

Science, Technology and Innovation Indicators in São Paulo

Women submitted 42% of all grant applications to FAPESP in 2010

Females now account for 43% of all researchers in the State of São Paulo

Proponents of applications for research grants

In 2010, FAPESP considered 19,678 initial requests for funding from researchers affiliated with institutions of higher learning or research institutes in the State of São Paulo. Of those, 42% were submitted by women. This proportion has been increasing continuously since 1992, when it was only 30%. For 2010, the overall success rate, defined as the number of approved proposals divided by the number of proposals analyzed throughout the year, was 61% for women and 60% for men.

Figure 1 shows the growth in the proportion of applications received from female principal investigators, as well as the success rates for men and women. As might be expected, there were differences in the gender distribution of applicants across the various areas of knowledge, as shown in Figure 2. Between 1992 and 2010, the proportion of female applicants showed marked growth in four areas: the health sciences (from 34% to 54%); the biological sciences (from 42% to 48%, peaking at 51% in 2009); agrarian sciences (from 23% to 40%); and engineering (from 8% to 22%, nearly tripling). Females currently account for more than half of the applicants in the areas of health sciences and human sciences, as well as in linguistics, literature, and the arts (Table 1). However, there has been a gradual decrease in the proportion of female applicants in the areas of linguistics, literature, and the arts, as well as in the humanities.

Table 2 displays the changes that have occurred in the area of engineering. There has been an overall increase in the participation of women, which has nearly doubled in the field of electrical engineering. The exception has been the field of mechanical engineering, in which the proportion of women remains low (at 7%) and shows no trend toward growth. However, there

Figure 1 Annual proportions of initial grant proposals submitted by women, together with the success rates for men and women

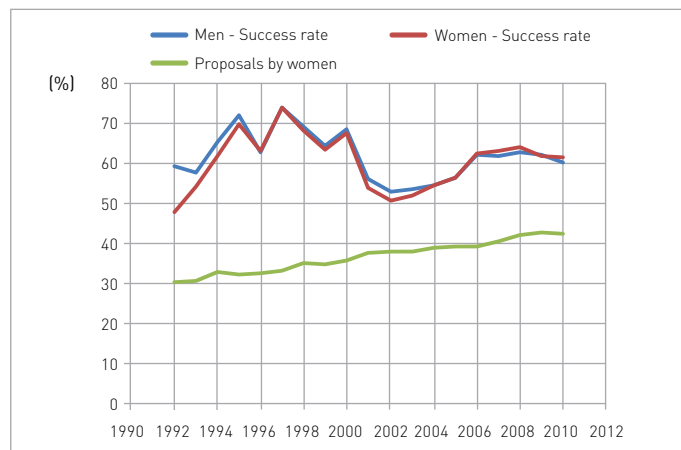


Figure 2 Evolution in the proportion of grant applications submitted to FAPESP by female researchers, 1992-2010

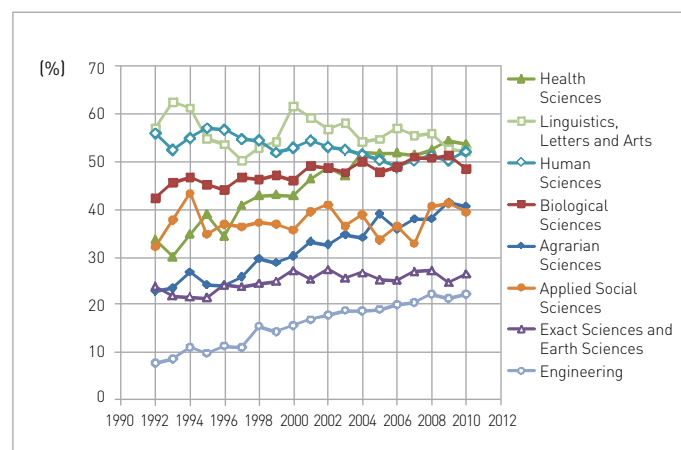


Table 1 Grant applications from women, as a proportion of the total number of initial requests for funding received by FAPESP, in 1992 and 2010

AREA OF STUDY	1992 (%)	2010 (%)
Agricultural Sciences	23	40
Biological Sciences	42	48
Health Sciences	34	54
Exact Sciences and Earth Sciences	24	26
Humanities	56	52
Applied Social Sciences	32	39
Engineering	8	22
Interdisciplinary Projects*	-	39
Linguistics, Literature and the Arts	57	52

*There were no proposals for interdisciplinary projects in 1992.

Table 2 Proportion of female researchers who submitted initial grant proposals to FAPESP in 1992, 1998, 2004 and 2010

FIELD OF ENGINEERING	1992 (%)	1998 (%)	2004 (%)	2010 (%)
Food Technology & Science	50	54	55	64
Aerospace	8	2	12	20
Agricultural	0	11	11	24
Biomedical	0	16	24	22
Civil	7	13	16	29
Material & Metallurgical	13	25	27	31
Mining	0	7	20	0
Production	0	18	22	23
Transport	0	18	21	33
Electrical	6	6	6	11
Mechanical	6	5	6	7
Naval & Oceanographic	0	0	0	0
Nuclear	25	29	59	48
Chemical	17	29	35	40
Sanitary	7	21	28	29

Table 3 Success rates, by gender, for grant applications submitted to FAPESP, 1992–1994 and 2008–2010

AREA OF STUDY	1992-1994			2008-2010		
	M (%)	F (%)	F/M (%)	M (%)	F (%)	F/M (%)
Agricultural Sciences	63	55	87	62	62	100
Biological Sciences	70	62	89	67	67	100
Health Sciences	53	45	85	59	61	103
Exact Sciences and Earth Sciences	64	62	97	66	66	100
Humanities	54	50	93	59	60	102
Applied Social Sciences	45	47	104	52	54	104
Engineering	58	50	86	59	56	95
Interdisciplinary Projects*	-	-	-	57	60	105
Linguistics, Literature and the Arts	46	35	76	60	62	103

*There were no proposals for interdisciplinary projects in the 1992–1994 period.

has been marked growth in the proportion of women entering the field of chemical engineering, in which females now account for 40% of all FAPESP grant applicants, as well as in the field of food science and technology, where women currently predominate, the proportion of applications submitted by women having increased from 50% in 1992 to 64% in 2010.

Success rates

The success rate is defined as the proportion of grants approved in relation to the number of proposals submitted, expressed as a percentage. As shown in Figure 1, the overall success rate has historically been similar for men and women. The same has been true for each specific area of knowledge, as can be seen in Table 3. In addition, in the 1992–1994 and 2008–2010 periods, the differences between men and for women in terms of the success rates for each area narrowed to such a point that the variations can be considered fluctuations.

Growth in the numbers of male and female applicants for research grants

The numbers of researchers who submitted initial proposals to FAPESP during the 1992–2010 period is represented, by gender and by year, in Figure 3. From 1992 to 1998, there was a great deal of growth in the overall number of researchers (male and female) seeking support from FAPESP, the average annual growth rate being 730 per year. In the 1998–2003 period, the total number of researchers leveled out at approximately 7,000. From 2003 to 2010, we see a return to growth in the number of researcher grant applicants, the average annual growth rate being 267 per year. Throughout the 1992–

2010 period, there was intense growth in the overall number of researchers submitting grant applications to FAPESP. However, on average, the number of female applicants grew at a slightly faster rate than did that of male applicants, which led to an increase in the proportion of female grant applicants, as can be seen in Figure 2.

The proportion of grant applications submitted by women rose from 32% in 1992 to 43% in 2010, having remained relatively stable (at 43%) for the last three years (2008–2010). According to the Higher Education Census conducted by the Instituto Nacional de Educação e Pesquisa (INEP, National Institute for Instruction and Research), this proportion is equal to that of female professors in the State of São Paulo.

The number of researchers who submit grant applications to FAPESP each year is lower than is the number of active researchers in the state, because not all researchers apply for FAPESP funding (some are funded by private enterprise) and because the average researcher will apply for FAPESP funding only once every two years (submitting two grant applications within the same calendar year).

In the six years between 2005 and 2010, 18,025 different researchers submitted proposals to FAPESP, a number that is comparable to the estimated 18,564 researchers employed at state universities or public research institutions in the State of São Paulo.

International comparisons

Table 4 displays figures published by international sources of funding for research, showing the proportions of applications submitted by women and the success rate differential (the success rate for men minus the success rate for women). As can be seen, the data related to female researchers receiving funding from FAPESP in the State of São Paulo (FAPESP) compare quite favorably with those related to female researchers supported by other funding agencies and at other locations around the world.

Figure 3 Evolution in the numbers of male and female researchers, as well as in the total number of researchers, applying for FAPESP funding between 1992 and 2010

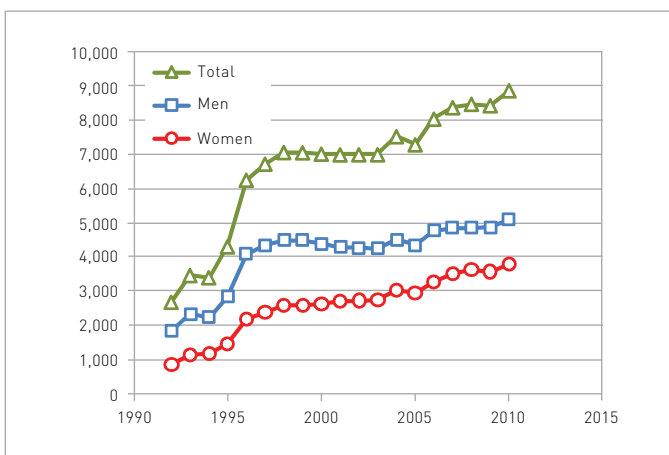


Figure 4 Proportions of male and female researchers who submitted grant applications or funding requests to FAPESP, 1992–2010

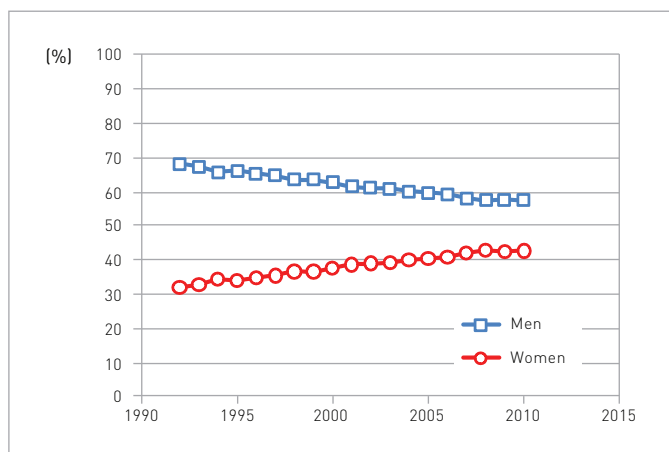


Table 4 Proportions of grant applications submitted by female principal investigators, proportions of female researchers among applicants, overall success rates, and the success rate differentials between male and female applicants

Reporting agency	Location	Applications by female PIs %	Female applicants %	Overall success rate [%]	M – F success rate [%]	Year
Finland Academia	Finland		31		-2.3	2007
FAPESP	SP, Brazil	42	43	60	-1.2	2010
NSF	USA	22		27	-1.0	2009
	UK		37		0.6	2007
BBSRC	UK	22	22	26	4.2	2006
NERC	UK	20	20	24	6.0	2006
EPSRC	UK			27	0.0	
	Spain		37		4.6	2007
DFG	Germany		23	38	5.1	2007
	Italy		33	25	5.7	2007
	Denmark		30		6.1	2007
	EU-25				6.4	2007
	EU-15				6.4	2007
	EU-27				7.1	2007

PIs = principal investigators; NSF = National Science Foundation; BBSRC = Biotechnology and Biological Sciences Research Council; NERC = Natural Environment Research Council; EPSRC = Engineering and Physical Sciences Research Council; DFG = Deutsche Forschungsgemeinschaft (German Research Foundation).

Sources: FAPESP: internal study.

NSF: Report on Merit Review Process, 2009.

Europe and european contries: Differential Success Rate for "The Gender Challenge in Research Funding: Assessing the European National Scenes", EUR 23721 EN (DG Research, 2009); percentage of researchers MSTI 2010.