

Research Material No. 128

Survey on Postdoctoral Fellows and Research Assistants
(FY2005)

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PREFACE

For the future of Japan's science and technology, it is important to train and secure creative and unique human resources in order to maintain and strengthen Japan's competitiveness. Under the First and Second Science and Technology Basic Plans, steps have been taken to boost the number of young researchers by providing a research environment for talented young researchers so that their abilities can be properly exploited, and implementing support programs for postdoctoral fellows. By implementing these support programs, the number of young researchers such as postdoctoral fellows has steadily increased. Now they make major contributions to the vigorous development of research activities.

Meanwhile, it has been pointed out that the career paths for postdoctoral scholars are unclear. In light of this, the Third Science and Technology Basic Plan made the following proposal: "to consider postdoctoral scholars as those who are at a preparatory stage for becoming young researchers and who are capable of carrying out research on an independent basis, and to bring transparency to the process of appointing young researchers and promote assistance for their self-support." It also proposed: "to promote career support for postdoctoral scholars, including offering career courses other than an academic career in research."

In considering and implementing the programs proposed in the Third Science and Technology Basic Plan for assisting self-support of postdoctoral scholars and promoting various forms of support for different career paths, and in determining effects of implemented programs, it is necessary to obtain and update data to find out the actual employment conditions of postdoctoral fellows.

To this end, this survey research was conducted through the joint efforts of the Knowledge Infrastructure Policy Division, Science and Technology Policy Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the 1st Policy-Oriented Research Group, National Institute of Science Technology Policy, MEXT. The objective was to find out the actual number of postdoctoral fellows and research assistants who are engaged in research activities at universities and colleges, public research institutes, or other organizations by ages, sex, funds, and research fields.

1. Objective and Method of Survey

(1) Objective

The objective of the survey is to provide information for designing support programs for researchers by determining the total number of postdoctoral fellows and research assistants engaged in research at universities and colleges, public research institutes, or other organizations as well as the actual number of doctoral students receiving financial support in the form of employment or others.

To this end, the survey sought to find out the number of postdoctoral fellows and research assistants employed for a fixed term supported by external funds, such as competitive funds, subsidies, or self-sponsored funds, and who were engaged in research activities at universities and colleges, public research institutes, or other organizations.

(2) Method, Period, and Subjects

Universities and colleges and research institutes, including research centers of private corporations¹, were sent questionnaires and asked to enter the total number² of persons receiving financial support, such as competitive funds, under the category of (1) doctoral students, (2) postdoctoral fellows³, and (3) other researchers, and then return them by electronic media⁴.

Questionnaires were sent to each research organization in December 2005 with responses due by February 15, 2006. The response deadline was extended for organizations which were believed to have a large number of postdoctoral fellows and research assistants relevant to the survey in order to receive as many responses as possible. (The survey was eventually closed in mid-April 2006.) Questionnaires were sent to a total of 1,236 organizations and 914 responded, including "not applicable" responses. The response rate was 74 percent.

¹ Independent administrative agencies, public-interest corporations, public experimental research institutions (which refer to institutes established by local public entities), and private corporations covered by the survey are those designated by the Minister of Education, Culture, Sports, Science and Technology as organization that apply for Grants-in-Aid for Academic Research and those that are believed to carry out some kind of research and development activities. "Universities and Colleges" in this report include inter-university research institute corporations.

² Note that there may be overlapping numbers because the survey determines the total number of persons in employment in the reference year.

³ The survey subjects include postdoctoral and similar scholars who do not receive any payment in the form of salary (or, who are not employed by the relevant organization) but have been accepted by the relevant organization in accordance with their internal regulations.

⁴ A separate survey was conducted for those employed by independent administrative agencies under certain programs, such as the Special Postdoctoral Researchers Program at RIKEN, and the responses were consolidated in the result of this survey.

Number of Surveyed Organizations: Number of Responses (Response Rate)

Organizations	Questionnaires Sent	Responses	Response Rate
Universities and Colleges	727	623	85.7%
Independent Administrative Agencies	90	61	67.8%
National Experimental Research Institutions	19	11	57.9%
Public Experimental Research Institutions	64	52	81.3%
Public-interest Corporations	178	105	59.0%
Private Corporations	158	62	39.2%
Total	1,236	914	74.0%

(3) Survey Subjects

The subjects of the survey⁵ include the following researchers classified into "doctoral students", "postdoctoral Fellows", and "others" (collectively referred to as "persons in employment").

"Doctoral students"

Doctoral students at research organizations covered by the survey who receive financial support from a university or other organizations.

"Postdoctoral Fellows"⁶

Of those who have completed doctorates, (1) those engaged in research activities at a research organization, such as a university, not as a professor, an associate professor, an assistant professor, or the like, or (2) researchers at a research organization, such as an independent administrative agency, who have been assigned to the position for a fixed term and are not a leader or a senior researcher of his/her research group. Both (1) and (2) include those who have terminated their student status but have been a graduate student for a period exceeding the required number of years for completing a doctoral course and have obtained the required credits ("Withdrawals upon obtaining required credits").

⁵ Refer to "2. Survey Subjects" in the questionnaire (Attachment 2) for details on the survey subjects.

⁶ Refer to "Table of types of assistance for postdoctoral and similar scholars" (Attachment 3) for various forms of employment and types of assistance for postdoctoral and similar scholars.

"Others"

Those other than the above "Doctoral students" and "Postdoctoral fellows", including those who perform research assistant work and provide technical assistance or are holders of a bachelor's degree or a master's degree and are engaged in research activities in conformity to postdoctoral programs. However, students in bachelor programs or master's programs, professors, associate professors, assistant professors, and the like are excluded.

2. Survey Results

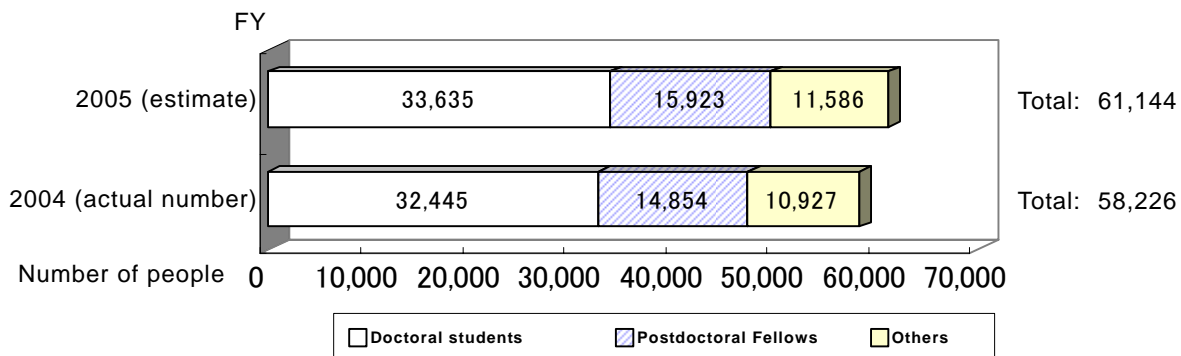
(1) Overview of Number of Persons in Employment in FY 05 (estimate) and Persons in Employment in FY 04 (actual number)

Questions in the questionnaire were designed to find out the actual number of persons in employment at each research organization in FY 04 and FY 05.

- The total number of persons in employment in FY 05 was estimated at 61,144, including 15,923 postdoctoral fellows. The actual number of persons in employment in FY 04 was 58,226 in total, including 14,854 postdoctoral fellows. The estimated numbers for FY 05 of both postdoctoral fellows and doctoral students exceeded the actual FY 04 numbers. (Fig. 1-1)

- The breakdown below shows the number of persons in employment in FY 04 (actual number) by organization. Universities and colleges had the largest number of persons in employment, 46,206, including 8,484 postdoctoral fellows, and independent administrative agencies had the second largest, 10,656, including 5,695 postdoctoral fellows. (Table 1-1)

Fig. 1-1 Total Number of Persons in Employment



(unit: in persons)

Table 1-1 Breakdown by Organization

Organizations	FY	Doctoral students		Postdoctoral fellows		Others		Total	
Universities and Colleges	2004 (actual number)	31,469	(97.0%)	8,484	(57.1%)	6,253	(57.2%)	46,206	(79.4%)
	2005 (estimate)	32,801	(97.5%)	9,513	(59.7%)	6,779	(58.5%)	49,093	(80.3%)
Independent administrative agencies	2004 (actual number)	847	(2.6%)	5,695	(38.3%)	4,114	(37.6%)	10,656	(18.3%)
	2005 (estimate)	697	(2.1%)	5,592	(35.1%)	4,123	(35.6%)	10,412	(17.0%)
National experimental research institutions	2004 (actual number)	29	(0.1%)	72	(0.5%)	42	(0.4%)	143	(0.2%)
	2005 (estimate)	40	(0.1%)	67	(0.4%)	28	(0.2%)	135	(0.2%)
Public experimental research institutions	2004 (actual number)	23	(0.1%)	56	(0.4%)	66	(0.6%)	145	(0.2%)
	2005 (estimate)	24	(0.1%)	61	(0.4%)	65	(0.6%)	150	(0.2%)
Public-interest corporations	2004 (actual number)	76	(0.2%)	264	(1.8%)	168	(1.5%)	508	(0.9%)
	2005 (estimate)	72	(0.2%)	294	(1.8%)	203	(1.8%)	569	(0.9%)
Private corporations	2004 (actual number)	1	(0.0%)	283	(1.9%)	284	(2.6%)	568	(1.0%)
	2005 (estimate)	1	(0.0%)	396	(2.5%)	388	(3.3%)	785	(1.3%)
Total	2004 (actual number)	32,445	(100.0%)	14,854	(100.0%)	10,927	(100.0%)	58,226	(100.0%)
	2005 (estimate)	33,635	(100.0%)	15,923	(100.0%)	11,586	(100.0%)	61,144	(100.0%)

(Unit: in persons)

(2) Doctoral Students

The survey sought to find out the actual number of doctoral students who receive financial support from a university or other organizations.

- Based on the breakdown of doctoral students in FY 04 (actual number) by organization, universities and colleges had the largest share, making up 97 percent, followed by independent administrative agencies, with 847 or 3 %. (Fig. 2-1)

- As for the breakdown of doctoral students in FY 04 (actual number) by fund, the largest number of students, 19,898 or 61 percent, received subsidies (internal funds). As for competitive funds, 5,336 students or 16 percent received financial support under the 21st Century Center of Excellence Program, and 978 or 3 percent received Grants-in-Aid for Academic Research. (Fig. 2-2)

Fig. 2-1 Breakdown of Doctoral Students by Organization (FY 04 actual number)

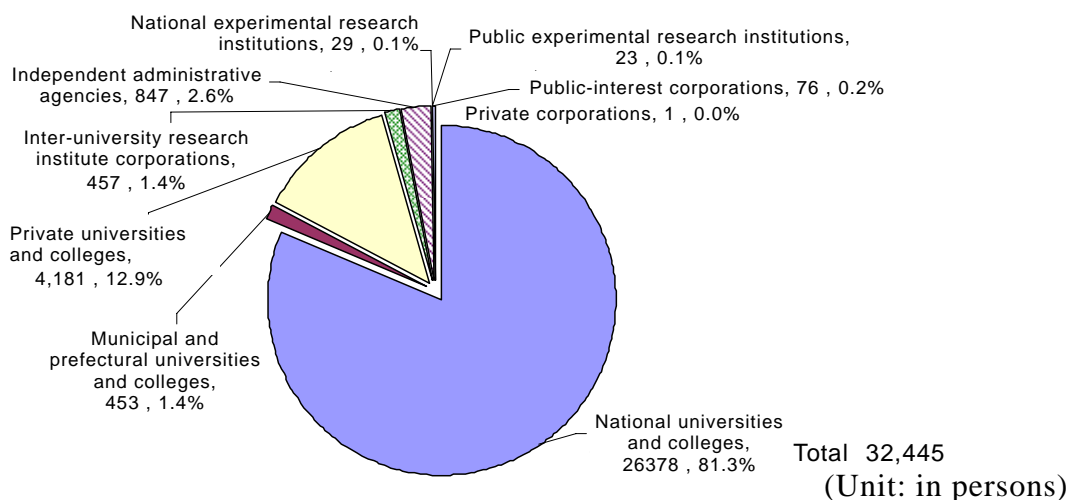


Table 2-1 Breakdown of Doctoral Students by Organization

Organizations	FY 04 actual number		FY 05 estimate	
Universities and Colleges	31,469	(97.0%)	32,801	(97.5%)
National university corporations	26,378	(81.3%)	27,337	(81.3%)
Municipal and prefectural universities and colleges	453	(1.4%)	525	(1.6%)
Private universities and colleges	4,181	(12.9%)	4,550	(13.5%)
Inter-university research institute corporations	457	(1.4%)	389	(1.2%)
Independent administrative agencies	847	(2.6%)	697	(2.1%)
National experimental research institutions	29	(0.1%)	40	(0.1%)
Public experimental research institutions	23	(0.1%)	24	(0.1%)
Public-interest corporations	76	(0.2%)	72	(0.2%)
Private corporations	1	(0.0%)	1	(0.0%)
Total	32,445	(100.0%)	33,635	(100.0%)

(Unit: in persons)

Fig. 2-2 Breakdown of Doctoral Students by Fund (FY 04 actual number)

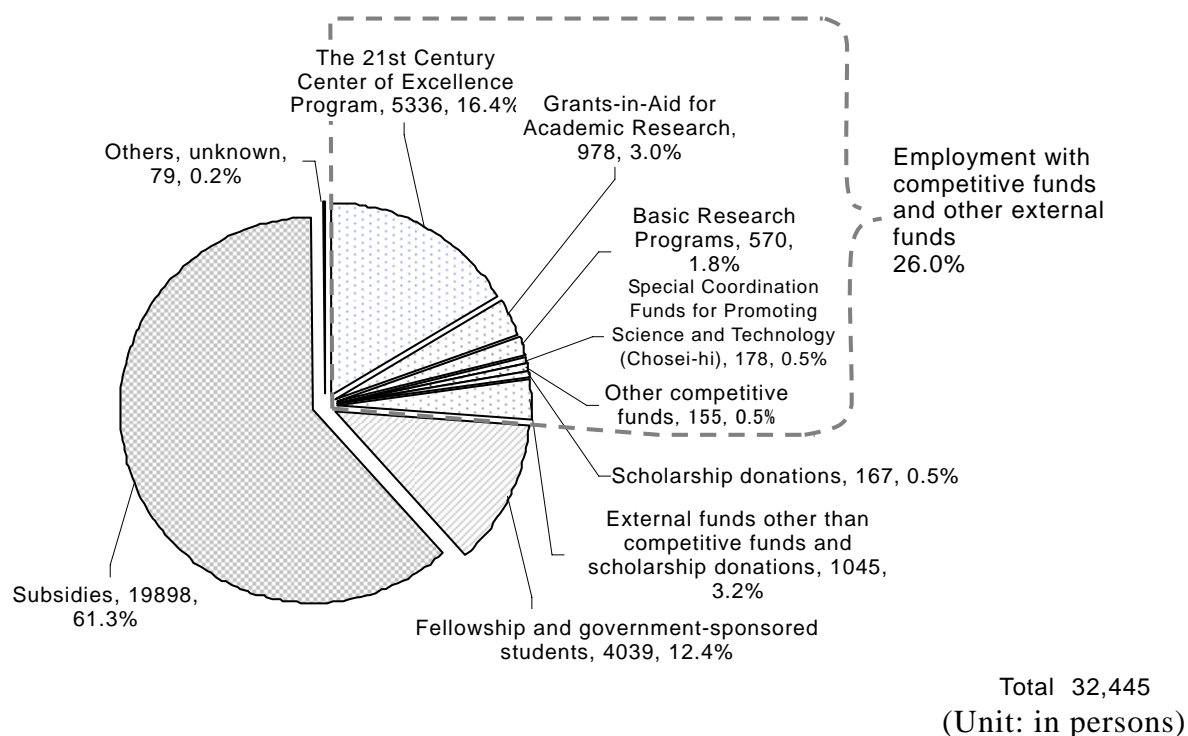


Table 2-2 Breakdown of Doctoral Students by Fund

Funds	FY 04 actual number		FY 05 estimate	
Competitive funds and other external funds	8,429	(26.0%)	9,045	(26.9%)
Competitive funds	7,217	(22.2%)	7,534	(22.4%)
The 21st Century Center of Excellence Programs	5,336	(16.4%)	5,872	(17.5%)
Grants-in-Aid for Academic Research	978	(3.0%)	917	(2.7%)
Basic Research Programs	570	(1.8%)	419	(1.2%)
Special Coordination Funds for Promoting Science and Technology (Chosei-hi)	178	(0.5%)	172	(0.5%)
Other competitive funds	155	(0.5%)	154	(0.5%)
Scholarship donations	167	(0.5%)	155	(0.5%)
External funds other than competitive funds and scholarship donations	1,045	(3.2%)	1,356	(4.0%)
Fellowship and government-sponsored students	4,039	(12.4%)	4,409	(13.1%)
Subsidies	19,898	(61.3%)	20,055	(59.6%)
Others, unknown	79	(0.2%)	126	(0.4%)
Total	32,445	(100.0%)	33,635	(100.0%)

(Unit: in persons)

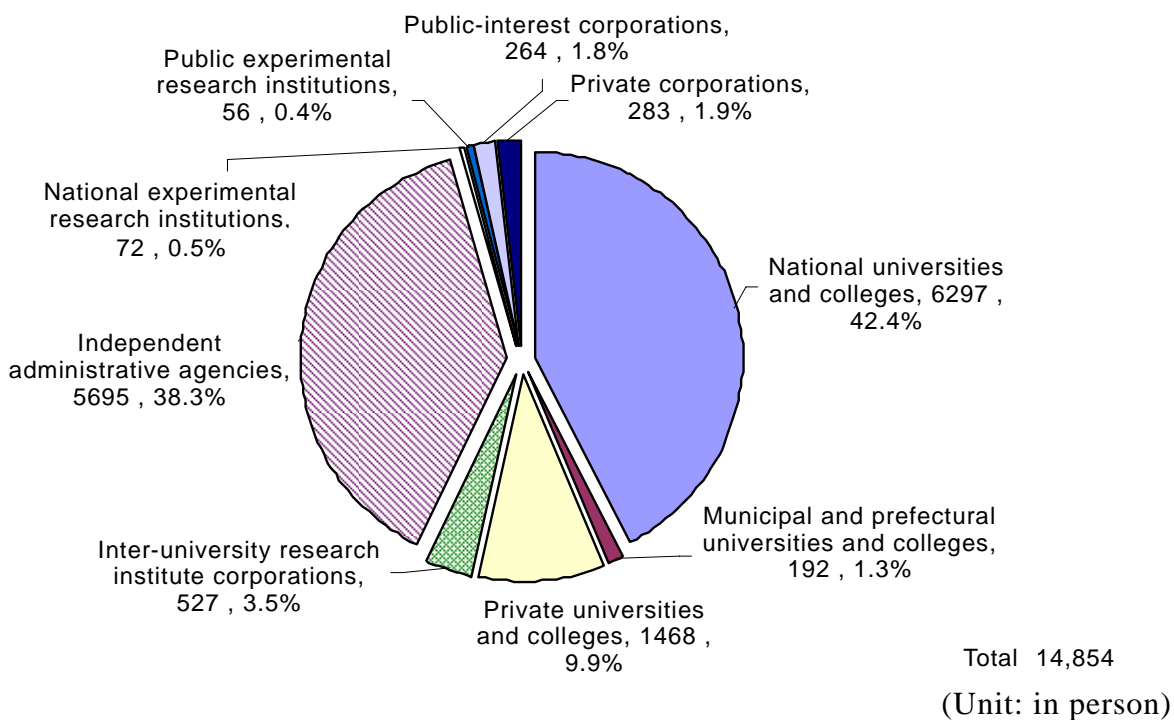
(3) Postdoctoral Fellows

The survey sought to find out the actual number of postdoctoral fellows engaged in research activities at each research organization that receive a salary, reward, or others, including those who have been appointed to the position in accordance with the internal regulations of the relevant organization.

- Based on the breakdown of postdoctoral fellows in FY 04 (actual number) by organization, universities and colleges had the largest share, 57 percent, followed by independent administrative agencies⁷, 38 percent. (Fig. 3-1)

- As for the breakdown by fund (actual number in FY 04), 33 percent of postdoctoral fellows received subsidies (internal funds) and 43 percent received competitive funds and other external funds. (Fig. 3-2)

Fig. 3-1 Breakdown of Postdoctoral Fellows by Organization
(FY 04 actual number)



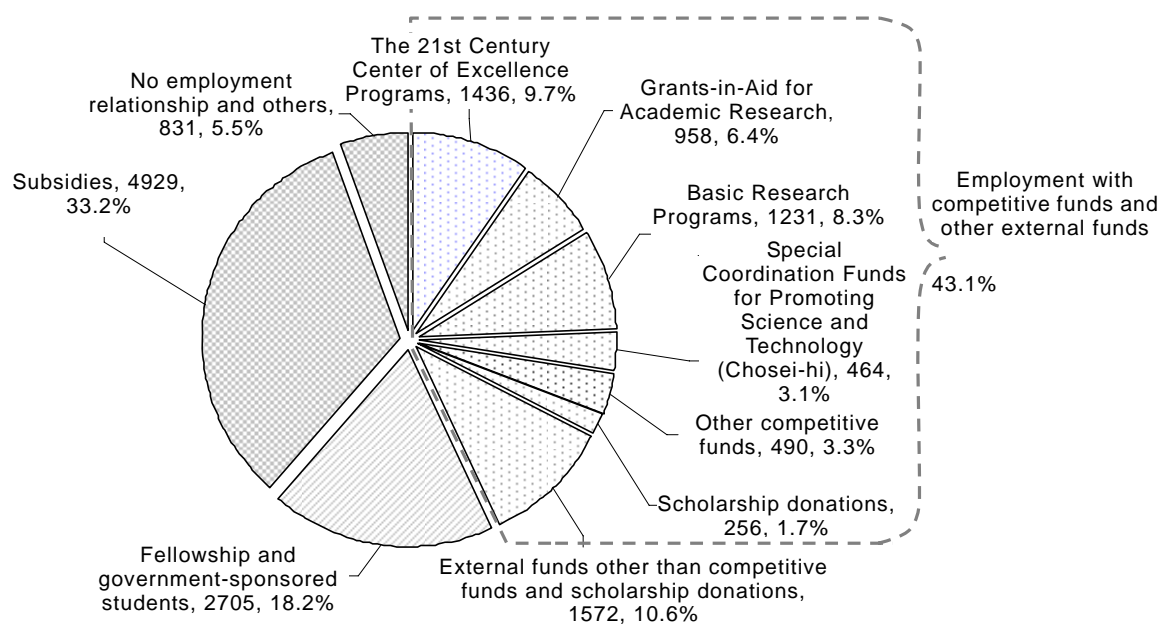
⁷ Postdoctoral fellows who were employed by independent administrative agencies and engaged in research activities at a university or other organization and researchers who were awarded a "Postdoctoral Fellowship for Research Abroad" from the Japan Society for the Promotion of Science were included in the category of "independent administrative agencies".

Table 3-1 Breakdown of Postdoctoral Fellows by Organization

Organizations	FY 04 actual number		FY 05 estimate	
Universities and colleges	8,484	(57.1%)	9,513	(59.7%)
National university corporations	6,297	(42.4%)	7,072	(44.4%)
Municipal and prefectural universities and colleges	192	(1.3%)	130	(0.8%)
Private universities and colleges	1,468	(9.9%)	1,727	(10.8%)
Inter-university research institute corporation	527	(3.5%)	584	(3.7%)
Independent administrative agencies	5,695	(38.3%)	5,592	(35.1%)
National experimental research institutions	72	(0.5%)	57	(0.4%)
Public experimental research institutions	56	(0.4%)	61	(0.4%)
Public-interest corporations	264	(1.8%)	294	(1.8%)
Private corporations	283	(1.9%)	3 96	(2.5%)
Total	14,854	(100.0%)	15,923	(100.0%)

(Unit: in persons)

Fig. 3-2 Breakdown of Postdoctoral Fellows by Fund
(FY 04 actual number)



Total 14,854
(Unit: in persons)

Table 3-2 Breakdown of Postdoctoral Fellows by Fund

Funds	FY 04 actual number		FY 05 estimate	
Competitive funds and other external funds	6,407	(43.1%)	7,026	(44.1%)
Competitive funds	4,579	(30.8%)	4,913	(30.9%)
The 21st Century Center of Excellence Programs	1,436	(9.7%)	1,524	(9.6%)
Grants-in-Aid for Academic Research	958	(6.4%)	1,171	(7.4%)
Basic Research Programs	1,231	(8.3%)	1,245	(7.8%)
Special Coordination Funds for Promoting Science and Technology (Chosei-hi)	464	(3.1%)	385	(2.4%)
Other competitive funds	490	(3.3%)	588	(3.7%)
Scholarship donations	256	(1.7%)	352	(2.2%)
External funds other than competitive funds and scholarship donations	1,572	(10.6%)	1,761	(11.1%)
Fellowship and government-sponsored students	2,705	(18.2%)	2,658	(16.7%)
Subsidies	4,929	(33.2%)	5,300	(33.3%)
No employment relationship and others	813	(5.5%)	939	(5.9%)
Total	14,854	(100.0%)	15,923	(100.0%)

(Unit: in persons)

(4) Attributes of Persons in Employment (FY 04 actual number)

The survey sought to find out (1) the age distribution, (2) the proportion of female researchers, (3) the proportion of foreign researchers, and (4) the proportion of those covered by the social insurance with respect to the persons in employment in FY 04.

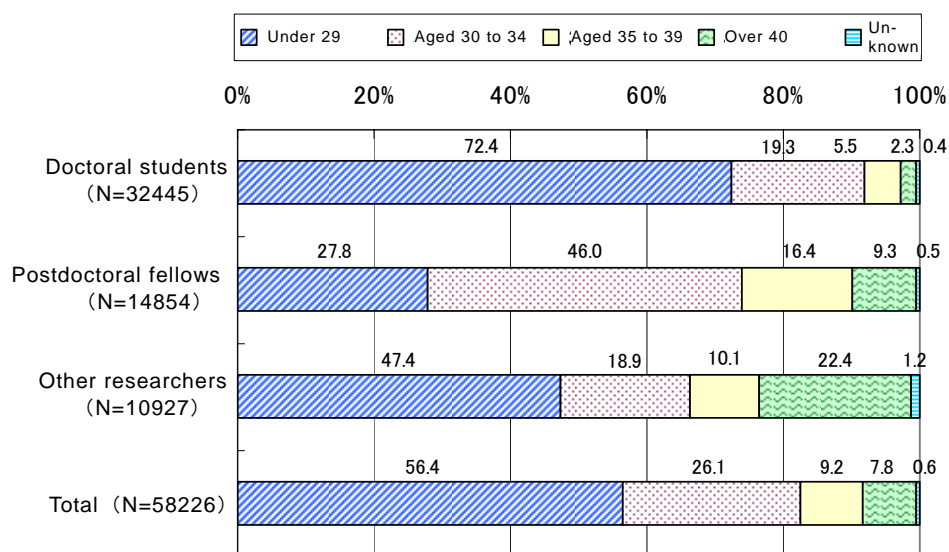
(i) Age Distribution

Data on the persons in employment in FY 04 was compiled, and assigned to the categories "under 29," "aged 30 to 34," "aged 35 to 39," and "over 40." (Fig. 4-1)

- Forty-six percent of postdoctoral fellows are aged 30 to 34, making up the highest share and nearly half of the total, while older persons over 40 make up 10 percent.

- Others who perform research assistant work and provide technical assistance comprised relatively young people aged under 29 years.

Fig. 4-1 Age Distribution (FY 04 actual number)



(ii) Proportion of Female

The survey sought to find out the number of female postdoctoral fellows and research assistants among the persons in employment in FY 04.

- Female postdoctoral fellows and research assistants make up 31 percent of all persons in employment, 24 percent of doctoral students, and 21 percent of postdoctoral fellows, respectively. (Fig. 4-2)

- The proportion of female doctoral students by age group indicates that the proportion becomes higher with age. Female doctoral students make up 42 percent of all doctoral students aged over 40. (Fig. 4-3)

- Based on the male-female ratio in postdoctoral fellows by age group, the proportions of female postdoctoral fellows in the groups aged under 29, aged 30 to 34, and aged 35 to 39 are all nearly 21 percent, while the proportion of female postdoctoral fellows becomes higher (26%) in the over 40 age group. (Fig. 4-4)

Fig. 4-2 Male-Female Ratio of Persons in Employment (FY 04 actual number)

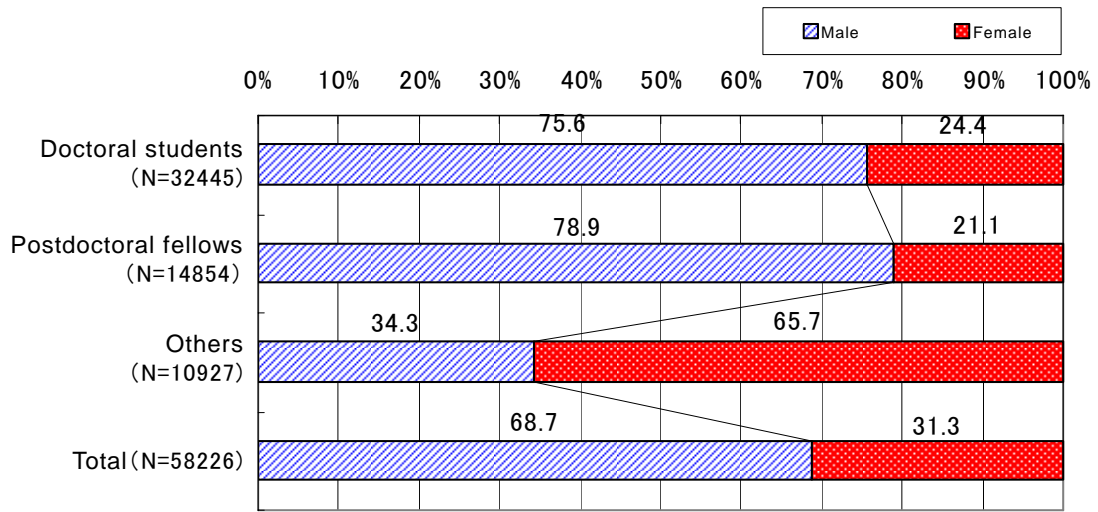


Fig. 4-3 Male-Female Ratio of Doctoral Students by Age Group (FY 04 actual number)

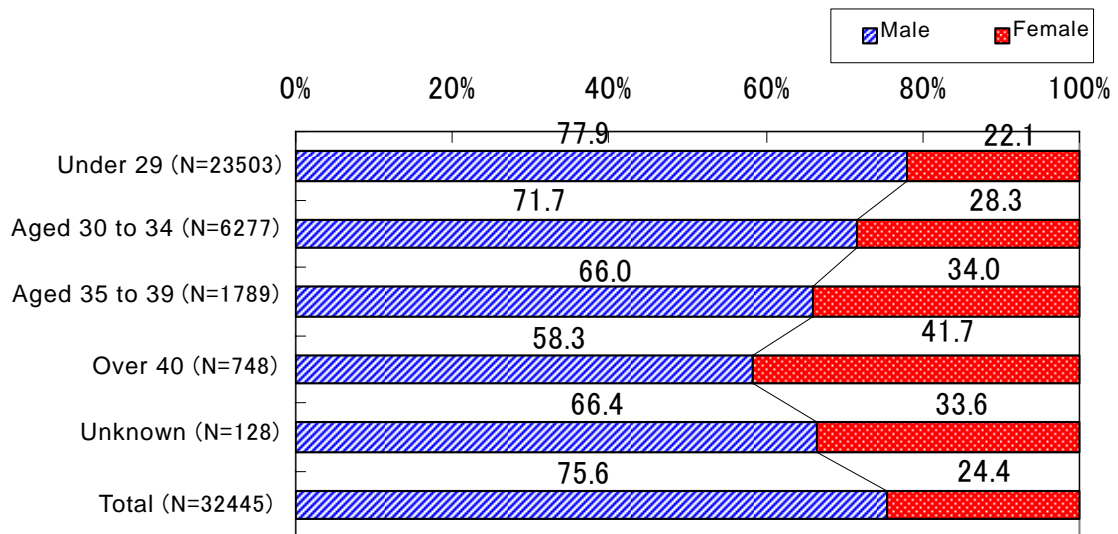


Fig. 4-4 Male-Female Ratio of Postdoctoral Fellows by Age Group
(FY 04 actual number)

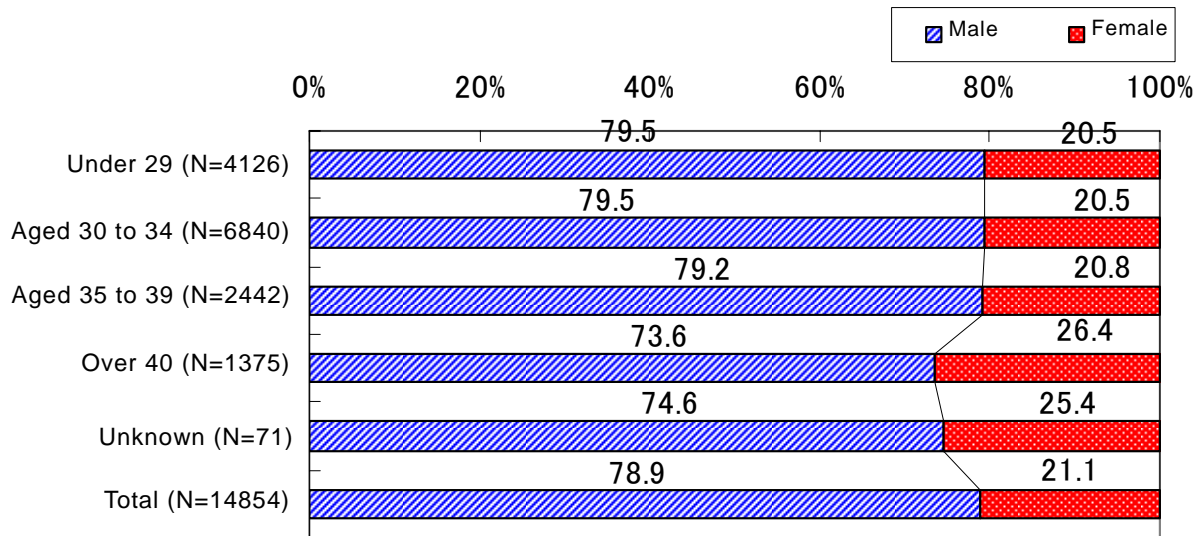


Table 4-1 Age Distribution by Sex (FY 04 actual number)

		Under 29		Aged 30 to 34		Aged 35 to 39		Over 40		Unknown	
Doctoral students	Male	18,313	(77.9%)	4,501	(71.7%)	1,180	(66.0%)	436	(58.3%)	85	(66.4%)
	Female	5,190	(22.1%)	1,776	(28.3%)	609	(34.0%)	312	(41.7%)	43	(33.6%)
	Subtotal	23,503	(100.0%)	6,277	(100.0%)	1,789	(100.0%)	748	(100.0%)	128	(100.0%)
Postdoctoral fellows	Male	3,280	(79.5%)	5,436	(79.5%)	1,934	(79.2%)	1,012	(73.6%)	53	(74.6%)
	Female	846	(20.5%)	1,404	(20.5%)	508	(20.8%)	363	(26.4%)	18	(25.4%)
	Subtotal	4,126	(100.0%)	6,840	(100.0%)	2,442	(100.0%)	1,375	(100.0%)	71	(100.0%)
Others	Male	1,911	(36.9%)	649	(31.5%)	308	(27.9%)	832	(34.0%)	46	(34.1%)
	Female	3,271	(63.1%)	1,412	(68.5%)	796	(72.1%)	1,613	(66.0%)	89	(65.9%)
	Subtotal	5,182	(100.0%)	2,061	(100.0%)	1,104	(100.0%)	2,445	(100.0%)	135	(100.0%)
Total		32,811		15,178		5,335		4,568		334	

(Unit: in persons)

(iii) Proportion of Foreigners

The survey sought to find out the number of foreign postdoctoral fellows and research assistants among the persons in employment in FY 04.

- Foreign postdoctoral fellows and research assistants make up 18 percent of all persons in employment, 20 percent of doctoral students, and 24 percent of postdoctoral fellows, respectively. (Fig. 4-5)

- The proportion of foreign postdoctoral fellows by organization is 26 percent at universities and colleges, 22 percent at independent administrative agencies, and 11 percent at private corporations. (Fig. 4-6)

Fig. 4-5 Proportion of Foreign Postdoctoral Fellows and Research Assistants
(FY 04 actual number)

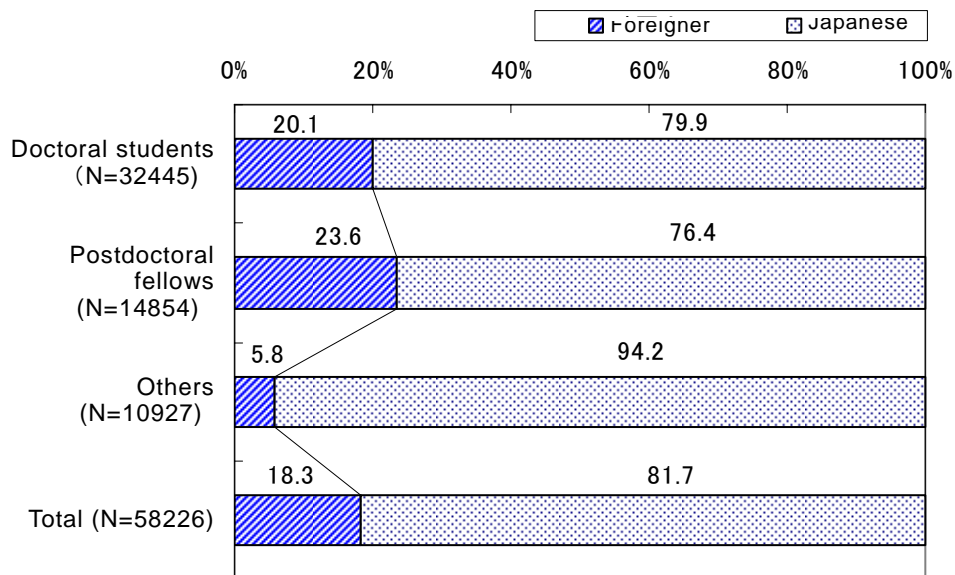
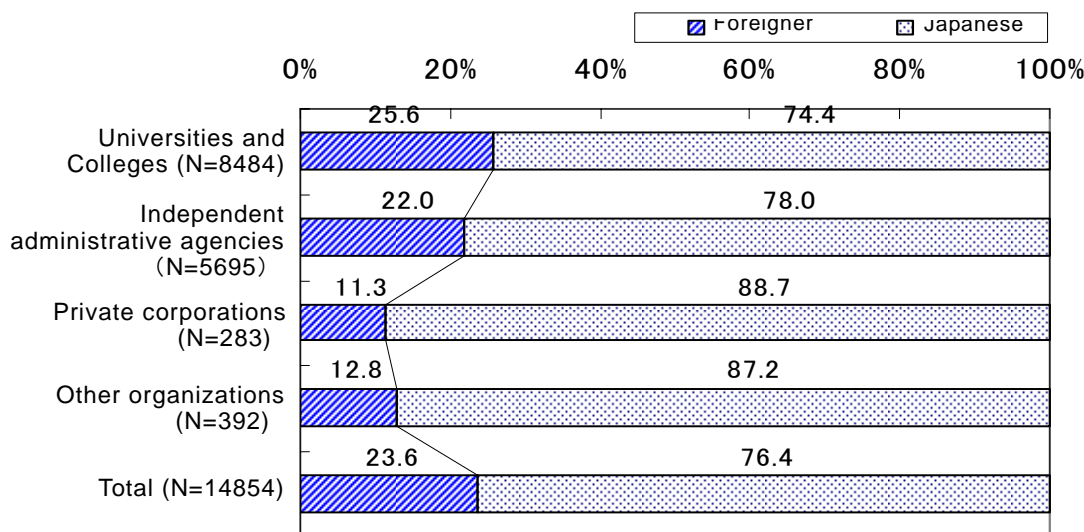


Fig. 4-6 Proportion of Foreign Postdoctoral Fellows by Organization
(FY 04 actual number)



(iv) Proportion of Those Covered by Social Insurance

The survey sought to find out the number of persons in employment who were covered by social insurance⁸ (the number of people whose social insurance premium is subsidized by the employer) in FY 04. The survey included this item to use it as an indicator to find out the number of persons in employment who are engaged in research activities according to a schedule (in terms of hours and days) that is close to that of a full-time worker. Those who are not covered by social insurance include persons who are not employed, such as those granted a fellowship, those employed on a daily basis, persons whose working hours are less than three-fourths of that of a full-time worker, or are dependents of their spouse or others.

- Those covered by the social insurance make up 24 percent of all persons in employment and 55 percent of postdoctoral fellows. (Fig. 4-7)

- As for postdoctoral fellows by organization, 40 percent were covered by social insurance at universities and colleges, 76 percent at independent administrative agencies, and 96 percent at private corporations. (Fig. 4-8)

⁸ The number of persons in employment that were members of the national social insurance scheme (“shakai hoken”), i.e., health insurance and employees pension. Those who are dependants of their spouse, those employed on a daily basis, and persons whose working hours are less than three-fourths of that of a full-time worker are not permitted to become members of this social insurance scheme. Also, those who are granted a fellowship and government-sponsored students are deemed to be not covered by the social insurance because they are not employed. Because only the cases where the surveyed organizations make the employer's contribution to the social insurance are reported in the survey, those who are covered by social insurance by being employed by a manpower outsourcing company or others are included in those not covered by the social insurance.

Fig. 4-7 Proportion of Those Covered by Social Insurance (FY 04 actual number)

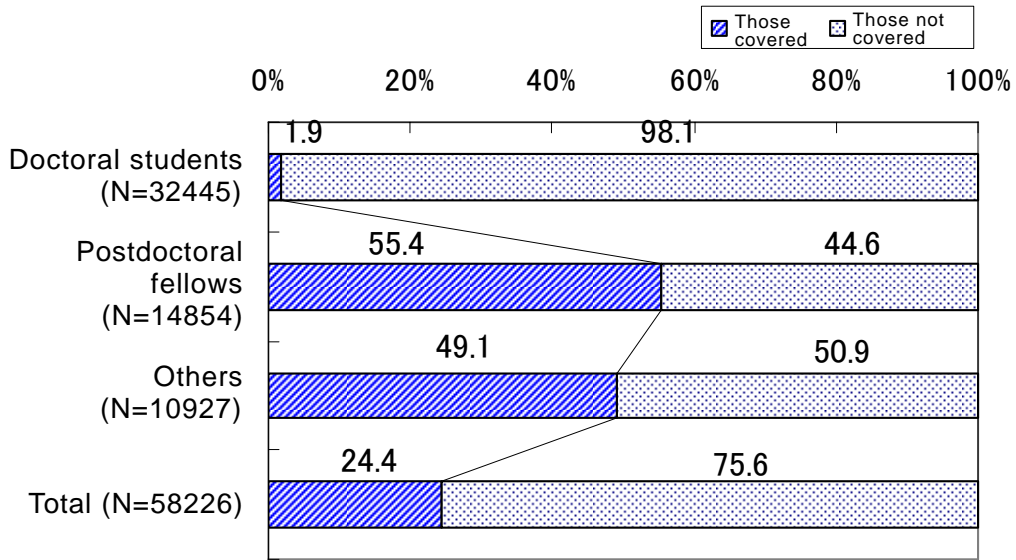
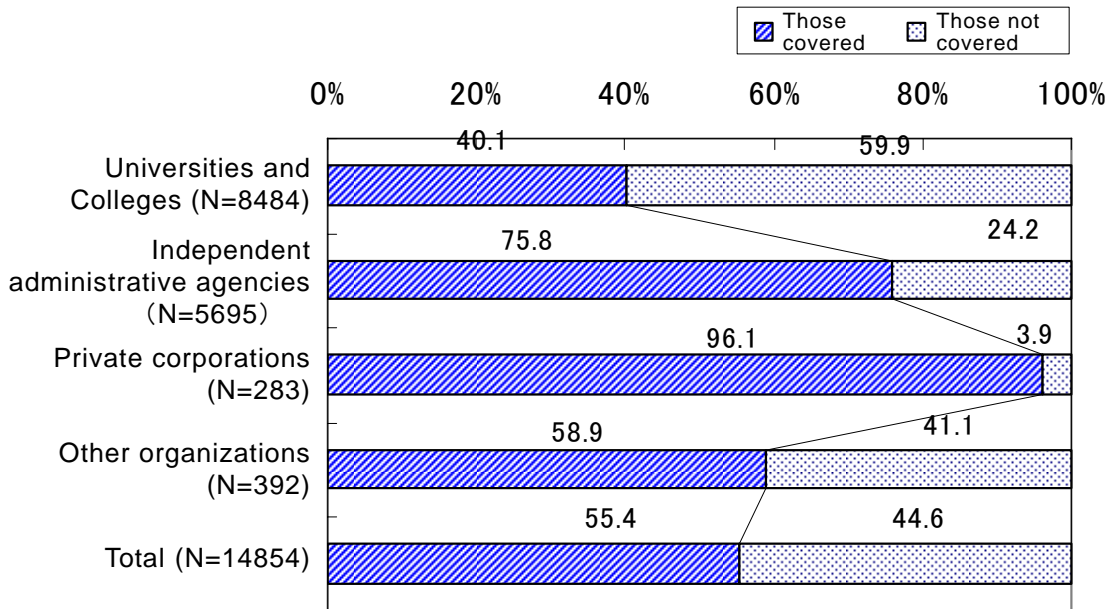


Fig. 4-8 Proportion of Postdoctoral Fellows Covered by Social Insurance by Organization (FY 04 actual number)



(5) Status of Employment by Research Field (FY 04 actual number)

The survey sought to find out the number of persons in employment by "research field", a survey item which was not included in the survey conducted last year. This survey included 11 research categories comprising the priority fields specified in the Second Science and Technology Basic Plan, namely, "Life Sciences," "Information and Communication Technology," "Environment," "Nanotechnology and Materials," "Energy," "Manufacturing Technology," "Social Infrastructure," and "Frontiers," as well as "Cultural Science and Social Science," "Other Fields," and "Unknown".

(i) Number of Persons in Employment by Research Field

The survey sought to determine the breakdown of doctoral students receiving financial support from a university or other organization as well as postdoctoral fellows engaged in research activities at each research organization by research field.

- Based on the breakdown of doctoral students by research field, Life sciences has the largest share, 35 percent, followed by Cultural Science and Social Science, 16 percent. (Fig. 5-1)

- As for the breakdown of postdoctoral fellows by research field, Life sciences also has the largest share, 41 percent. However, unlike doctoral students, the proportion for the Nanotechnology and Materials field is higher than that for Cultural Science and Social Science. (Fig. 5-2)

Fig. 5-1 Proportion of Doctoral Students by Research Field (FY 04 actual number)

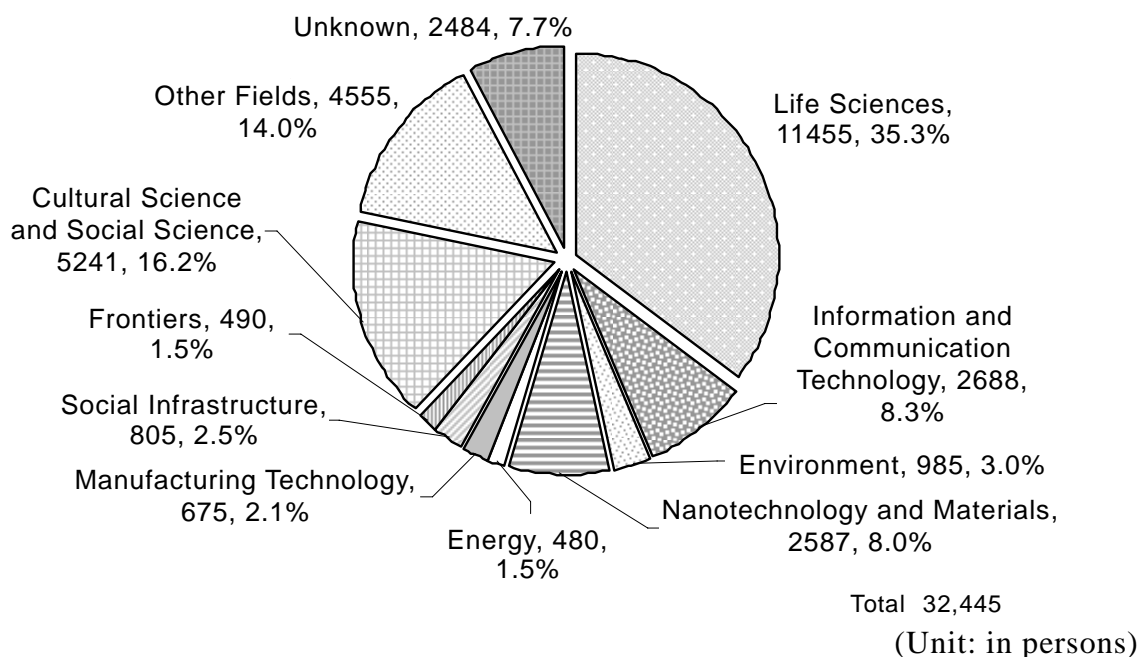
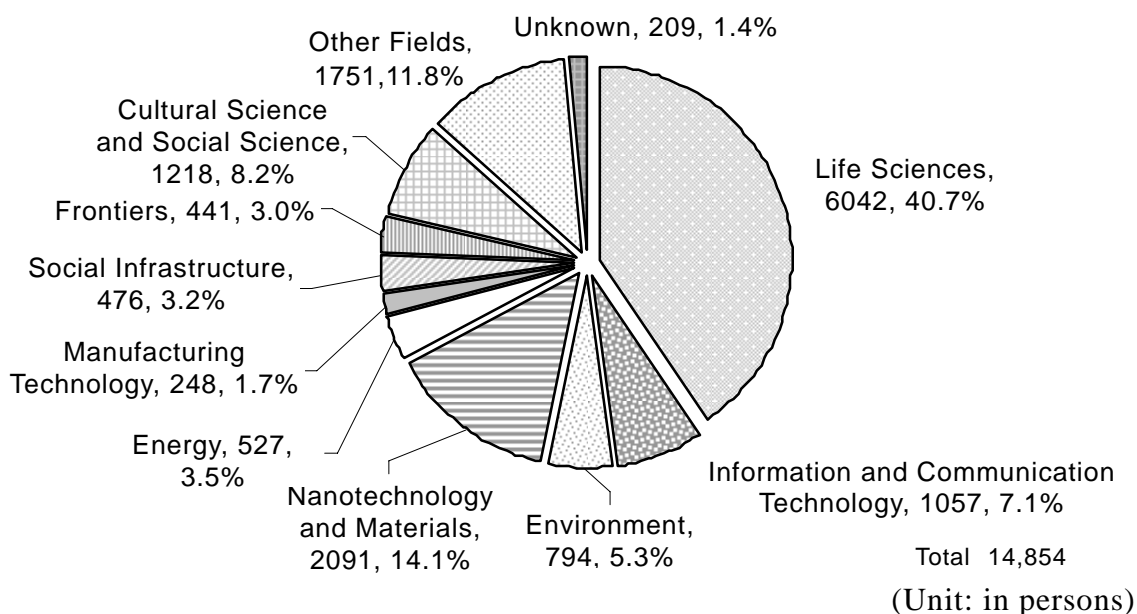


Fig. 5-2 Proportion of Postdoctoral Fellows by Research Field
(FY 04 actual number)



(ii) Postdoctoral Fellows

Organizations and the age distribution of postdoctoral fellows were compiled according to their research field.

- A significant number of postdoctoral fellows in the fields of Energy and Cultural Science and Social Science were accepted by independent administrative agencies and by universities and colleges, respectively. As for the fields of Information and Communication Technology, Environment, and Manufacturing Technology, universities and colleges and independent administrative agencies employed almost the same proportion of postdoctoral fellows. (Fig. 5-3)

- The largest number of postdoctoral fellows in all research fields was in the 30 to 34 age group. The largest number of postdoctoral fellows over age 35 was involved in the field of Manufacturing Technology, making up 32 percent, while the smallest number was in the Frontiers, field making up 18 percent. (Fig. 5-4)

Fig. 5-3 Organizations of Postdoctoral Fellows by Research Field
(FY 04 actual number)

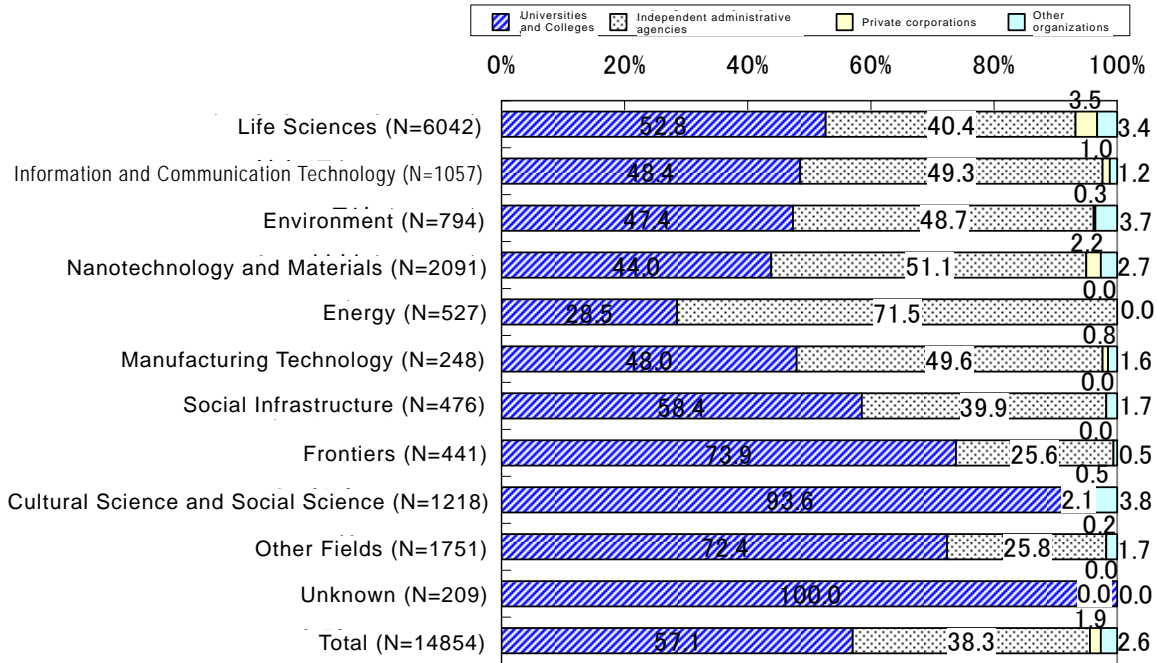
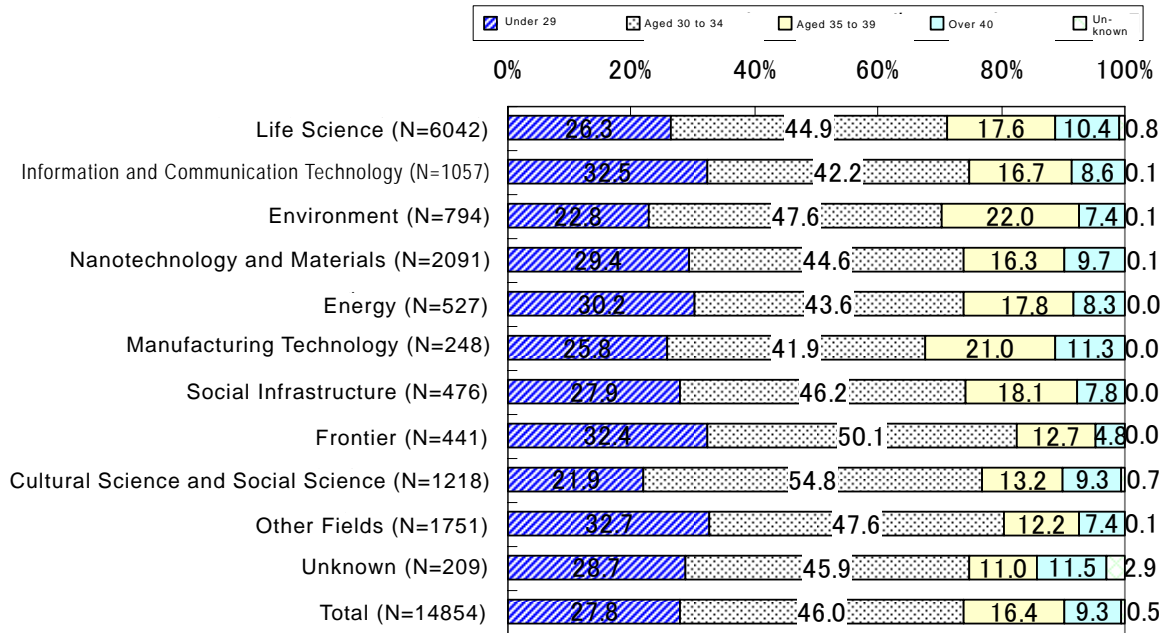


Fig. 5-4 Age Distribution of Postdoctoral Fellows by Research Field
(FY 04 actual number)



(iii) Proportion of Female by Research Field

The proportions of female doctoral students and postdoctoral fellows were compiled according to their research field.

- The proportion of female doctoral students and postdoctoral fellows is highest in the field of Cultural Science and Social Science: 41 percent of doctoral students and 37 percent of postdoctoral fellows. The proportion is second highest in Life sciences: 30 percent of doctoral students and 28 percent of postdoctoral fellows. (Fig 5-5, Fig. 5-6)

- Meanwhile, the proportion of female doctoral students and postdoctoral fellows is low, around 10 percent, in the fields of Information and Communication Technology, Nanotechnology and Materials, Energy, and Manufacturing Technology. (Fig. 5-5, Fig. 5-6)

Fig. 5-5 Male-Female Ratio of Doctoral Students by Research Field
(FY 04 actual number)

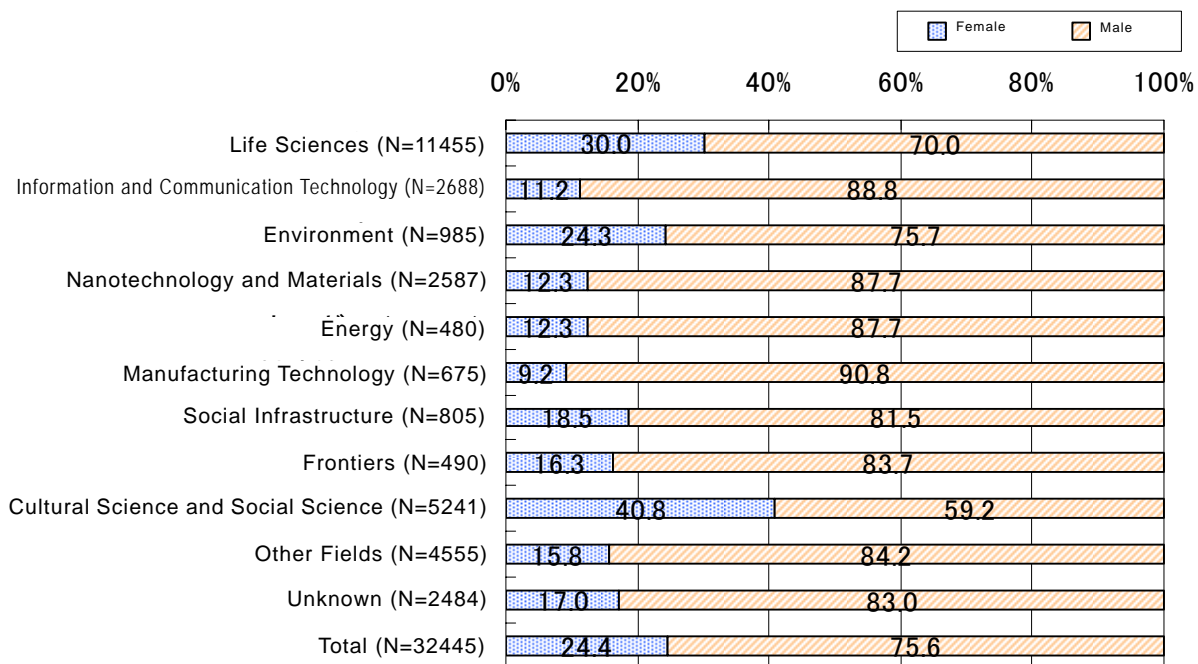
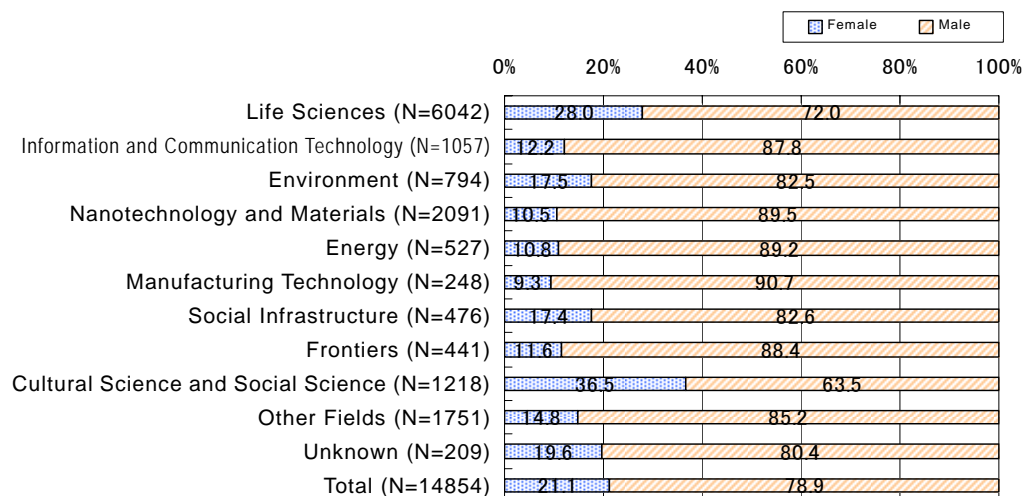


Fig. 5-6 Male-Female Ratio of Postdoctoral Fellows by Research Field
(FY 04 actual number)



(iv) Proportion of Foreigners by Research Field

The proportions of foreign doctoral students and postdoctoral fellows were compiled according to their research field.

- The proportion of foreign doctoral students is highest in the fields of Environment and Social Infrastructure, about 35 percent each. (Fig. 5-7)

- The proportion of foreign postdoctoral fellows is remarkably high in the field of Manufacturing Technology, 44 percent, followed by Nanotechnology and Materials, 35 percent, and Energy and Social Infrastructure, 34 percent each. (Fig. 5-8)

Fig. 5-7 Proportion of Foreign Doctoral Students by Research Field
(FY 04 actual number)

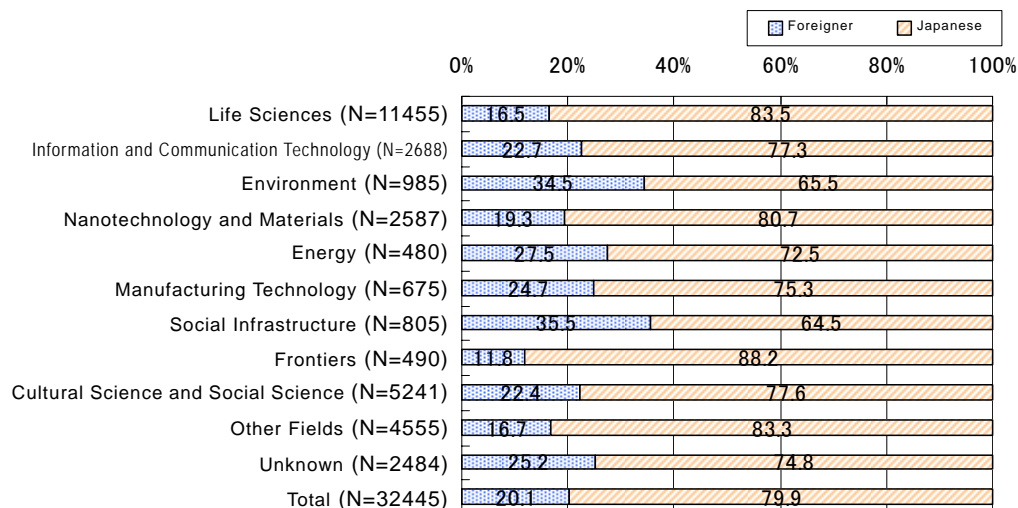
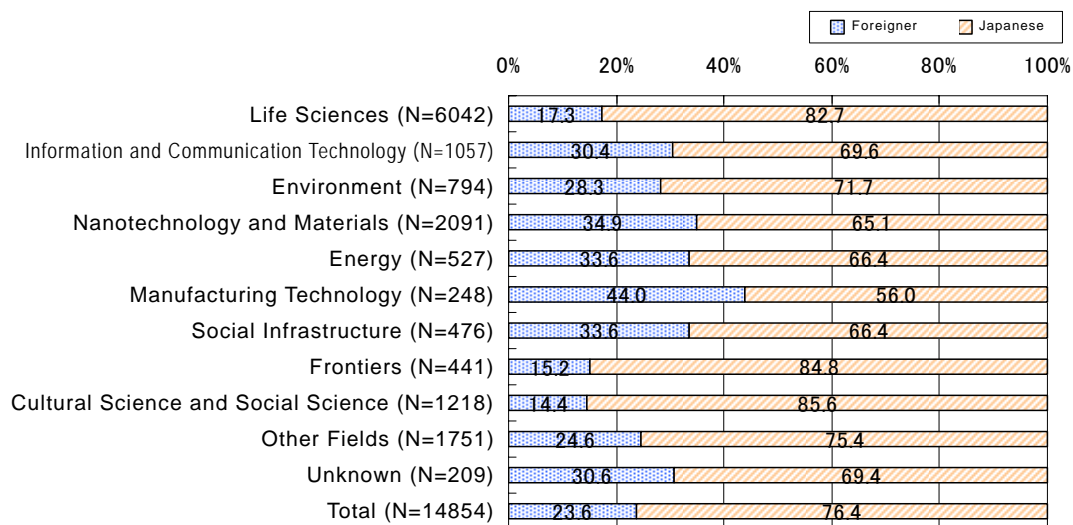


Fig. 5-8 Proportion of Foreign Postdoctoral Fellows by Research Field
(FY 04 actual number)



3. Conclusions

(1) Postdoctoral Fellows

(i) Overview

- The total number of postdoctoral fellows⁹ was 14,854 in FY 04 (actual number) and was estimated to be over 15,000 in FY 05.

- According to the breakdown by organization (FY 04 actual number), universities and colleges had the largest number of postdoctoral fellows, 57 percent, and independent administrative agencies had the second largest number, 38 percent.

(ii) Status of Employment by Fund

- As for funds, external funds, such as competitive funds, made up the largest proportion of all, 43 percent, and the breakdown is as follows: The 21st Century Center of Excellence Programs 10 percent; Basic Research Programs 8 percent; and the Grants-in-Aid for Academic Research 6 percent. Internal funds, such as subsidies, made up the second largest proportion, 33 percent, followed by fellowship and government-sponsored students, 18 percent.

- Judging from the fact that the proportion of those covered by social insurance was 55 percent, approximately half of all postdoctoral fellows were employed on a full-time basis.

(iii) Status of Employment by Research Field

- As for research fields, 41 percent of postdoctoral fellows were concentrated in the field of Life sciences. Except for "Other Fields," the second largest proportion, 14 percent, was in the field of Nanotechnology and Materials, followed by 8 percent in Cultural Science and Social Science, 7 percent in Information and Communication Technology, and 5 percent in the Environment field.

- Four priority fields on their own made up two-thirds of all postdoctoral fellows.

(iv) Proportion of Female

- The proportion of female postdoctoral fellows was 21 percent. The proportion rose to 26 percent for those over the age of 40.

- As for the breakdown of female postdoctoral fellows by research field,

⁹ Note that there may be overlapping numbers, in the case where the type of employment fund was changed or the person was transferred to a different organization within the same fiscal year, because the survey determines the total number of persons in employment in the reference year.

Cultural Science and Social Science had the highest proportion, 37 percent, followed by 28 percent in Life sciences.

(v) Proportion of Foreigners

- The proportion of foreign postdoctoral fellows was 24 percent. The proportion at universities and colleges was the highest, 26 percent, followed by 22 percent at independent administrative agencies.

- As for the breakdown by research field, Manufacturing Technology has the highest proportion, 44 percent, followed by 35 percent in Nanotechnology and Materials, 34 percent in Energy, and 34 percent in the Infrastructure field.

(2) Doctoral Students

(i) Overview

- The total number of doctoral students receiving any financial support ⁹ was 32,445 in FY 04 (actual number) and was estimated to exceed 33,000 in FY 05.

- According to the breakdown by organization (FY 04 actual number), universities and colleges made up 97 percent, of which national university corporations had the largest portion, 81.3 percent.

(ii) Status of Employment by Fund

- As for funds, internal funds, such as subsidies, made up the largest share of all, 61 percent. External funds, such as competitive funds, remain at 26 percent, and the major source of such external funds is the 21st Century Center of Excellence Programs, at 16 percent.

(iii) Status of Employment by Research Field

- As for the breakdown of doctoral students by research field, Life sciences had the highest proportion, 35 percent, followed by 16 percent in Cultural Science and Social Science.

- The total of four priority fields made up 55 percent.

(iv) Proportion of Female

- The proportion of female doctoral students was 24 percent, but the proportion tended to rise with age. The proportion of female doctoral students reached 42 percent in the age group comprising doctoral students over the age of 40.

- As for the breakdown by research field, Cultural Science and Social Science had the highest proportion, 41 percent, followed by 30 percent in the Life sciences

field.

(v) Proportion of Foreigners

- The proportion of foreign doctoral students was 20 percent.
- As for the breakdown by research field, Social Infrastructure had the highest proportion, 36 percent, followed by 35 percent in the Environment field.

(3) Comparison

(i) Status of Employment by Research Field

- As for postdoctoral fellows, four priority fields made up about two-thirds, 12 percentage points higher than for doctoral students.

(ii) Proportion of Female

- The proportion of female postdoctoral fellows, 21 percent, was slightly lower than for doctoral students, 24 percent.
- As for the proportion by research field, the proportion of female was highest among both doctoral students and postdoctoral fellows in the field of Cultural Science and Social Science, followed by the Life sciences field.

(iii) Proportion of Foreigners

- The proportion of foreign postdoctoral fellows, 24 percent, was slightly higher than for doctoral students, 20 percent.
- In particular, the proportion of foreign postdoctoralfellows was higher than that of foreign doctoral students by 19 percent in the field of Manufacturing Technology and by 16 percent in the field of Nanotechnology and Materials.

<Summary (FY 04 actual number)>

Item	Postdoctoral Fellows	Doctoral Students
Overview	a. Total number: 14,854 b. Breakdown by organization: (i) Universities and Colleges 57% - National university corporations 42% (ii) Independent administrative agencies 38%	a. Total number: 32,445 b. Breakdown by organization: (i) Universities and Colleges 97% - National university corporations 81% (ii) Independent administrative agencies 3%
Status of Employment by Fund	In descending order of magnitude: (i) External funds, such as competitive funds 43% - The 21st Century Center of Excellence Programs 10% - Basic Research Programs 8% - Grants-in-Aid for Academic Research 6% (ii) Internal funds, such as subsidies 33% * The proportion of those covered by social insurance was 55 percent.	In descending order of magnitude: (i) Internal funds, such as subsidies 61% (ii) External funds, such as competitive funds 26% - The 21st Century Center of Excellence Programs 16% - Grants-in-Aid for Academic Research 3% - Basic Research Programs 2%
Status of Employment by Research Field	The proportion in the four priority fields: approximately two-thirds Life sciences 41% Nanotechnology and Materials 14% Information and Communication Technology 7% Environment 5% The proportion in other research fields: Cultural Science and Social Science 8%	The proportion in the four priority fields: over fifty percent Life sciences 35% Nanotechnology and Materials 8% Information and Communication Technology 8% Environment 3% The proportion in other research fields: Cultural Science and Social Science 16%

<p>Proportion of Female</p>	<p>a. Twenty-one percent of postdoctoral fellows are female.</p> <p>b. Twenty-one percent for postdoctoral fellows under age 40, 26 percent for those over the age of 40.</p> <p>c. In descending order of magnitude by research field, except for the category “Unknown”:</p> <p>(i) Cultural Science and Social Science 37%</p> <p>(ii) Life sciences 28%</p> <p>(iii) Environment 18%</p>	<p>a. Twenty-four percent of doctoral students are female.</p> <p>b. The proportion of female rises with age. (42 percent for the group over the age of 40)</p> <p>c. In descending order of magnitude by research fields:</p> <p>(i) Cultural Science and Social Science 41%</p> <p>(ii) Life sciences 30%</p> <p>(iii) Environment 24%</p>
<p>Proportion of Foreigners</p>	<p>a. Twenty-four percent of postdoctoral fellows are foreigners.</p> <p>b. In descending order of magnitude by research field:</p> <p>(i) Manufacturing Technology 44%</p> <p>(ii) Nanotechnology and Materials 35%</p> <p>(iii) Infrastructure, Energy 34%</p>	<p>a. Twenty-percent of doctoral students are foreigners.</p> <p>b. In descending order of magnitude by research field:</p> <p>(i) Infrastructure 36%</p> <p>(ii) Environment 35%</p> <p>(iii) Energy 28%</p> <p>* The rate is low in both the fields of Manufacturing Technology, 25%, and Nanotechnology and Materials, 20%.</p>

Acknowledgement

For the survey, questionnaires were sent to a total of 1,236 organizations, including universities and colleges, independent administrative agencies, national experimental research institutions, public experimental research institutions, public-interest corporations, and private corporations, and 914 responded. Despite the wide-ranging survey items contained in the questionnaire, over 70 percent of organizations responded. Many organizations had to go through a verification process because the procedure of entering responses was somewhat complicated and the coverage of survey subjects and the classifications of employment were not exactly clear. With the great help of persons in charge at each organization, extremely useful data has been obtained to elucidate the actual situation of postdoctoral fellows and research assistants.

They also provided useful information on the actual situation of various forms of employment for postdoctoral fellows at preparatory interviews for designing the survey conducted during their busy business schedules.

We deeply appreciate the cooperation kindly provided from a large number of research organizations, without which the survey could not have been successfully conducted.

We also express our sincere appreciation to Mr. Kozo Horiguchi and Ms. Atsuko Yokoyama for having effectively compiled enormous amounts of data obtained from questionnaires returned from organizations.