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Handbook

on data collection on joint and open R&D programmes

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Handbook on data collection on Joint and Open Research Programmes (JOREP)

Annex to the Final Report

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1. INTRODUCTION

The JOREP project aims at providing a quantitative basis for the monitoring of investments in joint and open research programmes in the countries belonging to the European Research Area (ERA), pointing out the policy rationales behind them and their impact on the ERA. The study also aims at describing when, how and serving what purposes both types of programmes are combined.The two main activities concern 1) the collection of data on national funding dedicated to joint and open R&D programmes, according to a clear typology of joint and open R&D programmes shared by all the project participants, so that cross-country comparisons would be possible, and 2) the analysis of the impact of joint and open R&D programmes compared to national ones.

The project covers eleven countries chosen in order to cover representative situations in the ERA countries, which include medium-size countries with a well-developed science basis, large countries, Mediterranean countries and Central and Eastern European Member States. These countries are (in alphabetical order) Czech Republic, Denmark, France, Germany, Italy, Netherlands, Norway, Poland, Switzerland, Spain and the United Kingdom.

This document is an annex to JOREP final report (Deliverable D11) presenting in detail the methodology for data collection on joint and open programmes – including both programme descriptors and data on funding flows. It build on Deliverable D3 Study methodology, which has been the basis for the JOREP data collection, but it includes as well a number of improvements and changes from the experience made in JOREP. Accordingly, the methodology presented in this report is slightly different from the one employed to produce the data presented in the final report. The report covers the following topics

- The design of an overall conceptual framework on joint programmes, the basic definitions of these programmes and the identification of the perimeter for data collection (chapter 2 of this report).
- The guidelines for data collection on joint programmes (chapter 3), as well as a general description of procedures for data collection and integration (chapter 4).
- The methodology for data collection on open programmes, as well as opening of national programmes (chapter 5).
- Recommendations for future data collection, mainly addressed to National Statistic Offices and the Eurostat, are also presented (chapter 6).

1.1. Main changes compared to the JOREP study methodology (Deliverable D3)

We list below the main changes which have been introduced in the handbook and are different than the (experimental) methodology adopted for the JOREP study (Deliverable D3).

Box. Highlights on main changes introduced compared to methodology in Deliverable D3

Descriptors. All descriptors have been renumbered in sequential order. Following descriptors have been modified or updated:

- *The new classification of funding agencies devised in JOREP has been inserted (descriptors 1.10/1.11).*
- *NABS has been adopted for the classification by topic of programmes (descriptor 2.12); the other classification have been removed.*
- *A separate description for EU contribution has been introduced (2.19) and the descriptor on funding models has been modified accordingly (2.18).*
- *Two categorization by ERA category (2.20) and programme type have been introduced (2.21), consistently with the analysis performed in JOREP.*
- *A new section on dealing with programme history has been introduced (section 3.6).*

Data collection and management. This section has been completely revised by dropping the specific issues related to JOREP data collection. The data structure has been also revised following the changes in the list of descriptors.

Open programmes. This section has been redrafted following the results of the pilot data collection on opening of national programmes (see JOREP Deliverable D9).

2. CONCEPTUAL BACKGROUND, BASIC DEFINITIONS AND PERIMETER

The JOREP project specifically deals with integration of national research policies in the European Research Area (ERA) through the establishment of joint and open research funding programmes. In this section, we introduce some basic definitions in order also to establish the methodology of the study. We discuss open programmes in chapter 5 of this document.

2.1. A general framework on research funding systems

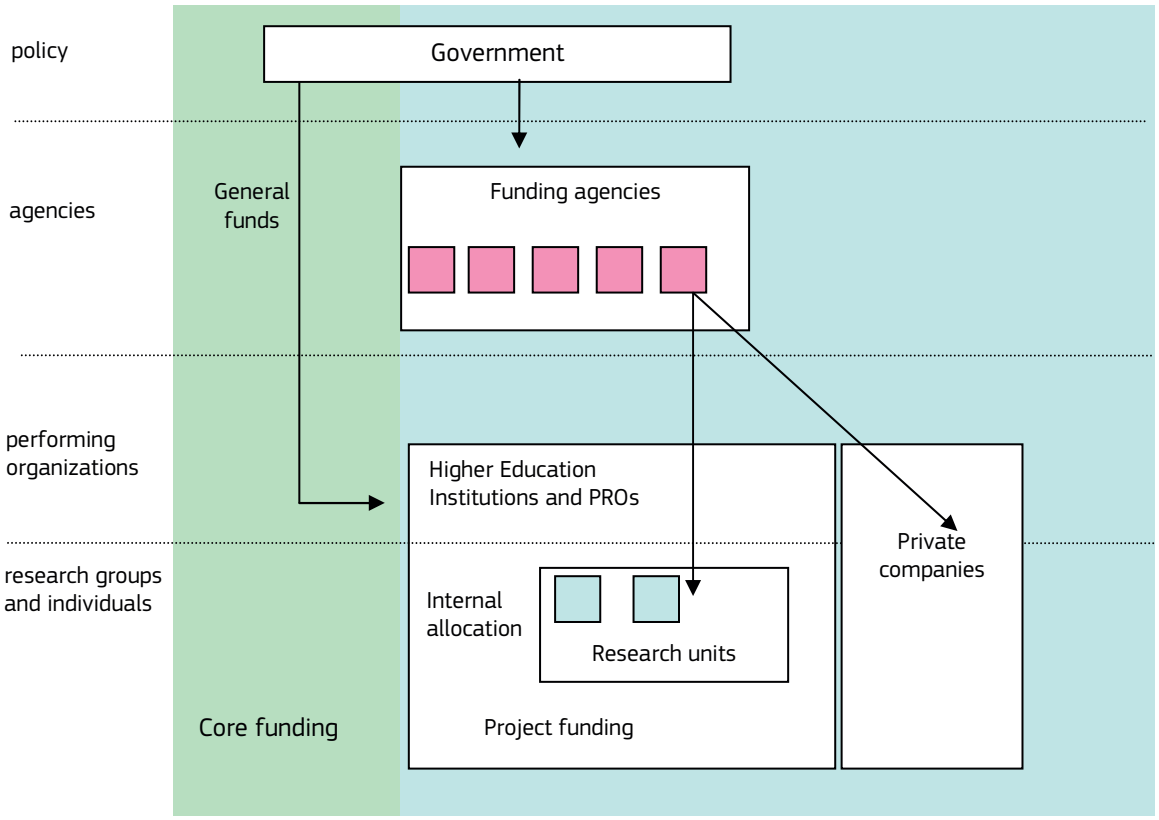
Joint programmes have to be seen in the context of the broader setting of research funding systems in developed countries and, in particular, of their increasingly layered and differentiated organization during the last decades (Lepori 2011). Thus, our model of research funding systems is based on four layers - representing different functions in research funding - namely policy, funding agencies, performing organizations and research groups, as well as two main allocation modes, namely institutional and project funding (see FIGURE 1).

Comparative studies have shown that, while national systems differ widely in the specific organization of each layer and in the share of resources devoted to institutional vs. project funding (Lepori, Dinges, Reale, Slipersaeter, Theves and Van den Besselaar 2007), in most European countries the four layers are organizationally separate – e.g. with a clear separation between funding agencies and research organizations – and the distinction between project and institutional funding can be drawn quite clearly.

The main relevant exception to this scheme is represented by vertically integrated national organizations assuming both the role of funding agency and of research performers, like the Academies of Sciences in some Central and Eastern European Countries (Lepori, Masso, Jablecka, Sima and Ukrainski 2009) and organizations like CNRS in France (Thèves, Lepori and Larédo 2007).

We define ***project funding*** as money attributed to a group or an individual to perform a R&D activity limited in scope, budget and time, in most cases on the basis of the submission of a project proposal describing the research activities to be done (OECD Directorate for Science, Technology and Industry 2010). The main criteria for identifying project funding – as distinguished from institutional funding – are a) the organizational separation between funding agency and beneficiary, b) the fact that funding is limited in time and c) the fact that resources are allocated directly to research groups instead of whole universities or research organizations. The main distinctive criterion is not whether the process of allocation is competitive or not (even if the launch of call for proposals is an important criterion to identify programmes).

FIGURE 1. A model of public funding systems for research



2.1.1. Research funding programmes and funding agencies

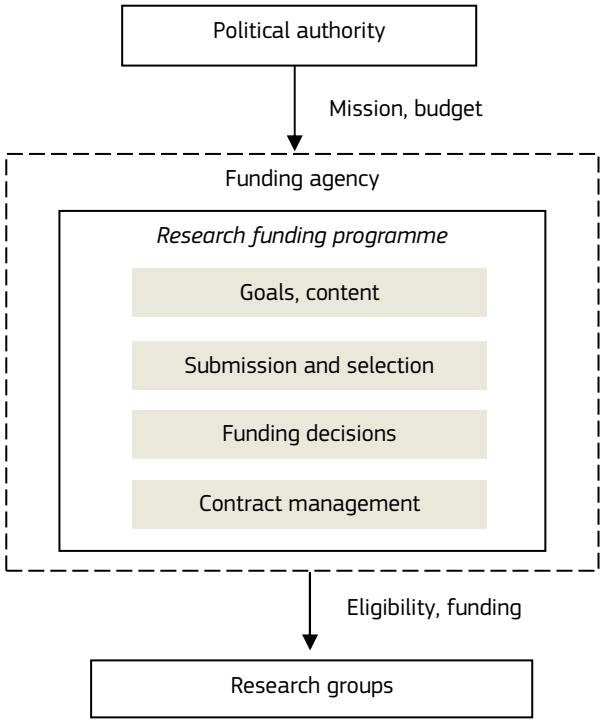
For the purpose of this study, we consider a **research funding programme** as an organizational setting that is able to distribute project funding to research groups (Lepori, van den Besselaar, Dinges, et al 2007) on a regular and organized basis; thus, a research funding programme involves the following functions:

- An explicit goal and mission statement, including the objectives to be reached.
- A statement of scientific priorities or perimeter concerned and an expression of the type and mode of research expected, expressed in the call for proposal.
- A procedure and set of rules for submitting proposals, as well as for their evaluation and selection.
- A dedicated budget related to the programme.
- The procedures for contract establishment and management, including follow-up and reporting.

This definition does not require that programmes are long-term activities with repeated calls, but excludes spot research contracts attributed for specific purposes and without a well-defined framework (even if the selection process of the contract is competitive, like in the case of tenders). Therefore, the main criterion to distinguish research funding programmes from other research coordination initiatives is the existence of open calls for proposals.

Remark. Open calls could be restricted to a subset of performers, for example only higher education institutions might be eligible. Internal calls for proposals of large-scale national research organizations – like CNRS – are included, but not internal calls for proposals of individual universities or research organizations. Programmes can be characterized in terms of their relationships with the policy layer – which is the political authority establishing their mission and providing the resources – and the organizational layer, namely the type and location of research organization which are eligible for receiving funding (see FIGURE 2).

FIGURE 2. Research funding programmes



Publicly funded research programmes are by definition those programmes included in the perimeter of the Government Global Budgetary Appropriations or Outlays for R&D (GBAORD), as defined in the Frascati Manual (OECD 2002 chapter 8) and according to the practice of National Statistical Institutes in each country. Thus, programmes funded by the non-profit sector (e.g. charities) are excluded from the JOREP perimeter, even if their mode of functioning might be very similar to public programmes. Programmes can fund public as well as private or non-profit entities performing research.

We notice that the fact that a programme is funding research – or better R&D activities – rather than for example innovation is related to its goals and mission and not to the activities performed with the funding attributed to the performers, as it would be impossible to check this without information from the performers themselves; this approach is conform to the one adopted in the calculation of GBAORD.

A **funding agency** is a formal organization executing at least one the programme functions listed above. In most cases, funding agencies execute functions for a number of different programmes; as such, a funding agency is endowed with a mission and specific goals, have its internal organizational structure and personnel and enjoy a (varying) degree of autonomy in taking decisions (Braun 1998, Slipersaeter, Lepori and Dinges 2007).

Since the characteristics of funding agencies are highly relevant also for the working of the programmes, we include in JOREP a minimal set of descriptors on the agencies themselves (see chapter 3 of this report).

Remark. The definition of funding agency is an extensive one, including not only formally independent agencies like research councils, but also organizational subunits inside ministries which are in charge of managing research programmes (e.g. ministerial committees) or organizations like COST which is legally an intergovernmental conference. Thus, a funding agency does not necessarily have a legal status on its own. While, in most cases, for national programmes the same funding agency manages all elements of a given programme, it is possible that different functions of a programme are operated by different agencies, as we shall see in case of many joint programmes. Moreover, some functions can be operated jointly by different funding agencies, e.g. the programme design and call contents are jointly developed by different agencies, a

situation which is encountered also for purely national programmes. Most research funding programmes are in fact a complex network of actors with different roles and interests (Shove 2003).

Remark. A funding agency does not necessarily have its own budget for funding research, even if it assumes functions in programme funding (e.g. the European Science Foundation manages calls and project selection, but almost all funding is managed by the national agencies participating to the different programmes).

2.1.2. Integration and the European Research Area

Traditionally most studies of research policy and innovation systems have focused on National States as the unit of analysis – e.g. works around national innovation systems (Lundvall 2000); the same applies for research and development (R&D) statistics based on the Frascati Manual (OECD 2002), which is completely based on national borders and does hardly cover international flows of funding.

However, processes of integration across national borders – broadly meaning the creation of stable relationships between actors located in different countries (Luukkonen and Nedeva 2010) – are a well-known feature of research systems; integration between scientific communities at the European and international level is probably as old as (modern) science and all existing studies display increasing levels of integration, e.g. through increasing shares of international co-authorships of scholarly publications.

Beyond of integration at the bottom layer of scientists and research groups, the integration processes taking place at the other system's layers, namely at the policy and funding level, are at stake here. The notion of a multilayer system displays that these processes influence mutually in both directions: thus, policy integration at the European level explicitly aims at fostering integration in the research layer, whereas one can assume that, at least in some areas, science integration might drive organizational responses (like establishing collaboration between research organizations or dedicated funding instruments). Both the organizational integration through the creation of European research performers, like CERN, and the policy integration through initiatives like the ERA, are widely studied processes (Edler 2009).

We focus here on integration processes at the funding layer of the system, namely on the creation of funding agencies and funding programmes crossing, to some extent, national borders, because they are located at the European level (e.g. European Space Agency or Framework Programmes), because they are jointly managed between different national states (e.g. ERA-NETs) or because they are located in a national space, but open to performers in other countries (open programmes). This form of integration is particularly interesting and relevant in the current context of European research policy since, after a phase focused on the development of European-level instruments like Framework programmes, the orientation of European research policy has shifted towards promoting variable geometry and open arrangements together with Member States and thus the domain of joint programming is rapidly developing (at least concerning the number of initiatives).

In this framework, JOREP deals with one specific form of integration in the funding layers, namely integration which leads to the creation of joint funding programmes, the key criterion to identify them being the existence of joint calls for distributing funding to performers.

Thus, joint initiatives dealing with the strategic coordination of funding agencies and programmes only, like many ERA-NET initiatives, are excluded, as well as international coordination of institutional funding, as in the case of international coordination between large research performers (e.g. CNRS - MPG agreements).

2.2. Joint programmes

2.2.1. Basic definitions

National programmes are those for which all programme functions are operated by one or more agencies located in the same country and which are related to the national policy strategy. This includes for example most programmes operated by national research councils.

European Union programmes are those for which all functions are operated by a European-level funding agency and for which mission and resources are provided solely by the European Union; thus, functionally, they display the same organization as national programmes, although covering the whole ERA. The EU Framework Programmes are the most typical example of EU programmes.

Joint programmes are publicly funded research programmes for which at least one of the functions is shared between more than a single country (or by regions belonging to more than one country). In almost all cases, this will imply that resources for the programme are provided by more than one country.

Example: in the case of the European Space Agency all functions are executed by an intergovernmental organization based on an international treaty between different countries.

Example: in the case of the European Science Foundation, goals, submission and selection are managed by an intergovernmental organization, while funding decisions and contract management are executed by national agencies. Funding is provided by each country for the participation of its own research groups.

In JOREP, different types of funding programmes have been identified depending on how the programme functions are managed by using the descriptors included in this data collection.

We notice that the existence of cross-border funding flows is **not** a criterion for identifying joint programmes. For example programmes where each party has to submit its own proposal to the national agency, but the project is funded only if both national agencies positively evaluate the proposal, are considered joint programmes as long as there is a joint call.

Remark. The definition leaves the possibility that programme functions are managed at regional level, e.g. programmes between two regions of different countries are included in the perimeter.

Type of activities. As a general rule, the JOREP perimeter includes only programmes funding research activities and not only travel and coordination costs. The possibility to use programme funding to hire researchers (including PhD students) is the main criterion for identifying these programmes. It is sufficient that this possibility is allowed for a significant share of accepted projects (thus programmes with funding schemes for research alongside with schemes for mobility should be included). Programmes, whose approved projects mostly fund only travel and coordination cost, are not included in the JOREP perimeter.

Exclusion cases. According to this definition, programmes managed by the European Union bilaterally with a single Member State – for example structural funds – are not considered as joint programmes.

Programmes directly managed by the European Union and funded only from the European budget are not considered as joint programmes.

Coordinated planning of research infrastructures between European countries is not included in JOREP. This concerns, for example, all international research performers or joint laboratories, like CERN, as well as initiatives where national states coordinate their investments in research infrastructures, like the European Strategy Forum on Research Infrastructures (ESFRI). Of course, competitive calls for funding research infrastructures at the performer's level are included in project funding, as well as in the JOREP perimeter.

Special case. National research organizations like Academy of Sciences or CNRS in France will be included in JOREP as far as they act as funding agencies for their laboratories. More specifically, this includes two types of funding schemes:

Funding for participation to joint programmes (e.g. COST or European Science Foundation), where the project' selection is managed at the international level and national funding is provided by the research organization to its participating laboratories.
Specific programmes based on bilateral agreements (e.g. CNRS – MPG agreements) where there are open calls for participation (at least for internal laboratories) and an independent selection procedure. Joint agreements for coordinating research activities between research organizations without open calls are not included in the JOREP perimeter.

2.2.2. Perimeter for data collection

The perimeter of JOREP data collection includes all joint programmes where at least one participating country is situated in the ERA. ERA includes the 27 EU Member States, EFTA countries (Iceland, Lichtenstein, Norway and Switzerland), candidate countries (Turkey, Croatia, Former Yugoslavian Republic of Macedonia) and Israel.

Example: a bilateral programme between France and Morocco is included in the perimeter, whereas a programme between Russia and China is not included.
Thus, the JOREP perimeter broadly corresponds to the two indicators on transnationally co-funded and coordinated public R&D programmes from the EUROSTAT pilot data collection, with the only difference that JOREP includes also programmes with third-countries (however, a distinction between ERA and non-ERA programmes is provided).

Remark. For the purposes of analysis, we will distinguish between ERA joint programmes – involving at least two ERA countries – and joint programmes outside the ERA (see chapter 3 for further details).

For the purposes of data collection, the definition of the perimeter will take place in two steps.
A list of **European initiatives** should be established at the European level, providing information on which country participated to a specific initiative in the reference year. As already introduced, the JOREP perimeter is smaller than the coordination of funding agencies overall and it does not include those initiatives which focus on strategic coordination between funding agencies and between performing organizations (as many ERA-NETs). It includes only those initiatives which come to establish joint funding programmes to performers. As a practical criterion, it is suggested including only those initiatives which launched a call for proposals in the reference year or in the preceding year (meaning that probably projects have been funded in the reference year).
We notice that in JOREP, most Joint Technological Initiatives and all Joint Programming Initiatives have been excluded since these did not launch call for projects until 2009; these are likely to be included in future data collections.
Second, a list of **national joint programmes** should be established by each country and then duplicates be removed by cross-checking of national perimeters – this would also allow identifying missing programmes in some countries. It is recommended that the perimeter and the identification of the restricted perimeter are validated by a national authority (e.g. the section on international affairs from the Ministry of Research).

Coverage of regional programmes. Joint programmes managed by regions are included in the JOREP perimeter and thus should be included in the full programme list to the extent this is possible.
Grouping of similar programmes and aggregation level. In some cases doubts might arise on the right aggregation level to consider in the data collection on joint programmes, e.g. in the case of funding schemes including different actions (like COST) or subprogrammes (like the EUROCORES programme of the European

Science Foundation). Some of these schemes involve a two-step selection process, the first one to select the subprogrammes or actions and the second one, restricted to individual actions, to select individual projects.
To decide on these cases, following **general rule** is advised: programmes should be considered separated if, at the programme level, they have a separated budget with dedicated calls.
Examples. ERA-NET, ERA-NET+ and art. 185 initiatives should be disaggregated at the level of the individual initiatives, since each of them has a dedicated structure for calls and proposal selection and a dedicated budget.

On the contrary, EUREKA and COST activities should not be disaggregated at the level of individual actions, since it is assumed that only a single budget for all COST activities exists both at the European and at the national level. Eurostars, being a cooperation programme within the EU, should be separated from EUREKA.
Despite the fact that there are internal calls, it is not requested to disaggregate EUROCORES at the level of individual programmes given their small size.
ERA-NET and ERA-NET+ have to be considered as separate programmes, even if an ERA-NET is transformed in a ERA-NET+.

Exclusion cases. A few exclusion cases are recommended, as these programmes do not have funding of research as their main goal. These include INTERREG programmes funded under the European Regional development fund, EUROCONTROL, which fund mostly cooperation activities and has no funding from national states.
The European Molecular Biology Organization (EMBO/EMBL) should be further excluded as it funds mainly researcher's grants. The same applies for the European Fusion Development Agency, whose main task is to convey national funding to the JET project.

3. DATA COLLECTION ON JOINT PROGRAMMES: DESCRIPTORS AND FUNDING FLOWS

This chapter provides the guidelines for the data collection on joint programmes in the JOREP countries; it is organized as follows:

In section 3.1 we introduce the overall structure for data collection.

In section 3.2, we discuss data sources, reference periods and handling of missing data.

In section 3.3, we introduce the descriptors on funding agencies.

In section 3.4 , we introduce the descriptors on joint programmes.

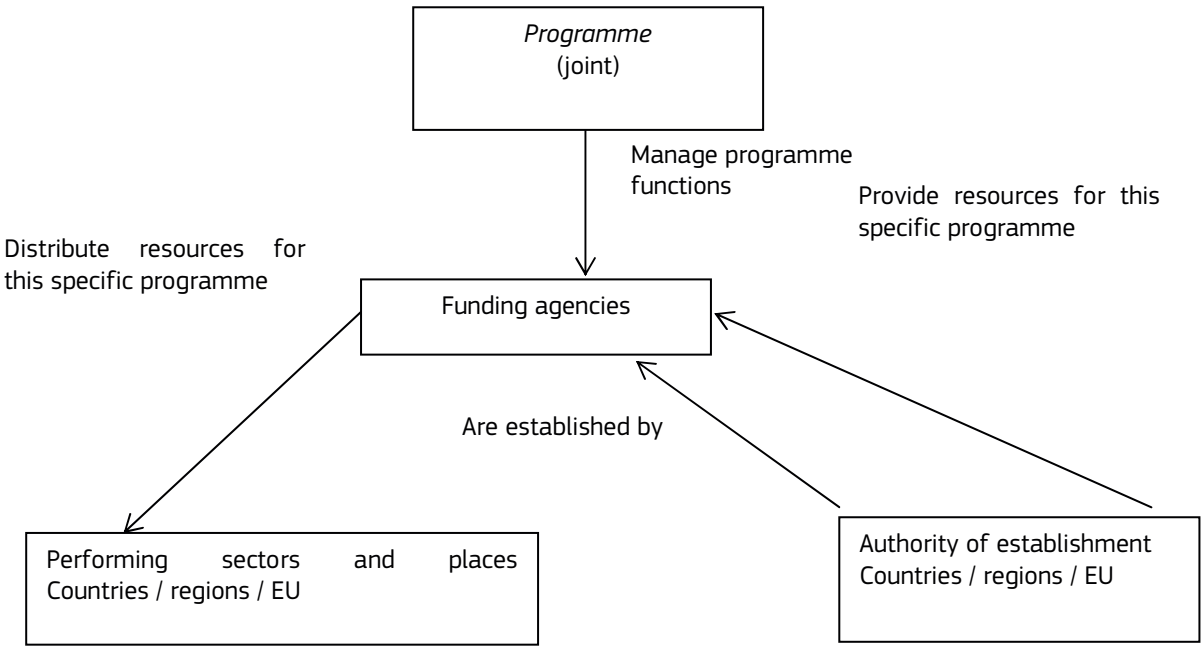
In section 3.5, we deal with data on funding flows.

In section 3.6, we discuss tracking changes in programmes across time and achieving consistency between different data collections.

3.1. Overall structure for data collection

The complex structure of joint programmes implies that, beyond purely quantitative data on funding flows, other kinds of descriptors have to be collected for each programme. Moreover, these data refer to different actors' levels and organizational units. The following figure provides a general representation of the logical structure of data collection.

FIGURE 3. Overview of data collection



Thus, programmes are the main statistical unit in JOREP and are characterized by a set of descriptors as presented in chapter 3.4 of this report.

Further, each programme is associated with a set of funding agencies – managing different functions as well as of countries providing financial resources; finally, it is associated with a set of performers participating to the programme, which are classified by performing sector (see section 3.5.2 of this report) and country. As we shall see in chapter 3.5, the difference between countries as sources of funding and countries as location of performers is central in the whole set of JOREP data collection.

While most of the data will pertain to the programmes themselves, it is envisaged to collect a few basic descriptors on the funding agencies themselves, since their organization is likely to influence also the way agencies manage the different programme functions.

3.2. Data sources

There are different types of data sources, which can be used for data collection; these have different characteristics and thus it is highly relevant to careful document the data source and to take into account their differences.

Source documentation. As a general principle, each data should include a clear statement of the data source and of the date of reference (e.g. when using a website for the description of programmes).
Programme descriptors. Concerning descriptors, following data sources can be used. On all of them, careful documentation of the sources is mandatory (including reference date).
Programme documents, like printed leaflets and information provided on the funding agency website.
Information directly from ministries or funding agencies, e.g. through interviews or personnel contact. For purposes of good documentation, it is requested to mention the source of information, but not the name of the respondent.

3.2.1. Matching European and national data sources

By their nature, data collection on joint programmes involves different countries, as well as in most cases, information to be collected at the European level. Hence, it becomes essential to devise a clear division of work, as well as procedures for matching these different sources. This section describes principles and procedures to this purpose.

Data collection. As a general principle, data (including descriptors) will be collected at the level where the specific function is managed and referred to the specific agency managing it. Following examples should clarify this rule:

- If calls for proposals are managed at the supranational level by a single agency, this information will be collected at the European level directly.
- If contracts are managed individually by national funding agencies participating to a joint programme, corresponding descriptors will be collected for each country individually and related to national agencies, although referring to the programme code of the specific programme.
- When functions are jointly managed by different agencies – e.g. in case of joint calls between national agencies – both national correspondents should provide their own descriptors and then reconciliation of the information will be performed at the European level.

3.2.2. Reference periods

Following reference periods should be adopted:
The perimeter should include all programmes which launched calls in the reference year or in the year before (2008 and 2009 for JOREP).
Descriptors should refer to the situation the last day of the reference year, i.e. 31.12.2009 for JOREP. If, for any reason, another date is chosen (e.g. programmes closed during the year), this has to be indicated in the methodological remarks.
Financial data should refer to the calendar year, i.e. 01.01-31.12 of each year; furthermore, JOREP provide a complete coverage of financial data for the years 2000-2009 based on the 2009 perimeter.

3.3. Descriptors on funding agencies

As already introduced, funding agencies are an essential part of programme life and their organizational characteristics are likely to influence its working; hence, JOREP will collect a minimal set of descriptors on the agencies themselves as background information for the analysis. This information will be mostly retrieved from websites or official documents.

Following descriptors are requested.

1.1 National agency identifier. The code identifying the national agency in the format of XX-NN where XX is the ISO code for the country and NN is the number of funding agencies for the same country running from 01 as long as necessary.

1.2 Country. For national and regional agencies only, the country where the agency is established.

1.3 Acronym. The official acronym of the funding agency, if available.

1.4 Name of the agency in official language. The full name in the language of establishment. For international agencies, the official English name should be used.

1.5 Name of the agency in English language. Full name of the agency in English, e.g. the one adopted in policy documents or on the agency website (if available).

1.6 Status of the agency. We distinguish between following categories.

National agency established by a single country.

European agency, established through European law (e.g. European Interest Groups).

Intergovernmental agency established by an international treaty between national states (possibly including also the European Union). These can be at the international, European or (country) regional level (e.g. Nordic Council).

International non-governmental association e.g. established through an agreement between national or regional funding agencies.

Regional agencies established by a regional authority.

We notice that this categorization refers to the authority of establishment and not to the geographical space where these agencies fund research.

1.7 Agency website. The official website of the agency, if available insert the link to the English section. This should be inserted to quickly retrieve additional information for the purposes of analysis.

1.8 Total budget. The total budget of the agency for research project funding for the year 2009 is provided as a rough measure of the size of the programmes it manages. Data should be provided in national currency at current prices. For agency performing other functions than research funding (e.g. ministries) or funding their own research centers, this value should refer to project funding research only. The data has to be provided in national currency at current prices.

1.9 Geographical level. Agencies are distinguished between supranational, national and regional. This distinction refers to the institutional embedding, not to the funding activities; e.g. a regional agency, funded under regional law, might support also research outside the region.

1.10 / 1.11 Agency classification. The classification of funding agencies is two-level, the first one refers to the position with respect to the State, while the second one specifies more precisely the domain of activity.

At the first level distinguish between following categories:

- Governmental agencies are agencies which are functionally part of the public administration, meaning for example division of ministries, ministerial committees, etc. Typical examples at the European level are DG research (managing the European FP), at national level research ministries. These are divided between:
  - National research/science ministry
  - National sectoral ministry (e.g. energy)
  - Regional government (non divided in subcategories)

- Independent agencies are agencies which have functionally a large degree of independence from the State in managing their activities and selecting the projects to be funded; in some cases this might be realized by a specific legal status granting autonomy. A key criterion to distinguish the two types of agencies is if the State (e.g. ministry) retains the right to take the final decision on granting money to specific projects. These are divided between:
  - Innovation agency, whose mission and funding are oriented towards innovation and creation of economic value.
  - Research councils, whose funding is mainly oriented towards basic research and which have strong connection to the academic community (for example in the composition of decision-making committee).
  - Sectoral agency – related to specific topic (energy, environment, etc.), e.g. sectoral regulatory agencies or sectoral funding agencies.
  - Intergovernmental agency created by international treaty (ESA).
  - EU-implementation agency based on EU law (e.g. the agency managing AAL).
  - International non-governmental association (European Science Foundation).
- Performers are organizations whose main mission is to perform R&D activities, even if might host some funding agencies activities. These are divided between:
  - Public research organizations (PRO) assuming also a function in funding
  - Private research organizations

3.4. Programme descriptors

A basic element of JOREP data collection is a set of programme descriptors allowing to provide in-depth information on the characteristics of joint programmes. All these descriptors are collected for the reference date (last day of the reference year). The following TABLE 1 provides a complete list of the envisaged descriptors and their main characteristics, while definitions are specified below. Some descriptors refer to the programme, others to characteristics of the national participation; in the latter case, there is typically one descriptor for each participating country.

TABLE 1. List of descriptors for joint programmes

Descriptor	Type	Category	Remarks
2.1 Programme identifier	Numeric code	Programme-level	
2.2 Name of the programme	Free text	Programme-level	
2.3 Programme start year	Closed list	Programme-level	
2.4 Participating countries	Closed list	National-level	
2.5 Year of participation	Closed list	National-level	
2.6 National role	Closed list	Programme-level	
2.7 Establishing authority	Free text	Programme-level	
2.8 Participating agencies	Closed list	Agency-level	
2.9 Agency function	Closed list	Agency-level	With identification of the functions of each agency
2.10 Programme duration	Binary	Programme-level	Limited/unlimited
2.11 Project duration	Closed list	Programme-level	
2.12 Research topics	Closed list	Programme-level	OST classification (DISC) and NABS classification
2.13 Beneficiary sectors	Closed list	National-level	Frascati sectors
2.14 Selection criteria	Scale	Programme-level	Scientific quality and relevance.
2.15 Submission procedure	Binary	Programme-level	Single entry point/multiple

		submission
2.16 Mode of integration	Closed list	Programme-level
2.17 Funding model	Closed list	Programme-level
2.18 EU funding	Closed list	Programme-level
2.19 Partner countries	List	Programme-level

3.4.1. Definitions and methodological remarks

2.1 Programme identifier. The code identifying the programme.

2.2 Name of the programme in English. If the main programme language is not English, the official translation if it exists. If there is no official name in English, the name in the national language should be used.

2.3 Start year of the programme, is the year when the specific programme has been officially created, by signing a specific agreement. This might be earlier than the official launch of the funding scheme, as well as the start of funding to performers.

We consider creation year when the instrument began to exist in its basic characteristics, like its name, the main objectives and the basic organizational setting.

2.4 Participating countries. The list of participating countries in the JOREP perimeter.

2.5 Year of national participation is a specific variable for each country participating to the programme in 2009 identifying the first year when funding has been budgeted for the programme in that country.

2.6 National role. This descriptor identifies the situation of national participants in the programme, as well as the availability of funds:

- Full participation, if research groups from the considered country can participate to all programme activities without restrictions; in case of programmes with national pot, this means also that full funding is available (e.g. for research purposes).
- Full participation with restricted funding, if research groups from the considered country can participate to all programme activities without restrictions, but availability of funding is restricted to coordination and networking activities.
- Limited participation if research group from the country can participate with limitations, e.g. as external partners or not taking a coordination role.

It is strongly advised to provide detailed information in the remarks section.

2.7 Establishing authorities. The body– EU, national states, regions, funding agencies – which officially established the programme, either by its own decision or by signing some kind of agreement. This includes political authorities, but also funding agencies when the decision is taken at this level.

Example. The D-CH-A Lead agency agreement has been established through a direct agreement between the participating research councils and thus these should be considered as the establishing authorities (rather than the national States involved).

2.8/2.9 Participating agencies and agency role. By definition, we consider as participating agencies those fulfilling at least one of the programme functions. For each agency, indication is requested if it manages at least one of following functions.

- Definition of the programme goals and mission.
- Preparation and diffusion of the call.
- Management of the submission process.
- Evaluation and selection process.
- Decision on which projects to fund.
- Management of contract and payments.

Three options are provided: yes, no and participation to collective decision in case a joint committee of agencies representatives takes decisions.

This list should include only the agencies taking the lead for each of these functions; other bodies cooperating in these functions (e.g. providing advice or helping in peer-review processes) should be included in the remark section. In cases where at national or European level different functions are managed by different agencies there will be more than one participating agency per country. If there is a two stages submission procedure, answers should refer to the final selection stage and provide information on other stages in the remarks section.

2.10 Programme duration. This variable distinguishes between:

Programmes limited in time and with one or few calls.

Periodic programmes without a time limitation, but with irregular calls.

Regular programmes without a time limitation and regular calls (e.g. yearly or each two years).

2.11 Project duration. This variable identifies the typical duration of projects funded by the programme, by using the following scale: less than 2 years, 2-4 years, more than 4 years. By typical, we mean that most of the projects are in this duration range.

This information should be derived from programme descriptions and calls. Exceptions and specific cases should be noted in the remarks.

2.12 Research topics. For classification of programme topics, the Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets from the Frascati Manual (2007 version) should be adopted. This classification refers to the socio-economic objective of the programme, not to the actual research content. Please notice that category 12 is not applicable for programmes, while investigator-driven programmes should be classified under category 13.

TABLE 2. NABS categories

Exploration and exploitation of the earth
Environment
Exploration and exploitation of space
Transport, telecommunication and other infrastructures
Energy
Industrial production and technology
Health
Agriculture
Education
Culture, recreation, religion and mass media
Political and social systems, structures and processes
General advancement of knowledge: R&D financed from general university funds (GUF)
General advancement of knowledge: R&R financed from other sources than GUF
Defence

More specific indication on subtopics can be inserted in the remark section.

2.13 Potential beneficiary sectors. This descriptor identifies the performing sectors which are legally entitled to get funding from the programme (actual data are included in the funding data collection; see chapter 3.5).

The sectoral classification of the Frascati Manual should be used:

- GOV: Government sector: Research institutes/governmental institutions with R&D which are mainly financed and controlled by the government.
- HEI: Higher education institutions.
- PNP: Non-market, private non-profit institutions serving households/ the general public.
- Private: Business enterprise sector: firms/organisations/institutions whose primary activity is the market production of goods or services, including the private non-profit institutions mainly serving the business enterprise sector.
- Abroad.

This descriptor provides synthetic information on the importance of the two following criteria in the selection of projects:

- Scientific quality.
- Relevance to strategic or economic priorities.

These criteria have to be assessed by national experts based on the information from programme descriptions and calls on the following point scale:

4: is the most important criterion for project selection.

3: it is an important criterion.

2: it is an additional criterion.

1: it is not a relevant criterion.

Total number of points for the two criteria has to be 5.

2.15 Submission procedure. Following categories are used:

Single-entry point when proposal are submitted to a single agency.

Parallel submission when proposal have to be submitted at the same time to two or more agencies (as in many bilateral programmes).

By submission is meant delivering the whole proposal for the purposes of evaluation and selection. Sending copies for purposes of information should not be considered as parallel submission.

2.16 Mode of integration. This descriptor identifies how the common programmes activities are institutionalized. We distinguish between three categories:

- Creation of a specific agency, where joint activities are managed by a supranational agency with an enduring and long-term status (agency).
- Management of joint activities through non-permanent structures like joint committees, whose existence is specifically related to the programme itself (coordination).
- Management of joint activities through the delegation to a national agency in one of the participating countries (delegation).
- Independent evaluation and selection, where the project is approved only if both parties decide independently to finance it (independent selection).

2.17 Funding model. As joint programmes do not necessarily involve cross-border flows of funding and the joint call function can be separated from the funding function, different possible options concerning the management of financial flows in joint programmes exist. This descriptor specifices how national funding for joint programmes is managed. We distinguish between the following models (ERAC, 2010):

- Common pot when all financial resources from participating countries are put in a single pot and used for financing the selected projects, independently of the country where research is performed.
- Common pot with return rules, when some relationships are formally requested between national contributions and funding to national performers. The rule should be stated in some official documents (including statutes, policy briefs, and minutes). This model is applied for example by the European Space Agency.

- National pot where financial resources for participating countries are managed separately and devoted to national performers. This model is applied, as an example, by European Science Foundation programmes.
- Mixed-mode, where the principle of national return is maintained and most of the resources are managed at national level, but there is a compensation mechanism to fund the best ranked proposals anyway, through top-up funding from national contributions. This model is applied in many ERA-NET initiatives.

The selection of the funding model should be based on the most important model adopted, e.g. if 90% of national funding is used in national pot model this category should be used.

2.18 EU contribution. This descriptor identifies whether the programme is co-funded by the European Union (yes/no). It does not necessarily require that funding is disbursed in the reference year (for example if the contribution was paid the previous year before of the current call); an extensive interpretation is advised where all programmes are included for which EU contribution is foreseen by an official decision.

2.19 Partner countries. For bilateral and multilateral programmes this field lists the partner countries up to a maximum of ten countries; above this threshold, regional categories should be used (e.g. developing countries).

2.19 ERA category. This descriptor provides a general categorization of joint programmes in terms of their relationships with the European research area. It is thus inserted in the database after data collection based on other descriptors. Following three categories are distinguished:

- European-level initiatives are those joint programmes which are in principle open to all ERA countries either because they are established by the European Union or based on international treaties.
- Bilateral programmes within the ERA are joint programmes established by a closed group of countries (not necessarily two) and which include only ERA countries.
- Bilateral programmes outside the ERA are joint programmes established by a closed group of countries (not necessarily two) and which include also countries not belonging to the European Research Area.

2.19 Programme type. This categorization has been introduced to distinguish the main organizational settings of joint programmes and is based on a set of other descriptions. Following categories are distinguished

- Integrated programmes are those characterized by the existence of a supranational agency (coordination mode: agency); they are further divided into integrated programmes with integration of funding (funding model: common pot) and without integration of funding (funding model: national pot).
- Coordinated programmes are those characterized by lighter coordination modes (coordination mode: coordination or delegation) and by single-entry point submission. They are further divided into coordinated programmes with delegation (coordination mode: delegation), coordinated programmes with integration of funding (coordination mode: coordination; funding model: real pot) and coordinated programmes without integration of funding (coordination mode: coordination; funding model: national pot).
- Collaborative programmes are those characterized by independent selection (collaborative programmes, independent programmes) ore those characterized by coordination and parallel submission (collaborative programmes, parallel programmes).

3.5. Data on funding flows

A key task of JOREP is to collect complete data on the funding flows related to joint programmes. This section provides guidelines and instructions on how to perform data collection.

Following the general approach on research funding presented in chapter 2 of this report, the analysis of funding flows distinguishes between three following levels:

The **sources of funding.** These are the budgetary units where resources for the programme itself are decided and provided. Sources of funding include national budgets, regional budgets and the European budget.

The **managing agencies** which manage these resources and pay the participating performers. Transfer of money from public budgets to managing agencies is not a necessary condition, i.e. in case of agencies whose treasury is managed by the State itself.

The **performers,** i.e. the research units receiving the money for purposes of realizing research. For the purpose of JOREP, performers are divided among public, private and abroad beneficiaries.

Hence, data collection on funding flows includes two different tables of flows, one concerning funding agencies and one concerning performers. These are to be considered as distinct and with separated rules and thus there reconciliation of flows is not attempted (e.g. in case that funding agencies receive resources in one year and allocate them in another year).

Funding data. All financial data should be based on official data, as included in reports, budgets or GBAORD data collection. It is highly important to clearly indicate the source used as different sources will not always be coherent.

Data from GBAORD data collection are the preferred source, as they are more standardized and internationally comparable. As far as possible, data should come from the detailed GBAORD survey data, to be accessed through the national statistical office. In all cases, these data need to be checked with national statistical institutes.

Data from public budgets or national research reports can be used as complementary sources when GBAORD data are not detailed enough.

Data from funding agencies directly (e.g. annual report) are used when national budgetary data are not sufficient, e.g. in case funding agencies receive an overall budget for their instruments without internal division, making it impossible to have information on the funding volume per programme.

In order to ensure completeness of data, estimates are allowed when there is a sufficient ground to provide them. Estimates should be clearly documented on their rationale.

Each national partner is requested to provide a detailed methodological annex on financial data, sources, methodological problems, performed corrections. It is highly recommended that financial data are validated with national statistical institutes and funding agencies, as well as with other data providers.

3.5.1. Budgetary allocations and funding agencies

Data collection on budgetary allocation identifies funding flows from public budgets (national and European) to the corresponding funding agencies.

The list of participating countries and of the involved agencies will match the one included in the descriptive part of the data collection. The final outcome of this data collection will be a matrix table covering all funding flows from the State (at European, national, regional level) to the funding agencies included in the JOREP perimeter.

TABLE 3. Cross table of funding sources and funding agencies.

Budgetary source Agency managing funding	Country A	Country B	Country C	EU
Agency A1	100’000			
Agency B1		100’000		
Agency C1			100’000	
Agency I1	20’000	20’000	20’000	200’000

General principles of data collection

As a general principle, the data will be collected in the country where funding are originated. Thus:

Funding from national states to the European Space Agency will be collected in each national country individually.

Funding from the European Union to specific agencies (e.g. the DIS managing art. 185 initiatives) will be collected in the European data collection sheet.

Coverage of budgeted items. Experience indicates that not in all cases participation to joint programmes is decided at the political level or funding are allocated through a separate budgetary line. In some cases decisions both on participation and on funding levels are delegated to funding agencies, like research councils, and this is part of the research council's priority setting (rather than decisions at the political level).

It is important to distinguish these situations as they have quite different implications in terms of policy, and they also lead to very different contexts of data availabilities.

Currency. National currency at current prices should be used for the purposes the data collection. Conversion to a single currency (e.g. Euros) will be done only when performing the data analysis.

Time frame. Data refer to the calendar year of the reference year. In JOREP, data collection covered the period 2000-2009.

Calculation basis. To the extent of possible, rules for calculating the amount of funding should follow the practice of the Frascati Manual concerning GBOARD. In particular, multi-annual projects should be allocated to the year of budgeting, not to the year of performance or the year when the original budgeting authorization was issued. The Frascati Manual (chapter 8) advises to use for final GBAORD data the final budget approved by the budgeting authority (e.g. national parliament), but leaves also the possibility to use effective allocation from the state accounts. National experts should use the same source and computation method as in the national GBAORD data.

For programmes funding private companies through (partially reimbursable) loans, care should be taken to discount them with their effective value (less the reimbursement) or a standard discount rate should be adopted, as otherwise funding for these programmes might be quite overestimated. Details have to be inserted in the remarks section.

List of variables

This data collection will include the following variables.

3.1 Programme identifier. Corresponding to those in the data collection for descriptors.

3.2 Origin of funding. The exact origin of the budget, including the European Union budget, the national budgets and regional budgets. This variable provides the specific name of the funding source (e.g. French research ministry).

3.3 Funding country. The national state (or EU) from where funding originates (in case of regional budgets the relevant country).

3.4 Source category. The classification of the funding source by distinguishing between EU, national budget and regional budget. This is inserted for purposes of future data analysis.

3.5 Funding agency. The funding agency receiving the funding amount specifically for this programme. If for a programme there is more than one agency receiving a share of the budget, the amount for each agency should be entered separately.

3.6 Currency. The currency in which the data are expressed. Standard ISO codes should be used.

3.7 Year. The calendar year to which the amount refers.

3.8 Budgeting. The type of budgeting conforming to the following categories:

- Specific budget line, when funding to joint programmes is explicitly part of a specific budgetary line which can be identified in GBAORD data. In these cases, the level of funds transferred to the funding agency should be derived directly from GBAORD data and comply with the EUROSTAT pilot data on transnational funded programmes.
- Earmarked budget, when there is no specific budgeting line, but it is specified (for example in political decision or strategic documents) that part of the general transfer to a funding agency should be used for

the participation to specific programmes. In these cases, data will have to be estimated from these policy documents (possibly by averaging over different years).

- Delegated budget, when there might be a general political decision to participate, but the decision on the level of funding is completely delegated to the agency. In this case, the volume of funds will have to be derived from data of the funding agency and should match the one in the funding to beneficiaries table.

3.9 Amount. The funding for the whole year expressed in currency units.

3.10 Data source category. This variable provides a categorization of data sources as follows:

- GBAORD or other budgetary data.
- Information from funding agency.
- Other source (specified in the following variable).
- National expert estimate (should be clarified under remarks).

3.11 Data source. The exact source of the data provided.

3.12 Remarks. Any relevant remarks to the data or descriptors

3.5.2. Funding from agencies to performers

Further, JOREP collects data on resources transferred from funding agencies to performers. Data on funding are collected for each funding agency managing resources for the programme and are disaggregated by country of the performing organization and by performing sector.

General principles of data collection

As a general principle, the data will be collected separately for each funding agency which manages funding for the specific programme and in the country where the agency is located; thus:

For supranational agencies which manage centrally their resources (real common pot) data are collected directly at the European level and have to be disaggregated by receiving countries.

For national or regional agencies managing national funding (either in joint or open programmes) data are collected at national level and no further disaggregation of resources going abroad will be requested.

Performing sector. To the extent of possible data should be disaggregated between public and private beneficiaries. Public should correspond to the higher education, government and public nonprofit sectors of the Frascati Manual. If only aggregated data are available, these should be entered separately. Estimates of the share public/private are acceptable.

Calculation basis. Data should refer to funding agencies decisions as these are budgeted (e.g. if multiannual projects are budgeted in different years, the corresponding repartition should be adopted). Data from funding decisions can be used, but they should be clearly marked as such. For programmes funding different activities (e.g. research and mobility) details of coverage should be provided in the remarks section.

Currency. National currency at current prices should be used for data collection. Conversion to a single currency (e.g. Euros) will be done only when performing the data analysis.

Time frame. Data will be collected separately for each year from 2000 to2009.

List of descriptors

4.1 Programme identifier. Code identifying the programme. The name and code should correspond to those in the data collection for programme descriptors.

4.2 Name of the programme in English. Full name of the programme in English.

4.3 Country. Country the funding amount refers to.

4.4 Funding agency. The name of the funding agency the funding (5.7) originates from. If for a programme there is more than one funding agency, the corresponding amounts should be entered separately.

4.5 Year. The calendar year to which the amount refers.

4.6 Currency. The national currency used. Standard ISO currency codes should be used.

4.7 Amount. For each year, the volume of funding transferred to public and private beneficiaries. Enter the amount for the whole year expressed in currency units.

4.8 Data source category. This variable provides a categorization of data sources as follows:

GBAORD or other budgetary data.

Information from funding agency.

Other source (specified in the following variable).

National expert estimate (should be clarified under remarks).

4.9 Data source. Please indicate the exact source from were data has been retrieved.

Remarks. Please write any relevant remarks to the data or descriptors.

3.6. Programme History and Demography

As introduced, the perimeter of joint programmes and their characteristics are likely to change significantly even in a very short period of time: some programmes might be closed, new ones launched, but also programmes change of organizational characteristics and even of name – like the case of ERA-NETs transforming into art. 185 initiatives. While JOREP collected data only on the year 2009 (and backward for the 2009 programmes on funding volumes), future data collections will have to deal carefully with this kind of issues, especially if the aim is to study temporal dynamics of programmes.

While a full system of notations for dealing with programme history will have to developed in the future rounds of data collection, we summarize here a few general principles.

a) As a general rule, programmes will have a unique time-independent ID, while all descriptors will receive a reference year label – the only exceptions being the descriptors which should be unique, including programme name and programme start year. Further, a new descriptor with programme end year will be introduced – ongoing programmes having receiving a missing value for that descriptor.

b) Second, a specific notation should be introduced for transformation of programmes, like changes in name, legal statute, etc.

This will take the form of a cross table linking two programmes with the following format:

ID of programme 1.

ID of programme 2.

Date of the transformation even.

Categorization of the transformation event. The main category is expected to by that programme 1 is replaced by programme 2, but a few other categories might be devised.

A remark section explaining the process which took place.

c) While it is expected that descriptors collection will not take place every year, it should be aimed to additionally collected following information:

Time of programme end for programmes which ceased to exists between two data collections.

Funding data for the intermediate year.

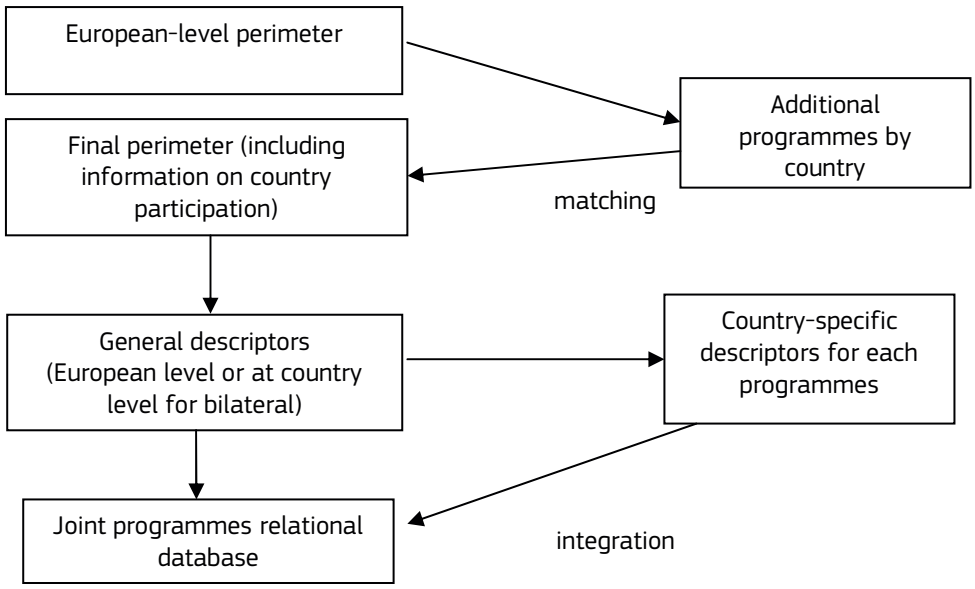
4. DATA COLLECTION, MANAGEMENT AND INTEGRATION

The complex nature of joint programmes implies a parallel complexity in data collection procedures and management, where information from the European level and different countries needs to be coordinated, matched and finally merged in a relational database. This chapter provides indication on how to manage these tasks which are critical for the quality of the collected data.

4.1. General description of the workflow

FIGURE 4 summarizes the workflow for the collection of data and their integration in the final joint programmes relational database.

FIGURE 4. Overall workflow for data collection on joint programmes



a) As a first step, a common definition of perimeter, including unique programme IDs, in undertaken. A general list of European initiatives is first compiled, including information on which countries are participating. Second, for each country, this list is checked concerning participation and integrated with information on bilateral programmes to be added to the list. Finally, a matching process takes place where bilateral programmes announced by different countries are merged and missing countries are added to the participation list (e.g. checking if a programme between France and Italy has been included for both countries).

b) The information for each programme is then collected separately.

First, for European initiatives, programme-level descriptors are collected at the European level; this includes also data on funding from the European Union to European agencies, as well as funding from these agencies to national beneficiaries (divided by country).

Second, country-specific descriptors, as well as all descriptors on bilateral programmes are collected independently by each participating country. This includes as well information on national funding to agencies (both national and European), as well as on funding by national agencies to beneficiaries (national).

Third, duplicate data provided by different countries (for bilateral programmes) are then matched for consistencies and case of differences are then checked and cleared.

c) Finally, the information from the different sheets is merged into a relational database (see below FIGURE 5).

4.2. Data collection tools

The data collections is organised by use of templates developed in Microsoft Excel. The sheets are organised to that information is collected in separate sheets for funding agencies, joint programmes, open programmes, funding flows to agencies and funding flows to beneficiaries. The templates are accompanied by guidelines with descriptor definitions, instructions for formatting and some additional standard definitions (ISO codes).

As from the programme structure, there are separate data collection sheets for each country participating to a joint programme. They include the full programme list, as well as codes to identify national participations in order to speed the data collection process.
The templates are prefilled with drop down lists containing descriptors indicating partner countries, funding agencies responsible for the programme, etc. National sheets will be cleaned and prepared before sending them out to the national experts and included data collected at the European level in order to avoid duplicate data.

4.2.1. Data quality checks

Given the complexity of data collection on joint programmes, it is extremely important that systematic data checking is undertaken before importing the data in the joint database. Checking includes inter alia.:

- Consistency checks between different descriptors, like national participation years and data on national funding to the programme.
- Control of the missing data and specification of their status (e.g. 'Not available', 'Not applicable' etc.).
- Flagging of data for which there are departures of the definitions and checking of the completeness of the remark section.

4.2.2. Database integration

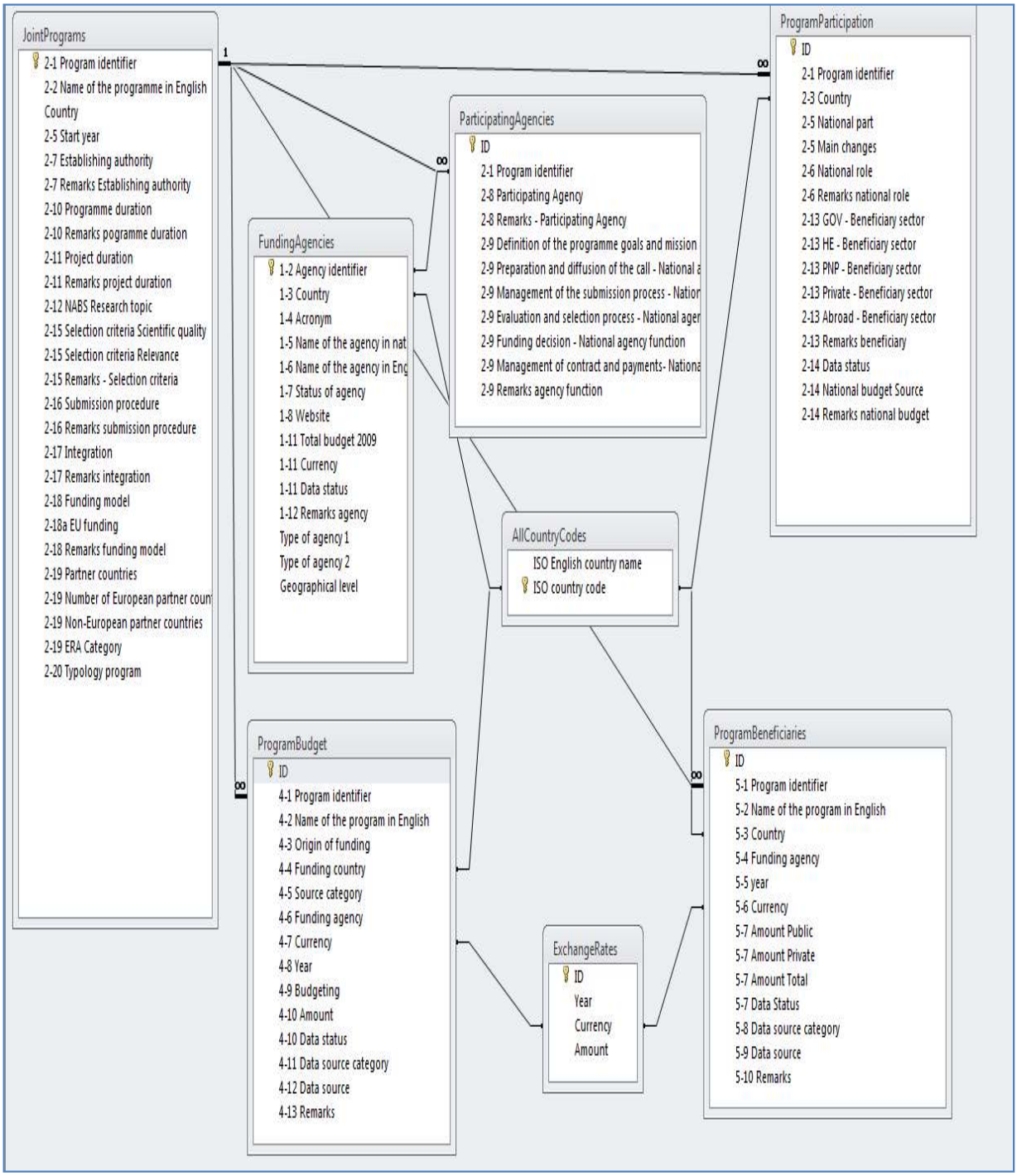
The multilevel and relational structure of joint programmes implies that the full dataset cannot be managed on a single sheet, for example in excel, but integration has to take place in a relational database which allows managing the relationships between countries, programmes and funding agencies.

The general database structure is based on the overall scheme presented at the beginning of chapter 3 (FIGURE 3) and is built around the following main tables:

- The joint programmes table includes all descriptors situated at the programme level.
- The programme participation table includes the descriptors referring to the participation of a specific country to a joint programme (e.g. start participation year).
- The funding agencies table includes the list of national and European funding agencies, as well as their descriptors.
- The programme budget table includes all data on transfer from national and European budget to funding agencies for the purposes of a specific programme.
- The programme beneficiaries table includes all data on transfer from a specific funding agency to beneficiaries in a country for a joint programme.

In JOREP the database has been implemented in MS Access, by enforcing all referential integrity checks needed (FIGURE 5); auxiliary tables have been introduced with country codes and exchange rates for the conversion of monetary values in euros. Further, a set of queries has been designed to extract the data needed for specific analyses.

FIGURE 5. Structure of the JOREP database



5. OPENING OF NATIONAL RESEARCH PROGRAMMES

Besides joint programmes, this handbook provides guidelines concerning data collection on open programme, broadly defined as national public funding research programmes where research organizations abroad can participate to some extent.

Opening of national research funding programmes – i.e. the possibility for organizations located abroad to participate in some form to national programmes – is considered a key dimension in the establishment of a European market of knowledge alongside with the establishment of joint programmes (Commission of the European communities 2000; 2587 Elena Pérez,S. 2010).

Namely, in a policy context where most of the R&D funding is channeled through national programmes, opportunities for participation of partners abroad are important in order to promote international collaboration of research, as well as to increase the quality of European research thanks to integration of competences and stronger competition – beyond the limitations of closed national research spaces.

The analyses performed in JOREP demonstrated however that opening is a multidimensional phenomenon which ranges from provisions for international collaboration in purely national projects until programmes where research performed by organizations abroad can be supported with national resources. The methodology developed by JOREP focuses on characterization of national programmes alongside these different dimensions rather than on the identification of open programmes in a restricted meaning.

5.1. Basic definitions and perimeter

Opening of national programmes indicates a set of provisions which allow foreign organizations to participate to national programmes in different forms. More specifically, this includes the following dimensions:

- The portability of grants, i.e. the possibility for a researcher being hired by a foreign research organization to bring the grant abroad.
- The possibility of research organizations abroad to be official project partners (for example applicants of co-applicants).
- The possibility for research organizations abroad to be project main applicant or coordinator. Three response options are proposed: yes, if it is possible in any case, conditional if it is possible subject to some conditions (to be specified in the remarks), no if it is not possible.
- The possibility for organizations abroad to receive research funding within the project.
- The availability of funding to support international cooperation in the projects, for example financing travel and the organization of joint workshops with cooperation partners abroad.

Remark. Definition and criteria for opening refer to the place of the research organization hiring the researcher, not to the nationality of the researcher or to the place where research is undertaken (for example empirical studies performed abroad are not included. Consequently, grant schemes hiring researchers from abroad to work in national research organizations are not included in the definition.

Remark. Purchase of services abroad without research content (e.g. specific types of analysis of data or materials) are not included in the opening definitions.

Perimeter. The perimeter for the analysis of opening includes the following programmes:
All large national research funding programmes. The criteria for inclusion should be based on the financial volume of the programmes (e.g. to some threshold), as well as their importance in the national funding landscape. Generally speaking, it is expected that all large national funding agencies and general-purpose schemes are covered (for example investigator-driven programmes), as well as thematic and oriented programmes of large size.

The national research funding programmes where legal provision foresee that research funding can be provided to organizations abroad (independently from the effective share of funds transferred; open programmes in a restricted meaning).

National experts are responsible of the final decision on inclusion. When data on total volume of national project funding are available (for example from the OECD/NESTI project) these should be used to assess coverage. It is recommended that the perimeter is validated by a national authority (e.g. the section on international affairs from the Ministry of Research). Information on validation should be included in the cover sheet of the data collection.

Exclusion cases. Following types of programmes are not considered as open and are excluded from the perimeter of JOREP data collection:

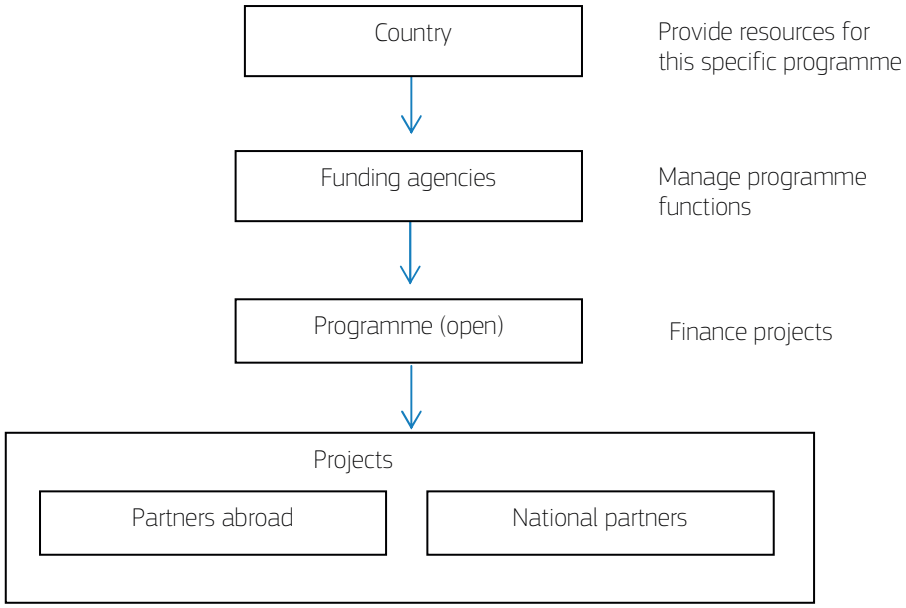
- Programmes which accept applications from researchers currently working abroad, but at the condition that, if the project is selected, they will be employed by a national organizations (e.g. brain-drain programmes).
- Programmes funding research performed by researchers employed by national organizations, but performed abroad (e.g. archeological searches in a third country).

Grouping of similar programmes and aggregation level. In some cases doubts might arise on the right aggregation level to consider in the data collection on open programmes, e.g. in the case of funding schemes including different actions or subprograms.
To decide on these cases, following general rule is advised: programmes should be considered separated if, at the programme level, they have a separated budget with dedicated calls.
Examples. If a national research council manages a general programme for research cooperation with third-party countries, this should not be further disaggregated by partner countries; however, cooperation programmes based on specific agreements and with an individual budget have to be included individually.

5.2. Overall structure for data collection

Since programmes considered in the opening data collection are national ones and, in most cases, will be managed by a single agency, the overall structure of data is much simpler than for of joint programmes. However, a new set of descriptors will be required to characterize levels of opening. FIGURE 6 provides a general representation of the logical structure of data collection.

FIGURE 6. Opening of national programmes. Overview of data collection



Thus, the main statistical unit for data collection are national programmes, for which both general descriptors and specific descriptors concerning levels of opening are collected. Furthermore, a few descriptors are collected concerning the funding agency managing the programme. As we shall detail later, general programme descriptors and agency descriptors are basically the same as for data collection on joint programmes.

5.2.1. Data sources

There are different types of data sources, which can be used for JOREP data collection; these have different characteristics and thus it is highly relevant to careful document the data source and to take into account their differences.

Source documentation. As a general principle, each data should include a clear statement of the data source and of the date of reference (e.g. when using a website for the description of programmes).

Programme descriptors. Concerning descriptors, following data sources can be used. On all of them, careful documentation of the sources is mandatory (including reference date).

Programme documents like printed leaflets and information provided on the funding agency website.

Information directly from ministries or funding agencies, e.g. through interviews or personnel contact. For purposes of good documentation, it is requested to mention the source of information, but not the name of the respondent.

5.2.2. Reference periods

Following reference periods are adopted for JOREP:

The perimeter should include all programmes matching the selection criteria for the reference year (2009 for JOREP).

Descriptors should refer to the situation the last day of the reference year, i.e. 31.12.2009 for JOREP. If, for any reason, another date is chosen (e.g. programmes closed during the year), this has to be indicated in the methodological remarks.

Financial data should refer to the calendar year, i.e. 01.01-31.12 of the reference year.

5.3. Descriptors on funding agencies

Descriptors on funding agencies are the same as for joint programmes and should be collected together. Hence, the reader should refer to section 3 of this handbook for reference on them.

5.3.1. Programme descriptors

General programme descriptors for open programmes are the same as for joint programmes, except of course those specifically referring to organizational settings of joint programmes. TABLE 4 summarizes the list of programme descriptors. We provide below detailed definitions concerning the descriptors specific to open programmes.

TABLE 4. List of descriptors for open programmes

Descriptor	Type	Remarks
2.1 Programme identifier	Numeric code	
2.2 Country	Closed list	The country of the programme (unique)
2.3 Agency	Closed list	The funding agency managing the programme
2.4 Name of the programme	Free text	
2.5 Programme start year	Closed list	
2.6 Programme budget	Numeric	Total programme budget 2009
2.7 Programme duration	Binary	Limited/unlimited
2.8 Project duration	Closed list	
2.9 Research topics	Closed list	NABS classification
2.10 Beneficiary sectors	Closed list	Frascati sectors
2.11 Selection criteria	Scale	Scientific quality and relevance.
2.12 Portability of grants	Closed list	
2.13 Foreign coordinator	Closed list	
2.14 Foreign partners	Closed list	
2.15Foreign partners research funding	Closed list	
2.16 International cooperation funding	Closed list	
2.17 Countries opened	Closed list	
2.18 Start year of opening	Year	
2.19 Call in English	Closed list	
2.20 Proposals in English	Closed list	
2.21 Visibility conditions	Closed list	
2.22 Share of projects with partners abroad	Percentage	
2.23 Share of projects with partners abroad receiving funding	Percentage	
2.24 Percentage of programme budget to organizations abroad	Percentage	

5.3.2. Definitions and methodological remarks

As descriptors 2.1 – 2.5 and 2.7-2.11 are common to open and joint programmes, the reader should refer to section 3.4.1 of this report.. Following descriptors are specific to open programmes only.

2.6 Total programme budget. The total budget of the programme in the reference year in national currency at current price. The accounting method adopted should be specified in the remarks (project decisions or funding outlays).

2.12 Portability of grants. This descriptors indicates whether a research hired by a foreign organization is allowed to take the grant abroad. Three response options are proposed: yes, if it is possible in any case, conditional if it is possible subject to some conditions (to be specified in the remarks), no if it is not possible.

2.13 Foreign coordinator. This descriptor indicates the possibility for research organizations abroad to be project main applicant or coordinator. Three response options are proposed: yes, if it is possible in any case, conditional if it is possible subject to some conditions (to be specified in the remarks), no if it is not possible.

2.14 Foreign partners. This descriptor indicates the possibility for research organizations abroad to be official project partners (for example applicants of co-applicants). Three response options are proposed: yes, if it is possible in any case, conditional if it is possible subject to some conditions (to be specified in the remarks), no if it is not possible.

2.15 Foreign partners research funding. The possibility for organizations abroad to receive research funding within the project. Research funding is defined as resources devoted to hiring researchers. Three response options are proposed: yes, if it is possible in any case, conditional if it is possible subject to some conditions (to be specified in the remarks), no if it is not possible.

2.16 International cooperation funding. The availability of funding to support international cooperation in the projects, for example financing travel and the organization of joint workshops with cooperation partners abroad. Response option: yes, no (details to be specified in the remarks section).

2.17 Countries opened. This descriptors specifies to which extent opening provisions apply to all countries worldwide (category "all"), to ERA countries (category "ERA") or to a restricted number of countries. Details on which provisions are open to which countries to be inserted in the remarks section.

2.18 Start year of opening. This descriptors provided information on the year where specific opening provisions have been introduced in the programme. Specification of different opening steps should be included in the remarks section.

5.3.3. Descriptors on language barriers and information

These descriptors characterize the use of English versus national languages, respectively the visibility of the information concerning foreign participation opportunities:

2.19 Call in English. This descriptor specifies whether the all for proposals is available also in English. Response options: yes (limitations to be specified in the remarks), no.

2.20 Proposals in English. This descriptor specifies whether it is possible to submitt a proposal in English. Response options: yes (limitations to be specified in the remarks), no.

2.21 Visibility conditions. This descriptor provides information on public availability of information on foreign participation opportunities. High: very detailed information clearly specifying rules and limitations; Medium; general information available. Low: no information available.

5.3.4. Data on effective level of opening

These data are important to assess the effective level of opening, as there are some indications that formal opening is not always followed by practice in terms of a significant share of projects with participation from abroad. This information allows also to better understand the significance of opening – e.g. real opening to

competition vs. selective opening in specific cases (e.g. when competences at national level are not available). Experience in JOREP demonstrated that precise measures based on budgetary are usually very difficult to obtain, thus it is advised to limit data collection to two simple indicators which can to some extent be estimated by experts based on projects lists.

2.22 Share of projects with foreign partners. This descriptor characterizes the extent of foreign participation by providing an estimate of the share of projects having an official foreign partner (for example co-applicant). Following categories should be used:

less than 1% of the projects have foreign partners.

between 5% and 10% of the projects have foreign partners.

between 10% and 50% of the projects have foreign partners.

more than 50% of the projects have foreign partners.

all projects have foreign partners (e.g. in case this is programme requirement).

This estimate should be based on the project funded in the year 2009; it can be based on information from the funding agencies, as well as on counts of subsamples of the projects.

2.23 Share of projects with foreign partners receiving research funding. This descriptor characterizes the extent of foreign participation by providing an estimate of the share of projects having an official foreign partner receiving research funding as well. The same categories as in the previous descriptor should be used.

2.23 Share of funding to abroad. This descriptor provides an estimate of the percentage of the total programme budget going to organizations abroad in the reference year. Usual conventions on performing sectors from the Frascati manual should be adopted.

5.3.5. Data collection and integration

The organization of data collection on opening of national programmes is much simpler than for joint programmes, as there is no need of matching data from different sources.

Data can be collected at national level through excel sheets prefilled with the list of descriptors and of categories, which are then merged in a single file including information an all countries. If data are collected at the same time for joint and open programme, it is advisable to include these data in the joint programme database as it can be linked to the funding agencies data already collected for joint programmes.

6. RECOMMENDATIONS FOR FUTURE DATA COLLECTIONS

JOREP recommendations for future data collection addressed to the European Commission and Eurostat are briefly presented below.
In terms of data to be collected, JOREP's recommendations deal with the three critical components of the dataset developed, namely the perimeter, the descriptors and, finally, data on funding flows.

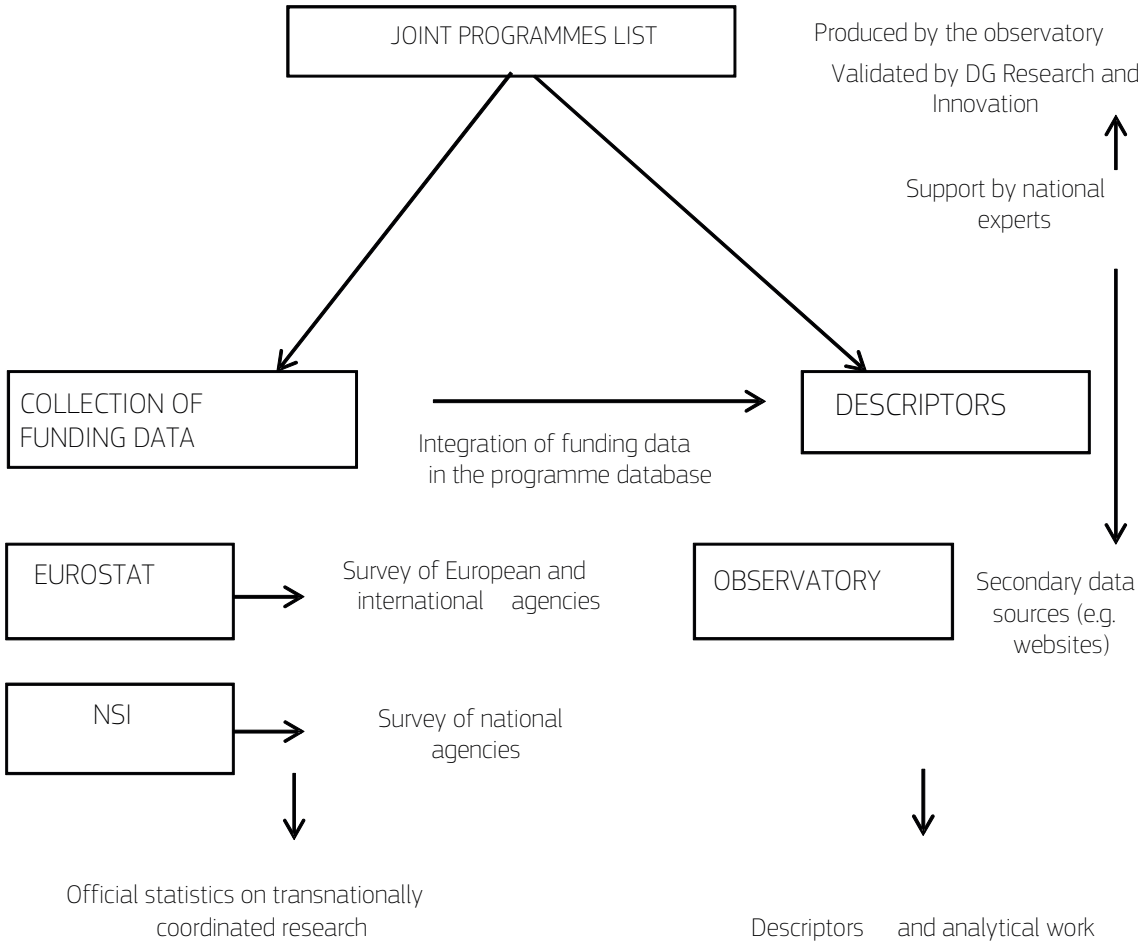
a) Perimeter of joint programmes. The construction of a list of joint programmes is a central requirement for data collection, also including financial data. Recommendation addressed is then to compile a list of all European-level joint programmes including the following information: the name of the programme, the list of participating countries and, for each country, of participating agencies. As a second priority, national experts in each country should include the bi- and multilateral programmes they consider relevant. This list should be adopted as official reference for all data collection activities at the European and national levels and be updated yearly.

b) Descriptors on organisational characteristics. The set of descriptors developed in the project proved to be very useful to analyse the landscape of joint programmes. Hence, it is strongly advised to maintain and extend the set of descriptors to all joint programmes in the European Research Area; given the fact that organisational characteristics are rather stable in time, the descriptors could be updated every 2 or 3 years rather than yearly.
Note: collecting national-level information requires a well-designed organisational structure with a central unit – taking care of the European-level descriptors, of quality control, and of the merging of data into an integrated dataset– as well as national experts. Moreover, as for multi-annual data collection, issues regarding programmes demography need to be carefully taken into account and a suitable notation has to be introduced into the dataset.

c) Data on funding flows. It is recommended to collect this information from national funding agencies through a dedicated questionnaire, detailing for each agency the programmes in which it participates (based on the common programmes list). Furthermore, data on European contributions should be collected directly by Eurostat. It is advised to provide a simple breakdown of public and private beneficiaries, as this is relevant to understand programme functions and easier to implement than a breakdown based on the Frascati sectors.

The suitable organizational form and of procedures for regular data collection proposed by JOREP is built on two main components (see Figure7).

Figure 7. Proposed organization of joint programme data collection



1) First, a European-level observatory on joint programmes should be set up, possibly integrated in existing structures like ERAWATCH or NETWATCH, with the following tasks:

- Defining the perimeter of joint programmes every year (including information on national participation and managing agencies), which should be validated by the European Commission.
- Updating the joint programme descriptors with changes and covering new programmes.
- Maintaining the dataset covering descriptors and programme-level funding data and providing a suitable interface for access by external users (e.g. a web interface to the programme database).
- Regularly producing analytical work on the mapping of joint programmes in Europe.

b) Second, the collection of funding data and the production of statistical indicators should be managed by Eurostat together with the National Statistical Authorities. This represents an extension and systematisation of the current pilot on transnational-coordinated research and is a step towards the integration of joint programmes into official statistics. Production of financial data should be managed through a dedicated survey provided to national funding agencies. Moreover, Eurostat should analyse the European-level funding agencies to determine the level of EU additional contribution to joint programmes and the allocation to beneficiaries of the funds distributed by these agencies directly (either EU funding or real pot funding from national states). These data would then be used by Eurostat to produce aggregated indicators on transnationally coordinated research funding and by the Observatory to produce analyses by integrating programme-level funding data into the joint programmes dataset

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This is a study designed, commissioned and owned by the European Commission (DG Research and Innovation, Unit C6-Economic analysis and indicators). This study is part of a set of projects providing key information for policy making in the perspective of contributing to growth in Europe through innovation policies.

The study provides a sound quantitative basis for the monitoring of investments in joint and open research programmes in EU countries, as well as empirical evidence of the policy rationales and impacts of these programmes on the European Research Area. The project has carried out a comprehensive collection of data about joint and open programmes according to a set of standardised descriptors, and provided an analysis of motivations and impact of these programmes.

This publication is the methodological Handbook of the study and is annexed to its Final report. These two publications, as well as a short Summary report of the study, the detailed Analysis Report and 11 Country reports, are available at:
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