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**EU Twinning Project**

**IS12/ENP-APFI/08**

Support to the Israeli Central Bureau of Statistics

in the development of National Accounts, Education Statistics, Survey Methodology, ICBS Website and

Coordination of Israel National Statistical System

Component B

**Education Statistics**

Activity B.4

Production of statistics on R&D and

researches involved in R&D

*Implemented by:*

|  |  |  |
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**Jerusalem**

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Final version

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Annex B4.5 Ph.D. statistics in Statistics Denmark –

Organization of Data Collection and Dissemination (Power Point, Karin Blix)

Annex B4.6 R&D statistics in Denmark (Power Point, Jens Brodersen)

Annex B4.7 R&D statistics in EU and the OECD (Power Point, Jens Brodersen)

Annex B4.8 Statistics Denmark's R&D questionnaire (pdf)

**List of Abbreviations**

BC Beneficiary Country (Israel)

CBS Central Bureau of Statistics (Israel)

MS Member State

NIS New Israeli Shekel

R&D Research and development

CDH Carrier of doctorate holders

PNP Private non-profit

FTE Full-time equivalent

HC Head count

HES Higher education sector

GOV Government sector

# General comments

The MS Expert mission B.4 was the second activity within the Education Statistics component of the EU/Israel Twinning project on statistics.

The mission was implemented according to the agreed set of Terms of Reference and Agenda which are included in this report as Annex B4.1 and B4.2, respectively.

Because the mission was the only activity dealing explicitly with R&D statistics, the mandatory result related to the activity was kept in focus together with its benchmark: *Leading principles and detailed plan for the development of indicators on personnel and positions engaged in R&D, prepared by 6th project quarter.*

The MS Experts would like to thank the staff of the Central Bureau of Statistics for their hospitality, fruitful discussions and all the information provided during the mission.

The views and observations stated in this report are those of the MS Experts, and do not necessarily correspond to the views of EU or Statistics Denmark.

# Assessment and results

In the assessment and review of statistics on R&D, personnel and positions aspects as data collection, presentations and estimation methodologies for the production of statistics across and within national sectors (higher education, business, non-profit and governmental sectors) were covered. Special emphasis was put on Higher Education Sector (HES).

From the presentations given on R&D statistics by experts from the ICBS and from the discussions during the four days of the mission the impression is that

* ICBS has a lot of different data sources to R&D statistics and publishes many interesting indicators
* The Frascati manual (OECD) is well understood
* Statistics on the financing of the R&D is well-covered
* The business sector and the PNP sector are well described
* The statistics on Carriers of Doctorate Holders (CDH) is well-covered
* Regarding the personnel part on Head Counts(HC) and Full time Equivalents (FTE), including further breakdowns on gender, education, occupation (positions) etc. the ICBS has a challenge regarding HES and the government sector (GOV)
* For the R&D statistics to be complete, GOV and, in particular, HES needs further development by the ICBS
	+ For these two sectors, no single data source describes the sector ”completely”, and the available sources must be used together to give the best possible coverage
	+ Physicians doing R&D in hospitals are by Israel categorized as private sector, while in Denmark they are included in HES. The situation concerning available data on physicians to ICBS was not analyzed during the meetings, and as part of the detailed work plan it probably should be included how to capture data on this R&D activity.

In the discussions the MS Expertsraised a number of questions to assess the present situation systematically.

The ICBS experts and the MS Experts started out going through which variables are needed/demanded. Then the need for definitions of the variables and the need of reporting specific elements was discussed – e.g. what is a researcher?: how to classify? and the delineation, e.g. ”Head count”: who are counted ?

After establishing the need for variables, there is a need to identify what distinguishes the different sectors from each other and assess the need for separate surveys for different sectors.

There is a need for operational explanations of single variables - e.g. occupation (position) at universities or hospitals.

When the need for variables and the characteristics of different sectors is in place, a good way forward may be to go through the available data sources. The question to ask is whether the present data sources (surveys) meet the needs.

# Conclusions and recommendations

From the presentations by CBS it was learned that statistics concerning R&D in the business sector and PNP sector is more or less in compliance with the OECD reporting proposals. The question was raised whether the inclusion of gender as a variable in the business survey would be needed in the future. For the higher education sector the situation is not equally good. The MS Experts’ recommendation is therefore to focus first on the Higher Education Sector, and then on the Government Sector. This prioritizing is recommended as it is the MS Experts’ anticipations that R&D is more prominent in HES than in GOV.

For the Higher Educations Sector it is recommended to go ahead the following way:

* + Choose the data source among the relevant sources for HES with the highest overall coverage for the relevant or most important variables
	+ Analyze at detailed level how much of the data reporting to the OECD can be done from this single source
	+ Analyze what of the other available data for HES sources could be used to fill in the remaining cells – either as a supplementary source or as part of the quality assuring (e.g. through consistency checks)
	+ Decide on the type of assumptions that would be needed to comply with the OECD recording – e.g. use of one source to distribute data from another source on field of science
	+ As a pilot project, choose a smaller, but important segment of the table (see Annex B4.x) and develop the methodology for this segment – and fill in the table
	+ If needed, collect additional information on ad-hoc basis from e.g. colleges etc.

In the long run, the recommendation would be to conduct a specific R&D survey concerning the higher education sector and the government sector. The Danish questionnaire concerning these sectors is attached in Annex B4.xx.

The discussions during the mission also lead to other recommendations. One recommendation regards the *coordination between ICBS Departments* involved in R&D statistic to develop the methodology including the necessary assumptions for estimations.

Another recommendation is regarding dissemination. During the mission it was demonstrated by a colleague from the EU-commission that data regarding R&D for Israel was not easy to find. The website is the most important dissemination tool and data could be organized differently and found more easily by the users. The CBS website and the linkage to the data warehouse is the component E of the Twinning project.

Yet another recommendation regards timeliness. The need for more timely data was demonstrated by another important user of the Israeli R&D data, Mr Shlomo Hershkovitz from the Israeli Ministry of Science and Technology. The MS Experts recommend that annual data should be published no longer than one year after the reference year. If the quality assurance of the data cannot be met in time for this, the use of preliminary data could be considered. At Statistics Denmark, the R&D statistics data for both the actual year surveyed and the previous year are revised during the quality assurance and corrections are made at micro-level. For the actual year Statistics Denmark produces preliminary data, and for the previous year final data are produced. At the most aggregated level the difference between the preliminary and the final figures is not very big, normally deviations around 1-2 per cent, while the revisions can be more substantial at detailed level.

As a last but very important aspect of dissemination it should be a goal for the ICBS to have metadata and documentation available at the same time as data are published. This is important for users and for ICBS, also in a strategic perspective regarding the long-term development of the R&D statistics.

# Road map and time plan

The benchmark for this part of the Twinning project’s component B is described as:

*Leading principles and detailed plan for the development of indicators on personnel and positions engaged in R&D, prepared by 6th project quarter*

Within the Twinning project period the detailed plan is being developed. The roadmap towards this detailed plan was discussed on the last day of the mission with the following milestones, and the following milestones and deadlines was suggested:

Milestones:

* Theoretical analysis – overview of data sources HES: *deadline 31 March 2014*
* Pilot project: *1 April – 30 June 2014*
* Detailed plan, first internal draft (ICBS management): *deadline 1 August 2014*
* Detailed plan, second draft (to be sent to users)*: deadline 31 August 2014*
* Detailed plan, final version: *deadline 1 October 2014*

The pilot project would test the outlined theory, i.e. how to combine the available data sources for a minor part of the HES, and evaluation of the results. Thus, the pilot should be used to gain experience with the working method as well as give a realistic time frame for the implementation of the detailed plan.

An example of an outline for a detailed plan was given as follows:

November 2014: Start of project

* Analysis phase
* Design phase
* Implementation phase
* Test phase
* Hearing phase – external users comments to the statistics and the methodology, including the applied assumptions
* Adjustments and optimizations
* Finalize documentation
* Formalize the production of the statistics

November 2016: Complete tables to OECD

# Annex B4.1 Terms of Reference

**Mandatory results and benchmarks related to activity B.4**

|  |  |
| --- | --- |
| **Mandatory result** | **Benchmark** |
| **MR11.** Strategy for the development of indicators on personnel and positions engaged in R&D. | Leading principles and detailed plan for the development of indicators on personnel and positions engaged in R&D, prepared by 6th project quarter |

**Subject / purpose of activity B.4**

Assessment and review of statistics on R&D, personnel and positions including data collection, presentation and estimation methodologies for the production of statistics across and within national sectors (higher education, business, non-profit and governmental sectors). Special emphasis will be on Higher Education Sector.

**Expected output from activity B.4**

Mission report on how to improve statistics on personnel and positions working in R&D

# Annex B4.2 Programme, 18-21 November 2013

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Place** | **Time** | **Event** |
| Mon18/11 |  | 09:00 | Introduction to component B: Statistics on R&D |
|  | 09:15 | BC: Overview of current statistics on R&D in Israel, including fulfilment of current and future international obligations |
|  |  | 10:30 | Coffee break |
|  |  | 11:00 | BC: Requirements to new statistics on personnel and positions |
|  |  | 12:15 | Lunch |
|  |  | 13:30 | MS: R&D statistics in EU and the OECD  |
|  |  | 14:15 | MS: R&D statistics in Denmark - organisation of data collection, and dissemination of R&D statistics |
|  |  | 15:00 | Coffee break |
|  |  | 15:15 | Discussion and conclusions |
| Tue 19/11 |  | 09:00 | Summary of Monday meeting |
| 09:15 | BC: Available data sources to R&D statistics |
| 10:45 | Coffee break |
| 11:15 | BC: The user perspective – what data on R&D is needed for effective policy making? |
| 12:15 | Lunch |
| 13:30 | MS: Methodological issues – Danish experience on1. Estimation
2. Data integration, i.e. combined use of administrative and survey data
 |
| 15:00 | Coffee break |
| 15:15 | Discussion and conclusions |
| Wed20/11 |  | 09:00 | Summary of Tuesday meeting |
| 09:15 | Discussion: 1. What data and methodologies are required for the production of the additional R&D statistics?
2. What direction shall the Israeli R&D statistics on personnel and positions take?
 |
| 10:30 | Coffee break |
| 11:00 | Discussion (*continued*) |
| 12:15 | Lunch |
| 13:30 | Discussion: first draft to work plan |
| 15:00 | Coffee break |
| 15:15 | Discussion:  |
| Thu21/11 |  | 09:00 | MS: presentation of preliminary recommendations |
| 10:30 | Coffee break |
| 11:00 | Ad hoc meetings |
| 12:15 | Lunch |
| 13:30 | MS Experts' preparation for debriefing and report writing |
| 15:00 | Debriefing |

Place: ICBS Main Building, Floor -1, Gilboa Meeting Room

# Annex B4.3 Persons met

CBS – the Surveillance of schooling and study procedures Sector:

Adnan Mansur, Director

Dan Scheinberg

Eta First

Yifat Klopshtok

Dalit Cohen-Lerner

Eva Rotenberg

Silvia Liplewski

CBS – the Science and Technology Sector:

Evyatar Kirschberg, Director

Nisan Yehuda

CBS - the Department of Social Services Expenditure Accounts

Nava Brener

Shiran Harari

The Ministry of Science, Technology and Space:

Shlomo Hershkovitz, Consultant to the Israel National Council for Research and Development for the Ministry

Abraham Garcia Torres, Consultant on R&D statistics, the Commission of the European Union

# Annex B4.4 Data sources for the Israeli R&D statistics - higher education sector

