector or public services, the following are fairly representative.

The **public sector** comprises the general government sector plus all public corporations including the central bank. (OECD 1997)

**Public services:** ‘General-interest services’ are services considered to be in the general interest by the public authorities and accordingly subjected to specific public-service obligations. They include non-market services (e.g. compulsory education, social protection), obligations of the State (e.g. security and justice) and services of general economic interest (e.g. transport, energy and communications). (EU-glossary; [http://europa.eu/scadplus/glossary/general\\_interest\\_services\\_en.htm](http://europa.eu/scadplus/glossary/general_interest_services_en.htm))

The concepts public sector and public services differ in that the public sector is defined in terms of ownership and control (essentially the SNA sector General Government plus other publicly owned or controlled entities), while public services are defined in terms of their functions or activities. The public sector implies an exclusive focus on organizations that are part of government or publicly owned. An alternative focus on public services would essentially follow the same approach as used for the business sector, where organizations are classified by their economic activity (in this case being the main activities classified or considered as public services). This approach would then include both publicly and privately owned institutions that provide public services.

Taking the public sector as a starting point in determining the target population, there is the question of whether any sectors or groups should be excluded (as is typically done in business innovation surveys). Among the possible subsectors that could be considered for exclusion from the target population are: social security funds, public corporations, non-profit institutions in market services, non-profit institutions in non-market services, higher education institutions, government research institutions, defence services and religious services. The target population can be further delineated to include a smaller group of activities or functions, for example based on a small set of main public sectors. However, narrowing down the target population requires a classification of units, which is a challenge in itself (see below).

A survey sample is drawn from the frame population, which may differ from the target population. It may include units that no longer exist or that are no longer part of the target population. In addition, the frame may not include all units that are part of the target population. In practical terms, the most likely source for frame populations of the public sector is a business register. However, there is a general lack of experience in drawing samples of public sector units from business registers.

An additional issue is identifying the desired statistical unit. According to the *Oslo Manual* (OECD/Eurostat 2005: Para. 231): ‘Ideally, innovation data should be compiled (and collected) at the organizational level

for which decisions on innovation activity are made. Taking into account how innovation activities are usually organized, the enterprise is in general the most appropriate statistical unit.’ However, for the public sector there are varying degrees of autonomy, which may mean that greater flexibility is needed in determining the ideal statistical unit. For example, the ideal observation unit may in some cases be the establishment unit. Some relevant examples here are schools, or breaking down large municipalities by activity. Related to this is the question of how similar the distinction between enterprise and establishment units is in business registers for different countries.

Yet another issue is how to classify units. Two possible methods are by type of economic activity using ISIC/NACE classifications or by Classification of Functions of Government (COFOG). ISIC/NACE has the advantage that it is available in business registers and is also used for the business sector. However, initial studies give the impression that the great majority of enterprise units are found within a single two-digit industry, public administration services. COFOG, on the other hand, is used for many public sector statistics; however, data on this classification are typically not available in business registers.

## 5. APPROACHES TO MEASURING PUBLIC SECTOR INNOVATION

A number of possible approaches can be followed in measuring public sector innovation. This section outlines the main types of approaches that, however, should not be considered mutually exclusive as some of them can be combined. The first could be called the *Oslo Manual* approach; that is, that measurement follows the same principles used for the *Oslo Manual* in terms of how innovations, innovation activities and other key concepts are defined and in terms of the use of the subject approach. Given that this is essentially the approach followed in the most recent work, it is also the primary focus of this chapter.

A second approach is the ‘object approach’, which can either focus on innovation projects or on individual innovations. There are a number of early examples of this approach for business innovations, and also some examples for public sector innovations through surveys based on innovation award competitions. The advantage with this approach is that many aspects of innovations such as objectives, effects and linkages can vary greatly across different innovations within the same organization. In addition, respondents are probably more able to answer questions on a single innovation than on innovation in general over a two–three-year period.

Surveys can also focus on a specific sector or type of organization, where many questions are formulated to be specifically applicable to the organizations in question. An example is an OECD project to measure innovation in schools.<sup>6</sup> This approach could of course be combined with a more general *Oslo Manual* approach by including sector-specific modules in a generalized questionnaire.

It was mentioned above that organizational aspects may be more policy relevant for the public sector than for businesses. This can motivate the development of surveys in order to create a benchmarking or management tool for individual organizations. Two examples of this approach, the Korean Government Innovation Index (Korean Ministry of Government Administration and Home Affairs 2005) and the Nesta Public Sector Innovation Index (Hughes and Baker 2011), are described below.

An alternative to covering organizational units is a two-tiered approach. The most common example here is employer–employee surveys of organizational changes, such as those outlined in the MEADOW guidelines (MEADOW Consortium 2010). However, such an approach can also be used to cover the organizational unit and individual projects or innovations.

A final approach would be to utilize existing data, either supplemented by the addition of a small set of questions concerning innovation or solely on the basis of existing data. This can be done at different levels of aggregation. Some examples of aggregate-level work on the basis of existing data is the OECD *Government at a Glance* (OECD 2009b) and output measurement and productivity analysis of the UKCemGa.<sup>7</sup>

## 6. EARLY AND RECENT STUDIES OF PUBLIC SECTOR INNOVATION

Much of the earliest work on the measurement of public sector innovation was not in the form of actual innovation surveys, but instead innovation competitions among public sector organizations. As part of these competitions, participating organizations were required to fill out a (typically open-ended) questionnaire on the individual innovation being nominated for the award. While the initial purpose was not to generate innovation data, the data have since been analysed and used to create indicators. Borins (2006) discusses a number of innovation award programs<sup>8</sup> conducted in the USA, Canada and other Commonwealth countries in which nominees are required to fill out an innovation survey questionnaire.

An early attempt at measuring public sector innovation through an actual survey was undertaken by Statistics Canada in 2000 (Earl 2002).

The study, which was part of a Survey of Electronic Commerce and Technology 2000 and essentially a supplementary module, inquired about the introduction of organizational and technological changes in both public sector organizations and private businesses. They found that very high shares of public sector organizations had implemented these changes, even among the smallest administrations. These results are quite similar to those found in recent studies, despite the use of very different definitions of innovation.

Other examples of *ad hoc* innovation surveys include two surveys conducted in the UK by the National Audit Office and the Audit Commission. The National Audit Office (2009) survey examines innovation in central government, covering organizations' own conceptualization of innovation, and on how the organization innovates, including culture and capabilities, risk management and the role of selected barriers and incentives. The Audit Commission study of local authorities in England (Audit Commission 2007) covers attitudes to innovation, the role of organizational structure and staff, barriers and enabling conditions, and learning activities. It also highlights a number of specific examples of innovations in local government.

The Korean Government Innovation Index (GII)<sup>9</sup> was developed as a management tool that uses an innovation survey to generate internal data. The GII survey focuses mainly on management and organizational capability for innovation, which creates diagnostic index measures that are used to analyse and benchmark public sector organizations. The GII thus represents an alternative type of survey, where the focus is less on the creation of aggregated indicators and instead on creating composite index measures for individual benchmarking. This general idea of an innovation management tool was also applied by Nesta in the UK towards the development of a public sector innovation index. However, the topics covered by the Nesta survey (described below) were fairly different from the GII.

The studies described above were either *ad hoc* surveys or were devoted to a specific purpose such as an innovation award or a management tool. In contrast, three recent studies, the Nordic MEPIN project, the EU Innobarometer 2010 and the Nesta Public Sector Innovation Index, have been directed more towards the development of internationally comparable statistics.<sup>10</sup> The Nordic MEPIN project (Measuring Public Innovation in the Nordic Countries, [www.mepin.eu](http://www.mepin.eu)) developed an initial measurement framework for conducting public sector innovation surveys and implemented a pilot survey of innovation among public sector organizations in the Nordic countries (Bugge et al. 2011; Bloch 2011). The EU's Innobarometer 2010 was devoted to innovation in public administration

(Gallup Organization 2011). A survey was conducted among 4063 public administration organizations in 29 countries across Europe using a questionnaire that draws partly on the MEPIN survey. And, as mentioned above, as part of the Public Sector Innovation Index, Nesta commissioned a pilot survey of innovation across two parts of the public sector: the National Health Service (NHS) and local government. The survey draws both on Nesta's Private Sector Index survey questionnaire, the MEPIN survey and the EU Community Innovation Survey (CIS) for businesses (Hughes and Baker 2011).

### **A Review of the MEPIN, Nesta and Innobarometer Studies**

Given that these last three studies constitute the state of the art at this point in time, the surveys are described here in greater detail. Of the three studies, the Nordic MEPIN has been most focused on development and testing aspects, since the creation of a framework and guidelines was the main objective of the project. The two other studies share a number of elements with MEPIN, both building on and modifying questions used in the MEPIN study and drawing on other sources. For a more detailed description of these studies, the reader is referred to the above-mentioned reports.

### **Innovations and Other Concepts**

The frameworks on which these studies were based are very much influenced by the *Oslo Manual*. A number of concepts or topics essentially follow the *Oslo Manual* approach, typically with minor modifications to make them more appropriate for the public sector. This includes the definitions of innovations and innovative novelty, innovation activities, objectives and effects of innovations, linkages-related aspects such as information sources for innovation and innovation cooperation, and hampering factors. At the same time, some additional topics were included, such as innovation drivers, innovation strategy and organization, and innovative public procurement. This section focuses on the definition of innovations and the newer topics included in the surveys. Information on the construction of other measures can be found in the reports for the individual studies.

The innovation concept used in these studies was fairly closely aligned with *Oslo Manual* definitions. While there were some differences in the actual wording used, all three studies essentially followed the same approach here. As an example, the definitions of innovation used in the MEPIN study are shown in Box 17.1. As can be seen, the four types are quite similar to the *Oslo Manual* definitions (OECD/Eurostat 2005),

### BOX 17.1 DEFINITIONS OF INNOVATION USED IN THE MEPIN STUDY

An **innovation** is the implementation of a significant change in the way your organization operates or in the products it provides. Innovations comprise new or significant changes to services and goods, operational processes, organizational methods, or the way your organization communicates with users.

Innovations must be new to your organization, although they can have been developed by others. They can either be the result of decisions within your organization or in response to new regulations or policy measures.

A **product innovation** is the introduction of a service or good that is new or significantly improved compared to existing services or goods in your organization. This includes significant improvements in the service or good's characteristics, in customer access or in how it is used.

A **process innovation** is the implementation of a method for the production and provision of services and goods that is new or significantly improved compared to existing processes in your organization. This may involve significant improvements in, for example, equipment and/or skills. This also includes significant improvements in support functions such as IT, accounting and purchasing.

An **organizational innovation** is the implementation of a new method for organizing or managing work that differs significantly from existing methods in your organization. This includes new or significant improvements to management systems or workplace organizations.

A **communication innovation** is the implementation of a new method of promoting the organization or its services and goods, or new methods to influence the behaviour of individuals or others. These must differ significantly from existing communication methods in your organization.

*Source:* Bloch (2010).

where marketing innovations are instead formulated as communication innovations, and the wording is slightly modified in an attempt to better reflect the nature of public sector activities. The main motivations behind this approach were that many existing definitions of public sector innovation<sup>11</sup> are essentially based on the same characteristics as the *Oslo Manual* and cognitive testing suggested that these definitions fit well with the perceptions of public sector organizations (Annerstedt and Björkbacka 2010). Initial results with very high shares of innovative public organizations (see below) can, however, be interpreted as questioning whether businesses and public sector organizations share the same perception of what an innovation is.

Innovation drivers can be people, organizations or other factors that push organizations to innovate. What is, however, of more specific interest with respect to the public sector is 'political drivers', as they provide some information on how much autonomy individual public sector organizations possess in making decisions on innovation activities. Among the political drivers covered in the studies were mandated budget increases or reductions, new laws or regulations, changes implemented in higher-level organizations, mandated introduction of new online services, and new policy priorities.

The question of autonomy is part of a broader question concerning to what extent public sector organizations are geared towards innovation. Questions on innovation strategy and management have sought to shed light on how the innovation process is organized in public sector organizations.<sup>12</sup> Among the topics included were:

- Specific goals/targets for innovation activities
- An innovation strategy included in the overall vision or strategy of the organization
- Development department/section
- Innovation activities organized as projects, steered by a dedicated group
- Evaluations of the innovation processes conducted regularly
- Managers give high priority to developing new ideas or new ways of working
- Managers support trial-and-error testing of new ideas
- Top management is active in leading the implementation of innovations
- Members of staff devote part of their time to development/innovation projects
- Staff incentives to identify new ideas and take part in their development

- Users involved in the design or planning of new or improved services.

The issue of public procurement has been approached in slightly different ways in each study. The MEPIN survey asks whether organizations make purchases that encourage the development of products or processes that do not yet exist or require new features, and whether selected procurement related activities are used to promote innovation.<sup>13</sup> Results were, however, somewhat mixed for this question (Bugge et al. 2011). The Innobarometer includes four questions on procurement: which types of services or goods are tendered; which actors are consulted with in preparing the tender; how innovation is weighed against cost when considering tenders; and whether any tenders have resulted in innovations or other important impacts.

### **Selecting the Population Frames**

The starting point for the MEPIN surveys was the populations of enterprise (or legal) units within the general government sector. Selected units in a number of countries were excluded by manual sorting, based on an assessment of their relevance for this pilot study. Universities and units within defence were typically excluded from all countries. Some of the Nordic countries also included selected direct service providers in their samples (where these are typically classified as establishment-level units). Norway, Denmark, Sweden and Iceland included hospitals and Denmark and Iceland included schools in their samples.

The 2010 Innobarometer focused exclusively on public administration organizations with ten or more employees. The survey included all EU countries plus Norway and Switzerland, 29 countries in all. Sampling sizes depended on country size with four classes: 400 units for large countries; 100 for medium-sized countries; 50 for small countries; and ten units for the smallest countries. Selection of units was based on business registers and continued until the target number of responses was reached in each country. This gave a total number of 4063 responses, which also includes a smaller number of non-profit institutions and private businesses.

The Nesta survey in the UK focused on two areas of government, surveying NHS trusts (hospitals or groups of hospitals) and local authorities (municipalities). In both cases, organizations were requested to participate in the survey, and those that agreed were surveyed by telephone. About 16 per cent (64 units) of trusts and 31 per cent (111 units) of local authorities participated in the survey.

## 7. KEY MEASUREMENT ISSUES

Recent studies have made considerable headway towards the development of internationally comparable measures of public sector innovation. The development work that has been undertaken and the survey results provide a solid basis that can be built upon in further work. At the same time it should be kept in mind that these are initial pilot studies designed to test measurement frameworks. While the results provide a useful impression of what has worked well and what has been less successful, no issues can be considered to be laid to rest based on these first results. In addition to this, there are of course questions about whether these pilots neglect key issues of importance for understanding public sector innovation, or whether other approaches might have been better. This section examines selected measurement issues that are motivated by these recent studies.

A first issue concerns the definition of innovation. In all three recent studies, shares of public sector organizations with innovations are very high, more than perhaps was expected and substantially higher than shares for businesses. For example, from the MEPIN study, shares with product innovations ranged from 44 per cent in Sweden to 72 per cent in Denmark, and the EU-27 average (for service innovations) in the Innobarometer study was around 66 per cent. Shares in the Nesta survey are even higher at around 90 per cent. There is a need for a better understanding of what factors are driving these results and better methods of characterizing or distinguishing innovations.

While further testing is needed to do this, a number of potential factors can be identified. One possible factor is that public sector organizations may interpret the concept of innovation differently from businesses, particularly concerning changes that are either borderline in terms of meeting the criteria for an innovation or perhaps also changes that should not be considered as innovations. A second factor is that public sector organizations are typically larger than businesses. Given that large units are found to be more likely to be innovative, this would be expected to push innovative shares upwards. Another factor could be that low response rates may introduce a bias in the results. For example, the MEPIN study was a voluntary survey where, with the exception of Iceland, response rates were under 50 per cent.<sup>14</sup> Finally, there may be a large number of innovations that are driven by political mandates or by broad governmental changes or changes elsewhere in the public sector.

A second issue is the measurement of innovation expenditures, where great difficulties were encountered in recent studies. The MEPIN study followed an *Oslo Manual* approach in asking for expenditures on innovation activities, although intervals were used instead of actual amounts.

The Nesta survey adopted an 'intangibles' approach, covering five types of expenditures (which may or may not be directly related to the development or implementation of an innovation): staff training, external consultants, new equipment or software, research, and design or design services. Neither of these approaches was able to produce satisfactory results, with high non-response rates indicating that respondents experienced great difficulty in answering the questions. Provided there is interest in further pursuit of quantitative measures of innovation expenditures, it is unclear which direction is most advisable based on these results. However, a next step might be to examine in more detail what types of expenditure data public sector organizations are typically able to report on.

A third issue concerns the survey methodological aspects, such as the target population, statistical units and classifications. The main challenges involved here have already been outlined above. For example, what classification should be used in order to delineate the population? How well does the enterprise unit appear to function as the ideal statistical unit? What is the quality of business registers with respect to public sector units? And are all these issues similar across countries? Of the three recent studies, only the MEPIN study has attempted to construct a population frame for the entire public sector. While the experiences of the MEPIN study offer a number of examples that are potentially applicable in a broader international context, piloting across a much wider range of countries is needed in order to get a better idea of what work is needed and what approaches are most applicable across a broader range of countries.

A much-discussed issue concerning the measurement of public sector innovation is the heterogeneity of public sector organizations. Is it possible to conduct a harmonized survey across such a wide range of organizations? Each of the three recent studies uses what could be characterized as a 'generic' survey that is applicable across subsectors. The general impression from these studies when examining results across subgroups for individual countries is that a generic approach is feasible. However, this does not mean that a differentiation of questionnaires may not be useful in some cases. In particular, for specific groups of institutions, such as hospitals or schools, it would be valuable to include modules of questions that target specific aspects relevant to the group in question. This approach with 'sector-specific' modules has, however, not yet been used. An alternative approach would be to completely tailor a survey to a specific subgroup, which, however, would sacrifice generalizability across sectors.

An issue related to this is the lack of output measures. Measuring output for any individual public sector group is a very difficult task in itself, but there are some possibilities for homogeneous groups such as schools or

hospitals. In contrast, no general measures exist of outputs for the public sector. At the same time, a key area of interest in measuring public sector innovation is what its impacts are on the organization's activities. While there is no question that this is one of the most difficult aspects of public sector innovation to measure, there is at least a fairly strong motivation to continue examining this aspect.

## 8. CONCLUSION

This chapter has reviewed work to date on the measurement of innovation in the public sector. As discussed, recent work has accomplished much, but additional experience and testing are needed in order to arrive at a measurement framework with a sufficient degree of international comparability. Broadly speaking, there are two directions for further work, involving a wider set of countries in this measurement work and further examination of many of the issues that have been explored in recent work. For both of these, international coordination by, for example, the OECD and Eurostat will be important. While the Innobarometer 2010 survey covered a large number of countries, this was a telephone survey based on limited samples. A larger-scale pilot survey that is more representative of the entire public sector, perhaps carried out by official statistical offices, would be very beneficial in establishing internationally comparable statistics. Likewise, additional testing work is needed to further explore a number of issues, among these the definition of innovation and the quality of business registers.

## NOTES

1. See, e.g., OECD (2010), European Commission (2010), Danish Agency for Science, Technology and Innovation (2008), UK Department of Business, Innovation and Skills (2008).
2. See also Mulgan and Albury (2003), Halvorsen et al. (2005), Hartley (2005) and Bugge et al. (2010).
3. However, there are exceptions to this. For example, many services are provided as assets or stocks, e.g. IT, public libraries, parks, hospitals, and environmental services.
4. For a more detailed discussion of many of these issues, see Mortensen (2010).
5. Surveys of ICT usage, which are regularly conducted among businesses in most OECD countries, are also implemented for the public sector in some countries (among these, the Nordic countries, Canada and New Zealand).
6. See OECD (2009a) for an overview of the project.
7. See <http://www.ons.gov.uk/ons/guide-method/ukcemga/index.html>. See also Atkinson (2005) for a discussion of the main issues involved in measuring public sector output and productivity.

8. USA: Ford-KSG awards; Canada: IPAC awards; and countries of the Commonwealth: CAPAM awards.
9. This short description of the Korean GII is based on PowerPoint presentations by the Korean Ministry of Government Administration and Home Affairs (2005) and Yoon (2006).
10. This is perhaps only partly the case for the Nesta Public Sector Innovation Index; while its questionnaire seeks to achieve comparability with the other two studies, the main purpose of the survey is to create the Index.
11. Some examples are Mulgan (2007): 'The simplest definition is that public sector innovation is about new ideas that work at creating public value. The ideas have to be at least in part new (rather than improvements); they have to be taken up (rather than just being good ideas); and they have to be useful.' And the UK Audit Commission (2007): 'practices undertaken by organizations in order to improve the product or service they provide, characterised by: Change – step-change and impact; Novelty – new to the organization in question; Action – completed, not just an idea'. See also Bloch (2010).
12. These factors can also be related to measures of knowledge management practices that have been developed and tested for businesses. See, e.g., OECD (2003).
13. Innovative procurement is defined as purchases that encourage the development of products or processes that do not yet exist or require new features.
14. This is partly due to the fact that only one reminder was sent out under data collection. See Bugge et al. (2011).

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