R&D Personnel

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Classification by occupation

R&D Personnel

All persons employed directly on R&D, as well as those providing direct services such as R&D managers, administrators, and clerical staff:

Researchers

Technicians and equivalent staff

Other supporting staff

R&D Personnel

Researchers

Professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned

Researchers are classified in ISCO-88 Major Group 2, "Professionals", and in "Research and Development Department Managers" (ISCO-88, 1237). By convention, members of the armed forces with similar skills who perform R&D should also be included.

Managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work also fall into this category. Their rank is usually equal or superior to that of persons directly employed as researchers and they are often former or part-time researchers.

Postgraduate students at the PhD level engaged in R&D should be considered as researchers. They typically hold basic university degrees (ISCED level 5A) and perform research while working towards the PhD (ISCED level 6).

R&D Personnel

Technicians and equivalent staff

are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences or social sciences and humanities. They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers.

Equivalent staff perform the corresponding R&D tasks under the supervision of researchers in the social sciences and humanities.

Technicians and equivalent staff are classified in ISCO-88 Major Group 3, "Technicians and Associate Professionals", notably in Sub-major Groups 31, "Physical and Engineering Science Associate Professionals", and 32, "Life Science and Health Associate Professionals", and in ISCO-88, 3434, "Statistical, Mathematical and Related Associate Professionals". Members of the armed forces who work on similar tasks should also be included.

Their tasks include:

Carrying out bibliographic searches and selecting relevant material from archives and libraries.

Preparing computer programmes.

Carrying out experiments, tests and analyses.

Preparing materials and equipment for experiments, tests and analyses.

Recording measurements, making calculations and preparing charts and graphs.

Carrying out statistical surveys and interviews.

R&D Personnel

Other supporting staff

Includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects.

Excluded are:

- The services of central finance and personnel departments.
- Security, cleaning, maintenance, canteens, etc.

Other R&D supporting staff are essentially found in ISCO-88 Major Groups 4, “Clerks”; 6, ”Skilled Agricultural and Fishery Workers”; and 8, ”Plant and Machine Operators and Assemblers”.

Included under this heading are all managers and administrators dealing mainly with financial and personnel matters and general administration, insofar as their activities are a direct service to R&D. They are mainly found in ISCO-88 Major Group 2, “Professionals”, and Minor Group 343, “Administrative Associate Professionals” (except 3434).

R&D Personnel

"Head Count (HC)" data

are data on the total number of persons who are mainly or partially employed on R&D.

Headcount data are the most appropriate measure for collecting additional information about R&D personnel, such as age, gender or national origin.

Possible approaches and options

Number of persons engaged in R&D at a given date (*e.g.* end of period).

Average number of persons engaged in R&D during the (calendar) year.

Total number of persons engaged in R&D during the (calendar) year.

Full-Time Equivalent

Series based on the number of full-time equivalent staff are considered to be a true measure of the volume of R&D.

R&D may be the primary function of some persons (*e.g.* workers in an R&D laboratory), it may also be a significant part-time activity (*e.g.* university teachers or postgraduate students). It may be a secondary function (*e.g.* members of a design and testing establishment). To count only persons whose primary function is R&D would result in an underestimate of the effort devoted to R&D; to do a headcount of everyone spending some time on R&D would lead to an overestimate. The number of persons engaged in R&D must, therefore, be expressed in full-time equivalents on R&D activities.

Full-Time Equivalent

One FTE may be thought of as one person-year. Thus, a person who normally spends 30% of his/her time on R&D and the rest on other activities (such as teaching, university administration and student counselling) should be considered as 0.3 FTE. Similarly, if a full-time R&D worker is employed at an R&D unit for only six months, this results in an FTE of 0.5.

Another option is to calculate FTEs based on the average hours worked per week, or devoted to each activity per week. This would best express those working on R&D in universities.

Full-Time Equivalent

Calculating full-time equivalents (FTE) is key to adequately calculating the Gross Expenditure in R&D (GERD).

Since researcher's salaries are a significant part of GERD, it is important to include in the GERD only the proportion of the salaries devoted to R&D, this is, the FTE R&D salaries.

If the HC salaries are included, GERD will be significantly overestimated.

Total national R&D personnel by sector and by occupation (HC & FTE)

Total national R&D personnel by sector and by level of qualification (HC & FTE)

Researchers and, if possible, other categories of R&D personnel (HC), by:

Sex

Age

Regional data

Classification by level of formal qualification

ISCED (International Standard Classification of Education) provides the basis for classifying R&D personnel by formal qualification. Six classes are recommended for the purposes of R&D statistics.

Classification by level of formal qualification

Holders of university degrees at PhD level (ISCED level 6)

Holders of basic university degrees below the PhD level (ISCED level 5A)

Holders of other tertiary level diplomas (ISCED level 5B)

Holders of other post-secondary non-tertiary diplomas (ISCED level 4)

Holders of diplomas of secondary education (ISCED level 3)

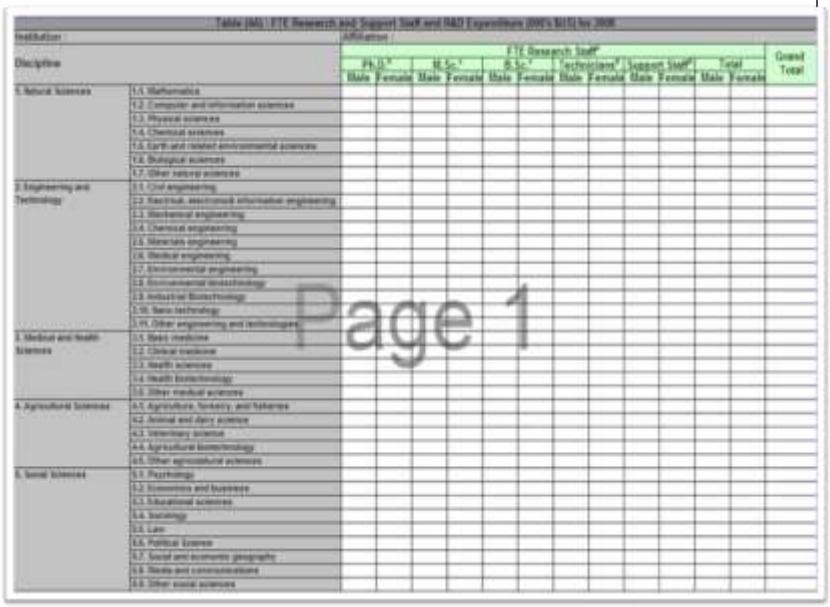

Table (8A) : FTE Research and Support Staff and R&D Expenditure (000's $US) for 2008

Institution		Affiliation													
Discipline		FTE Research Staff*												Grand Total
		Ph.D.*		M.Sc.*		B.Sc.*		Technicians**		Support Staff**		Total		
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
1. Natural Sciences	1.1. Mathematics													
	1.2. Computer and information sciences													
	1.3. Physical sciences													
	1.4. Chemical sciences													
	1.5. Earth and related environmental sciences													
	1.6. Biological sciences													
	1.7. Other natural sciences													
2. Engineering and Technology	2.1. Civil engineering													
	2.2. Electrical, electronic& information engineering													
	2.3. Mechanical engineering													
	2.4. Chemical engineering													
	2.5. Materials engineering													
	2.6. Medical engineering													
	2.7. Environmental engineering													
	2.8. Environmental biotechnology													
	2.9. Industrial Biotechnology													
	2.10. Nano technology													
	2.11. Other engineering and technologies													
3. Medical and Health Sciences	3.1. Basic medicine													
	3.2. Clinical medicine													
	3.3. Health sciences													
	3.4. Health biotechnology													
	3.5. Other medical sciences													
4. Agricultural Sciences	4.1. Agriculture, forestry, and fisheries													
	4.2. Animal and dairy science													
	4.3. Veterinary science													
	4.4. Agricultural biotechnology													
	4.5. Other agricultural sciences													
5. Social Sciences	5.1. Psychology													
	5.2. Economics and business													
	5.3. Educational sciences													
	5.4. Sociology													
	5.5. Law													
	5.6. Political Science													
	5.7. Social and economic geography													
	5.8. Media and communications													
	5.9. Other social sciences													

THANK YOU