



Centre for Science, Technology and Innovation
Indicators

Human Sciences Research Council

for

Department of Science and Technology

NATIONAL SURVEY OF RESEARCH & DEVELOPMENT 2003/2004

Provisional
Report on the Sectors

1 September 2005

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Executive Summary

1. On 28 January 2004, the Centre for Science, Technology and Innovation Indicators (CeSTII) was launched within the Knowledge Management research programme of the HSRC, with a mandate from the Department of Science and Technology to carry out future surveys on both Research and Experimental Development and Innovation.
2. CeSTII is envisaged as a national resource to perform such surveys according to international best practice and to form the hub of a network of excellence involving local, regional and international peers.
3. This Report presents the second survey that CeSTII has conducted, namely the 2003/04 Survey of Inputs into Research and Experimental Development, abbreviated as the 2003/04 R&D Survey.
4. The 2003/04 R&D Survey built on the firm basis provided through the experience of conducting the 2001/02 R&D Survey.
5. As previously the 2003/04 questionnaire followed the OECD Frascati Manual guidelines. In order to improve the response rate the questionnaire comprised only the core questions needed to address the major indicators. The respondent burden of this questionnaire was thus reduced compared with the first survey.
6. The universe of R&D performers was divided into the following five sectors:
 - i. **The Business Enterprise Sector:** The business sector of large, medium and small enterprises, including state-owned companies.
 - ii. **The Government Sector:** All government departments with an R&D component, government research institutions and museums.
 - iii. **The Higher Education Sector:** All public Higher Education institutions and some private higher education institutions with an R&D component 35 Higher Education institutions (18 Universities, 8 Technikons, 3 Universities of Science and Technology, 1 Institute of Technology and 5 private higher education institutions.
 - iv. **The Not-for-Profit Sector:** Non-governmental and other organisations formally registered as not-for-profit institutions.
 - v. **The Science Council Sector:** the 8 science research councils plus the Africa Institute, all established through Acts of Parliament
7. In earlier surveys these five sectors have sometimes been contracted into three: Higher Education, Business and Government. With Government including the Science Councils, and the NPOs sometimes being with Government or Business.
8. The indicators provided in this Report are the main subset of the S&T indicators specified for R&D surveys by the OECD.
9. In Table E1 we present the breakdown of the national total of R10, 1 billion of intra-mural R&D Expenditure by sector.

Table E1: Total In-house R&D expenditure* per sector, 2003/04 and 2001/02

Sector	2003/4		2001/2	
	R 000s	%	R 000s	%
Business enterprise (BERD)	5,591,325	55.5	4,023,576	53.7
Government	465,367	4.6	203,110	2.7
Higher education	2,071,351	20.5	1,896,156	25.3
Not-for-profit	209,023	2.1	70,778	0.9
Science Councils	1,745,493	17.3	1,294,454	17.3
Grand Total	10,082,559	100.0	7,488,074	100.0

*Rounding error sums to 99,9%

10. The Business Sector at 55,5% of the spend was the largest performer; Government combined with the Science Councils accounts for 21,9%; Higher Education comprises 20,5%. The Business Sector response rate rose to 69%. No response rates are relevant to the Higher Education, Science Council and Government sectors.

11. Table E2 depicts the main information on human resources by sector.

Table E2: Headcount of R&D personnel by sector, 2003/04

	Researchers	Technicians Directly Supporting R&D	Other Personnel Directly Supporting R&D	Grand Total	%
Business enterprise	5058	3430	3120	11608	28.6
Government	929	322	1032	2283	5.6
Higher Education*	14054.54	2594	2728.5	19377.04	47.7
Science Councils	2414	1612	2496	6522	16.1
Not-for-profit	305	235	275	815	2.0
Grand Total	22760.54	8193	9651.5	40605.04	100.0

*Excluding postgraduate students

17. Deployment of Researchers varies considerably by sector. For example, in the Business Sector the time spent by R&D personnel on research is up to three times that of the time Higher Education personnel spend. The large difference is accounted for by teaching and other duties.
18. 19406 Researchers and a grand total of 32501 personnel support the country's R&D effort. The latter translates into 0,73 R&D personnel per 1000 population.
19. The implementation of the 2003/04 R&D Survey demonstrated that considerable learning by both the survey team and respondents has occurred. The survey fieldwork was completed by mid February 2005, and the launch of the Key High-Level Results of the survey occurred almost one year after the launch of the survey.
20. A close working relationship was maintained with Statistics Canada who provided valuable guidance in the finalization of the survey results.
21. The Science and Industry Directorate of the OECD also gave valuable advice toward submission of the 2001/02 R&D Survey results for inclusion in the *OECD Main S&T Indicators* and the accompanying *OECD S&T Scoreboard*.
22. Statistics South Africa declared the 2001/02 Survey of Inputs to Research and Development as a component of Official Statistics on 13 June 2005.
23. The Higher Education sector and the Business sector questionnaires are provided in a separate Annex as Appendices 1 and 2 respectively. Also included is the User Guide (Appendix 3).
24. A public web site www.hsrc.ac.za/RnDSurvey was commissioned in June 2004 via which portal users may down load the various Surveys reports and tables. The web

documents are provided in both .pdf and .xls format for the convenience of users. Onward interpretation of the data rests with the party that downloads the data.

25. All data extractions that CeSTII performs for users are governed by the Access Protocol, and are generally provided free of charge unless they require fairly substantial analytical work.
26. The full 2003/04 Research and Development Survey will be followed by the 2004/05 survey thereby marking the transition to annual rather than biennial surveys.
27. The knowledge and expertise developed through the two surveys will be codified in the CeSTII Survey Operations Manual that is currently being drafted.
28. The recurring advice from various participants in this sector continues to be that the feedback process following each survey will affect the success of future surveys. There exists a real interest in the findings of any analysis of the data, especially where these indicate the competitive standing of organizations.

Disclaimer

Survey data may be freely used, subject to the acknowledgment of its source.
Any interpretation or further analysis is the responsibility of the third party

Acknowledgements

The 2003/04 R&D Survey was launched even before the full reporting on the 2001/02 survey was completed. The second survey was conducted in new custom-designed premises that the enlarged staff occupied in December 2003. In addition the database server went on-line and this enabled more rapid compilation of the data. An ongoing process of staff development began with an international workshop in January 2004 that also served to launch the new premises of the Knowledge Management research programme. This enabling environment laid the basis for a more rapid execution of the second survey.

We again extend appreciation to the Dr. Rob Adam, Director-General of the Department of Science and Technology and his staff; to Dr. Mark Orkin, President of the HSRC, and to the members of Corporate Services.

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The process of moving from the first survey team to the second went smoothly and it is clear that significant capability has been developed in a short space of time. As previously we acknowledge the cooperation of the respondents, especially those who attended to the questionnaire under pressure and even outside work hours.

Finally our appreciation to our own administration staff, especially Valda West, Fredericka Davies and Shiraaj Gamiieldien.

The R&D Survey will now be conducted annually. The steady increase in the number of requests for data extractions attests to its value to the policy community. CeSTII continues to learn and is now able further to contribute to measuring the national system of innovation.

Prof. Michael Kahn, Executive Director, Knowledge Management

Glossary of Abbreviations

AISA	Africa Institute of South Africa
ARC	Agricultural Research Council
BERD	Business Expenditure on R&D
BUS	Business
CGS	Council for Geosciences
CSIR	Council for Scientific and Industrial Research
DST	Department of Science and Technology
DTI	Department of Trade and Industry
ICT	Information and Communication Technology
FTE	Full Time Equivalent
GERD	Gross Expenditure on Research and Development
GDP	Gross Domestic Product
GOV	Government
GOVERD	Government Expenditure on Research and Development
HEI	Higher Education Institution
HERD	Higher Education Expenditure on R&D
HSRC	Human Sciences Research Council
Mintek	Council for Mineral Technology
MRC	Medical Research Council
NGO	Non-Governmental Organisation
NIF	National Innovation Fund
NPO	Not-for-Profit Organisation
NRF	National Research Foundation
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Development
SABS	South African Bureau of Standards
SAIAB	South African Institute for Aquatic Biodiversity
SCI	Science Councils
SIC	Standard Industrial Classification
SMRS	Survey Management and Results System
THRIP	Technology for Human Resources and Industry Programme
UOM	Unit of Measure