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South African National Survey of Research and Experimental Development

STATISTICAL REPORT 2024/25



Science, Technology
and Innovation
Statistics South Africa



HSRC
Human Sciences
Research Council

Produced by the Centre for Science, Technology and Innovation Indicators on behalf of the Department of Science, Technology and Innovation.

First published: October 2026

Recommended citation: Centre for Science, Technology and Innovation Indicators (CeSTII). (2026). *South African National Survey of Research and Experimental Development: Statistical Report 2024/25*. Pretoria: Human Sciences Research Council.



DISSEMINATION

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- <https://www.dsti.gov.za/resource-hub?category=sti-surveys&sub=r-d-survey-reports>
- <https://hsrc.ac.za/about-cestii/measuring-rd-activity-in-south-africa/>

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User feedback

A user satisfaction survey questionnaire is included as **Annexure G** of this report. It would be appreciated if users could complete the questionnaire and return it by e-mail to CeSTIIData@hsrc.ac.za. The feedback is analysed following each survey cycle to ensure the continued improvement of the South African National Survey of Research and Experimental Development (R&D Survey).

Revisions

The Department of Science, Technology and Innovation (DSTI), Statistics South Africa (Stats SA) and the Human Sciences Research Council's Centre for Science, Technology and Innovation Indicators (HSRC-CeSTII) jointly reserve the right to revise the data and indicators in this report. Such revisions may result from revisions by Stats SA of socio-economic indicators such as the gross domestic product (GDP), or population or employment numbers, or amendments in response to internal and external data quality and consistency monitoring, such as that carried out by the Organisation for Economic Co-operation and Development (OECD), which conducts quality checks through global comparative analyses, time series analyses, and other methods. Explanations of any revisions will be available on the DSTI and HSRC websites. Real Gross Expenditure on Research and Experimental Development (GERD) levels are calculated using 2015 Rand values. The most recent GDP series (Stats SA, 2026) has been used to calculate the headline GERD/GDP indicator.

FOREWORD



The 2024/25 National Survey of Research and Experimental Development (R&D Survey) continues to make an important contribution to South Africa's official science, technology and innovation statistics. For over two decades, the Department of Science, Technology and Innovation (DSTI) has contributed to the National Statistics System (NSS) through the annual production of this survey, thereby strengthening the evidence base required to monitor the performance of the National System of Innovation (NSI). Reliable information on R&D expenditure, funding, human resources and areas of research remains essential for informed policy development, planning, investment decisions and the effective allocation of public and private resources in the NSI.

The Statistics Act, (Act No. 6 of 1999), as amended, mandates the Statistician-General (SG) to coordinate statistical production beyond the scope of Statistics South Africa. In fulfilling this mandate, the SG has introduced several instruments to address the quality, data, and capacity gaps within the statistical system. The South African Statistical Quality Assessment Framework (SASQAF) was specifically developed to address the quality gap and to expand the body of official statistics in support of evidence-based decision-making. The R&D Survey has fully adopted SASQAF standards throughout its statistical production processes.

Consistent with previous survey cycles, the 2024/25 R&D Survey was subjected to a rigorous quality assurance process prior to its publication, including independent technical verification and review by a clearance committee comprising experts across various sectors. Data audit outcome highlighted that all sampled tables were successfully verified against the underlying data, resulting in a 100% verification success rate. This confirms the accuracy and consistency of the figures for the tables included in the audit sample. These processes assessed and validated the quality of the survey and its outputs, confirming compliance with recognised statistical standards and best practice. The 2024/25 R&D Survey was implemented in accordance with established quality requirements, meeting 71.4% of the quality indicators in the R&D Survey Assessment Tool. Following the formal independent SASQAF assessment conducted in the 2023/24 financial year, a phased quality improvement plan is being implemented to strengthen the robustness, reliability, and credibility of the survey results and to address identified quality deficiencies before the next SASQAF assessment.

Based on my evaluation and the commitment demonstrated by the Centre for Science, Technology and Innovation Indicators (CeSTII) and DSTI to continuous quality improvement, I endorse the results of the 2024/25 R&D Survey. I encourage policymakers, researchers, industry leaders and other stakeholders to utilise these findings in support of evidence-based decision-making, strategic planning and the advancement of South Africa's innovation system.

A handwritten signature in black ink, appearing to read 'Risenga Maluleke'.

Risenga Maluleke

Statistician-General of the Republic of South Africa and head of Statistics South Africa

ACKNOWLEDGEMENTS

The project team extends its appreciation to Dr Mlungisi Cele, Director-General of the DSTI, Mr Risenga Maluleke, Statistician-General, and Prof. Sarah Mosoetsa, Chief Executive Officer of the HSRC, for their support of the R&D Survey. The support and contributions of Dr Mmboneni Muofhe, Ms Kgomoetso Matjila, Ms Tshidi Lekala, and Mr Thabo Manyaka of the DSTI are much appreciated.

Technical inputs and advice by the DSTI and Stats SA teams as well as the Clearance Committee for Science, Technology and Innovation Statistical Reports have helped improve the quality of this publication and are appreciated. Interactions with the OECD Working Party of National Experts on Science and Technology Indicators (NESTI) provide invaluable assistance in maintaining the quality and standards of the South African R&D surveys and analysis of the results.

The HSRC-CeSTII project team for the 2024/25 South African National Survey of Research and Experimental Development comprised: Mbali Bongoza, Jacqueline Borel-Saladin, Isaac Cameron, Mario Clayford, Sibongile Dasi, Keemera Govender, Atoko Kasongo, Rory Liedeman, Jerry Mathekga, Dimpho Mashifane, Sebaki Mosololi, Nazeem Mustapha, Zikhona Ngqula, Gerard Ralphs, Kgabo Ramoroka, Theodore Sass, Natasha Saunders, Natalie Vlotman, Malusi Volo and Darryn Whisgary.

We further acknowledge the contributions and support of HSRC IT staff, copy editor Kathryn Isdale and designer Tracey Watson, and the administrative staff Maria Makhaukane, Bongiwe Ngqaqu, Alizwe Mabaso, and Zinziswa Hlakula.

We are most grateful for, and acknowledge the cooperation of, the respondents to the questionnaire.

ABBREVIATIONS

ARC	Agricultural Research Council
BERD	Business expenditure on R&D
CeSTII	Centre for Science, Technology and Innovation Indicators
DSTI	Department of Science, Technology and Innovation
EC	European Community
FTE	Full-time equivalent
GDP	Gross domestic product
GERD	Gross domestic expenditure on R&D
GOVERD	Government expenditure on R&D
HEMIS	Higher Education Management Information System
HERD	Higher education expenditure on R&D
HSRC	Human Sciences Research Council
ICT	Information, Computer and Communication Technologies
IMF	International Monetary Fund
JSE	Johannesburg Stock Exchange
MRC	Medical Research Council
Mintek	Council for Mineral Technology
NABS	Nomenclature for the Analysis and Comparison of Scientific Programs and Budgets
NESTI	National Experts on Science and Technology Indicators
NPO	Not-for-profit organisation
NRF	National Research Foundation
NSI	National system of innovation
NSO	National Statistical Organisation
OECD	Organisation for Economic Co-operation and Development
R&D	Research and experimental development
RDI	Research, development and innovation
RDSMS	Research and Development Survey Management System
SASQAF	South African Statistical Quality Assessment Framework
SEO	Socio-economic objective
SOE	State-owned enterprise
SIC	Standard Industrial Classification
SPII	Support Programme for Industrial Innovation
Stats SA	Statistics South Africa
SVC	Statistical value chain
TB	Tuberculosis
THRIP	Technology and Human Resources for Industry Programme
UN	United Nations
VAT	Value-added tax

DEFINITIONS AND DESCRIPTIONS

Applied research is original investigation undertaken to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

Biotechnology is an application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

Capital expenditures are the annual gross expenditures on fixed assets used in the R&D programmes of statistical units. These are reported in full for the period when they took place and are not registered as an element of depreciation. Capital expenditures on R&D consist of buildings, vehicles, plant machinery and equipment.

Census refers to the collecting of data from every single member or unit in an entire population, rather than just a portion of it.

Civil gross expenditure on research and development (Civil GERD) is the sum of all expenditure by socio-economic objective (SEO), minus expenditure on defence R&D.

Constant 2015 Rands is the value of goods and services of a given year using the prices of a determined base reference year, which is 2015 in this case. These values were obtained by deflating with the GDP deflator using data published in the Stats SA GDP survey P0441, 1st Quarter 2026 (Stats SA, 2026).

Current expenditure is expenditure on items that generally reoccur after a short period. Current expenditure on R&D activities consists of labour costs and other current expenditures.

Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

Full-time equivalent (FTE) is an estimate of the time spent on R&D activities. It is the proportion of time spent on R&D activities out of all time spent at work.

Gross domestic product (GDP) is the total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports. This statistic is obtained from the Stats SA GDP survey P0441, 1st Quarter 2026 (Stats SA, 2026).

Gross expenditure on research and development (GERD) covers all expenditures for R&D performed on national territory in a given year. It thus includes domestically performed R&D, which is financed from abroad but excludes R&D funds paid abroad, notably to international agencies.

Headcount is the number of people directly involved in or supporting R&D (i.e. the total number of R&D personnel within a category).

In-house or intramural R&D refers to R&D performed by the unit or entity itself (i.e. by the personnel of the unit or entity). This is R&D performed within the borders of South Africa, even if funded by foreign sources.

Labour costs comprise annual wages and salaries and all associated costs or fringe benefits, such as bonus payments, holiday pay, contributions to pension funds and other social security payments, payroll taxes, etc. The labour costs of persons providing indirect services which are not included in the personnel data (such as security and maintenance personnel or the staff of central libraries, computer departments or head offices) are excluded and included in other current costs.

Master's students refer to students doing a full research master's as well as those doing coursework plus thesis with a research component.

New materials pertain to the technology and R&D activities of high-tech companies particularly in the aerospace, construction, electronic, biomedical, renewable energy, environmental remediation, food and packaging, manufacturing and motorcar industries. New materials include multi-functional materials, advanced materials, nanomaterials, nanocomposites and nanotechnology.

Nanotechnology is the understanding and control of matter at dimensions of roughly 1 to 100 nanometres, where unique phenomena enable novel applications.

Open-source software is computer software available in source code form under an open-source licence. The source code and certain other rights normally reserved for copyright holders are provided under a software licence that permits anyone to study, change, improve and at times also to distribute the software.

Other current expenditure comprises non-capital purchases of materials, supplies and equipment to support R&D performed by the statistical unit in a given year. These include, but are not limited to running costs, overhead expenses, repairs and maintenance, payments to outside organisations for use of specialised testing facilities, payments to outside organisations for specialised services and on-site consultant expenses in support of R&D projects carried out by the R&D performer.

Outsourced R&D refers to R&D done by another entity on behalf of the reporting unit and paid for by the reporting unit.

R&D intensity estimated by GERD as a proportion of GDP is the total intramural expenditures on R&D performed in the country in a given year relative to GDP.

R&D personnel refers to all persons (irrespective of nationality) employed directly on R&D, as well as those providing direct services such as R&D managers, administrators, and clerical staff. These include emeritus professors, honorary fellows and research fellows.¹

Researchers are R&D personnel engaged in the conception or creation of new knowledge, products, processes, methods and systems and in the management of the projects concerned.

Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications.

Socio-economic objective (SEO) classification provides an indication of the R&D activities by main purpose. The SEO classification used in this survey is consistent with the Nomenclature for the Analysis and Comparison of Scientific Programs and Budgets (NABS) (Eurostat, 2007).

Statistical unit is an entity for which statistical data are collected or derived.

Standard Industrial Classification (SIC) codes are used by Stats SA to describe the economic activities of industries.

State-owned enterprises (SOEs) are public corporations owned by government units mainly engaged in market production and sale of the kind of goods and services often produced by private enterprises.

Total employment is the total employed labour force in the South African economy. This statistic is obtained from Stats SA Labour Force Survey series P0211, 1st Quarter 2025 (Stats SA, 2025), where employed persons were defined as those aged 15–64 years who, during the reference week, did any work for at least one hour, or had a job or business but were not at work (temporarily absent).

¹ Prior to 2016/17, the R&D personnel measure comprised only South African researchers, technicians and other R&D personnel. Emeritus professors, honorary fellows and research fellows were not explicitly included in the estimates of R&D personnel.

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A. INTRODUCTION

This Statistical Report presents data tables from the 2024/25 South African National Survey of Research and Experimental Development (R&D Survey). It provides key findings from the survey with commentary, standard summary tables of the overall findings from 2024/25 and comparative time series data from previous instances of the survey. The R&D Survey covers a 12-month period corresponding with the sectoral financial year. For the business, government, science councils and not-for-profit organisation (NPO) sectors, this is from 1 April 2024 to 31 March 2025, or the nearest complete financial year. In the higher education sector, the calendar year is surveyed, ending 31 December 2025.

The survey covers these sectors that perform R&D in South Africa:

- **Business enterprise sector**, comprising large, medium and small enterprises, including state-owned enterprises.
- **Government sector**, comprising national, provincial and local government with an R&D component; government research institutions and museums.
- **Higher education sector**, comprising all public and private higher education institutions with an R&D component.
- **Not-for-profit sector**, comprising non-governmental and other organisations formally registered as not-for-profit institutions.
- **Science council sector**, comprising the seven science councils established through Acts of Parliament.

This approach is followed for consistency with the institutional sector categorisation recommended by the Organisation for Economic Co-operation and Development (OECD) in *The Measurement of Scientific and Technological Activities: Proposed Standard Practice for Surveys on Research and Experimental Development*, also known as the Frascati Manual (OECD, 2015). The split of government into two sectors – a government sector and a science council sector – is an adjustment for the South African context.

This report presents R&D statistics in tables in the following categories:

- Gross domestic expenditure on R&D
- R&D expenditure by R&D-performing sectors
- Local and international sources of funding for R&D sectors
- R&D expenditure by field of research and socio-economic objective
- R&D expenditure by industrial sector in the business sector
- R&D expenditure in selected areas of policy interest, namely: biotechnology, nanotechnology, space science, environment-related, open-source software, new materials, and TB, HIV/AIDS and malaria research
- R&D personnel

GDP values were obtained from the Stats SA GDP statistical release P0441 (Stats SA, 2026) and the total employment level was taken from the Stats SA Quarterly Labour Force Survey statistical release P0211 (Stats SA, 2025).

The financial quantities presented in the report are in current values, unless otherwise indicated. Constant 2015 Rand values were calculated using the GDP deflator.

The headline indicator of GERD/GDP has been recalculated to adjust for ongoing revisions in the Stats SA GDP series. The R&D Survey uses the GDP series calculated using Stats SA's production method.

The classification of main institutional sectors recommended in the System of National Accounts (EC, IMF, OECD, UN and World Bank, 2009) is indicated in terms of those used in the Frascati Manual (OECD, 2015). Since 2009/10, further work has been done with Stats SA to enhance the South African Statistical Quality Assessment Framework (SASQAF) aspects of the R&D Survey. Based on quality requirements, SASQAF offers transparent procedures and precise criteria for assessing the standard of data and statistics. The framework outlines the eight quality-dimension evaluations of the collected data, quality criteria for assessing statistics, self-assessment standards for data producers to evaluate their own products, and the prerequisite parameters that affect data quality.

Since the 2014/15 R&D Survey, tables have been included to assess the R&D activities of state-owned enterprises.

From the 2016/17 R&D Survey onward, the master's student category has been split into two types: students doing a research master's degree and those doing a master's degree with coursework and a dissertation component. Further, non-South African R&D staff were included in headcount estimates from 2016/17.

Section B provides the survey's main findings, including commentary on key developments. Section C contains a detailed set of tables describing the results of the 2024/25 survey and the preceding nine years, starting with 2015/16. The survey methodology is described in Section D, sources consulted are provided in Section E, and the higher education sector questionnaire for the 2024/25 R&D Survey is provided in Section F.

B. KEY FINDINGS

Gross domestic expenditure on R&D decreased in real terms

In 2015 prices, gross domestic expenditure on research and development (GERD) declined by 1.9% year-on-year in 2024/25, from R28.621 billion in 2023/24 to R28.065 billion in 2024/25. GERD as a percentage of gross domestic product (GDP) was 0.60% in 2024/25, down by 0.2 basis points from 2023/24.

Table B.1: Summary of key statistics and indicators (2022/23 to 2024/25)

Key indicator	2022/23	2023/24	2024/25
Expenditure on R&D (Rm)			
Gross domestic expenditure on R&D (GERD) (Rm)	40 918	43 413	44 237
Business enterprise expenditure on R&D (BERD) (Rm)	14 507	15 111	14 369
Not-for-profit (NPO) expenditure on R&D (Rm)	1 770	1 758	2 075
Government expenditure on R&D (GOVERD) (Rm)	2 720	3 053	3 160
Science council (SCI) expenditure on R&D (Rm)	7 023	7 696	7 920
Higher education (HE) expenditure on R&D (HERD) (Rm)	14 898	15 794	16 713
Gross domestic expenditure on R&D in constant 2015 prices (Rm)	28 250	28 621	28 065
Funding sources (Rm)			
Government-funded* R&D (Rm)	20 664	21 847	22 168
Business-funded R&D (Rm)	11 754	12 034	12 017
Foreign funding of R&D (Rm)	7 060	8 106	8 351
Foreign funding of BERD (Rm)	2 347	2 928	2 213
Foreign funding of NPO R&D (Rm)	1 166	1 214	1 488
Foreign funding of GOVERD (Rm)	73	64	65
Foreign funding of SCI R&D (Rm)	884	884	906
Foreign funding of HERD (Rm)	2 591	3 016	3 678
R&D personnel			
Total R&D personnel (FTE)	44 420.2	44 256.9	43 138.5
Total researchers (FTE)	27 520.3	27 561.4	26 902.3
Total researchers (headcount)	61 547	66 387	66 858
Female researchers (headcount)	29 303	31 638	32 219
Indicators computed from R&D Survey			
GERD as % of GDP	0.61	0.62	0.60
Civil GERD as % of GDP	0.58	0.59	0.58
BERD as % of GERD	35.5	34.8	32.5
Basic research (Rm)	11 528	12 520	12 704
Total R&D personnel (FTE*) per 1 000 in total employment	2.7	2.6	2.6
Total researchers# (FTE*) per 1 000 in total employment	1.7	1.6	1.6
Female researchers# headcount as % of total researcher headcount	47.6	47.7	48.2
Indicators obtained from external data sources			
GDP level at current prices (Rm)	6 666 581	7 037 674	7 352 449
GDP (%)	2.1	0.8	0.5
SA employment ('000)	16 192	16 745	16 787

* FTE: Full-time Equivalent

Researchers include doctoral students and post-doctoral fellows, as well specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards. These categories do not incur a salary, but they do incur research-related costs which are recorded under "Other current costs".

Highlights of the R&D Survey

Economic growth outpaced real R&D expenditure

South Africa's GDP growth rate dropped 0.3 percentage points to 0.5% in 2024/25, (Stats SA, 2026). GERD declined by 1.9% in constant 2015 prices. The level of R&D expenditure compared to the level of GDP went down to 0.60% in 2024/25 from the 0.62% recorded in 2023/24 (Table B.1).

Higher education drove the nominal increase as business R&D contracted

Nominal GERD increased from R43.413 billion to R44.237 billion in 2024/25. Higher education recorded the largest nominal increase in R&D expenditure, rising by R919 million to R16.713 billion (Table C.1), continuing the trend since 2019/20 of being the largest contributor to GERD, at 37.8% (Table C.3). NPO expenditure increased by R318 million, science councils by R223 million, and government by R107 million.

However, real GERD declined by 1.9%, indicating that R&D expenditure did not keep pace with economic activity. This was due mainly to the decline in business R&D expenditure, which fell by R742 million to R14.369 billion (nominal), reducing its share of GERD by 2.3 points to 32.5% (Tables C.1 and C.3).

The decline in business R&D expenditure occurred against a backdrop of weak business confidence and investment conditions, rather than a total halt in national R&D spending, with the Rand Merchant Bank and Bureau for Economic Research Business Confidence Index at 30% in early 2024.

Foreign funding continued to rise, but shifted away from business

Government remained the largest source of R&D funding in 2024/25 at R22.168 billion (50.1%), followed by business at R12.017 billion (27.2%) and foreign sources at R8.351 billion (18.9%) (Tables C.19 and C.20). Foreign funding increased by R245 million. However, foreign funding for higher education R&D rose by R663 million and NPO R&D by R274 million, while business R&D fell by R715 million (Tables C.19, C.20 and C.26).

The decline in business-sector R&D was concentrated in mining and manufacturing

Mining and quarrying recorded the largest drop in business R&D expenditure from the previous year, declining by R632 million, while manufacturing fell by R254 million and agriculture, hunting, forestry and fishing by R129 million in 2024/25 (Tables C.50 and C.51). In contrast, R&D spending in financial intermediation, real estate and business services increased by R72 million and it remained the largest business R&D industry, at R6.987 billion (48.6% of BERD), followed by manufacturing at R4.260 billion (29.6%) (Tables C.50 and C.51).

Applied research remained the most prevalent type of R&D

Applied research accounted for 49.6% (R21.949 billion) of GERD in 2024/25. Basic research contributed 28.7% (R12.704 billion), while experimental development accounted for 21.7% (R9.584 billion) (Tables C.5 and C.6). The composition was broadly unchanged from 2023/24, although expenditure increased in nominal terms across all three types (Tables C.5 and C.6).

Gauteng led provincial R&D spending as the Western Cape continued gaining

Gauteng led R&D spending in 2024/25, as in previous years, at R17.538 billion, though its national share fell 0.5 percentage points to 39.6% (Tables C.17 and C.18). The Western Cape followed with R12.406 billion (28.0%), continuing its steady, consistent growth in the share of provincial R&D expenditure since 2018/19. The largest nominal increases were recorded in the Eastern Cape (R487 million), Mpumalanga (R335 million) and the Western Cape (R307 million), while KwaZulu-Natal and the Northern Cape declined by R360 million and R274 million respectively (Tables C.17 and C.18).

Medical and health sciences remained the largest research field, while ICT strengthened

Medical and health sciences remained the largest research field by R&D expenditure in 2024/25, accounting for R10.823 billion (24.5%) of GERD, followed by social sciences at R7.011 billion (15.8%), engineering sciences at R6.023 billion (13.6%), and information, computer and communication technologies (ICT) at R5.687 billion (12.9%) (Tables C.13 and C.14). R&D spending in ICT recorded the largest increase, R853 million, while material sciences recorded the largest decline, R377 million (Tables C.13 and C.14).

R&D spending in priority policy areas showed sharply mixed results

Expenditure on TB, HIV/AIDS, and malaria R&D in 2024/25 increased by R950 million over 2023/24, to R6.815 billion, raising its share of GERD from 13.5% the previous year to 15.4% (Tables C.11 and C.12). In stark contrast, environment-related research fell by R897 million to R3.338 billion. Expenditure on R&D in both open-source software and new materials declined, by R276 million and R280 million respectively, while space science R&D spending remained broadly stable at R1.172 billion. Biotechnology and nanotechnology R&D spending also declined, by R146 million and R292 million respectively (Tables C.9 to C.12).

R&D headcounts rose, but full-time equivalents (FTEs) declined

The total R&D personnel headcount increased by 1 004 (1.1%) to 90 608 headcounts between 2023/24 and 2024/25 - significantly less, however, than the increase of 5 329 headcounts the previous year (Tables C.28 and C.29). Despite this increase in headcounts, total R&D personnel FTEs fell marginally by 2.5% (or 1 118.4 FTEs, to 43 138.5 in total) (Tables C.28 and C.29). Researcher headcount also increased, by 471 to 66 858, but researcher FTEs declined too, by 659.1 to 26 902.3. This widening gap indicates that the expansion in R&D personnel did not translate into equivalent growth in research effort; that is, researchers and support staff appear to be spending a smaller fraction of their overall working hours on R&D, potentially shifting time toward teaching, administration, consulting, or other operational duties.

Women accounted for all net growth in researcher headcount

Female researcher headcount increased by 581 to 32 219 headcounts in 2024/25, while male researcher headcount declined by 110. Women therefore accounted for 48.2% of all researchers in 2024/25, up by 0.5 percentage points from 2023/24 and continuing the upward trend in gender representation (Table C.29 and Table B.1).

C. TABLES

Notes:

- Totals in the tables may not add up to the sum of their constituent items due to rounding effects.
- Data from 2001/02 onwards may be downloaded from <https://hsr.ac.za/about-cestii/accessing-cestii-data/>

C.1. General survey results

C.1.1. Expenditure on research and experimental development

Table C.1: R&D expenditure by sector (2015/16 to 2024/25)

Year	GERD	Government	Science councils	Higher education	Business	Not-for-profit
	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	32 336 679	2 013 021	5 740 897	9 876 623	13 814 995	891 142
2016/17	35 692 973	2 098 646	6 136 183	11 659 258	14 781 270	1 017 616
2017/18	38 724 590	2 325 875	6 313 344	13 009 876	15 859 185	1 216 310
2018/19	36 783 968	2 223 426	5 443 885	13 183 119	14 447 833	1 485 704
2019/20	34 484 862	1 893 543	6 198 363	14 178 960	10 704 481	1 509 515
2020/21	33 541 332	2 237 531	5 902 414	13 785 736	10 047 344	1 568 307
2021/22	38 185 599	2 472 434	6 354 298	14 232 128	13 527 182	1 599 557
2022/23	40 917 649	2 719 866	7 023 307	14 897 549	14 506 774	1 770 153
2023/24	43 412 618	3 052 880	7 696 319	15 794 499	15 111 319	1 757 600
2024/25	44 237 180	3 159 605	7 919 687	16 713 473	14 368 963	2 075 452

Table C.2: R&D expenditure by sector, constant 2015 Rand values (2015/16 to 2024/25)

Year	GERD	Government	Science councils	Higher education	Business	Not-for-profit
	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	32 336 679	2 013 021	5 740 897	9 876 623	13 814 995	891 142
2016/17	33 372 836	1 962 229	5 737 315	10 901 375	13 820 449	951 469
2017/18	34 328 482	2 061 836	5 596 638	11 532 964	14 058 812	1 078 231
2018/19	31 356 025	1 895 331	4 640 571	11 237 782	12 315 872	1 266 470
2019/20	28 099 791	1 542 943	5 050 700	11 553 644	8 722 484	1 230 020
2020/21	25 932 820	1 729 970	4 563 511	10 658 581	7 768 206	1 212 553
2021/22	27 745 526	1 796 462	4 617 011	10 341 016	9 828 804	1 162 232
2022/23	28 250 048	1 877 829	4 848 978	10 285 451	10 015 655	1 222 136
2023/24	28 621 033	2 012 700	5 074 023	10 412 984	9 962 578	1 158 749
2024/25	28 065 353	2 004 545	5 024 480	10 603 513	9 116 088	1 316 727

Table C.3: R&D percentage expenditure composition by sector (2015/16 to 2024/25)

Year	Government	Science councils	Higher education	Business	Not-for-profit
	%	%	%	%	%
2015/16	6.2	17.8	30.5	42.7	2.8
2016/17	5.9	17.2	32.7	41.4	2.9
2017/18	6.0	16.3	33.6	41.0	3.1
2018/19	6.0	14.8	35.8	39.3	4.0
2019/20	5.5	18.0	41.1	31.0	4.4
2020/21	6.7	17.6	41.1	30.0	4.7
2021/22	6.5	16.6	37.3	35.4	4.2
2022/23	6.6	17.2	36.4	35.5	4.3
2023/24	7.0	17.7	36.4	34.8	4.0
2024/25	7.1	17.9	37.8	32.5	4.7

Table C.4: R&D expenditure as a percentage of GDP by sector (2015/16 to 2024/25)

Year	GERD/GDP*	Government	Science councils	Higher education	Business	Not-for-profit
	%	%	%	%	%	%
2015/16	0.73	0.05	0.13	0.22	0.31	0.02
2016/17	0.75	0.04	0.13	0.24	0.31	0.02
2017/18	0.76	0.05	0.12	0.26	0.31	0.02
2018/19	0.69	0.04	0.10	0.25	0.27	0.03
2019/20	0.61	0.03	0.11	0.25	0.19	0.03
2020/21	0.60	0.04	0.11	0.25	0.18	0.03
2021/22	0.62	0.04	0.10	0.23	0.22	0.03
2022/23	0.61	0.04	0.11	0.22	0.22	0.03
2023/24	0.62	0.04	0.11	0.22	0.21	0.02
2024/25	0.60	0.04	0.11	0.23	0.20	0.03

* Note R&D intensity figures are rounded to nearest decimal place.

The headline indicator of GERD/GDP has been recalculated to adjust for ongoing revisions in the Stats SA GDP series.

Totals in the tables may not add up to the sum of their constituent items due to rounding effects.

Table C.5: R&D expenditure by type of research (2015/16 to 2024/25)

Year	GERD	Basic research	Applied research	Experimental development
	R'000	R'000	R'000	R'000
2015/16	32 336 679	8 209 662	15 349 070	8 777 948
2016/17	35 692 973	9 542 644	17 061 167	9 089 162
2017/18	38 724 590	10 223 956	20 623 856	7 876 778
2018/19	36 783 968	10 364 091	19 316 433	7 103 444
2019/20	34 484 862	11 043 171	16 074 948	7 366 744
2020/21	33 541 332	9 856 349	15 848 231	7 836 752
2021/22	38 185 599	11 148 327	18 380 000	8 657 271
2022/23	40 917 649	11 527 937	20 449 158	8 940 554
2023/24	43 412 618	12 520 493	21 483 722	9 408 403
2024/25	44 237 180	12 704 197	21 949 301	9 583 682

Table C.6: Proportional R&D expenditure by type of research (2015/16 to 2024/25)

Year	Basic research	Applied research	Experimental development
	%	%	%
2015/16	25.4	47.5	27.1
2016/17	26.7	47.8	25.5
2017/18	26.4	53.3	20.3
2018/19	28.2	52.5	19.3
2019/20	32.0	46.6	21.4
2020/21	29.4	47.2	23.4
2021/22	29.2	48.1	22.7
2022/23	28.2	50.0	21.9
2023/24	28.8	49.5	21.7
2024/25	28.7	49.6	21.7

Table C.7: R&D expenditure by accounting category (2015/16 to 2024/25)

Year	Capital expenditure on R&D						Current expenditure on R&D			
	GERD	Land: buildings and other structures	Vehicles, plant, machinery, equipment	Capitalised computer software*	Total: vehicles, plant, machinery, equipment and software	Subtotal: capital expenditure	Labour costs	Total cost of R&D postgraduate students	Other current expenditure [#]	Subtotal: current expenditure
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	32 336 679	711 631	3 008 992	0	3 008 992	3 720 622	14 781 549	1 926 301	11 908 207	28 616 057
2016/17	35 692 973	1 274 737	2 822 229	0	2 822 229	4 096 967	16 505 080	1 928 108	13 162 819	31 596 007
2017/18	38 724 590	1 715 060	2 385 032	0	2 385 032	4 100 092	18 757 628	1 889 065	13 977 805	34 624 498
2018/19	36 783 968	879 489	2 393 110	0	2 393 110	3 272 599	18 112 670	1 938 984	13 459 715	33 511 369
2019/20	34 484 862	843 941	1 733 054	135 027	1 868 080	2 712 021	15 984 538	1 969 872	13 818 431	31 772 841
2020/21	33 541 332	500 532	1 552 588	433 636	1 986 224	2 486 756	15 743 599	1 895 876	13 415 100	31 054 575
2021/22	38 185 599	800 666	2 426 402	377 722	2 804 124	3 604 791	17 638 424	1 989 659	14 952 725	34 580 808
2022/23	40 917 649	858 386	2 164 191	486 651	2 650 842	3 509 228	18 223 464	2 048 469	17 136 488	37 408 421
2023/24	43 412 618	724 320	2 542 000	297 963	2 839 963	3 564 282	18 333 862	2 207 254	19 307 220	39 848 336
2024/25	44 237 180	752 105	2 386 455	497 932	2 884 386	3 636 491	18 526 851	2 262 533	19 811 305	40 600 689

* Capitalised computer software data only collected from 2019/20 onwards.

Specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) were included under "Other current expenditure" from 2017/18 onwards.

Table C.8: Proportional R&D expenditure by accounting category (2015/16 to 2024/25)

Year	Capital expenditure on R&D					Current expenditure on R&D			
	Land: buildings and other structures	Vehicles, plant, machinery, equipment	Capitalised computer software*	Total: vehicles, plant, machinery, equipment and software	Subtotal: capital expenditure	Labour costs	Total cost of R&D postgraduate students	Other current expenditure [#]	Subtotal: current expenditure
	%	%	%	%	%	%	%	%	%
2015/16	2.2	9.3	0.0	9.3	11.5	45.7	6.0	36.8	88.5
2016/17	3.6	7.9	0.0	7.9	11.5	46.2	5.4	36.9	88.5
2017/18	4.4	6.2	0.0	6.2	10.6	48.4	4.9	36.1	89.4
2018/19	2.4	6.5	0.0	6.5	8.9	49.2	5.3	36.6	91.1
2019/20	2.4	5.0	0.4	5.4	7.9	46.4	5.7	40.1	92.1
2020/21	1.5	4.6	1.3	5.9	7.4	46.9	5.7	40.0	92.6
2021/22	2.1	7.3	1.0	7.3	9.4	46.2	5.2	39.2	90.6
2022/23	2.1	5.3	1.2	6.5	8.6	44.5	5.0	41.9	91.4
2023/24	1.7	5.9	0.7	6.5	8.2	42.2	5.1	44.5	91.8
2024/25	1.7	5.4	1.1	6.5	8.2	41.9	5.1	44.8	91.8

* Capitalised computer software data only collected from 2019/20 onwards.

Specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) were included under "Other current expenditure" from 2017/18 onwards.

Table C.9: Expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Year	GERD	Biotechnology	Nanotechnology
	R'000	R'000	R'000
2015/16	32 336 679	1 843 363	871 426
2016/17	35 692 973	1 788 728	853 121
2017/18	38 724 590	1 797 013	718 527
2018/19	36 783 968	1 862 865	824 420
2019/20	34 484 862	2 459 421	855 790
2020/21	33 541 332	2 659 080	1 349 918
2021/22	38 185 599	2 985 191	1 284 063
2022/23	40 917 649	3 316 372	1 347 891
2023/24	43 412 618	3 649 980	1 341 911
2024/25	44 237 180	3 503 553	1 050 317

Table C.10: Proportional expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Year	Biotechnology	Nanotechnology
	%	%
2015/16	5.7	2.7
2016/17	5.0	2.4
2017/18	4.6	1.9
2018/19	5.1	2.2
2019/20	7.1	2.5
2020/21	7.9	4.0
2021/22	7.8	3.4
2022/23	8.1	3.3
2023/24	8.4	3.1
2024/25	7.9	2.4

Table C.11: R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Year	GERD	Open source software	Tuberculosis, HIV/AIDS, malaria	Environment / environment-related	New materials	Space science*
	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	32 336 679	1 145 590	3 462 704	2 056 659	1 146 470	N/A
2016/17	35 692 973	826 648	3 947 430	2 452 367	1 008 578	633 930
2017/18	38 724 590	1 233 636	4 621 859	2 815 269	850 606	300 763
2018/19	36 783 968	465 624	5 105 952	3 083 232	965 820	888 214
2019/20	34 484 862	629 995	4 684 747	3 317 882	1 195 028	982 824
2020/21	33 541 332	632 882	4 727 038	3 788 949	926 881	1 041 747
2021/22	38 185 599	860 999	5 056 305	4 263 513	1 477 114	1 654 313
2022/23	40 917 649	790 802	6 019 989	4 396 010	1 033 040	1 273 205
2023/24	43 412 618	900 749	5 864 701	4 235 179	1 116 103	1 160 111
2024/25	44 237 180	624 368	6 814 671	3 338 407	835 983	1 172 245

* Space science data only collected from 2016/17 onwards.

Table C.12: Proportional R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Year	Open source software	Tuberculosis, HIV/AIDS, malaria	Environment / environment-related	New materials	Space science*
	%	%	%	%	%
2015/16	3.5	10.7	6.4	3.5	N/A
2016/17	2.3	11.1	6.9	2.8	1.8
2017/18	3.2	11.9	7.3	2.2	0.8
2018/19	1.3	13.9	8.4	2.6	2.4
2019/20	1.8	13.6	9.6	3.5	2.9
2020/21	1.9	14.1	11.3	2.8	3.1
2021/22	2.3	13.2	11.2	3.9	4.3
2022/23	1.9	14.7	10.7	2.5	3.1
2023/24	2.1	13.5	9.8	2.6	2.7
2024/25	1.4	15.4	7.5	1.9	2.6

* Space science data only collected from 2016/17 onwards.

Table C.13: R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	25 562 694	27 253 955	28 666 760	27 582 242	27 590 791	25 894 833	30 105 115	33 072 629	35 336 653	36 029 040
Mathematical sciences	646 870	713 360	879 045	934 136	969 234	799 796	888 597	912 662	1 076 228	1 203 171
Physical sciences	769 739	876 009	1 070 851	930 033	973 726	911 291	834 297	974 388	985 871	1 016 609
Chemical sciences	1 491 410	1 761 693	1 668 359	1 685 031	1 460 763	1 127 071	1 231 637	1 458 920	1 400 719	1 122 898
Earth sciences	635 291	780 402	766 556	826 869	1 020 560	1 061 388	1 143 310	1 282 548	1 480 234	1 263 519
Information, computer and communication technologies	3 877 852	4 494 987	4 006 992	3 636 363	3 560 762	3 640 261	5 007 507	4 981 582	4 834 549	5 687 153
Applied sciences and technologies	1 525 646	1 585 106	1 628 489	1 537 213	1 362 852	1 367 857	1 545 204	1 489 934	1 646 163	1 604 354
Engineering sciences	5 444 740	4 611 038	5 068 338	4 735 131	4 627 317	4 332 527	4 462 856	5 018 357	5 760 419	6 022 667
Biological sciences	1 452 763	1 416 454	1 562 103	1 579 782	1 685 936	1 530 697	1 682 135	1 777 658	2 358 244	2 448 036
Agricultural sciences	2 573 509	2 741 962	2 999 821	3 051 678	3 119 335	2 654 666	2 942 151	3 268 295	3 598 279	3 599 477
Medical and health sciences	6 389 455	6 868 131	7 540 190	7 793 148	7 407 626	7 404 019	8 717 753	10 000 846	10 577 683	10 823 327
Environmental sciences	375 455	992 281	1 125 709	435 578	602 065	440 186	701 600	799 140	729 835	687 987
Material sciences	299 069	287 507	206 687	190 551	545 685	328 498	735 472	934 561	722 385	345 181
Marine sciences	80 897	125 024	143 621	246 728	254 931	296 576	212 597	173 739	166 045	204 660
Division 2: Social sciences and humanities	6 773 985	8 439 018	10 057 830	9 201 726	6 894 071	7 646 499	8 080 484	7 845 020	8 075 964	8 208 140
Social sciences	6 043 806	7 495 167	9 168 767	8 238 808	5 836 521	6 597 460	7 040 864	6 759 856	6 854 651	7 011 278
Humanities	730 179	943 851	889 064	962 918	1 057 550	1 049 039	1 039 620	1 085 163	1 221 314	1 196 862
Total	32 336 679	35 692 973	38 724 590	36 783 968	34 484 862	33 541 332	38 185 599	40 917 649	43 412 618	44 237 180

Table C.14: Proportional R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	79.1	76.4	74.0	75.0	80.0	77.2	78.8	80.8	81.4	81.4
Mathematical sciences	2.0	2.0	2.3	2.5	2.8	2.4	2.3	2.2	2.5	2.7
Physical sciences	2.4	2.5	2.8	2.5	2.8	2.7	2.2	2.4	2.3	2.3
Chemical sciences	4.6	4.9	4.3	4.6	4.2	3.4	3.2	3.6	3.2	2.5
Earth sciences	2.0	2.2	2.0	2.2	3.0	3.2	3.0	3.1	3.4	2.9
Information, computer and communication technologies	12.0	12.6	10.3	9.9	10.3	10.9	13.1	12.2	11.1	12.9
Applied sciences and technologies	4.7	4.4	4.2	4.2	4.0	4.1	4.0	3.6	3.8	3.6
Engineering sciences	16.8	12.9	13.1	12.9	13.4	12.9	11.7	12.3	13.3	13.6
Biological sciences	4.5	4.0	4.0	4.3	4.9	4.6	4.4	4.3	5.4	5.5
Agricultural sciences	8.0	7.7	7.7	8.3	9.0	7.9	7.7	8.0	8.3	8.1
Medical and health sciences	19.8	19.2	19.5	21.2	21.5	22.1	22.8	24.4	24.4	24.5
Environmental sciences	1.2	2.8	2.9	1.2	1.7	1.3	1.8	2.0	1.7	1.6
Material sciences	0.9	0.8	0.5	0.5	1.6	1.0	1.9	2.3	1.7	0.8
Marine sciences	0.3	0.4	0.4	0.7	0.7	0.9	0.6	0.4	0.4	0.5
Division 2: Social sciences and humanities	20.9	23.6	26.0	25.0	20.0	22.8	21.2	19.2	18.6	18.6
Social sciences	18.7	21.0	23.7	22.4	16.9	19.7	18.4	16.5	15.8	15.8
Humanities	2.3	2.6	2.3	2.6	3.1	3.1	2.7	2.7	2.8	2.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.15: R&D expenditure by socio-economic objectives (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	1 814 789	1 629 650	2 124 098	1 571 796	1 747 323	1 594 793	1 672 596	2 054 509	2 055 695	1 939 899
Defence	1 814 789	1 629 650	2 124 098	1 571 796	1 747 323	1 594 793	1 672 596	2 054 509	2 055 695	1 939 899
Division 2: Economic development	16 644 668	18 357 187	19 528 226	17 902 898	14 919 363	14 081 873	16 420 497	17 195 685	18 164 892	18 370 675
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	1 426 609	1 920 246	1 701 055	1 746 483	1 879 578	1 379 102	1 555 544	1 932 734	1 999 640	1 932 786
Animal production and animal primary products	655 059	746 579	794 314	748 145	764 501	707 826	778 689	798 137	871 136	891 963

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Mineral resources (excluding Energy)	1 759 268	1 328 413	1 256 826	1 321 249	1 259 257	1 401 816	1 518 802	1 876 008	2 143 722	1 504 907
Energy resources	178 434	556 147	546 831	605 311	265 828	303 671	451 002	432 031	338 863	432 095
Energy supply	636 596	730 849	853 099	927 403	1 008 795	932 553	978 400	877 669	876 232	947 371
Manufacturing	2 665 871	2 543 694	2 628 725	2 495 718	2 440 795	1 924 862	2 391 995	2 488 613	2 659 539	2 585 913
Construction	229 284	300 582	318 837	363 788	282 651	305 468	393 604	446 697	498 522	508 722
Transport	1 115 349	1 195 426	1 247 963	1 099 974	712 749	512 148	715 539	587 553	604 219	481 228
Information and communication services	2 347 021	2 694 355	2 129 740	1 768 149	1 559 066	1 522 190	2 134 145	2 329 765	2 339 053	2 648 007
Commercial services	2 789 611	3 134 235	4 448 419	3 492 749	1 269 391	1 532 397	1 581 135	1 186 092	1 155 017	1 478 435
Economic framework	1 797 751	1 997 933	2 343 788	2 147 239	2 248 020	2 262 348	2 589 298	2 847 726	3 036 863	3 023 958
Natural resources	1 043 816	1 208 728	1 258 630	1 186 690	1 228 735	1 297 494	1 332 345	1 392 660	1 642 087	1 935 288
Division 3: Society	6 815 987	7 558 386	8 517 207	8 323 617	8 721 748	8 732 871	10 358 127	10 954 001	11 620 982	11 482 927
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	4 154 557	4 733 478	5 118 330	5 675 740	5 128 170	5 397 930	6 281 588	7 001 510	7 357 308	7 146 385
Education and training	1 603 117	1 307 791	1 398 846	1 344 005	1 594 278	1 566 843	1 629 780	1 657 150	1 610 407	1 635 082
Social development and community services	1 058 313	1 517 117	2 000 031	1 303 872	1 999 300	1 768 099	2 446 759	2 295 341	2 653 266	2 701 461
Division 4: Environment	1 475 053	2 015 344	2 092 706	2 166 332	1 953 590	2 147 652	2 156 591	2 503 764	2 402 328	2 324 034
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	853 071	969 476	1 016 592	964 261	1 029 870	1 180 361	1 060 660	1 388 753	1 419 647	1 407 586
Environmental aspects of development	304 008	361 391	357 509	455 915	425 587	419 346	504 860	546 831	514 159	524 316
Environmental and other aspects	317 975	684 478	718 604	746 156	498 133	547 945	591 071	568 180	468 522	392 132
Division 5: Advancement of knowledge	5 586 182	6 132 406	6 462 352	6 819 325	7 142 838	6 984 142	7 577 788	8 209 691	9 168 720	10 119 645
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	3 891 834	4 424 024	4 771 950	5 022 207	5 258 091	5 075 189	5 661 980	6 210 744	6 451 395	7 506 646
Social sciences and humanities	1 694 348	1 708 382	1 690 403	1 797 118	1 884 747	1 908 953	1 915 809	1 998 947	2 717 325	2 612 999
Total	32 336 679	35 692 973	38 724 590	36 783 968	34 484 862	33 541 332	38 185 599	40 917 649	43 412 618	44 237 180

Table C.16: Proportional R&D expenditure by socio-economic objectives (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	5.6	4.6	5.5	4.3	5.1	4.8	4.4	5.0	4.7	4.4
Defence	5.6	4.6	5.5	4.3	5.1	4.8	4.4	5.0	4.7	4.4
Division 2: Economic development	51.5	51.4	50.4	48.7	43.3	42.0	43.0	42.0	41.8	41.5
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	4.4	5.4	4.4	4.7	5.5	4.1	4.1	4.7	4.6	4.4
Animal production and animal primary products	2.0	2.1	2.1	2.0	2.2	2.1	2.0	2.0	2.0	2.0
Mineral resources (excluding Energy)	5.4	3.7	3.2	3.6	3.7	4.2	4.0	4.6	4.9	3.4
Energy resources	0.6	1.6	1.4	1.6	0.8	0.9	1.2	1.1	0.8	1.0
Energy supply	2.0	2.0	2.2	2.5	2.9	2.8	2.6	2.1	2.0	2.1
Manufacturing	8.2	7.1	6.8	6.8	7.1	5.7	6.3	6.1	6.1	5.8
Construction	0.7	0.8	0.8	1.0	0.8	0.9	1.0	1.1	1.1	1.1
Transport	3.4	3.3	3.2	3.0	2.1	1.5	1.9	1.4	1.4	1.1
Information and communication services	7.3	7.5	5.5	4.8	4.5	4.5	5.6	5.7	5.4	6.0
Commercial services	8.6	8.8	11.5	9.5	3.7	4.6	4.1	2.9	2.7	3.3
Economic framework	5.6	5.6	6.1	5.8	6.5	6.7	6.8	7.0	7.0	6.8
Natural resources	3.2	3.4	3.3	3.2	3.6	3.9	3.5	3.4	3.8	4.4
Division 3: Society	21.1	21.2	22.0	22.6	25.3	26.0	27.1	26.8	26.8	26.0
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	12.8	13.3	13.2	15.4	14.9	16.1	16.5	17.1	16.9	16.2
Education and training	5.0	3.7	3.6	3.7	4.6	4.7	4.3	4.0	3.7	3.7
Social development and community services	3.3	4.3	5.2	3.5	5.8	5.3	6.4	5.6	6.1	6.1
Division 4: Environment	4.6	5.6	5.4	5.9	5.7	6.4	5.6	6.1	5.5	5.3
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	2.6	2.7	2.6	2.6	3.0	3.5	2.8	3.4	3.3	3.2
Environmental aspects of development	0.9	1.0	0.9	1.2	1.2	1.3	1.3	1.3	1.2	1.2
Environmental and other aspects	1.0	1.9	1.9	2.0	1.4	1.6	1.5	1.4	1.1	0.9

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 5: Advancement of knowledge	17.3	17.2	16.7	18.5	20.7	20.8	19.8	20.1	21.1	22.9
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	12.0	12.4	12.3	13.7	15.2	15.1	14.8	15.2	14.9	17.0
Social sciences and humanities	5.2	4.8	4.4	4.9	5.5	5.7	5.0	4.9	6.3	5.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.17: R&D expenditure by province (2015/16 to 2024/25)

Year	GERD	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	Northern Cape	North West	Western Cape
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	32 336 679	2 142 919	1 778 469	14 666 111	3 335 141	627 125	791 248	660 963	1 209 434	7 125 269
2016/17	35 692 973	2 206 473	1 834 572	16 421 582	3 639 100	728 874	699 720	532 530	1 298 778	8 331 345
2017/18	38 724 590	2 300 631	2 149 267	17 319 635	4 172 713	854 885	715 616	576 963	1 306 478	9 328 402
2018/19	36 783 968	2 211 524	1 976 953	15 767 101	4 074 154	806 624	853 859	905 844	1 682 406	8 505 504
2019/20	34 484 862	2 091 071	1 711 039	14 385 849	3 629 403	772 074	841 877	900 545	1 700 184	8 452 820
2020/21	33 541 332	1 998 900	1 241 827	14 717 743	3 278 682	983 369	706 459	867 333	1 364 854	8 382 165
2021/22	38 185 599	2 010 947	1 732 973	15 689 758	3 716 120	1 016 496	1 263 082	1 086 102	1 499 418	10 170 702
2022/23	40 917 649	2 153 716	2 055 196	15 963 272	4 090 416	1 257 112	1 108 706	1 325 497	1 811 975	11 151 759
2023/24	43 412 618	2 215 516	1 803 561	17 446 171	4 329 981	1 156 344	1 073 106	1 366 751	1 921 505	12 099 683
2024/25	44 237 180	2 702 237	1 824 989	17 537 792	3 969 748	1 263 325	1 408 523	1 093 099	2 031 084	12 406 383

Table C.18: Proportional R&D expenditure by province (2015/16 to 2024/25)

Year	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	Northern Cape	North West	Western Cape
	%	%	%	%	%	%	%	%	%
2015/16	6.6	5.5	45.4	10.3	1.9	2.4	2.0	3.7	22.0
2016/17	6.2	5.1	46.0	10.2	2.0	2.0	1.5	3.6	23.3
2017/18	5.9	5.6	44.7	10.8	2.2	1.8	1.5	3.4	24.1
2018/19	6.0	5.4	42.9	11.1	2.2	2.3	2.5	4.6	23.1
2019/20	6.1	5.0	41.7	10.5	2.2	2.4	2.6	4.9	24.5
2020/21	6.0	3.7	43.9	9.8	2.9	2.1	2.6	4.1	25.0
2021/22	5.3	4.5	41.1	9.7	2.7	3.3	2.8	3.9	26.6
2022/23	5.3	5.0	39.0	10.0	3.1	2.7	3.2	4.4	27.3
2023/24	5.1	4.2	40.2	10.0	2.7	2.5	3.1	4.4	27.9
2024/25	6.1	4.1	39.6	9.0	2.9	3.2	2.5	4.6	28.0

C.1.2. Source of R&D funds

Table C.19: Funding for R&D by source (2015/16 to 2024/25)

Year	Total funds	Government*	Business	Other South African [#]	Foreign
	R'000	R'000	R'000	R'000	R'000
2015/16	32 336 679	14 425 992	12 578 499	1 122 328	4 209 861
2016/17	35 692 973	16 427 596	14 045 892	1 047 980	4 171 507
2017/18	38 724 590	18 082 182	16 066 846	638 858	3 936 705
2018/19	36 783 968	17 475 173	14 534 123	775 938	3 998 734
2019/20	34 484 862	19 416 933	9 358 770	1 046 861	4 662 299
2020/21	33 541 332	18 871 543	9 034 026	1 174 220	4 461 542
2021/22	38 185 599	20 049 283	11 080 806	1 516 441	5 539 069
2022/23	40 917 649	20 664 276	11 754 450	1 439 107	7 059 815
2023/24	43 412 618	21 846 744	12 033 513	1 426 297	8 106 063
2024/25	44 237 180	22 168 385	12 016 640	1 700 820	8 351 335

* Includes science council and university own funds.

[#] Includes funds from higher education institutions, NPOs and individual donations disbursed to all sectors.

Table C.20: Proportional funding for R&D by source (2015/16 to 2024/25)

Year	Government*	Business	Other South African [#]	Foreign
	%	%	%	%
2015/16	44.6	38.9	3.5	13.0
2016/17	46.0	39.4	2.9	11.7
2017/18	46.7	41.5	1.6	10.2
2018/19	47.5	39.5	2.1	10.9
2019/20	56.3	27.1	3.0	13.5
2020/21	56.3	26.9	3.5	13.3
2021/22	52.5	29.0	4.0	14.5
2022/23	50.5	28.7	3.5	17.3
2023/24	50.3	27.7	3.3	18.7
2024/25	50.1	27.2	3.8	18.9

* Includes science council and university own funds.

[#] Includes funds from higher education institutions, NPOs and individual donations disbursed to all sectors.

Table C.21: Sources of R&D funding by sector, amount and as a percentage of total funds (2024/25)

Source of funds	Total		Government		Science councils		Higher education		Business		Not-for-profit	
	R'000	%	R'000	%	R'000	%	R'000	%	R'000	%	R'000	%
Own funds	21 957 182	49.6	2 293 300	72.6	889 152	11.2	7 875 339	47.1	10 690 641	74.4	208 750	10.1
Internal sources	21 957 182	49.6	2 293 300	72.6	889 152	11.2	7 875 339	47.1	10 690 641	74.4	208 750	10.1
Government	11 110 594	25.1	730 469	23.1	5 795 329	73.2	3 685 726	22.1	682 128	4.7	216 943	10.5
Grants	4 312 069	9.7	729 179	23.1	2 857 020	36.1	0	0.0	577 489	4.0	148 380	7.1
Contracts	3 112 800	7.0	1 290	0.0	2 938 309	37.1	0	0.0	104 638	0.7	68 563	3.3
All other government source	3 685 726	8.3	N/A	N/A	N/A	N/A	3 685 726	22.1	N/A	N/A	N/A	N/A
National, provincial and local government	697 033	1.6	N/A	N/A	N/A	N/A	697 033	4.2	N/A	N/A	N/A	N/A
Government research institutes	185 444	0.4	N/A	N/A	N/A	N/A	185 444	1.1	N/A	N/A	N/A	N/A

Source of funds	Total		Government		Science councils		Higher education		Business		Not-for-profit	
	R'000	%	R'000	%	R'000	%	R'000	%	R'000	%	R'000	%
Agency funding (e.g. NRF, MRC, ARC, etc.)	2 521 675	5.7	N/A	N/A	N/A	N/A	2 521 675	15.1	N/A	N/A	N/A	N/A
Science councils	281 573	0.6	N/A	N/A	N/A	N/A	281 573	1.7	N/A	N/A	N/A	N/A
Business	1 325 999	3.0	2 992	0.1	278 190	3.5	762 733	4.6	202 263	1.4	79 821	3.8
Local business	1 325 999	3.0	2 992	0.1	278 190	3.5	762 733	4.6	202 263	1.4	79 821	3.8
Other SA sources	1 492 070	3.4	67 649	2.1	50 519	0.6	711 240	4.3	580 754	4.0	81 907	3.9
Higher education	252 218	0.6	43 110	1.4	19 691	0.2	159 590	1.0	0	0.0	29 827	1.4
Not-for-profit	847 034	1.9	0	0.0	30 828	0.4	200 966	1.2	580 754	4.0	34 486	1.7
Individual donations	392 818	0.9	24 539	0.8	0	0.0	350 684	2.1	0	0.0	17 594	0.8
Foreign	8 351 335	18.9	65 195	2.1	906 496	11.4	3 678 435	22.0	2 213 177	15.4	1 488 032	71.7
All sources*	8 351 335	18.9	65 195	2.1	906 496	11.4	3 678 435	22.0	2 213 177	15.4	1 488 032	71.7
Total	44 237 180	100.0	3 159 605	100.0	7 919 687	100.0	16 713 473	100.0	14 368 963	100.0	2 075 452	100.0

Note: N/A indicates that data were not collected at that level in that particular sector.

* Refers to all funds for R&D from outside South Africa.

Table C.22: Government-funded* R&D by sector (2015/16 to 2024/25)

Year	Total	Government	Science councils	Higher education	Business	Not-for-profit
	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	14 425 992	1 425 598	4 922 223	7 393 857	522 631	161 682
2016/17	16 427 596	1 530 964	5 076 805	9 222 246	453 958	143 623
2017/18	18 082 182	1 769 929	5 311 190	10 486 989	371 165	142 908
2018/19	17 475 173	1 898 230	4 644 414	10 501 066	214 541	216 922
2019/20	19 416 933	1 682 484	5 493 352	11 380 375	648 604	212 118
2020/21	18 871 543	2 125 220	5 025 925	10 933 622	592 551	194 225
2021/22	20 049 283	2 348 152	5 392 693	11 353 867	773 672	180 899
2022/23	20 664 276	2 573 711	5 815 562	11 472 797	622 555	179 651
2023/24	21 846 744	2 919 014	6 517 728	11 591 195	538 803	280 004
2024/25	22 168 385	3 023 768	6 684 482	11 561 065	682 128	216 943

*Includes science council and university own funds.

Table C.23: Proportional government-funded R&D by sector (2015/16 to 2024/25)

Year	Government*	Science councils#	Higher education†	Business	Not-for-profit
	%	%	%	%	%
2015/16	9.9	34.1	51.3	3.6	1.1
2016/17	9.3	30.9	56.1	2.8	0.9
2017/18	9.8	29.4	58.0	2.1	0.8
2018/19	10.9	26.6	60.1	1.2	1.2
2019/20	8.7	28.3	58.6	3.3	1.1
2020/21	11.3	26.6	57.9	3.1	1.0
2021/22	11.7	26.9	56.6	3.9	0.9
2022/23	12.5	28.1	55.5	3.0	0.9
2023/24	13.4	29.8	53.1	2.5	1.3
2024/25	13.6	30.2	52.2	3.1	1.0

* Includes funding from science councils.

Includes funding from other science councils.

† Includes funding from science councils and university own funds.

Table C.24: Business-funded R&D by sector (2015/16 to 2024/25)

Year	Total	Government	Science councils	Higher education	Business	Not-for-profit
	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	12 578 499	41 109	326 648	770 448	11 384 710	55 585
2016/17	14 045 892	1 261	483 166	906 651	12 586 109	68 705
2017/18	16 066 846	519	354 820	679 563	14 963 198	68 747
2018/19	14 534 123	4 614	206 648	463 413	13 787 512	71 937
2019/20	9 358 770	42 664	191 520	519 848	8 541 773	62 965
2020/21	9 034 026	0	310 034	546 329	8 101 658	76 005
2021/22	11 080 806	10 296	238 561	564 157	10 176 993	90 799
2022/23	11 754 450	10 397	291 424	424 463	10 924 479	103 687
2023/24	12 033 513	5 000	250 052	662 891	11 026 902	88 669
2024/25	12 016 640	2 992	278 190	762 733	10 892 904	79 821

Table C.25: Proportional business-funded R&D by sector (2015/16 to 2024/25)

Year	Government	Science councils	Higher education	Business	Not-for-profit
	%	%	%	%	%
2015/16	0.3	2.6	6.1	90.5	0.4
2016/17	0.0	3.4	6.5	89.6	0.5
2017/18	0.0	2.2	4.2	93.1	0.4
2018/19	0.0	1.4	3.2	94.9	0.5
2019/20	0.5	2.0	5.6	91.3	0.7
2020/21	0.0	3.4	6.0	89.7	0.8
2021/22	0.1	2.2	5.1	91.8	0.8
2022/23	0.1	2.5	3.6	92.9	0.9
2023/24	0.04	2.1	5.5	91.6	0.7
2024/25	0.02	2.3	6.3	90.6	0.7

Table C.26: Foreign-funded R&D by sector (2015/16 to 2024/25)

Year	Total	Government	Science councils	Higher education	Business	Not-for-profit
	R'000	R'000	R'000	R'000	R'000	R'000
2015/16	4 209 861	499 966	469 507	1 206 192	1 532 766	501 430
2016/17	4 171 507	512 090	537 503	1 143 451	1 338 662	639 801
2017/18	3 936 705	471 786	617 838	1 506 077	474 762	866 241
2018/19	3 998 734	296 918	550 456	1 851 900	400 462	898 998
2019/20	4 662 299	133 832	439 774	1 979 372	1 168 659	940 661
2020/21	4 461 542	55 787	432 691	1 976 510	978 260	1 018 294
2021/22	5 539 069	55 349	629 492	2 006 272	2 002 607	845 349
2022/23	7 059 815	72 964	883 533	2 591 128	2 346 533	1 165 657
2023/24	8 106 063	64 181	884 161	3 015 821	2 927 699	1 214 201
2024/25	8 351 335	65 195	906 496	3 678 435	2 213 177	1 488 032

Table C.27: Proportional foreign-funded R&D by sector (2015/16 to 2024/25)

Year	Government	Science councils	Higher education	Business	Not-for-profit
	%	%	%	%	%
2015/16	11.9	11.2	28.7	36.4	11.9
2016/17	12.3	12.9	27.4	32.1	15.3
2017/18	12.0	15.7	38.3	12.1	22.0
2018/19	7.4	13.8	46.3	10.0	22.5
2019/20	2.9	9.4	42.5	25.1	20.2
2020/21	1.3	9.7	44.3	21.9	22.8
2021/22	1.0	11.4	36.2	36.2	15.3
2022/23	1.0	12.5	36.7	33.2	16.5
2023/24	0.8	10.9	37.2	36.1	15.0
2024/25	0.8	10.9	44.0	26.5	17.8

C.1.3. R&D personnel

Table C.28: R&D personnel headcount and full-time equivalents by occupation (2015/16 to 2024/25)

Year	R&D personnel			Researchers			Technicians		Other R&D personnel	
	Headcount*	FTEs	FTEs per 1000 in total employment	Headcount*	FTEs	FTEs per 1000 in total employment	Headcount	FTEs per 1000 in total employment	Headcount	FTEs per 1000 in total employment
2015/16	74 931	41 054.5	2.6	51 877	26 159.4	1.7	11 518	7 688.3	11 536	7 206.9
2016/17	80 029	42 533.0	2.6	56 761	27 656.2	1.7	11 346	7 563.1	11 922	7 313.6
2017/18	84 262	44 259.3	2.7	61 840	29 515.2	1.8	11 219	7 383.3	11 203	7 360.8
2018/19	84 036	43 774.3	2.7	62 166	29 110.8	1.8	10 545	7 069.0	11 325	7 594.5
2019/20	82 068	41 856.2	2.8	62 002	28 358.3	1.9	10 080	6 879.9	9 986	6 618.0
2020/21	82 744	42 925.9	2.9	61 406	27 697.6	1.8	9 870	6 846.5	11 468	8 381.7
2021/22	85 601	44 355.4	3.0	63 122	27 763.3	1.9	10 221	7 657.1	12 258	8 935.0
2022/23	84 275	44 420.2	2.7	61 547	27 520.3	1.7	9 619	7 193.4	13 109	9 706.6
2023/24	89 604	44 256.9	2.6	66 387	27 561.4	1.6	9 622	7 072.9	13 595	9 622.6
2024/25	90 608	43 138.5	2.6	66 858	26 902.3	1.6	9 401	6 006.9	14 349	10 229.4

* Includes doctoral students and post-doctoral fellows, as well as specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.29: R&D personnel headcount and full-time equivalents by occupation and gender including and excluding students (2022/23 to 2024/25)

Year	Headcount			Full-time equivalents (FTEs)			
2022/23	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
Researchers*	61 547	32 244	29 303	27 520.3	14 390.6	13 129.7	44.7
Technicians directly supporting R&D	9 619	5 031	4 588	7 193.4	3 519.2	3 674.1	74.8
Other personnel directly supporting R&D	13 109	5 073	8 036	9 706.6	3 762.5	5 944.1	74.0
Total*	84 275	42 348	41 927	44 420.2	21 672.4	22 747.9	52.7
Researchers [#]	34 136	18 073	16 063	11 782.1	6 194.8	5 587.3	34.5
Technicians directly supporting R&D	9 619	5 031	4 588	7 193.4	3 519.2	3 674.1	74.8
Other personnel directly supporting R&D	13 109	5 073	8 036	9 706.6	3 762.5	5 944.1	74.0
Total[#]	56 864	28 177	28 687	28 682.0	13 476.6	15 205.5	50.4
2023/24	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
Researchers*	66 387	34 749	31 638	27 561.4	14 448.7	13 112.7	41.5
Technicians directly supporting R&D	9 622	4 935	4 687	7 072.9	3 418.1	3 654.9	73.5
Other personnel directly supporting R&D	13 595	5 203	8 392	9 622.6	3 742.3	5 880.3	70.8
Total*	89 604	44 887	44 717	44 256.9	21 609.1	22 647.8	49.4
Researchers [#]	36 418	19 368	17 050	11 132.5	5 753.6	5 378.9	30.6
Technicians directly supporting R&D	9 622	4 935	4 687	7 072.9	3 418.1	3 654.9	73.5
Other personnel directly supporting R&D	13 595	5 203	8 392	9 622.6	3 742.3	5 880.3	70.8
Total[#]	59 635	29 506	30 129	27 828.0	12 914.0	14 914.0	46.7
2024/25	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
Researchers*	66 858	34 639	32 219	26 902.3	13 991.1	12 911.2	40.2
Technicians directly supporting R&D	9 401	4 983	4 418	6 006.9	3 249.1	2 757.7	63.9
Other personnel directly supporting R&D	14 349	5 491	8 858	10 229.4	3 857.2	6 372.2	71.3
Total*	90 608	45 113	45 495	43 138.5	21 097.4	22 041.1	47.6
Researchers [#]	36 545	19 230	17 315	11 417.2	6 033.9	5 383.2	31.2
Technicians directly supporting R&D	9 401	4 983	4 418	6 006.9	3 249.1	2 757.7	63.9
Other personnel directly supporting R&D	14 349	5 491	8 858	10 229.4	3 857.2	6 372.2	71.3
Total[#]	60 295	29 704	30 591	27 653.4	13 140.3	14 513.1	45.9

* Includes doctoral students and post-doctoral fellows, as well as specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.).

Excludes doctoral students and post-doctoral fellows but includes specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.).

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.30: R&D personnel headcount by sector (2015/16 to 2024/25)

Year	Total R&D personnel headcount*	Government	Science councils	Higher education	Business	Not-for-profit
2015/16	74 931	2 997	5 162	48 034	17 245	1 493
2016/17	80 029	3 076	4 955	52 384	17 998	1 616
2017/18	84 262	3 027	4 866	57 074	17 554	1 741
2018/19	84 036	2 910	4 514	57 799	16 876	1 937
2019/20	82 068	3 157	4 070	60 168	12 748	1 925
2020/21	82 744	3 159	4 111	59 502	14 177	1 795
2021/22	85 601	3 314	4 190	61 159	15 094	1 844
2022/23	84 275	3 374	4 117	59 511	15 364	1 909
2023/24	89 604	2 932	4 185	65 228	15 386	1 873
2024/25	90 608	2 849	4 410	65 833	15 778	1 738

* Includes doctoral students and post-doctoral fellows at higher education institutes, as well as specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.31: R&D personnel full-time equivalents by sector (2015/16 to 2024/25)

Year	Total R&D personnel FTEs*	Government	Science councils	Higher education	Business	Not-for-profit
2015/16	41 054.5	2 056.2	4 361.2	20 812.0	12 457.8	1 367.3
2016/17	42 533.0	2 031.6	4 421.4	22 061.4	12 549.2	1 469.5
2017/18	44 259.3	2 000.4	4 294.9	23 415.1	12 952.9	1 596.0
2018/19	43 774.3	1 999.0	3 941.8	24 456.8	11 691.0	1 685.8
2019/20	41 856.5	2 173.1	3 562.8	25 109.4	9 300.8	1 710.1
2020/21	42 925.9	2 060.4	3 606.0	24 843.1	10 860.3	1 556.1
2021/22	44 355.4	2 095.5	3 838.5	24 789.8	12 054.6	1 577.1
2022/23	44 420.2	2 100.2	3 784.1	24 406.1	12 507.7	1 622.1
2023/24	44 256.9	2 244.4	3 839.1	24 266.6	12 442.5	1 464.3
2024/25	43 138.5	2 098.1	4 033.8	23 749.0	11 697.9	1 559.8

* Includes doctoral students and post-doctoral fellows at higher education institutes, as well as specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.32: Researcher headcount by sector (2015/16 to 2024/25)

Year	Total researchers (headcount)*	Government	Science councils	Higher education	Business	Not-for-profit
2015/16	51 877	1 573	2 072	41 639	6 128	465
2016/17	56 761	1 677	2 189	46 028	6 463	404
2017/18	61 840	1 671	2 053	50 549	7 142	425
2018/19	62 166	1 662	1 951	51 187	6 942	424
2019/20	62 002	1 742	1 858	53 371	4 641	390
2020/21	61 406	1 706	1 774	52 985	4 510	431
2021/22	63 122	1 789	1 735	54 784	4 370	444
2022/23	61 547	1 872	1 749	53 059	4 395	472
2023/24	66 387	1 597	1 707	58 280	4 334	469
2024/25	66 858	1 599	1 687	58 765	4 402	405

* Includes doctoral students and post-doctoral fellows at higher education institutes, as well as specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.33: Researcher headcount by gender (2015/16 to 2024/25)

Year	Total researchers (headcount)*	Male	Female
2015/16	29 455	16 150	13 305
2016/17	33 035	17 957	15 078
2017/18	36 233	19 800	16 433
2018/19	35 597	19 116	16 481
2019/20	34 358	18 547	15 811
2020/21	34 072	18 315	15 757
2021/22	35 097	18 770	16 327
2022/23	34 136	18 073	16 063
2023/24	36 418	19 368	17 050
2024/25	36 545	19 230	17 315

* Excludes doctoral students and post-doctoral fellows at higher education institutes and specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.34: Researcher headcount by race (2015/16 to 2024/25)

Year	Total researchers (headcount)*	African	Coloured	Indian/Asian	White	Non-SA
2015/16	29 454	9 548	1 881	2 629	15 396	N/A
2016/17	33 035	9 968	1 957	2 921	15 151	3 038
2017/18	36 233	10 815	2 209	3 352	15 795	4 062
2018/19	35 597	10 572	2 099	3 370	14 890	4 667
2019/20	34 358	10 724	1 968	3 191	14 224	4 251
2020/21	34 072	10 950	2 077	3 145	13 450	4 450
2021/22	35 097	11 880	2 066	3 285	13 091	4 775
2022/23	34 136	12 405	1 933	3 160	12 057	4 581
2023/24	36 418	13 163	2 157	3 209	12 822	5 067
2024/25	36 545	13 732	2 384	3 216	12 421	4 792

* Excludes doctoral students and post-doctoral fellows at higher education institutes and specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.35: R&D personnel headcount (2024/25)

Occupation and qualification	Total R&D personnel (headcount)	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers*	66 858	34 639	32 219	13 058	13 161	1 637	2 168	1 941	2 752	8 058	8 938	9 945	5 200
Doctoral degree or equivalent	48 122	25 181	22 941	8 982	8 962	1 048	1 394	1 071	1 734	4 884	6 009	9 196	4 842
Master's, honours, bachelor or equivalent	15 426	7 767	7 659	3 460	3 568	461	603	743	819	2 593	2 405	510	264
Diplomas	3 310	1 691	1 619	616	631	128	171	127	199	581	524	239	94
Researchers#	36 545	19 230	17 315	7 092	6 640	1 061	1 323	1 465	1 751	6 221	6 200	3 391	1 401
Doctoral degree or equivalent	17 809	9 772	8 037	3 016	2 441	472	549	595	733	3 047	3 271	2 642	1 043
Master's, honours, bachelor or equivalent	15 426	7 767	7 659	3 460	3 568	461	603	743	819	2 593	2 405	510	264
Diplomas	3 310	1 691	1 619	616	631	128	171	127	199	581	524	239	94
Technicians directly supporting R&D	9 401	4 983	4 418	2 385	2 202	607	401	290	315	1 499	1 260	202	240
Doctoral degree or equivalent	370	174	196	43	43	6	20	11	18	72	79	42	36
Master's, honours, bachelor or equivalent	4 579	2 247	2 332	1 091	1 151	174	172	143	178	719	667	120	164
Diplomas	4 452	2 562	1 890	1 251	1 008	427	209	136	119	708	514	40	40
Other personnel directly supporting R&D	14 349	5 491	8 858	3 519	5 842	549	1 192	250	301	989	1 363	184	160
Doctoral degree or equivalent	581	281	300	116	99	13	30	12	18	95	122	45	31
Master's, honours, bachelor or equivalent	4 343	1 749	2 594	920	1 383	151	362	139	154	464	631	75	64
Diplomas	9 425	3 461	5 964	2 483	4 360	385	800	99	129	430	610	64	65
Total*	90 608	45 113	45 495	18 962	21 205	2 793	3 761	2 481	3 368	10 546	11 561	10 331	5 600
Total#	60 295	29 704	30 591	12 996	14 684	2 217	2 916	2 005	2 367	8 709	8 823	3 777	1 801

* Includes doctoral students and post-doctoral fellows.

Excludes doctoral students and post-doctoral fellows.

C.2. Sector tables

C.2.1. Business sector

Table C.36: Business sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Basic research	906 730	909 278	1 021 152	948 319	758 971	788 740	1 567 352	1 358 442	1 352 754	1 249 896
Applied research	7 492 229	8 389 888	10 551 512	9 819 344	6 218 563	6 014 078	7 834 505	8 517 075	9 059 028	8 497 292
Experimental development research	5 416 037	5 482 104	4 286 521	3 680 170	3 726 947	3 244 526	4 125 325	4 631 257	4 699 538	4 621 775
Total	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

Table C.37: Proportional business sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Basic research	6.6	6.2	6.4	6.6	7.1	7.9	11.6	9.4	9.0	8.7
Applied research	54.2	56.8	66.5	68.0	58.1	59.9	57.9	58.7	59.9	59.1
Experimental development research	39.2	37.1	27.0	25.5	34.8	32.3	30.5	31.9	31.1	32.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.38: Business sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Capital expenditure	1 289 228	1 727 929	1 421 699	1 545 944	984 728	969 093	1 851 120	1 687 624	1 604 438	1 422 495
Land: Buildings & other structures	186 396	288 957	270 191	370 231	343 953	183 111	451 832	365 550	377 193	162 409
Total: Vehicles, plant, machinery, equipment and software	1 102 833	1 438 972	1 151 508	1 175 713	640 776	785 982	1 399 288	1 322 074	1 227 245	1 260 086
Vehicles, plant, machinery, equipment	1 102 833	1 438 972	1 151 508	1 175 713	584 324	559 525	1 118 884	977 554	1 070 418	939 614
Capitalised computer software*	N/A	N/A	N/A	N/A	56 452	226 457	280 404	344 520	156 827	320 472
Current expenditure	12 525 767	13 053 341	14 437 485	12 901 890	9 719 752	9 078 252	11 676 062	12 819 150	13 506 882	12 946 467
Labour costs	7 821 865	8 486 640	9 747 037	8 612 310	5 992 573	5 387 961	6 793 891	7 046 654	7 153 482	6 913 958
Other current expenditure	4 703 901	4 566 701	4 690 449	4 289 579	3 727 179	3 690 290	4 882 170	5 772 496	6 353 399	6 032 509
Total	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.39: Proportional business sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Capital expenditure	11.7	9.0	10.7	9.2	9.2	9.6	13.7	11.6	10.6	9.9
Land: Buildings & other structures	2.0	1.7	2.6	3.2	3.2	1.8	3.3	2.5	2.5	1.1
Total: Vehicles, plant, machinery, equipment and software	9.7	7.3	8.1	6.0	6.0	7.8	10.3	9.1	8.1	8.8
Vehicles, plant, machinery, equipment	9.7	7.3	8.1	5.5	5.5	5.6	8.3	6.7	7.1	6.5
Capitalised computer software*	N/A	N/A	N/A	0.5	0.5	2.3	2.1	2.4	1.0	2.2
Current expenditure	88.3	91.0	89.3	90.8	90.8	90.4	86.3	88.4	89.4	90.1
Labour costs	57.4	61.5	59.6	56.0	56.0	53.6	50.2	48.6	47.3	48.1
Other current expenditure	30.9	29.6	29.7	34.8	34.8	36.7	36.1	39.8	42.0	42.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.40: Business sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Biotechnology	729 299	685 170	721 698	702 168	992 682	901 293	993 533	1 257 517	1 749 082	1 798 923
Nanotechnology	134 063	268 320	113 260	155 956	77 163	73 309	102 815	127 105	110 388	81 868
Total	863 362	953 490	834 958	858 124	1 069 845	974 603	1 096 348	1 384 623	1 859 470	1 880 790
Business expenditure on R&D	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

Table C.41: Proportional business sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biotechnology	5.3	4.6	4.6	4.9	9.3	9.0	7.3	8.7	11.6	12.5
Nanotechnology	1.0	1.8	0.7	1.1	0.7	0.7	0.8	0.9	0.7	0.6
Total	6.2	6.5	5.3	5.9	10.0	9.7	8.1	9.5	12.3	13.1

Table C.42: Business sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Environment-related	173 356	280 651	377 030	472 759	532 424	591 414	1 008 487	804 676	671 692	870 356
Open-source software	326 856	207 849	193 239	154 894	176 450	219 128	453 683	215 700	331 442	104 331
New materials	224 433	179 108	186 858	268 298	447 596	354 411	569 008	664 568	679 108	431 307
TB, HIV/AIDS, malaria	1 176 149	1 153 668	1 332 248	1 801 869	1 347 208	1 316 084	1 687 720	2 260 472	2 607 909	2 828 691
Space science*	N/A	33 099	42 291	47 018	19 990	4 659	498 372	66 746	110 212	98 477
Total	1 900 794	1 854 375	2 131 666	2 744 839	2 523 667	2 485 695	4 217 269	4 012 161	4 400 364	4 333 162
Business expenditure on R&D	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

* Space science data only collected from 2016/17 onwards.

Table C.43: Proportional business sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Environment-related	1.3	1.9	2.4	3.3	5.0	5.9	7.5	5.5	4.4	6.1
Open-source software	2.4	1.4	1.2	1.1	1.6	2.2	3.4	1.5	2.2	0.7
New materials	1.6	1.2	1.2	1.9	4.2	3.5	4.2	4.6	4.5	3.0
TB, HIV/AIDS, malaria	8.5	7.8	8.4	12.5	12.6	13.1	12.5	15.6	17.3	19.7
Space science*	N/A	0.2	0.3	0.3	0.2	0.0	3.7	0.5	0.7	0.7
Total	13.8	12.5	13.4	19.0	23.6	24.7	31.2	27.7	29.1	30.2

* Space science data only collected from 2016/17 onwards.

Table C.44: Business sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	11 447 693	11 918 539	11 793 445	11 719 001	10 552 496	9 533 861	12 883 090	14 451 444	15 041 460	14 254 375
Mathematical sciences	119 900	138 858	188 550	196 143	181 438	184 125	188 752	166 662	147 153	188 942
Physical sciences	35 616	45 816	90 281	87 440	108 895	123 589	78 346	156 312	97 881	103 068
Chemical sciences	972 398	1 153 685	1 154 404	1 102 373	800 201	628 780	714 191	977 837	886 898	584 193
Earth sciences	93 302	104 072	160 745	156 112	285 180	197 020	219 212	217 394	180 477	105 795
Information, computer and communication technologies	2 572 364	3 111 146	2 584 726	2 295 683	2 074 429	2 118 762	3 442 168	3 022 290	2 912 301	3 354 237
Applied sciences and technologies	903 958	915 101	1 143 251	942 480	608 833	539 767	773 565	774 657	890 694	791 511
Engineering sciences	3 429 786	2 651 327	2 971 162	2 786 664	2 332 755	2 232 226	2 339 006	2 903 433	3 194 336	3 446 121
Biological sciences	254 071	250 356	220 193	154 696	175 572	245 176	250 139	245 558	639 552	680 988

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Agricultural sciences	671 194	686 697	778 583	1 008 216	1 070 593	666 564	742 632	903 056	1 026 541	838 339
Medical and health sciences	2 300 587	2 283 200	2 384 920	2 855 116	2 395 653	2 289 175	3 238 019	3 934 739	4 246 374	3 780 361
Environmental sciences	21 920	480 612	60 379	69 676	130 311	101 190	295 153	367 824	252 412	208 731
Material sciences	71 967	97 670	56 253	63 653	388 110	206 974	601 417	780 961	566 390	171 675
Marine sciences	630	0	0	750	526	512	489	721	450	413
Division 2: Social sciences and humanities	2 367 302	2 862 731	4 065 740	2 728 832	151 985	513 483	644 092	55 330	69 859	114 587
Social sciences	2 367 302	2 858 585	4 065 740	2 727 641	151 985	513 483	644 092	55 330	69 859	114 587
Humanities	0	4 146	0	1 191	0	0	0	0	0	0
Total	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

Table C.45: Proportional business sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	82.9	80.6	74.4	81.1	98.6	94.9	95.2	99.6	99.5	99.2
Mathematical sciences	0.9	0.9	1.2	1.4	1.7	1.8	1.4	1.1	1.0	1.3
Physical sciences	0.3	0.3	0.6	0.6	1.0	1.2	0.6	1.1	0.6	0.7
Chemical sciences	7.0	7.8	7.3	7.6	7.5	6.3	5.3	6.7	5.9	4.1
Earth sciences	0.7	0.7	1.0	1.1	2.7	2.0	1.6	1.5	1.2	0.7
Information, computer and communication technologies	18.6	21.0	16.3	15.9	19.4	21.1	25.4	20.8	19.3	23.3
Applied sciences and technologies	6.5	6.2	7.2	6.5	5.7	5.4	5.7	5.3	5.9	5.5
Engineering sciences	24.8	17.9	18.7	19.3	21.8	22.2	17.3	20.0	21.1	24.0
Biological sciences	1.8	1.7	1.4	1.1	1.6	2.4	1.8	1.7	4.2	4.7
Agricultural sciences	4.9	4.6	4.9	7.0	10.0	6.6	5.5	6.2	6.8	5.8
Medical and health sciences	16.7	15.4	15.0	19.8	22.4	22.8	23.9	27.1	28.1	26.3
Environmental sciences	0.2	3.3	0.4	0.5	1.2	1.0	2.2	2.5	1.7	1.5
Material sciences	0.5	0.7	0.4	0.4	3.6	2.1	4.4	5.4	3.7	1.2
Marine sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Division 2: Social sciences and humanities	17.1	19.4	25.6	18.9	1.4	5.1	4.8	0.4	0.5	0.8
Social sciences	17.1	19.4	25.6	18.9	1.4	5.1	4.8	0.4	0.5	0.8
Humanities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.46: Business sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	937 964	830 331	1 187 443	975 765	985 893	923 205	1 082 978	1 335 553	1 259 984	1 425 007
Defence	937 964	830 331	1 187 443	975 765	985 893	923 205	1 082 978	1 335 553	1 259 984	1 425 007
Division 2: Economic development	10 362 668	11 554 708	11 730 578	10 197 220	6 944 128	6 471 578	8 413 717	8 221 669	8 517 944	8 175 137
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	622 367	1 026 707	628 123	791 508	919 470	529 292	590 356	913 047	946 211	797 024
Animal production and animal primary products	74 267	66 547	41 588	55 615	45 062	50 273	62 704	72 791	65 878	57 313
Mineral resources (excluding Energy)	1 348 618	947 258	812 439	867 249	787 924	973 275	1 048 406	1 407 422	1 646 825	981 696
Energy resources	79 210	470 860	431 681	488 026	116 459	209 543	301 461	286 466	199 137	242 338
Energy supply	362 656	461 804	555 067	574 180	674 663	659 620	689 021	553 975	545 103	591 337
Manufacturing	2 106 255	1 924 020	1 965 446	1 788 564	1 758 500	1 281 713	1 770 822	1 822 868	1 913 852	1 794 954
Construction	55 625	54 328	22 942	32 416	22 651	53 209	100 008	135 931	153 507	40 880
Transport	1 046 235	1 098 281	1 124 099	1 045 650	630 950	437 619	618 080	486 848	488 802	349 696
Information and communication services	1 685 124	2 085 856	1 403 512	1 011 167	690 243	712 864	1 223 477	1 028 818	998 686	1 247 183
Commercial services	2 643 503	2 929 445	4 196 652	3 154 500	897 099	1 197 714	1 272 773	879 072	815 689	1 106 570
Economic framework	273 497	422 742	476 032	302 938	326 180	304 383	639 142	536 783	629 728	661 573
Natural resources	65 312	66 859	72 996	85 409	74 926	62 073	97 468	97 648	114 527	304 573
Division 3: Society	1 433 935	1 498 255	2 027 742	2 476 255	2 106 630	2 100 049	2 991 356	3 555 675	4 019 512	3 549 211
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	1 216 127	1 289 142	1 364 830	2 419 773	1 459 043	1 460 434	2 125 198	2 476 032	2 734 412	2 153 790
Education and training	33 707	21 076	23 586	16 021	27 515	24 891	32 722	38 524	42 906	43 688
Social development and community services	184 102	188 036	639 326	40 461	620 072	614 724	833 436	1 041 119	1 242 194	1 351 733
Division 4: Environment	196 802	201 177	283 454	207 806	195 663	198 780	332 566	408 078	242 237	165 093
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	62 471	45 213	116 313	50 017	57 772	42 158	35 094	53 902	46 059	47 276
Environmental aspects of development	18 915	48 553	52 852	52 754	16 820	32 251	96 362	129 747	69 739	51 302
Environmental and other aspects	115 415	107 410	114 289	105 035	121 070	124 371	201 110	224 429	126 438	66 515

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 5: Advancement of knowledge	883 626	696 800	629 967	590 788	472 168	353 733	706 564	985 799	1 071 642	1 054 516
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	880 474	696 770	629 967	590 788	472 168	353 733	706 564	985 799	1 071 642	1 054 516
Social sciences and humanities	3 152	30	0	0	0	0	0	0	0	0
Total	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

Table C.47: Proportional business sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	6.8	5.6	7.5	6.8	9.2	9.2	8.0	9.2	8.3	9.9
Defence	6.8	5.6	7.5	6.8	9.2	9.2	8.0	9.2	8.3	9.9
Division 2: Economic development	75.0	78.2	74.0	70.6	64.9	64.4	62.2	56.7	56.4	56.9
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	4.5	6.9	4.0	5.5	8.6	5.3	4.4	6.3	6.3	5.5
Animal production and animal primary products	0.5	0.5	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4
Mineral resources (excluding Energy)	9.8	6.4	5.1	6.0	7.4	9.7	7.8	9.7	10.9	6.8
Energy resources	0.6	3.2	2.7	3.4	1.1	2.1	2.2	2.0	1.3	1.7
Energy supply	2.6	3.1	3.5	4.0	6.3	6.6	5.1	3.8	3.6	4.1
Manufacturing	15.2	13.0	12.4	12.4	16.4	12.8	13.1	12.6	12.7	12.5
Construction	0.4	0.4	0.1	0.2	0.2	0.5	0.7	0.9	1.0	0.3
Transport	7.6	7.4	7.1	7.2	5.9	4.4	4.6	3.4	3.2	2.4
Information and communication services	12.2	14.1	8.8	7.0	6.4	7.1	9.0	7.1	6.6	8.7
Commercial services	19.1	19.8	26.5	21.8	8.4	11.9	9.4	6.1	5.4	7.7
Economic framework	2.0	2.9	3.0	2.1	3.0	3.0	4.7	3.7	4.2	4.6
Natural resources	0.5	0.5	0.5	0.6	0.7	0.6	0.7	0.7	0.8	2.1
Division 3: Society	10.4	10.1	12.8	17.1	19.7	20.9	22.1	24.5	26.6	24.7
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	8.8	8.7	8.6	16.7	13.6	14.5	15.7	17.1	18.1	15.0
Education and training	0.2	0.1	0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.3

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Social development and community services	1.3	1.3	4.0	0.3	5.8	6.1	6.2	7.2	8.2	9.4
Division 4: Environment	1.4	1.4	1.8	1.4	1.8	2.0	2.5	2.8	1.6	1.1
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	0.5	0.3	0.7	0.3	0.5	0.4	0.3	0.4	0.3	0.3
Environmental aspects of development	0.1	0.3	0.3	0.4	0.2	0.3	0.7	0.9	0.5	0.4
Environmental and other aspects	0.8	0.7	0.7	0.7	1.1	1.2	1.5	1.5	0.8	0.5
Division 5: Advancement of knowledge	6.4	4.7	4.0	4.1	4.4	3.5	5.2	6.8	7.1	7.3
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	6.4	4.7	4.0	4.1	4.4	3.5	5.2	6.8	7.1	7.3
Social sciences and humanities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.48: Business sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Eastern Cape	651 533	690 478	707 348	674 516	439 537	214 755	241 315	252 981	291 057	237 596
Free State	1 124 042	1 060 177	1 105 873	991 206	694 454	470 355	998 559	1 186 428	988 484	1 008 755
Gauteng	7 183 557	7 876 139	8 285 425	7 617 873	5 447 407	5 577 133	6 785 927	6 477 267	6 840 207	7 150 635
KwaZulu-Natal	1 436 737	1 553 130	1 679 718	1 446 281	1 193 914	821 492	1 061 049	1 252 446	1 385 350	1 056 818
Limpopo	145 736	171 567	223 014	184 199	78 484	199 637	136 397	393 755	285 613	265 771
Mpumalanga	339 985	284 655	304 990	392 986	370 695	258 575	438 496	452 041	465 525	505 472
North West	451 891	526 962	565 486	601 653	566 308	526 476	581 045	714 383	848 286	754 328
Northern Cape	206 786	49 508	60 007	50 561	39 576	29 084	112 703	308 237	296 075	44 229
Western Cape	2 274 728	2 568 653	2 927 324	2 488 558	1 874 107	1 949 835	3 171 691	3 469 236	3 710 724	3 345 358
Total	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

Table C.49: Proportional business sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Eastern Cape	4.7	4.7	4.5	4.7	4.1	2.1	1.8	1.7	1.9	1.7
Free State	8.1	7.2	7.0	6.9	6.5	4.7	7.4	8.2	6.5	7.0
Gauteng	52.0	53.3	52.2	52.7	50.9	55.5	50.2	44.6	45.3	49.8
KwaZulu-Natal	10.4	10.5	10.6	10.0	11.2	8.2	7.8	8.6	9.2	7.4
Limpopo	1.1	1.2	1.4	1.3	0.7	2.0	1.0	2.7	1.9	1.8
Mpumalanga	2.5	1.9	1.9	2.7	3.5	2.6	3.2	3.1	3.1	3.5
North West	3.3	3.6	3.6	4.2	5.3	5.2	4.3	4.9	5.6	5.2
Northern Cape	1.5	0.3	0.4	0.3	0.4	0.3	0.8	2.1	2.0	0.3
Western Cape	16.5	17.4	18.5	17.2	17.5	19.4	23.4	23.9	24.6	23.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.50: Business sector R&D expenditure by Standard Industrial Classification (2015/16 to 2024/25)

Standard Industrial Classification	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Agriculture, hunting, forestry and fishing	484 384	472 472	395 011	560 631	707 251	451 499	454 235	717 014	727 662	598 482
Mining and quarrying	1 220 985	1 069 826	1 101 202	1 748 437	686 064	927 055	888 716	1 321 976	1 580 349	948 028
Manufacturing	4 442 466	4 107 936	4 473 167	3 166 486	3 456 739	2 895 406	4 049 490	4 529 566	4 513 910	4 259 688
Manufacture of food products, beverages and tobacco products	376 884	328 832	455 335	498 001	452 243	273 509	240 474	254 102	255 639	218 097
Manufacture of textiles, clothing and leather goods	9 335	8 932	21 968	11 129	11 306	16 547	26 709	27 015	33 339	22 904
Manufacture of wood and products of wood and cork, except furniture; Manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Manufacture of publishing, printing and reproduction of recorded material	95 555	87 814	91 005	76 413	79 627	77 126	103 141	124 422	103 902	82 030
Manufacture of refined petroleum, coke and nuclear fuel; Manufacture of chemicals and chemical products (including pharmaceuticals); Manufacture of rubber and plastic products	1 800 420	1 696 770	1 692 447	802 217	1 165 107	1 096 348	1 704 714	1 734 600	1 596 983	1 606 734
Manufacture of non-metallic mineral products	28 095	37 531	24 657	43 350	19 376	36 079	24 095	89 733	16 864	20 249
Manufacture of basic metals, fabricated metal products, machinery and equipment; Manufacture of office, accounting and computing machinery	660 205	519 108	581 073	525 937	548 762	422 697	695 090	716 307	916 503	725 117
Manufacture of electrical machinery and apparatus	381 971	455 378	635 655	374 509	250 907	300 913	423 722	614 154	602 783	609 143
Manufacture of radio, television and communication equipment and apparatus; Manufacture of medical, precision and optical instruments, watches and clocks	569 127	629 240	625 773	486 808	538 682	567 514	552 318	742 645	762 369	828 848
Manufacture of transport equipment	402 772	321 638	316 503	315 433	381 531	96 840	236 450	175 198	224 724	145 832
Manufacture of furniture; Recycling; Manufacturing not elsewhere classified	118 102	22 692	28 752	32 689	9 198	7 833	42 778	51 390	804	735
Electricity, gas and water supply	439 157	544 850	639 298	708 166	762 345	708 350	412 425	382 874	428 901	446 544
Construction	5 613	4 297	3 562	9 408	5 065	4 762	9 700	80 580	155 162	136 126
Wholesale and retail	42 977	54 553	84 403	102 393	89 487	64 403	21 638	74 712	4 643	103 781
Transport, storage & communication	897 359	1 543 763	978 548	1 111 760	503 415	274 353	805 449	384 936	341 824	512 350
Financial intermediation, real estate and business services	5 910 332	6 555 245	7 744 370	6 402 099	4 032 237	4 250 465	6 187 437	6 372 521	6 915 007	6 987 332
Community, social and personal services	371 723	428 328	439 625	638 452	461 877	471 053	698 091	642 595	443 860	376 631
Total	13 814 995	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344	13 527 182	14 506 774	15 111 319	14 368 963

Table C.51: Proportional business sector R&D expenditure by Standard Industrial Classification (2015/16 to 2024/25)

Standard Industrial Classification	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Agriculture, hunting, forestry and fishing	3.2	2.5	3.9	6.6	6.6	4.5	3.4	4.9	4.8	4.2
Mining and quarrying	7.2	6.9	12.1	6.4	6.4	9.2	6.6	9.1	10.5	6.6
Manufacturing	27.8	28.2	21.9	32.3	32.3	28.8	29.9	31.2	29.9	29.6
Manufacture of food products, beverages and tobacco products	2.2	2.9	3.4	4.2	4.2	2.7	1.8	1.8	1.7	1.5
Manufacture of textiles, clothing and leather goods	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
Manufacture of wood and products of wood and cork, except furniture; Manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Manufacture of publishing, printing and reproduction of recorded material	0.6	0.6	0.5	0.7	0.7	0.8	0.8	0.9	0.7	0.6
Manufacture of refined petroleum, coke and nuclear fuel; Manufacture of chemicals and chemical products (including pharmaceuticals); Manufacture of rubber and plastic products	11.5	10.7	5.6	10.9	10.9	10.9	12.6	12.0	10.6	11.2
Manufacture of non-metallic mineral products	0.3	0.2	0.3	0.2	0.2	0.4	0.2	0.6	0.1	0.1
Manufacture of basic metals, fabricated metal products, machinery and equipment; Manufacture of office, accounting and computing machinery	3.5	3.7	3.6	5.1	5.1	4.2	5.1	4.9	6.1	5.0
Manufacture of electrical machinery and apparatus	3.1	4.0	2.6	2.3	2.3	3.0	3.1	4.2	4.0	4.2
Manufacture of radio, television and communication equipment and apparatus; Manufacture of medical, precision and optical instruments, watches and clocks	4.3	3.9	3.4	5.0	5.0	5.6	4.1	5.1	5.0	5.8
Manufacture of transport equipment	2.2	2.0	2.2	3.6	3.6	1.0	1.7	1.2	1.5	1.0
Manufacture of furniture; Recycling; Manufacturing not elsewhere classified	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.4	0.0	0.0
Electricity, gas and water supply	3.7	4.0	4.9	7.1	7.1	7.1	3.0	2.6	2.8	3.1
Construction	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.6	1.0	0.9
Wholesale and retail	0.4	0.5	0.7	0.8	0.8	0.6	0.2	0.5	0.0	0.7
Transport, storage & communication	10.4	6.2	7.7	4.7	4.7	2.7	6.0	2.7	2.3	3.6
Financial intermediation, real estate and business services	44.3	48.8	44.3	37.7	37.7	42.3	45.7	43.9	45.8	48.6
Community, social and personal services	2.9	2.8	4.4	4.3	4.3	4.7	5.2	4.4	2.9	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.52: Business sector R&D personnel headcount and full-time equivalents by occupation (2015/16 to 2024/25)

Year	Headcount				Full-time equivalents (FTEs)			
	Total	Researchers	Technicians	Other R&D personnel	Total	Researchers	Technicians	Other R&D personnel
2015/16	17 245	6 128	6 090	5 027	12 457.8	4 626.8	4 227.4	3 603.6
2016/17	17 998	6 463	6 156	5 379	12 549.2	4 777.3	4 149.4	3 622.5
2017/18	17 554	7 142	5 655	4 757	12 952.9	5 481.7	3 807.5	3 663.8
2018/19	16 876	6 942	5 286	4 648	11 691.0	4 535.1	3 546.9	3 609.0
2019/20	12 748	4 641	4 989	3 118	9 300.8	3 227.8	3 486.8	2 586.3
2020/21	14 177	4 510	4 796	4 871	10 860.3	3 055.5	3 454.5	4 350.3
2021/22	15 094	4 370	5 347	5 377	12 054.6	2 927.7	4 435.4	4 691.6
2022/23	15 364	4 395	4 702	6 267	12 507.7	3 121.9	3 885.4	5 500.4
2023/24	15 386	4 334	4 620	6 432	12 442.5	3 080.6	3 746.8	5 615.2
2024/25	15 778	4 402	4 469	6 907	11 697.9	3 200.3	2 729.9	5 767.8

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.53: Business sector R&D personnel headcount and full-time equivalents by occupation and gender (2022/23 to 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
2022/23							
Researchers	4 395	2 749	1 646	3 121.9	1 829.6	1 292.3	71.0
Technicians directly supporting R&D	4 702	2 506	2 196	3 885.4	1 892.3	1 993.1	82.6
Other personnel directly supporting R&D	6 267	2 538	3 729	5 500.4	2 068.3	3 432.2	87.8
Total	15 364	7 793	7 571	12 507.7	5 790.2	6 717.6	81.4
2023/24							
Researchers	4 334	2 714	1 620	3 080.6	1 817.2	1 263.4	71.1
Technicians directly supporting R&D	4 620	2 431	2 189	3 746.8	1 768.1	1 978.7	81.1
Other personnel directly supporting R&D	6 432	2 660	3 772	5 615.2	2 156.7	3 458.4	87.3
Total	15 386	7 805	7 581	12 442.5	5 742.0	6 700.5	80.9
2024/25							
Researchers	4 402	2 814	1 588	3 200.3	1 950.6	1 249.7	72.7
Technicians directly supporting R&D	4 469	2 471	1 998	2 729.9	1 620.4	1 109.5	61.1
Other personnel directly supporting R&D	6 907	2 869	4 038	5 767.8	2 207.1	3 560.7	83.5
Total	15 778	8 154	7 624	11 697.9	5 778.1	5 919.8	74.1

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.54: Business sector R&D personnel headcount by occupation, qualification, population group and gender (2024/25)

Occupation and qualification	Total	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers	4 402	2 814	1 588	638	583	141	133	323	202	1 628	643	84	27
Doctoral degree or equivalent	460	266	194	64	38	21	18	22	30	135	98	24	10
Master's, honours, bachelor or equivalent	3 032	2 020	1 012	438	389	79	71	261	140	1 210	403	32	9
Diplomas	910	528	382	136	156	41	44	40	32	283	142	28	8
Technicians directly supporting R&D	4 469	2 471	1 998	970	784	243	165	166	158	1 033	838	59	53
Doctoral degree or equivalent	116	57	59	12	17	0	6	10	7	23	20	12	9
Master's, honours, bachelor or equivalent	1 792	940	852	300	287	72	53	70	73	465	409	33	30
Diplomas	2 561	1 474	1 087	658	480	171	106	86	78	545	409	14	14
Other personnel directly supporting R&D	6 907	2 869	4 038	1 807	3 186	247	212	164	101	611	481	40	58
Doctoral degree or equivalent	73	43	30	9	1	1	1	0	3	28	17	5	8
Master's, honours, bachelor or equivalent	1 306	755	551	311	263	48	34	98	56	290	185	8	13
Diplomas	5 528	2 071	3 457	1 487	2 922	198	177	66	42	293	279	27	37
Total	15 778	8 154	7 624	3 415	4 553	631	510	653	461	3 272	1 962	183	138

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.55: Foreign and local business sector partners engaged in collaborative R&D, and total R&D collaboration expenditure (2022/23 to 2024/25)

Collaboration partners	2022/23		2023/24		2024/25	
	Within South Africa	Outside South Africa	Within South Africa	Outside South Africa	Within South Africa	Outside South Africa
Government research institutes	22	7	24	8	19	5
Higher education institutions	84	22	77	20	70	19
Members of own company	43	21	36	19	34	16
Not-for-profit organisations	12	5	10	5	9	6
Other companies	80	31	79	27	70	22
Science councils	54	11	48	11	42	9
Total number of R&D collaborations	295	97	274	90	244	77
R&D Expenditure	R'000	R'000	R'000	R'000	R'000	R'000
Total in-house plus outsourced R&D collaboration expenditure (excl. VAT)	N/A	N/A	N/A	N/A	N/A	N/A

Note: Collaborative R&D entails partnerships, alliances and collaborations.

Business sector: State-owned enterprises

Table C.56: Business sector: SOEs – Number, R&D expenditure, and R&D expenditure as a proportion of BERD (2015/16 to 2024/25)

Year	Number of R&D performers	R&D expenditure	Proportion of BERD
		R'000	%
2015/16	18	1 973 416	14.3
2016/17	16	2 621 883	17.7
2017/18	16	2 536 374	16.0
2018/19	16	2 492 520	17.3
2019/20	16	2 053 331	19.2
2020/21	15	1 659 038	14.2
2021/22	15	2 079 682	15.4
2022/23	15	1 230 797	8.5
2023/24	15	1 155 523	7.6
2024/25	16	1 364 460	9.5

Table C.57: Business sector: SOEs – R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Basic research	65 556	110 249	140 989	153 137	132 998	87 580	665 416	105 586	116 415	141 561
Applied research	860 904	1 588 222	1 886 756	1 970 733	1 406 439	1 312 496	1 108 746	799 138	722 048	833 715
Experimental development research	1 046 956	923 413	508 629	368 650	513 895	258 961	305 520	326 073	317 061	389 183
Total	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

Table C.58: Business sector: SOEs – Proportional R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Basic research	3.3	4.2	5.6	6.1	6.5	5.3	32.0	8.6	10.1	10.4
Applied research	43.6	60.6	74.4	79.1	68.5	79.1	53.3	64.9	62.5	61.1
Experimental development research	53.1	35.2	20.1	14.8	25.0	15.6	14.7	26.5	27.4	28.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.59: Business sector: SOEs – R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Capital expenditure	122 272	726 071	702 156	768 912	368 628	131 658	809 848	130 051	158 392	211 643
Land: Buildings & other structures	31 884	183 145	173 025	193 483	204 147	30 276	157 238	21 705	20 927	21 472
Total: Vehicles, plant, machinery, equipment and software	90 388	542 926	529 131	575 429	164 481	101 382	652 610	108 346	137 465	190 171
Vehicles, plant, machinery, equipment	90 388	542 926	529 131	575 429	164 331	100 716	527 075	98 985	105 645	143 363
Capitalised computer software*	N/A	N/A	N/A	N/A	150	666	125 535	9 361	31 820	46 808
Current expenditure	1 851 145	1 895 812	1 834 218	1 723 607	1 684 703	1 527 380	1 269 834	1 100 746	997 131	1 152 817
Labour costs	976 713	1 040 703	968 562	892 376	842 680	721 809	773 881	719 992	676 444	747 182
Other current expenditure	874 432	855 109	865 656	831 231	842 023	805 571	495 953	380 754	320 687	405 635
Total	1 973 417	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.60: Business sector: SOEs – Proportional R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Capital expenditure	6.2	27.7	27.7	30.8	18.0	7.9	38.9	10.6	13.7	15.5
Land: Buildings & other structures	1.6	7.0	6.8	7.8	9.9	1.8	7.6	1.8	1.8	1.6
Total: Vehicles, plant, machinery, equipment and software	4.6	20.7	20.9	23.1	8.0	6.1	31.4	8.8	11.9	13.9
Vehicles, plant, machinery, equipment	4.6	20.7	20.9	23.1	8.0	6.1	25.3	8.0	9.1	10.5
Capitalised computer software*	N/A	N/A	N/A	N/A	0.0	0.0	6.0	0.8	2.8	3.4
Current expenditure	93.8	72.3	72.3	69.2	82.0	92.1	61.1	89.4	86.3	84.5
Labour costs	49.5	39.7	38.2	35.8	41.0	43.5	37.2	58.5	58.5	54.8
Other current expenditure	44.3	32.6	34.1	33.3	41.0	48.6	23.8	30.9	27.8	29.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.61: Business sector: SOEs – R&D expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Biotechnology	12 278	16 457	18 514	8 116	9 352	9 705	8 636	23 787	32 363	9 849
Nanotechnology	144	0	0	0	369	384	422	820	3 883	0
Total	12 422	16 457	18 514	8 116	9 721	10 089	9 058	24 607	36 246	9 849
Business expenditure on R&D	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

Table C.62: Business sector: SOEs – Proportional expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biotechnology	0.6	0.6	0.7	0.3	0.5	0.6	0.4	1.9	2.8	0.7
Nanotechnology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0
Total	0.6	0.6	0.7	0.3	0.5	0.6	0.4	2.0	3.1	0.7

Table C.63: Business sector: SOEs – R&D expenditure on select areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Environment-related	30 864	136 523	150 811	171 166	187 339	152 349	383 861	106 322	108 183	257 460
Open-source software	50 589	0	0	0	19 769	1 894	142 591	4 146	6 691	7 706
New materials	64 021	15 353	21 144	23 841	32 115	30 962	24 070	26 341	27 296	27 039
TB, HIV/AIDS, malaria	0	0	0	0	943	496	756	375	392	342
Space science*	N/A	32 571	33 063	34 998	9 462	947	427 774	29 020	20 074	23 117
Total	145 474	184 446	205 018	230 005	249 628	186 648	979 052	166 204	162 636	315 664
Business expenditure on R&D	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

* Space science data only collected from 2016/17 onwards.

Table C.64: Business sector: SOEs – Proportional R&D expenditure on selective areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Environment-related	1.6	5.2	5.9	6.9	9.1	9.2	18.5	8.6	9.4	18.9
Open-source software	2.6	0.0	0.0	0.0	1.0	0.1	6.9	0.3	0.6	0.6
New materials	3.2	0.6	0.8	1.0	1.6	1.9	1.2	2.1	2.4	2.0
TB, HIV/AIDS, malaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space science*	N/A	1.2	1.3	1.4	0.5	0.1	20.6	2.4	1.7	1.7
Total	7.4	7.0	8.1	9.2	12.2	11.3	47.1	13.5	14.1	23.1

* Space science data only collected from 2016/17 onwards.

Table C.65: Business sector: SOEs – R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	1 963 821	2 524 169	2 437 185	2 387 524	2 043 870	1 658 091	2 044 035	1 228 724	1 153 850	1 362 533
Mathematical sciences	87 387	85 055	134 335	142 171	143 412	143 414	175 702	152 660	117 458	159 689
Physical sciences	32 100	42 210	81 896	86 032	83 931	106 613	73 080	142 356	63 797	57 035
Chemical sciences	64 230	68 251	55 705	50 406	56 752	58 973	70 702	132 447	124 687	137 972
Earth sciences	12 254	17 750	17 522	9 297	27 651	26 227	23 975	4 351	21 120	32 867
Information, computer and communication technologies	541 009	935 325	483 015	511 409	219 824	142 888	650 766	60 385	42 252	64 889
Applied sciences and technologies	133 687	277 702	446 635	363 768	274 949	124 361	260 083	140 466	273 773	298 172
Engineering sciences	981 683	971 414	1 059 843	1 040 397	924 156	877 692	537 373	279 822	266 301	322 413
Biological sciences	33 874	13 112	12 338	26 520	27 002	24 903	23 852	40 293	30 706	23 200
Agricultural sciences	12 665	9 079	9 282	5 857	16 669	12 927	10 497	33 188	5 100	19 670
Medical and health sciences	36 548	23 990	76 571	80 711	153 719	81 265	26 028	29 287	44 044	19 265
Environmental sciences	16 310	47 674	51 225	58 605	67 425	40 162	169 783	181 267	140 060	182 573
Material sciences	12 073	32 605	8 818	12 352	48 380	18 666	22 195	32 202	24 554	44 787
Marine sciences	0	0	0	0	0	0	0	0	0	0
Division 2: Social sciences and humanities	9 595.11	97 714.26	99 188.85	104 995	9 462	947	35 648	2 073	1 673	1 926
Social sciences	9 595	97 714	99 189	104 995	9 462	947	35 648	2 073	1 673	1 926
Humanities	0	0	0	0	0	0	0	0	0	0
Total	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

Table C.66: Business sector: SOEs – Proportional R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	99.5	96.3	96.1	95.8	99.5	99.9	98.3	99.8	99.9	99.9
Mathematical sciences	4.4	3.2	5.3	5.7	7.0	8.6	8.4	12.4	10.2	11.7
Physical sciences	1.6	1.6	3.2	3.5	4.1	6.4	3.5	11.6	5.5	4.2
Chemical sciences	3.3	2.6	2.2	2.0	2.8	3.6	3.4	10.8	10.8	10.1
Earth sciences	0.6	0.7	0.7	0.4	1.3	1.6	1.2	0.4	1.8	2.4
Information, computer and communication technologies	27.4	35.7	19.0	20.5	10.7	8.6	31.3	4.9	3.7	4.8
Applied sciences and technologies	6.8	10.6	17.6	14.6	13.4	7.5	12.5	11.4	23.7	21.9
Engineering sciences	49.7	37.1	41.8	41.7	45.0	52.9	25.8	22.7	23.0	23.6

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biological sciences	1.7	0.5	0.5	1.1	1.3	1.5	1.1	3.3	2.7	1.7
Agricultural sciences	0.6	0.3	0.4	0.2	0.8	0.8	0.5	2.7	0.4	1.4
Medical and health sciences	1.9	0.9	3.0	3.2	7.5	4.9	1.3	2.4	3.8	1.4
Environmental sciences	0.8	1.8	2.0	2.4	3.3	2.4	8.2	14.7	12.1	13.4
Material sciences	0.6	1.2	0.3	0.5	2.4	1.1	1.1	2.6	2.1	3.3
Marine sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Division 2: Social sciences and humanities	0.5	3.7	3.9	4.2	0.5	0.1	1.7	0.2	0.1	0.1
Social sciences	0.5	3.7	3.9	4.2	0.5	0.1	1.7	0.2	0.1	0.1
Humanities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.67: Business sector: SOEs – R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	399 183	304 302	676 595	497 808	524 278	398 046	410 108	371 536	285 502	333 428
Defence	399 183	304 302	676 595	497 808	524 278	398 046	410 108	371 536	285 502	333 428
Division 2: Economic development	1 360 120	1 901 235	1 424 957	1 522 995	1 257 352	1 075 905	1 526 222	679 625	709 361	868 460
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	10 203	8 610	8 610	9 287	10 302	9 241	9 835	11 473	11 900	12 663
Animal production and animal primary products	0	0	0	0	0	0	0	0	0	0
Mineral resources (excluding Energy)	7 743	8 500	8 818	9 236	0	0	0	6 008	0	0
Energy resources	27 874	30 602	12 479	13 070	71 813	54 254	126 681	21 911	26 804	97 231
Energy supply	316 868	410 091	516 908	546 952	614 824	584 239	543 753	401 193	426 145	516 424
Manufacturing	103 757	110 104	112 307	114 695	103 465	95 463	307 542	109 100	121 826	97 680
Construction	0	0	0	0	0	0	0	0	0	0
Transport	253 742	333 284	335 410	357 608	222 975	177 757	182 152	80 957	85 649	85 404
Information and communication services	609 251	873 600	302 316	319 210	72 508	15 498	335 899	28 220	16 161	37 225
Commercial services	16 235	16 878	18 002	19 049	16 898	640	703	820	850	905
Economic framework	14 447	109 566	110 107	115 191	120 014	118 203	0	0	0	0
Natural resources	0	0	0	18 697	24 554	20 611	19 657	19 945	20 027	20 928
Division 3: Society	54 784	51 876	70 963	87 496	188 813	109 720	76 869	44 154	69 242	58 579
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	19 804	25 631	39 533	54 213	150 830	75 259	57 930	32 821	65 046	57 675

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Education and training	14 447	0	0	0	0	0	0	0	3 346	0
Social development and community services	20 533	26 246	31 431	33 282	37 984	34 461	18 939	11 333	850	905
Division 4: Environment	56 760	86 865	94 694	100 236	82 888	75 367	66 483	135 482	81 382	103 992
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	33 494	28 662	30 816	32 619	39 060	34 101	30 487	54 742	44 743	46 749
Environmental aspects of development	2 741	32 571	33 063	34 998	0	0	10 763	49 200	11 575	9 421
Environmental and other aspects	20 525	25 631	30 816	32 619	43 828	41 265	25 234	31 540	25 064	47 822
Division 5: Advancement of knowledge	102 570	277 605	269 165	283 984	0	0	0	0	10 037	0
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	99 448	277 605	269 165	283 984	0	0	0	0	10 037	0
Social sciences and humanities	3 122	0	0	0	0	0	0	0	0	0
Total	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

Table C.68: Business sector: SOEs – Proportional R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	20.2	11.6	26.7	20.0	25.5	24.0	19.7	30.2	24.7	24.4
Defence	20.2	11.6	26.7	20.0	25.5	24.0	19.7	30.2	24.7	24.4
Division 2: Economic development	68.9	72.5	56.2	61.1	61.2	64.9	73.4	55.2	61.4	63.6
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	0.5	0.3	0.3	0.4	0.5	0.6	0.5	0.9	1.0	0.9
Animal production and animal primary products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mineral resources (excluding Energy)	0.4	0.3	0.3	0.4	0.0	0.0	0.0	0.5	0.0	0.0
Energy resources	1.4	1.2	0.5	0.5	3.5	3.3	6.1	1.8	2.3	7.1
Energy supply	16.1	15.6	20.4	21.9	29.9	35.2	26.1	32.6	36.9	37.8
Manufacturing	5.3	4.2	4.4	4.6	5.0	5.8	14.8	8.9	10.5	7.2
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transport	12.9	12.7	13.2	14.3	10.9	10.7	8.8	6.6	7.4	6.3

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Information and communication services	30.9	33.3	11.9	12.8	3.5	0.9	16.2	2.3	1.4	2.7
Commercial services	0.8	0.6	0.7	0.8	0.8	0.0	0.0	0.1	0.1	0.1
Economic framework	0.7	4.2	4.3	4.6	5.8	7.1	0.0	0.0	0.0	0.0
Natural resources	0.0	0.0	0.0	0.8	1.2	1.2	0.9	1.6	1.7	1.5
Division 3: Society	2.8	2.0	2.8	3.5	9.2	6.6	3.7	3.6	6.0	4.3
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	1.0	1.0	1.6	2.2	7.3	4.5	2.8	2.7	5.6	4.2
Education and training	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Social development and community services	1.0	1.0	1.2	1.3	1.8	2.1	0.9	0.9	0.1	0.1
Division 4: Environment	2.9	3.3	3.7	4.0	4.0	4.5	3.2	11.0	7.0	7.6
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	1.7	1.1	1.2	1.3	1.9	2.1	1.5	4.4	3.9	3.4
Environmental aspects of development	0.1	1.2	1.3	1.4	0.0	0.0	0.5	4.0	1.0	0.7
Environmental and other aspects	1.0	1.0	1.2	1.3	2.1	2.5	1.2	2.6	2.2	3.5
Division 5: Advancement of knowledge	5.2	10.6	10.6	11.4	0.0	0.0	0.0	0.0	0.9	0.0
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	5.0	10.6	10.6	11.4	0.0	0.0	0.0	0.0	0.9	0.0
Social sciences and humanities	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.69: Business sector: SOEs – R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Eastern Cape	10 854	45 081	52 404	50 850	27 532	18 658	18 057	2 176	2 176	1 926
Free State	10 854	42 824	45 798	48 477	34 521	17 170	89 353	8 394	7 194	1 926
Gauteng	1 558 538	1 937 851	1 682 598	1 715 224	1 306 669	1 037 875	1 342 306	875 847	829 057	1 065 684
KwaZulu-Natal	86 565	188 606	197 355	242 371	222 198	219 340	113 762	42 764	42 930	35 785
Limpopo	3 019	615	1 024	1 094	2 619	2 613	22 228	2 995	3 026	905
Mpumalanga	13 222	9 594	9 594	10 348	19 056	10 931	93 017	21 178	20 454	14 110
North West	170 118	180 261	214 709	189 393	245 578	175 388	157 993	152 366	158 827	136 633
Northern Cape	2 397	0	409	431	11 465	2 919	82 058	6 321	5 521	11 559
Western Cape	117 850	217 052	332 484	234 330	183 695	174 142	160 908	118 756	86 339	95 931
Total	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

Table C.70: Business sector: SOEs – Proportional R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Eastern Cape	0.5	1.7	2.1	2.0	1.3	1.1	0.9	0.2	0.2	0.1
Free State	0.5	1.6	1.8	1.9	1.7	1.0	4.3	0.7	0.6	0.1
Gauteng	79.0	73.9	66.3	68.8	63.6	62.6	64.5	71.2	71.7	78.1
KwaZulu-Natal	4.4	7.2	7.8	9.7	10.8	13.2	5.5	3.5	3.7	2.6
Limpopo	0.2	0.0	0.0	0.0	0.1	0.2	1.1	0.2	0.3	0.1
Mpumalanga	0.7	0.4	0.4	0.4	0.9	0.7	4.5	1.7	1.8	1.0
North West	8.6	6.9	8.5	7.6	12.0	10.6	7.6	12.4	13.7	10.0
Northern Cape	0.1	0.0	0.0	0.0	0.6	0.2	3.9	0.5	0.5	0.8
Western Cape	6.0	8.3	13.1	9.4	8.9	10.5	7.7	9.6	7.5	7.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.71: Business sector: SOEs – R&D expenditure by Standard Industrial Classification (2015/16 to 2024/25)

Standard Industrial Classification	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Agriculture, hunting, forestry and fishing	18 646	20 052	20 390	21 702	24 242	25 263	11 875	48 757	1 700	19 613
Mining and quarrying	0	0	0	0	0	0	0	0	0	0
Manufacturing	370 407	161 096	461 776	270 718	284 344	157 561	271 556	189 538	437 471	418 157
Manufacture of food products, beverages and tobacco products	0	0	0	0	0	0	0	0	0	0
Manufacture of textiles, clothing and leather goods	0	0	0	0	0	0	0	0	0	0
Manufacture of wood and products of wood and cork, except furniture; Manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Manufacture of publishing, printing and reproduction of recorded material	1 458	1 230	1 230	1 327	1 230	1 280	12 645	14 751	15 300	16 281
Manufacture of refined petroleum, coke and nuclear fuel; Manufacture of chemicals and chemical products (including pharmaceuticals); Manufacture of rubber and plastic products	8 616	14 489	24 007	14 343	14 950	15 185	13 274	13 523	44 590	12 598
Manufacture of non-metallic mineral products	0	0	0	0	0	0	0	0	0	0
Manufacture of basic metals, fabricated metal products, machinery and equipment; Manufacture of office, accounting and computing machinery	297 289	75 855	146 953	74 588	212 512	86 276	98 338	53 855	264 304	307 906
Manufacture of electrical machinery and apparatus	20 430	21 690	242 822	127 036	0	0	0	0	0	0
Manufacture of radio, television and communication equipment and apparatus; Manufacture of medical, precision and optical instruments, watches and clocks	0	0	0	0	0	0	25 444	9 722	10 253	0
Manufacture of transport equipment	42 614	47 833	46 764	53 425	55 652	54 820	121 855	97 687	103 024	81 372
Manufacture of furniture; Recycling; Manufacturing not elsewhere classified	0	0	0	0	0	0	0	0	0	0

Standard Industrial Classification	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Electricity, gas and water supply	424 561	531 606	633 700	698 810	725 835	697 653	406 475	376 574	408 329	432 804
Construction	0	0	0	0	0	0	0	0	0	0
Wholesale and retail	0	0	0	0	0	0	0	0	0	0
Transport, storage & communication	826 532	1 516 160	952 348	1 004 572	396 000	260 144	576 953	84 638	15 163	85 363
Financial intermediation, real estate and business services	196 661	174 576	176 127	184 533	288 975	201 458	426 482	206 139	220 237	328 911
Community, social and personal services	136 609	218 393	292 033	312 183	333 936	316 958	386 342	325 151	72 624	79 612
Total	1 973 416	2 621 883	2 536 374	2 492 520	2 053 331	1 659 038	2 079 682	1 230 797	1 155 523	1 364 460

Table C.72: Business sector: SOEs – Proportional R&D expenditure by Standard Industrial Classification (2015/16 to 2024/25)

Standard Industrial Classification	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Agriculture, hunting, forestry and fishing	0.9	0.8	0.8	0.9	1.2	1.5	0.6	4.0	0.1	1.4
Mining and quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	18.8	6.1	18.2	10.9	13.8	9.5	13.1	15.4	37.9	30.6
Manufacture of food products, beverages and tobacco products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufacture of textiles, clothing and leather goods	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Manufacture of wood and products of wood and cork, except furniture; Manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Manufacture of publishing, printing and reproduction of recorded material	0.1	0.0	0.0	0.1	0.7	0.1	0.6	1.2	1.3	1.2
Manufacture of refined petroleum, coke and nuclear fuel; Manufacture of chemicals and chemical products (including pharmaceuticals); Manufacture of rubber and plastic products	0.4	0.6	0.9	0.6	0.0	0.9	0.6	1.1	3.9	0.9
Manufacture of non-metallic mineral products	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0
Manufacture of basic metals, fabricated metal products, machinery and equipment; Manufacture of office, accounting and computing machinery	15.1	2.9	5.8	3.0	0.0	5.2	4.7	4.4	22.9	22.6
Manufacture of electrical machinery and apparatus	1.0	0.8	9.6	5.1	0.0	0.0	0.0	0.0	0.0	0.0
Manufacture of radio, television and communication equipment and apparatus; Manufacture of medical, precision and optical instruments, watches and clocks	0.0	0.0	0.0	0.0	2.7	0.0	1.2	0.8	0.9	0.0
Manufacture of transport equipment	2.2	1.8	1.8	2.1	0.0	3.3	5.9	7.9	8.9	6.0
Manufacture of furniture; Recycling; Manufacturing not elsewhere classified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Standard Industrial Classification	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Electricity, gas and water supply	21.5	20.3	25.0	28.0	35.3	42.1	19.5	30.6	35.3	31.7
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale and retail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transport, storage & communication	41.9	57.8	37.5	40.3	19.3	15.7	27.7	6.9	1.3	6.3
Financial intermediation, real estate and business services	10.0	6.7	6.9	7.4	14.1	12.1	20.5	16.7	19.1	24.1
Community, social and personal services	6.9	8.3	11.5	12.5	16.3	19.1	18.6	26.4	6.3	5.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.73: Business sector: SOEs – R&D personnel headcount and full-time equivalents by occupation (2015/16 to 2024/25)

Year	Headcount				Full-time equivalents (FTEs)			
	Total	Researchers	Technicians	Other R&D personnel	Total	Researchers	Technicians	Other R&D personnel
2015/16	2 476	959	1 163	354	1 150.1	477.7	587.9	84.5
2016/17	2 983	1 113	1 437	433	1 213.8	415.2	688.2	110.4
2017/18	2 853	1 509	1 021	323	1 182.5	668.6	394.4	119.6
2018/19	2 738	1 445	992	301	984.3	555.0	316.9	112.5
2019/20	2 327	1 146	864	317	932.8	472.3	322.5	138.0
2020/21	2 279	1 082	878	319	771.7	374.7	270.0	127.0
2021/22	1 797	857	690	250	718.0	318.2	274.0	125.8
2022/23	1 437	686	533	218	616.1	309.0	211.6	95.6
2023/24	1 418	666	528	224	627.3	307.3	216.7	103.3
2024/25	1 480	663	566	251	724.9	326.5	267.6	130.8

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.74: Business sector: SOEs – R&D personnel headcount and full-time equivalents by occupation and gender (2022/23 to 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
2022/23							
Researchers	686	522	164	309.0	209.5	99.6	45.0
Technicians directly supporting R&D	533	388	145	211.6	145.9	65.7	30.8
Other personnel directly supporting R&D	218	85	133	95.6	29.4	66.2	43.8
Total	1 437	995	442	616.1	384.7	231.5	42.9
2023/24							
Researchers	666	511	155	307.3	213.6	93.7	46.1
Technicians directly supporting R&D	528	391	137	216.7	149.9	66.8	41.0
Other personnel directly supporting R&D	224	85	139	103.3	29.6	73.7	46.1
Total	1 418	987	431	627.3	393.1	234.2	44.2
2024/25							
Researchers	663	504	159	326.5	227.4	99.1	49.2
Technicians directly supporting R&D	566	425	141	267.6	187.6	80.0	47.3
Other personnel directly supporting R&D	251	108	143	130.8	52.9	78.0	52.1
Total	1 480	1 037	443	724.9	467.9	257.1	49.0

Table C.75: Business sector: SOEs – R&D personnel headcount by occupation, qualification, population group and gender (2024/25)

Occupation and qualification	Total	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers	663	504	159	158	90	26	6	54	19	254	42	12	2
Doctoral degree or equivalent	84	56	28	20	13	4	1	8	7	16	5	8	2
Master's, honours, bachelor or equivalent	499	388	111	123	63	17	5	42	11	202	32	4	0
Diplomas	80	60	20	15	14	5	0	4	1	36	5	0	0
Technicians directly supporting R&D	566	425	141	187	71	39	20	23	9	176	41	0	0
Doctoral degree or equivalent	23	15	8	5	5	0	3	4	0	6	0	0	0
Master's, honours, bachelor or equivalent	142	110	32	51	12	12	2	11	8	36	10	0	0
Diplomas	401	300	101	131	54	27	15	8	1	134	31	0	0
Other personnel directly supporting R&D	251	108	143	51	91	7	12	8	1	42	39	0	0
Doctoral degree or equivalent	6	6	0	4	0	0	0	0	0	2	0	0	0
Master's, honours, bachelor or equivalent	67	30	37	16	25	0	6	6	0	8	6	0	0
Diplomas	178	72	106	31	66	7	6	2	1	32	33	0	0
Total	1 480	1 037	443	396	252	72	38	85	29	472	122	12	2

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.76: Business sector: SOEs – Foreign and local business sector partners engaged in collaborative R&D, and total R&D collaboration expenditure (2022/23 to 2024/25)

Collaboration partners	2022/23		2023/24		2024/25	
	Within South Africa	Outside South Africa	Within South Africa	Outside South Africa	Within South Africa	Outside South Africa
Government research institutes	6	2	6	2	4	1
Higher education institutions	9	3	9	3	10	3
Members of own company	4	2	4	2	3	0
Not-for-profit organisations	3	0	3	0	1	0
Other companies	5	0	5	0	6	0
Science councils	9	2	9	2	9	2
Total number of R&D collaborations	36	9	36	9	33	6
R&D Expenditure	R'000	R'000	R'000	R'000	R'000	R'000
Total in-house plus outsourced R&D collaboration expenditure (excl. VAT)	N/A	N/A	N/A	N/A	N/A	N/A

Note: Collaborative R&D entails partnerships, alliances and collaborations.

C.2.2. Not-for-profit sector

Table C.77: Not-for-profit sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Basic research	200 040	232 304	280 032	291 509	349 219	381 683	407 280	444 288	439 284	441 586
Applied research	508 738	558 059	661 575	841 861	779 943	805 222	872 076	1 030 519	1 029 908	1 294 035
Experimental development research	182 365	227 254	274 703	352 334	380 353	381 402	320 201	295 346	288 409	339 831
Total	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

Table C.78: Proportional not-for-profit sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Basic research	22.4	22.8	23.0	19.6	23.1	24.3	25.5	25.1	25.0	21.3
Applied research	57.1	54.8	54.4	56.7	51.7	51.3	54.5	58.2	58.6	62.3
Experimental development research	20.5	22.3	22.6	23.7	25.2	24.3	20.0	16.7	16.4	16.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.79: Not-for-profit sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Capital expenditure	53 800	91 083	75 522	103 851	57 865	65 031	80 526	91 063	156 128	89 749
Land: Buildings & other structures	18 391	20 765	23 962	41 676	15 201	17 132	24 650	39 844	41 689	20 769
Total: Vehicles, plant, machinery, equipment and software	35 409	70 318	51 560	62 175	42 664	47 899	55 876	51 219	114 439	68 980
Vehicles, plant, machinery, equipment	35 409	70 318	51 560	62 175	38 076	39 173	48 528	44 602	108 228	62 754
Capitalised computer software*	N/A	N/A	N/A	N/A	4 588	8 726	7 348	6 617	6 211	6 226
Current expenditure	837 342	926 534	1 140 787	1 381 853	1 451 650	1 503 276	1 519 030	1 679 090	1 601 472	1 985 703
Labour costs	468 883	506 181	634 168	648 726	681 740	742 825	767 849	827 265	772 947	907 816
Other current expenditure	368 459	420 353	506 620	733 127	769 910	760 451	751 182	851 826	828 525	1 077 887
Total	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.80: Proportional not-for-profit sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Capital expenditure	6.0	9.0	6.2	7.0	3.8	4.1	5.0	5.1	8.9	4.3
Land: Buildings & other structures	2.1	2.0	2.0	2.8	1.0	1.1	1.5	2.3	2.4	1.0
Total: Vehicles, plant, machinery, equipment and software	4.0	6.9	4.2	4.2	2.8	3.1	3.5	2.9	6.5	3.3
Vehicles, plant, machinery, equipment	4.0	6.9	4.2	4.2	2.5	2.5	3.0	2.5	6.2	3.0
Capitalised computer software*	N/A	N/A	N/A	N/A	0.0	1.0	0.0	0.4	0.4	0.3
Current expenditure	94.0	91.0	93.8	93.0	96.2	95.9	95.0	94.9	91.1	95.7
Labour costs	52.6	49.7	52.1	43.7	45.2	47.4	48.0	46.7	44.0	43.7
Other current expenditure	41.3	41.3	41.7	49.3	51.0	48.5	47.0	48.1	47.1	51.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.81: Not-for-profit sector expenditure on multidisciplinary R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Biotechnology	159 045	123 879	160 846	261 324	339 841	305 702	401 968	415 476	303 344	276 121
Nanotechnology	81 103	841	543	569	0	0	0	0	0	0
Total	240 148	124 720	161 389	261 892	339 841	305 702	401 968	415 476	303 344	276 121
NPO expenditure on R&D	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

Table C.82: Proportional not-for-profit sector expenditure on multidisciplinary R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biotechnology	17.8	12.2	13.2	17.6	22.5	19.5	25.1	23.5	17.3	13.3
Nanotechnology	9.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	26.9	12.3	13.3	17.6	22.5	19.5	25.1	23.5	17.3	13.3

Table C.83: Not-for-profit sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Environment-related	52 156	54 904	56 218	70 733	85 245	148 730	121 822	135 518	133 010	136 954
Open-source software	756	824	952	930	1 335	3 065	4 963	3 828	3 946	4 195
New materials	79 322	223	1 814	0	20 594	27 149	25 925	27 581	36 035	32 806
TB, HIV/AIDS, malaria	482 298	689 315	876 132	1 118 507	1 147 804	1 142 974	1 174 877	1 117 917	935 441	1 404 526
Space science*	N/A	0	0	0	0	0	0	0	0	0
Total	614 532	745 265	935 117	1 190 170	1 254 979	1 321 918	1 327 587	1 284 845	1 108 431	1 578 482
NPO expenditure on R&D	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

* Space science data only collected from 2016/17 onwards.

Table C.84: Proportional not-for-profit sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Environment-related	5.9	5.4	4.6	4.8	5.6	9.9	7.6	7.7	7.6	6.6
Open-source software	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2
New materials	8.9	0.0	0.1	0.0	1.4	1.8	1.6	1.6	2.1	1.6
TB, HIV/AIDS, malaria	54.1	67.7	72.0	75.3	76.0	75.7	73.5	63.2	53.2	67.7
Space science*	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	69.0	73.2	76.9	80.1	83.1	87.6	83.0	72.6	63.1	76.1

* Space science data only collected from 2016/17 onwards.

Table C.85: Not-for-profit sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	766 355	909 337	1 096 247	1 374 844	1 402 157	1 451 797	1 469 338	1 652 073	1 647 160	1 961 223
Mathematical sciences	14 293	13 540	14 797	16 009	16 684	14 497	45 199	50 218	61 015	58 934
Physical sciences	1 191	1 300	1 504	1 551	1 616	1 284	1 429	547	0	0
Chemical sciences	0	0	0	0	0	0	0	0	0	0
Earth sciences	8 356	8 727	8 008	8 594	7 532	9 157	9 399	13 070	8 376	6 914
Information, computer and communication technologies	528	0	1 925	0	365	2 350	2 804	6 345	5 512	17 966
Applied sciences and technologies	30 565	29 946	29 379	30 941	31 097	32 863	36 228	50 847	50 852	46 774
Engineering sciences	4 005	3 393	1 572	1 645	1 746	30	554	1 264	49	454
Biological sciences	11 400	42 787	44 312	62 027	64 866	67 468	68 638	66 308	70 281	65 096

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Agricultural sciences	60 727	62 269	63 037	52 807	52 884	56 448	61 799	69 538	70 533	87 768
Medical and health sciences	614 889	719 902	905 867	1 174 074	1 200 011	1 244 118	1 201 431	1 335 336	1 328 107	1 614 733
Environmental sciences	19 552	25 746	24 150	25 335	23 586	21 949	40 560	52 985	48 241	45 277
Material sciences	0	0	0	0	0	0	0	3 978	4 196	17 072
Marine sciences	848	1 725	1 697	1 860	1 770	1 634	1 296	1 636	0	235
Division 2: Social sciences and humanities	124 787	108 280	120 063	110 860	107 358	116 510	130 219	118 080	110 440	114 230
Social sciences	117 549	98 355	109 068	99 304	87 132	94 871	104 766	100 578	109 415	113 159
Humanities	7 238	9 925	10 995	11 556	20 226	21 639	25 452	17 502	1 025	1 070
Total	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

Table C.86: Proportional not-for-profit sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	86.0	89.4	90.1	92.5	92.9	92.6	91.9	93.3	93.7	94.5
Mathematical sciences	1.6	1.3	1.2	1.1	1.1	0.9	2.8	2.8	3.5	2.8
Physical sciences	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Chemical sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Earth sciences	0.9	0.9	0.7	0.6	0.5	0.6	0.6	0.7	0.5	0.3
Information, computer and communication technologies	0.1	0.0	0.2	0.0	0.0	0.1	0.2	0.4	0.3	0.9
Applied sciences and technologies	3.4	2.9	2.4	2.1	2.1	2.1	2.3	2.9	2.9	2.3
Engineering sciences	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0
Biological sciences	1.3	4.2	3.6	4.2	4.3	4.3	4.3	3.7	4.0	3.1
Agricultural sciences	6.8	6.1	5.2	3.6	3.5	3.6	3.9	3.9	4.0	4.2
Medical and health sciences	69.0	70.7	74.5	79.0	79.5	79.3	75.1	75.4	75.6	77.8
Environmental sciences	2.2	2.5	2.0	1.7	1.6	1.4	2.5	3.0	2.7	2.2
Material sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.8
Marine sciences	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Division 2: Social sciences and humanities	14.0	10.6	9.9	7.5	7.1	7.4	8.1	6.7	6.3	5.5
Social sciences	13.2	9.7	9.0	6.7	5.8	6.0	6.5	5.7	6.2	5.5
Humanities	0.8	1.0	0.9	0.8	1.3	1.4	1.6	1.0	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.87: Not-for-profit sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	0	0	0	0	0	0	0	0	0	0
Defence	0	0	0	0	0	0	0	0	0	0
Division 2: Economic development	157 608	129 359	118 415	103 702	92 455	108 865	119 692	134 055	139 513	149 313
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	32 936	35 240	35 197	26 579	23 124	22 599	22 735	21 457	23 630	29 083
Animal production and animal primary products	7 628	9 856	2 635	2 858	2 378	3 084	4 252	3 652	1 427	1 488
Mineral resources (excluding Energy)	7 955	7 708	0	0	0	0	0	0	0	0
Energy resources	4 008	3 278	4 022	4 875	4 508	5 307	8 184	8 422	2 328	2 836
Energy supply	6 242	10 628	7 994	8 852	7 102	8 177	11 197	16 380	14 712	13 749
Manufacturing	31 646	230	0	308	321	316	352	359	0	0
Construction	0	0	0	0	0	0	0	0	243	254
Transport	0	0	0	0	0	0	0	0	0	0
Information and communication services	2 411	327	2 513	0	365	0	1 854	1 218	1 191	894
Commercial services	1 135	1 962	1 675	0	0	0	522	0	5 686	3 823
Economic framework	53 406	47 465	57 125	53 099	47 407	52 747	57 058	70 385	77 454	73 454
Natural resources	10 242	12 665	7 253	7 131	7 251	16 635	13 538	12 183	12 842	23 733
Division 3: Society	632 030	767 620	941 505	1 058 928	1 079 921	1 218 236	1 140 634	1 227 713	1 257 926	1 411 327
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	527 783	667 371	835 603	955 738	962 721	1 074 859	993 512	1 083 650	1 094 070	1 227 606
Education and training	59 917	59 123	61 652	60 123	80 287	102 542	95 100	99 281	115 681	110 638
Social development and community services	44 330	41 126	44 250	43 066	36 913	40 835	52 022	44 782	48 175	73 082
Division 4: Environment	17 503	19 734	38 078	39 974	37 194	45 433	46 995	55 671	54 016	58 079
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	9 949	9 712	23 780	23 201	22 225	30 236	35 262	39 432	38 990	43 023
Environmental aspects of development	4 494	6 269	6 559	7 544	6 393	7 294	7 428	9 742	4 182	3 266
Environmental and other aspects	3 060	3 753	7 739	9 229	8 576	7 903	4 305	6 498	10 844	11 791

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 5: Advancement of knowledge	84 002	100 903	118 312	283 100	299 945	195 773	292 236	352 714	306 145	456 733
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	69 845	90 114	107 310	272 540	286 464	186 060	280 279	340 885	298 699	449 934
Social sciences and humanities	14 157	10 789	11 001	10 561	13 481	9 713	11 957	11 828	7 445	6 799
Total	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

Table C.88: Proportional not-for-profit sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Division 2: Economic development	17.7	12.7	9.7	7.0	6.1	6.9	7.5	7.6	7.9	7.2
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	3.7	3.5	2.9	1.8	1.5	1.4	1.4	1.2	1.3	1.4
Animal production and animal primary products	0.9	1.0	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1
Mineral resources (excluding Energy)	0.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy resources	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.1	0.1
Energy supply	0.7	1.0	0.7	0.6	0.5	0.5	0.7	0.9	0.8	0.7
Manufacturing	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information and communication services	0.3	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Commercial services	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.2
Economic framework	6.0	4.7	4.7	3.6	3.1	3.4	3.6	4.0	4.4	3.5
Natural resources	1.1	1.2	0.6	0.5	0.5	1.1	0.8	0.7	0.7	1.1
Division 3: Society	70.9	75.4	77.4	71.3	71.5	77.7	71.3	69.4	71.6	68.0
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	59.2	65.6	68.7	64.3	63.8	68.5	62.1	61.2	62.2	59.1
Education and training	6.7	5.8	5.1	4.0	5.3	6.5	5.9	5.6	6.6	5.3

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Social development and community services	5.0	4.0	3.6	2.9	2.4	2.6	3.3	2.5	2.7	3.5
Division 4: Environment	2.0	1.9	3.1	2.7	2.5	2.9	2.9	3.1	3.1	2.8
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	1.1	1.0	2.0	1.6	1.5	1.9	2.2	2.2	2.2	2.1
Environmental aspects of development	0.5	0.6	0.5	0.5	0.4	0.5	0.5	0.6	0.2	0.2
Environmental and other aspects	0.3	0.4	0.6	0.6	0.6	0.5	0.3	0.4	0.6	0.6
Division 5: Advancement of knowledge	9.4	9.9	9.7	19.1	19.9	12.5	18.3	19.9	17.4	22.0
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	7.8	8.9	8.8	18.3	19.0	11.9	17.5	19.3	17.0	21.7
Social sciences and humanities	1.6	1.1	0.9	0.7	0.9	0.6	0.7	0.7	0.4	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.89: Not-for-profit sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Eastern Cape	21 026	17 053	15 150	19 452	19 676	20 462	14 846	36 166	36 802	384 060
Free State	8 890	6 643	8 086	11 332	29 633	9 743	2 432	6 635	7 209	6 520
Gauteng	345 937	333 359	440 863	528 725	543 971	572 423	469 019	535 873	542 518	383 258
KwaZulu-Natal	232 636	277 770	317 706	316 771	267 615	357 192	334 603	348 433	432 727	410 331
Limpopo	56 143	64 105	78 996	67 940	79 897	92 664	118 601	85 290	97 440	59 051
Mpumalanga	25 944	29 964	32 775	29 863	25 003	18 360	17 170	18 634	25 976	28 389
North West	97 918	136 641	133 473	136 626	162 503	171 737	140 181	225 031	211 656	2 140
Northern Cape	2 200	4 782	4 868	3 238	3 837	2 389	70 706	4 430	3 362	327 670
Western Cape	100 448	147 299	184 392	371 758	377 380	323 336	431 998	509 661	399 910	474 035
Total	891 142	1 017 616	1 216 310	1 485 704	1 509 515	1 568 307	1 599 557	1 770 153	1 757 600	2 075 452

Table C.90: Proportional not-for-profit sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Eastern Cape	2.4	1.7	1.2	1.3	1.3	1.3	0.9	2.0	2.1	18.5
Free State	1.0	0.7	0.7	0.8	2.0	0.6	0.2	0.4	0.4	0.3
Gauteng	38.8	32.8	36.2	35.6	36.0	36.5	29.3	30.3	30.9	18.5
KwaZulu-Natal	26.1	27.3	26.1	21.3	17.7	22.8	20.9	19.7	24.6	19.8
Limpopo	6.3	6.3	6.5	4.6	5.3	5.9	7.4	4.8	5.5	2.8
Mpumalanga	2.9	2.9	2.7	2.0	1.7	1.2	1.1	1.1	1.5	1.4
North West	11.0	13.4	11.0	9.2	10.8	11.0	8.8	12.7	12.0	0.1
Northern Cape	0.2	0.5	0.4	0.2	0.3	0.2	4.4	0.3	0.2	15.8
Western Cape	11.3	14.5	15.2	25.0	25.0	20.6	27.0	28.8	22.8	22.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.91: Not-for-profit sector R&D personnel by occupation (2015/16 to 2024/25)

Year	Headcount				Full-time equivalents (FTEs)			
	Total	Researchers	Technicians	Other R&D personnel	Total	Researchers	Technicians	Other R&D personnel
2015/16	1 493	465	436	592	1 367.3	384.8	411.2	571.2
2016/17	1 616	404	607	605	1 469.5	340.5	575.6	553.4
2017/18	1 741	425	678	638	1 596.0	346.1	644.7	605.2
2018/19	1 937	424	843	670	1 685.8	367.3	693.2	625.4
2019/20	1 925	390	878	657	1 710.1	330.9	766.0	613.3
2020/21	1 795	431	718	646	1 556.1	352.0	595.7	608.4
2021/22	1 844	444	680	720	1 577.1	349.4	549.4	678.3
2022/23	1 909	472	714	723	1 622.1	354.7	584.4	683.0
2023/24	1 873	469	791	613	1 464.3	350.7	552.8	560.8
2024/25	1 738	405	428	905	1 559.8	339.2	390.2	830.3

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.92: Not-for-profit sector R&D personnel by occupation and gender (2022/23, 2023/24 and 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
2022/23							
Researchers	472	176	296	354.7	136.6	218.1	75.1
Technicians directly supporting R&D	714	170	544	584.4	140.1	444.3	81.9
Other personnel directly supporting R&D	723	210	513	683.0	200.0	483.0	94.5
Total	1 909	556	1 353	1 622.1	476.7	1 145.4	85.0
2023/24							
Researchers	469	171	298	350.7	133.8	216.9	74.8
Technicians directly supporting R&D	791	179	612	552.8	133.0	419.8	69.9
Other personnel directly supporting R&D	613	169	444	560.8	159.3	401.5	91.5
Total	1 873	519	1 354	1 464.3	426.1	1 038.1	77.8
2024/25							
Researchers	405	153	252	339.2	124.0	215.2	83.8
Technicians directly supporting R&D	428	108	320	390.2	94.1	296.2	91.2
Other personnel directly supporting R&D	905	263	642	830.3	242.4	588.0	91.7
Total	1 738	524	1 214	1 559.8	460.4	1 099.3	89.7

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.93: Not-for-profit sector R&D personnel by occupation, qualification, population group and gender (2024/25)

Occupation and qualification	Total	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers	405	153	252	66	100	7	26	14	28	52	79	14	19
Doctoral degree or equivalent	133	57	76	13	17	2	13	7	4	27	31	8	11
Master's, honours, bachelor or equivalent	233	81	152	42	70	4	11	6	18	23	45	6	8
Diplomas	39	15	24	11	13	1	2	1	6	2	3	0	0
Technicians directly supporting R&D	428	108	320	85	217	2	13	9	56	8	28	4	6
Doctoral degree or equivalent	5	1	4	0	0	0	0	0	3	1	1	0	0
Master's, honours, bachelor or equivalent	176	30	146	16	73	1	10	7	39	2	19	4	5
Diplomas	247	77	170	69	144	1	3	2	14	5	8	0	1
Other personnel directly supporting R&D	905	263	642	222	522	14	52	9	26	12	40	6	2
Doctoral degree or equivalent	5	1	4	0	1	0	2	0	0	1	1	0	0
Master's, honours, bachelor or equivalent	252	58	194	37	126	7	34	5	14	7	19	2	1
Diplomas	648	204	444	185	395	7	16	4	12	4	20	4	1
Total	1 738	524	1 214	373	839	23	91	32	110	72	147	24	27

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

C.2.3. Government sector

Table C.94: Government sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Basic research	358 666	348 775	329 263	416 131	400 775	411 837	442 048	496 883	576 753	624 830
Applied research	1 390 221	1 444 821	1 685 367	1 495 783	1 241 999	1 572 122	1 762 689	1 936 355	2 168 315	2 202 644
Experimental development research	264 134	305 051	311 246	311 513	250 769	253 572	267 697	286 627	307 811	332 131
Total	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 605

Table C.95: Proportional government sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Basic research	17.8	16.6	14.2	18.7	21.2	18.4	17.9	18.3	18.9	19.8
Applied research	69.1	68.8	72.5	67.3	65.6	70.3	71.3	71.2	71.0	69.7
Experimental development research	13.1	14.5	13.4	14.0	13.2	11.3	10.8	10.5	10.1	10.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.96: Government sector R&D expenditure by spheres and institutes of government and accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Municipalities	61 703	76 493	59 114	84 160	99 754	106 207	122 886	184 068	157 195	190 124
Capital expenditure	13 059	20 271	13 265	30 048	20 120	24 170	17 150	71 454	75 910	76 463
Land: Buildings and other structures	6 598	9 575	7 065	13 305	8 500	8 750	2 750	4 200	5 500	732
Total: Vehicles, plant, machinery, equipment and software	6 461	10 696	6 200	16 743	11 620	15 420	14 400	67 254	70 410	75 731
Vehicles, plant, machinery, equipment	6 461	10 696	6 200	16 743	7 900	9 600	8 500	13 154	15 410	16 818
Capitalised computer software*	N/A	N/A	N/A	N/A	3 720	5 820	5 900	54 100	55 000	58 913
Current expenditure	48 644	56 222	45 849	54 112	79 634	82 037	105 736	112 614	81 285	113 661
Labour costs	38 687	41 407	38 279	42 316	70 310	74 527	77 686	81 802	71 425	101 582
Other current expenditure	9 957	14 815	7 570	11 796	9 324	7 510	28 050	30 812	9 860	12 079
Provincial departments	401 512	405 760	411 195	410 454	412 428	427 623	446 832	444 272	459 250	443 341
Capital expenditure	43 918	48 084	35 517	27 502	44 238	42 072	29 115	22 265	27 075	24 920
Land: Buildings and other structures	7 900	12 264	14 864	12 130	14 035	13 506	10 548	11 665	9 141	9 527
Total: Vehicles, plant, machinery, equipment and software	36 018	35 820	20 653	15 372	30 203	28 566	18 567	10 600	17 934	15 393
Vehicles, plant, machinery, equipment	36 018	35 820	20 653	15 372	25 056	25 763	14 980	7 606	14 713	13 936
Capitalised computer software*	N/A	N/A	N/A	N/A	5 147	2 803	3 587	2 994	3 221	1 457
Current expenditure	357 594	357 676	375 678	382 951	368 190	385 551	417 716	422 007	432 175	418 421
Labour costs	225 621	252 286	264 285	252 129	265 436	278 148	277 591	273 489	295 690	271 553
Other current expenditure	131 973	105 390	111 393	130 823	102 754	107 403	140 125	148 518	136 485	146 868
National departments	356 575	408 803	512 743	546 432	453 849	668 116	729 031	726 992	920 832	965 390
Capital expenditure	57 905	56 999	71 632	77 174	66 915	78 421	86 032	84 665	92 991	111 440
Land: Buildings and other structures	18 037	6 424	6 920	16 143	18 321	17 861	18 480	18 954	8 269	20 962
Total: Vehicles, plant, machinery, equipment and software	39 868	50 575	64 712	61 031	48 594	60 560	67 552	65 711	84 722	90 478
Vehicles, plant, machinery, equipment	39 868	50 575	64 712	61 031	46 705	58 950	65 957	64 935	74 681	73 473
Capitalised computer software*	N/A	N/A	N/A	N/A	1 889	1 610	1 595	776	10 041	17 005
Current expenditure	298 670	351 804	441 111	469 258	386 934	589 695	642 999	642 327	827 841	853 950
Labour costs	171 849	216 103	228 761	194 471	204 110	181 989	198 143	197 214	415 749	334 226
Other current expenditure	126 821	135 701	212 350	274 787	182 824	407 706	444 856	445 113	412 092	519 724
Government research institutes	1 165 161	1 179 994	1 326 427	1 161 197	885 825	996 858	1 128 652	1 313 813	1 468 233	1 511 479
Capital expenditure	202 878	199 952	271 029	342 078	254 023	236 377	276 091	359 506	461 238	456 424
Land: Buildings and other structures	112 710	107 971	131 824	105 507	116 115	132 749	133 505	161 297	195 521	176 415
Total: Vehicles, plant, machinery, equipment and software	90 168	91 981	139 205	236 571	137 908	103 628	142 586	198 209	265 717	280 009
Vehicles, plant, machinery, equipment	90 168	91 981	139 205	236 571	132 565	93 433	119 181	153 114	223 930	247 905
Capitalised computer software*	N/A	N/A	N/A	N/A	5 343	10 195	23 405	45 095	41 787	32 104
Current expenditure	962 283	980 042	1 055 398	819 119	631 802	760 482	852 561	954 307	1 006 995	1 055 055
Labour costs	311 876	323 121	328 656	394 182	425 678	459 866	574 592	612 831	660 887	711 207
Other current expenditure	650 407	656 921	726 741	424 937	206 124	300 616	277 969	341 476	346 108	343 848
Museums	28 070	27 596	16 396	21 184	41 688	38 727	45 033	50 720	47 369	49 270
Capital expenditure	2 005	2 704	796	2 106	5 574	6 679	4 100	5 290	5 452	7 642
Land: Buildings and other structures	663	774	0	0	1 346	50	1 066	1 067	1 075	3 087
Total: Vehicles, plant, machinery, equipment and software	1 342	1 930	796	2 106	4 228	6 629	3 034	4 223	4 377	4 555
Vehicles, plant, machinery, equipment	1 342	1 930	796	2 106	2 626	6 349	2 825	3 808	3 927	4 104
Capitalised computer software*	N/A	N/A	N/A	N/A	1 602	280	209	415	450	451
Current expenditure	26 065	24 892	15 600	19 078	36 114	32 048	40 933	45 430	41 917	41 628
Labour costs	23 751	24 004	14 775	17 610	29 837	30 059	36 680	40 568	37 524	37 133
Other current expenditure	2 314	888	825	1 468	6 277	1 989	4 253	4 862	4 393	4 495
Government sector	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 605
Capital expenditure	319 765	328 010	392 239	478 908	390 870	387 719	412 488	543 180	662 666	676 889
Land: Buildings and other structures	145 908	137 008	160 673	147 085	158 317	172 916	166 349	197 183	219 506	210 723
Total: Vehicles, plant, machinery, equipment and software	173 857	191 002	231 566	331 823	232 553	214 803	246 139	345 997	443 160	466 166
Vehicles, plant, machinery, equipment	173 857	191 002	231 566	331 823	214 852	194 095	211 443	242 617	332 661	356 236
Capitalised computer software*	N/A	N/A	N/A	N/A	17 701	20 708	34 696	103 380	110 499	109 930
Current expenditure	1 693 256	1 770 636	1 933 636	1 744 518	1 502 673	1 849 812	2 059 946	2 176 685	2 390 214	2 482 716
Labour costs	771 784	856 921	874 757	900 707	995 370	1 024 588	1 164 692	1 205 904	1 481 275	1 455 702
Other current expenditure	921 472	913 715	1 058 879	843 811	507 303	825 224	895 253	970 781	908 938	1 027 014

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.97: Proportional government sector R&D expenditure by spheres and institutes of government and accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Municipalities	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Capital expenditure	21.2	26.5	22.4	35.7	20.2	22.8	14.0	38.8	48.3	40.2
Land: Buildings and other structures	10.7	12.5	12.0	15.8	8.5	8.2	2.2	2.3	3.5	0.4
Total: Vehicles, plant, machinery, equipment and software	10.5	14.0	10.5	19.9	11.6	14.5	11.7	36.5	44.8	39.8
Vehicles, plant, machinery, equipment	10.5	14.0	10.5	19.9	7.9	9.0	6.9	7.1	9.8	8.8
Capitalised computer software*	N/A	N/A	N/A	N/A	4	5.5	4.8	29.4	35.0	31.0
Current expenditure	78.8	73.5	77.6	64.3	79.8	77.2	86.0	61.2	51.7	59.8
Labour costs	62.7	54.1	64.8	50.3	70.5	70.2	63.2	44.4	45.4	53.4
Other current expenditure	16.1	19.4	12.8	14.0	9.3	7.1	22.8	16.7	6.3	6.4
Provincial departments	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Capital expenditure	10.9	11.9	8.6	6.7	10.7	9.8	6.5	5.0	5.9	5.6
Land: Buildings and other structures	2.0	3.0	3.6	3.0	3.4	3.2	2.4	2.6	2.0	2.1
Total: Vehicles, plant, machinery, equipment and software	9.0	8.8	5.0	3.7	7.3	6.7	4.2	2.4	3.9	3.5
Vehicles, plant, machinery, equipment	9.0	8.8	5.0	3.7	6.1	6.0	3.4	1.7	3.2	3.1
Capitalised computer software*	N/A	N/A	N/A	N/A	1	0.7	0.8	0.7	0.7	0.3
Current expenditure	89.1	88.1	91.4	93.3	89.3	90.2	93.5	95.0	94.1	94.4
Labour costs	56.2	62.2	64.3	61.4	64.4	65.0	62.1	61.6	64.4	61.3
Other current expenditure	32.9	26.0	27.1	31.9	24.9	25.1	31.4	33.4	29.7	33.1
National departments	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Capital expenditure	16.2	13.9	14.0	14.1	14.7	11.7	11.8	11.6	10.1	11.5
Land: Buildings and other structures	5.1	1.6	1.3	3.0	4.0	2.7	2.5	2.6	0.9	2.2
Total: Vehicles, plant, machinery, equipment and software	11.2	12.4	12.6	11.2	10.7	9.1	9.3	9.0	9.2	9.4
Vehicles, plant, machinery, equipment	11.2	12.4	12.6	11.2	10.3	8.8	9.0	8.9	8.1	7.6
Capitalised computer software*	N/A	N/A	N/A	N/A	0	0.2	0.2	0.1	1.1	1.8
Current expenditure	83.8	86.1	86.0	85.9	85.3	88.3	88.2	88.4	89.9	88.5
Labour costs	48.2	52.9	44.6	35.6	45.0	27.2	27.2	27.1	45.1	34.6
Other current expenditure	35.6	33.2	41.4	50.3	40.3	61.0	61.0	61.2	44.8	53.8
Government research institutes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Capital expenditure	17.4	16.9	20.4	29.5	28.7	23.7	24.5	27.4	31.4	30.2
Land: Buildings and other structures	9.7	9.2	9.9	9.1	13.1	13.3	11.8	12.3	13.3	11.7
Total: Vehicles, plant, machinery, equipment and software	7.7	7.8	10.5	20.4	15.6	10.4	12.6	15.1	18.1	18.5
Vehicles, plant, machinery, equipment	7.7	7.8	10.5	20.4	15.0	9.4	10.6	11.7	15.3	16.4
Capitalised computer software*	N/A	N/A	N/A	N/A	1	1.0	2.1	3.4	2.8	2.1
Current expenditure	82.6	83.1	79.6	70.5	71.3	76.3	75.5	72.6	68.6	69.8
Labour costs	26.8	27.4	24.8	33.9	48.1	46.1	50.9	46.6	45.0	47.1
Other current expenditure	55.8	55.7	54.8	36.6	23.3	30.2	24.6	26.0	23.6	22.7
Museums	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Capital expenditure	7.1	9.8	4.9	9.9	13.4	17.2	9.1	10.4	11.5	15.5
Land: Buildings and other structures	2.4	2.8	0.0	0.0	3.2	0.1	2.4	2.1	2.3	6.3
Total: Vehicles, plant, machinery, equipment and software	4.8	7.0	4.9	9.9	10.1	17.1	6.7	8.3	9.2	9.2
Vehicles, plant, machinery, equipment	4.8	7.0	4.9	9.9	6.3	16.4	6.3	7.5	8.3	8.3
Capitalised computer software*	N/A	N/A	N/A	N/A	4	0.7	0.5	0.8	0.9	0.9
Current expenditure	92.9	90.2	95.1	90.1	86.6	82.8	90.9	89.6	88.5	84.5
Labour costs	84.6	87.0	90.1	83.1	71.6	77.6	81.5	80.0	79.2	75.4
Other current expenditure	8.2	3.2	5.0	6.9	15.1	5.1	9.4	9.6	9.3	9.1
Government sector	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Capital expenditure	15.9	15.6	16.9	21.5	20.6	17.3	16.7	20.0	21.7	21.4
Land: Buildings and other structures	7.2	6.5	6.9	6.6	8.4	7.7	6.7	7.2	7.2	6.7
Total: Vehicles, plant, machinery, equipment and software	8.6	9.1	10.0	14.9	12.3	9.6	10.0	12.7	14.5	14.8
Vehicles, plant, machinery, equipment	8.6	9.1	10.0	14.9	11.3	8.7	8.6	8.9	10.9	11.3
Capitalised computer software*	N/A	N/A	N/A	N/A	1	0.9	1.4	3.8	3.6	3.5
Current expenditure	84.1	84.4	83.1	78.5	79.4	82.7	83.3	80.0	78.3	78.6
Labour costs	38.3	40.8	37.6	40.5	52.6	45.8	47.1	44.3	48.5	46.1
Other current expenditure	45.8	43.5	45.5	38.0	26.8	36.9	36.2	35.7	29.8	32.5

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.98: Government sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Biotechnology	81 409	87 557	84 738	89 293	100 237	104 270	64 506	95 648	111 774	118 454
Nanotechnology	11 774	12 620	12 741	24 732	10 784	13 115	13 490	19 562	23 806	24 453
Total	93 183	100 176	97 479	114 025	111 021	117 385	77 996	115 210	135 581	142 907
Government expenditure on R&D	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 605

Table C.99: Proportional government sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biotechnology	4.0	4.2	3.6	4.0	5.3	4.7	2.6	3.5	3.7	3.7
Nanotechnology	0.6	0.6	0.5	1.1	0.6	0.6	0.5	0.7	0.8	0.8
Total	4.6	4.8	4.2	5.1	5.9	5.2	3.2	4.2	4.4	4.5

Table C.100: Government sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Environment-related	192 774	202 351	316 188	339 012	314 713	552 121	551 439	696 625	746 205	468 293
Open-source software	0	0	597	710.62	5 553	43 034	45 500	54 026	44 752	13 855
New materials	5 291	6 143	7 599	13 172	8 594	15 866	21 353	45 733	68 395	62 491
TB, HIV/AIDS, malaria	389 279	395 996	435 045	237 974	114 727	190 057	212 240	273 399	320 645	318 227
Space science*	N/A	39 882	0	0	51 887	52 566	28 322	69 646	69 479	60 653
Total	587 343	644 372	759 430	590 869	495 475	853 644	858 854	1 139 429	1 249 476	923 519
Government expenditure on R&D	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 605

* Space science data only collected from 2016/17 onwards.

Table C.101: Proportional government sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Environment-related	9.6	9.6	13.6	15.2	16.6	24.7	22.3	25.6	24.4	14.8
Open-source software	0.0	0.0	0.0	0.0	0.3	1.9	1.8	2.0	1.5	0.4
New materials	0.3	0.3	0.3	0.6	0.5	0.7	0.9	1.7	2.2	2.0
TB, HIV/AIDS, malaria	19.3	18.9	18.7	10.7	6.1	8.5	8.6	10.1	10.5	10.1
Space science*	N/A	1.9	0.0	0.0	2.7	2.3	1.1	2.6	2.3	1.9
Total	29.2	30.7	32.7	26.6	26.2	38.2	34.7	41.9	40.9	29.2

* Space science data only collected from 2016/17 onwards.

Table C.102: Government sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	1 520 894	1 560 315	1 722 617	1 592 766	1 401 551	1 739 342	1 860 053	2 090 277	2 355 795	2 330 240
Mathematical sciences	397	539	85	1 855	11 408	8 075	7 075	48 703	34 800	58 363
Physical sciences	26 455	28 529	49 051	54 017	8 725	5 105	5 971	5 607	11 101	21 444
Chemical sciences	61 688	68 937	73 898	81 603	45 405	32 280	35 965	59 372	61 423	55 199
Earth sciences	79 942	85 550	50 110	103 767	163 319	359 200	327 087	404 267	421 807	419 499
Information, computer and communication technologies	4 662	5 540	398	0	0	35 986	36 418	34 935	101 676	35 306
Applied sciences and technologies	22 531	25 444	23 016	38 562	49 438	45 394	40 847	49 485	54 170	100 551
Engineering sciences	12 129	13 572	17 076	14 574	14 071	27 752	6 568	13 004	15 180	14 514
Biological sciences	196 053	195 922	215 624	254 654	246 541	187 733	261 068	256 817	302 904	327 288
Agricultural sciences	471 798	485 417	523 343	557 157	591 668	566 999	618 335	630 458	651 011	636 057
Medical and health sciences	608 530	615 067	673 437	370 294	167 039	307 108	343 477	422 890	510 829	483 145
Environmental sciences	14 478	13 921	13 085	17 270	29 249	30 808	29 510	31 274	57 664	46 578
Material sciences	0	0	0	0	0	3 244	3 050	0	0	0
Marine sciences	22 232	21 877	83 495	99 013	74 686	129 657	144 682	133 466	133 231	132 296
Division 2: Social sciences and humanities	492 127	538 331	603 258	630 660	491 992	498 188	612 381	629 588	697 084	829 365
Social sciences	479 316	529 080	591 813	620 433	476 565	485 014	600 385	616 589	690 685	823 824
Humanities	12 811	9 251	11 445	10 227	15 427	13 174	11 997	13 000	6 399	5 541
Total	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 605

Table C.103: Proportional government sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	75.6	74.3	74.1	71.6	74.0	77.7	75.2	76.9	77.2	73.8
Mathematical sciences	0.0	0.0	0.0	0.1	0.6	0.4	0.3	1.8	1.1	1.8
Physical sciences	1.3	1.4	2.1	2.4	0.5	0.2	0.2	0.2	0.4	0.7
Chemical sciences	3.1	3.3	3.2	3.7	2.4	1.4	1.5	2.2	2.0	1.7
Earth sciences	4.0	4.1	2.2	4.7	8.6	16.1	13.2	14.9	13.8	13.3
Information, computer and communication technologies	0.2	0.3	0.0	0.0	0.0	1.6	1.5	1.3	3.3	1.1
Applied sciences and technologies	1.1	1.2	1.0	1.7	2.6	2.0	1.7	1.8	1.8	3.2

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Engineering sciences	0.6	0.6	0.7	0.7	0.7	1.2	0.3	0.5	0.5	0.5
Biological sciences	9.7	9.3	9.3	11.5	13.0	8.4	10.6	9.4	9.9	10.4
Agricultural sciences	23.4	23.1	22.5	25.1	31.2	25.3	25.0	23.2	21.3	20.1
Medical and health sciences	30.2	29.3	29.0	16.7	8.8	13.7	13.9	15.5	16.7	15.3
Environmental sciences	0.7	0.7	0.6	0.8	1.5	1.4	1.2	1.1	1.9	1.5
Material sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Marine sciences	1.1	1.0	3.6	4.5	3.9	5.8	5.9	4.9	4.4	4.2
Division 2: Social sciences and humanities	24.4	25.7	25.9	28.4	26.0	22.3	24.8	23.1	22.8	26.2
Social sciences	23.8	25.2	25.4	27.9	25.2	21.7	24.3	22.7	22.6	26.1
Humanities	0.6	0.4	0.5	0.5	0.8	0.6	0.5	0.5	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.104: Government sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	42 233	34 213	7 582	46 886	31 484	26 989	22 188	27 986	12 869	11 636
Defence	42 233	34 213	7 582	46 886	31 484	26 989	22 188	27 986	12 869	11 636
Division 2: Economic development	745 129	826 860	1 009 575	1 117 257	1 045 765	1 068 644	1 257 768	1 364 823	1 496 000	1 709 279
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	92 506	103 212	117 664	115 406	127 551	117 715	114 499	262 849	117 932	132 817
Animal production and animal primary products	125 737	134 227	129 024	135 755	141 189	131 528	141 857	0	134 613	143 641
Mineral resources (excluding Energy)	6 548	2 854	12 395	5 508	5 729	4 829	5 159	5 256	1 368	1 429
Energy resources	5 291	5 716	5 706	6 413	2 446	1 312	1 312	1 336	1 368	28 460
Energy supply	29 705	32 772	40 959	53 254	15 204	11 714	30 105	43 675	26 357	36 988
Manufacturing	1 318	5 201	5 433	10 794	15 855	28 956	14 533	29 656	29 049	22 368
Construction	1 394	1 501	1 584	8 501	6 112	5 935	28 103	28 638	30 214	139 689
Transport	21 537	24 896	21 926	7 268	9 686	7 231	7 186	15 008	15 719	12 928
Information and communication services	7 977	6 071	19 938	18 583	13 385	5 220	14 292	14 184	9 341	7 550
Commercial services	13 531	12 616	47 515	72 388	55 141	53 609	9 749	7 913	8 024	13 412
Economic framework	262 289	343 537	394 216	404 073	381 306	388 478	503 328	525 234	592 295	620 176
Natural resources	177 298	154 258	213 214	279 313	272 162	312 117	387 645	431 075	529 722	549 822

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 3: Society	952 108	951 859	1 029 316	746 234	529 902	669 831	711 446	812 110	954 825	913 740
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	482 472	511 031	554 746	303 831	137 831	253 420	285 713	0	424 012	428 678
Education and training	209 544	169 499	173 547	139 984	96 114	116 193	138 154	508 298	110 426	127 265
Social development and community services	260 092	271 328	301 023	302 419	295 956	300 218	287 579	303 812	420 387	357 797
Division 4: Environment	191 334	204 573	208 704	237 373	191 622	374 408	364 490	372 524	395 305	385 191
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	107 265	116 996	100 339	117 228	123 194	340 112	328 874	333 682	348 213	328 300
Environmental aspects of development	53 541	55 508	50 936	64 148	48 503	23 399	20 336	30 295	41 139	52 735
Environmental and other aspects	30 528	32 069	57 429	55 997	19 924	10 898	15 280	8 547	5 953	4 156
Division 5: Advancement of knowledge	82 217	81 141	70 698	75 676	94 771	97 658	116 542	142 424	193 881	139 758
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	58 401	57 655	57 473	61 475	78 751	77 069	88 698	113 855	122 196	114 763
Social sciences and humanities	23 816	23 486	13 225	14 201	16 019	20 590	27 844	28 568	71 685	24 995
Total	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 604

Table C.105: Proportional government sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	2.1	1.6	0.3	2.1	1.7	1.2	0.9	1.0	0.4	0.4
Defence	2.1	1.6	0.3	2.1	1.7	1.2	0.9	1.0	0.4	0.4
Division 2: Economic development	37.0	39.4	43.4	50.2	55.2	47.8	50.9	50.2	49.0	54.1
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	4.6	4.9	5.1	5.2	6.7	5.3	4.6	9.7	3.9	4.2
Animal production and animal primary products	6.2	6.4	5.5	6.1	7.5	5.9	5.7	0.0	4.4	4.5
Mineral resources (excluding Energy)	0.3	0.1	0.5	0.2	0.3	0.2	0.2	0.2	0.0	0.0
Energy resources	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.9

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Energy supply	1.5	1.6	1.8	2.4	0.8	0.5	1.2	1.6	0.9	1.2
Manufacturing	0.1	0.2	0.2	0.5	0.8	1.3	0.6	1.1	1.0	0.7
Construction	0.1	0.1	0.1	0.4	0.3	0.3	1.1	1.1	1.0	4.4
Transport	1.1	1.2	0.9	0.3	0.5	0.3	0.3	0.6	0.5	0.4
Information and communication services	0.4	0.3	0.9	0.8	0.7	0.2	0.6	0.5	0.3	0.2
Commercial services	0.7	0.6	2.0	3.3	2.9	2.4	0.4	0.3	0.3	0.4
Economic framework	13.0	16.4	16.9	18.2	20.1	17.4	20.4	19.3	19.4	19.6
Natural resources	8.8	7.4	9.2	12.6	14.4	13.9	15.7	15.8	17.4	17.4
Division 3: Society	47.3	45.4	44.3	33.6	28.0	29.9	28.8	29.9	31.3	28.9
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	24.0	24.4	23.9	13.7	7.3	11.3	11.6	0.0	13.9	13.6
Education and training	10.4	8.1	7.5	6.3	5.1	5.2	5.6	18.7	3.6	4.0
Social development and community services	12.9	12.9	12.9	13.6	15.6	13.4	11.6	11.2	13.8	11.3
Division 4: Environment	9.5	9.7	9.0	10.7	10.1	16.7	14.7	13.7	12.9	12.2
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	5.3	5.6	4.3	5.3	6.5	15.2	13.3	12.3	11.4	10.4
Environmental aspects of development	2.7	2.6	2.2	2.9	2.6	1.0	0.8	1.1	1.3	1.7
Environmental and other aspects	1.5	1.5	2.5	2.5	1.1	0.5	0.6	0.3	0.2	0.1
Division 5: Advancement of knowledge	4.1	3.9	3.0	3.4	5.0	4.4	4.7	5.2	6.4	4.4
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	2.9	2.7	2.5	2.8	4.2	3.4	3.6	4.2	4.0	3.6
Social sciences and humanities	1.2	1.1	0.6	0.6	0.8	0.9	1.1	1.1	2.3	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.106: Government sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Eastern Cape	225 603	222 456	281 201	305 629	301 816	383 648	390 162	401 321	428 113	453 607
Free State	61 802	81 957	81 890	59 694	45 660	51 714	52 374	58 749	83 120	87 574
Gauteng	832 397	885 142	974 192	836 827	581 945	626 239	821 650	914 244	1 050 429	1 098 370
KwaZulu-Natal	187 088	172 655	206 551	236 602	205 503	284 898	290 063	306 663	295 558	326 618
Limpopo	84 232	76 541	86 876	89 889	81 308	90 390	112 845	114 631	138 196	145 186
Mpumalanga	112 173	107 237	104 154	88 922	83 648	74 233	78 600	82 241	109 051	115 031
North West	61 815	57 994	60 594	66 727	57 423	60 752	25 891	30 024	38 657	53 057
Northern Cape	69 174	66 200	94 659	88 575	52 399	131 729	136 529	139 064	162 987	148 263
Western Cape	378 737	428 465	435 757	450 560	483 841	533 926	564 321	672 928	746 768	731 898
Total	2 013 021	2 098 646	2 325 875	2 223 426	1 893 543	2 237 531	2 472 434	2 719 866	3 052 880	3 159 605

Table C.107: Proportional government sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Eastern Cape	11.2	10.6	12.1	13.7	15.9	17.1	15.8	14.8	14.0	14.4
Free State	3.1	3.9	3.5	2.7	2.4	2.3	2.1	2.2	2.7	2.8
Gauteng	41.4	42.2	41.9	37.6	30.7	28.0	33.2	33.6	34.4	34.8
KwaZulu-Natal	9.3	8.2	8.9	10.6	10.9	12.7	11.7	11.3	9.7	10.3
Limpopo	4.2	3.6	3.7	4.0	4.3	4.0	4.6	4.2	4.5	4.6
Mpumalanga	5.6	5.1	4.5	4.0	4.4	3.3	3.2	3.0	3.6	3.6
North West	3.1	2.8	2.6	3.0	3.0	2.7	1.0	1.1	1.3	1.7
Northern Cape	3.4	3.2	4.1	4.0	2.8	5.9	5.5	5.1	5.3	4.7
Western Cape	18.8	20.4	18.7	20.3	25.6	23.9	22.8	24.7	24.5	23.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.108: Government sector R&D personnel headcount and full-time equivalents by occupation (2015/16 to 2024/25)

Year	Headcount				Full-time equivalents (FTes)			
	Total	Researchers	Technicians	Other R&D personnel	Total	Researchers	Technicians	Other R&D personnel
2015/16	2 997	1 573	537	887	2 056.2	953.9	365.7	736.7
2016/17	3 076	1 677	538	861	2 031.6	969.1	357.9	704.6
2017/18	3 027	1 671	517	839	2 000.4	899.1	347.7	753.7
2018/19	2 910	1 662	416	832	1 999.0	920.8	324.9	753.3
2019/20	3 157	1 742	548	867	2 173.1	1 027.3	374.3	771.6
2020/21	3 159	1 706	534	919	2 060.4	963.3	334.6	762.5
2021/22	3 314	1 789	623	902	2 095.5	1 030.2	338.5	726.8
2022/23	3 374	1 872	626	876	2 100.2	1 060.2	362.3	677.7
2023/24	2 932	1 597	495	840	2 244.4	1 118.3	392.9	733.2
2024/25	2 849	1 599	565	685	2 098.1	1 127.1	438.6	532.4

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.109: Government sector R&D personnel headcount and full-time equivalents by occupation and gender (2022/23, 2023/24 and 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
2022/23	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
Researchers	1 872	869	1 003	1 060.2	452.8	607.4	56.6
Technicians directly supporting R&D	626	348	278	362.3	192.3	170.1	57.8
Other personnel directly supporting R&D	876	538	338	677.7	457.7	220.0	77.4
Total	3 374	1 755	1 619	2 100.2	1 102.7	997.5	62.2
2023/24	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
Researchers	1 597	700	897	1 118.3	470.5	647.8	70.0
Technicians directly supporting R&D	495	267	228	392.9	213.9	179.0	79.4
Other personnel directly supporting R&D	840	519	321	733.2	485.7	247.5	87.3
Total	2 932	1 486	1 446	2 244.4	1 170.1	1 074.3	76.5
2024/25	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
Researchers	1 599	694	905	1 127.1	475.1	652.0	70.5
Technicians directly supporting R&D	565	277	288	438.6	216.7	222.0	77.6
Other personnel directly supporting R&D	685	367	318	532.4	317.0	215.4	77.7
Total	2 849	1 338	1 511	2 098.1	1 008.8	1 089.3	73.6

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.110: Government sector R&D personnel headcount by occupation, qualification, population group and gender (2024/25)

Occupation and qualification	Total	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers	1 599	694	905	430	529	41	67	40	80	163	220	20	9
Doctoral degree or equivalent	539	221	318	90	110	14	32	23	50	80	122	14	4
Master's, honours, bachelor or equivalent	991	439	552	320	397	27	33	15	27	75	93	2	2
Diplomas	69	34	35	20	22	0	2	2	3	8	5	4	3
Technicians directly supporting R&D	565	277	288	174	184	53	40	9	15	40	49	1	0
Doctoral degree or equivalent	14	6	8	4	4	0	1	0	1	2	2	0	0
Master's, honours, bachelor or equivalent	383	175	208	110	140	28	26	7	9	30	33	0	0
Diplomas	168	96	72	60	40	25	13	2	5	8	14	1	0
Other personnel directly supporting R&D	685	367	318	311	250	20	38	1	5	21	23	14	2
Doctoral degree or equivalent	10	9	1	0	1	0	0	0	0	5	0	4	0
Master's, honours, bachelor or equivalent	125	42	83	25	67	1	4	1	4	5	8	10	0
Diplomas	550	316	234	286	182	19	34	0	1	11	15	0	2
Total	2 849	1 338	1 511	915	963	114	145	50	100	224	292	35	11

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

C.2.4. Science council sector

Table C.111: Science council sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Basic research	1 348 533	1 372 702	1 349 946	1 244 253	1 388 847	1 294 844	1 423 138	1 809 051	1 873 807	1 767 351
Applied research	2 781 198	3 202 019	3 460 650	2 855 564	3 337 342	3 033 375	3 276 969	3 871 742	4 274 227	4 546 996
Experimental development research	1 611 166	1 561 462	1 502 748	1 344 068	1 472 175	1 574 195	1 654 191	1 342 514	1 548 286	1 605 340
Total	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 319	7 919 687

Table C.112: Proportional science council sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Basic research	23.5	22.4	21.4	22.9	22.4	21.9	22.4	25.8	24.3	22.3
Applied research	48.4	52.2	54.8	52.5	53.8	51.4	51.6	55.1	55.5	57.4
Experimental development research	28.1	25.4	23.8	24.7	23.8	26.7	26.0	19.1	20.1	20.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.113: Science council sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Capital expenditure	916 480	857 241	823 937	460 304	571 628	499 152	459 899	539 802	576 178	551 070
Land: Buildings & other structures	162 904	211 246	386 063	62 598	105 660	37 189	42 472	91 878	82 001	54 265
Total: Vehicles, plant, machinery, equipment and software	753 576	645 995	437 874	397 706	465 968	461 963	417 427	447 924	494 177	496 805
Vehicles, plant, machinery, equipment	753 576	645 995	437 874	397 706	430 090	424 749	371 431	431 817	477 198	478 890
Capitalised computer software*	N/A	N/A	N/A	N/A	35 878	37 214	45 996	16 107	16 979	17 915
Current expenditure	4 824 418	5 278 942	5 489 407	4 983 581	5 626 735	5 403 262	5 894 399	6 483 505	7 120 141	7 368 617
Labour costs	2 142 875	2 339 348	2 421 297	2 371 273	2 260 207	2 264 933	2 601 051	2 644 197	2 814 693	3 148 507
Other current expenditure	2 681 543	2 939 594	3 068 110	2 612 308	3 366 528	3 138 329	3 293 348	3 839 308	4 305 449	4 220 110
Total	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 319	7 919 687

* Capitalised computer software data only collected from 2019/20 onwards.

Table C.114: Proportional science council sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Capital expenditure	12.0	16.0	14.0	13.1	9.2	8.5	7.2	7.7	7.5	7.0
Land: Buildings & other structures	7.2	2.8	3.4	6.1	1.7	0.6	0.7	1.3	1.1	0.7
Total: Vehicles, plant, machinery, equipment and software	4.7	13.1	10.5	6.9	7.5	7.8	6.6	6.4	6.4	6.3
Vehicles, plant, machinery, equipment	4.7	13.1	10.5	6.9	6.9	7.2	5.8	6.1	6.2	6.0
Capitalised computer software*	N/A	N/A	N/A	N/A	0.6	0.6	0.7	0.2	0.2	0.2
Current expenditure	88.0	84.0	86.0	86.9	90.8	91.5	92.8	92.3	92.5	93.0
Labour costs	39.7	37.3	38.1	38.4	36.5	38.4	40.9	37.6	36.6	39.8
Other current expenditure	48.3	46.7	47.9	48.6	54.3	53.2	51.8	54.7	55.9	53.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Capitalised computer software only collected from 2019/20 onwards.

Table C.115: Science council sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Biotechnology	320 048	360 163	299 783	257 498	325 251	296 543	348 861	366 530	724 226	593 423
Nanotechnology	139 107	139 783	272 372	222 662	289 934	95 110	104 250	92 613	225 836	140 133
Total	459 154	499 946	572 155	480 160	615 186	391 652	453 111	459 143	950 062	733 556
Science council expenditure on R&D	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 319	7 919 687

Table C.116: Proportional science council sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biotechnology	5.6	5.9	4.7	4.7	5.2	5.0	5.5	5.2	9.4	7.5
Nanotechnology	2.4	2.3	4.3	4.1	4.7	1.6	1.6	1.3	2.9	1.8
Total	8.0	8.1	9.1	8.8	9.9	6.6	7.1	6.5	12.3	9.3

Table C.117: Science council sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Environment-related	1 054 651	1 031 393	953 077	831 377	881 520	802 772	946 401	1 140 335	1 304 327	805 454
Open-source software	692 096	453 879	842 548	107 063	226 090	56 908	61 508	121 145	180 979	143 528
New materials	374 463	373 768	401 995	329 199	297 042	225 040	234 872	215 777	165 875	149 835
TB, HIV/AIDS, malaria	470 488	625 806	670 209	572 650	492 341	519 670	620 403	693 579	709 266	865 620
Space science*	N/A	296 236	0	593 920	614 780	635 906	743 319	757 468	789 131	791 525
Total	2 591 697	2 781 082	2 867 828	2 434 208	2 511 774	2 240 296	2 606 502	2 928 304	3 149 578	2 755 962
Science council expenditure on R&D	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 319	7 919 687

* Space science data only collected from 2016/17 onwards.

Table C.118: Proportional science council sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Environment-related	18.4	16.8	15.1	15.3	14.2	13.6	14.9	16.2	16.9	10.2
Open-source software	12.1	7.4	13.3	2.0	3.6	1.0	1.0	1.7	2.4	1.8
New materials	6.5	6.1	6.4	6.0	4.8	3.8	3.7	3.1	2.2	1.9
TB, HIV/AIDS, malaria	8.2	10.2	10.6	10.5	7.9	8.8	9.8	9.9	9.2	10.9
Space science*	N/A	4.8	0.0	10.9	9.9	10.8	11.7	10.8	10.3	10.0
Total	45.1	45.3	45.4	44.7	40.5	38.0	41.0	41.7	40.9	34.8

* Space science data only collected from 2016/17 onwards.

Table C.119: Science council sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	5 486 847	5 889 463	6 112 974	5 314 694	6 062 356	5 801 859	6 197 153	6 782 596	7 446 483	7 719 798
Mathematical sciences	54 212	47 890	61 223	180 075	154 147	44 050	46 717	22 504	59 698	60 050
Physical sciences	418 648	444 274	502 615	410 797	457 042	423 591	446 937	497 805	475 923	436 389
Chemical sciences	71 024	66 188	77 952	48 685	94 308	59 447	61 528	74 172	81 783	83 140
Earth sciences	181 876	254 414	198 140	202 037	231 490	214 568	286 203	342 069	539 412	376 887
Information, computer and communication technologies	977 891	999 538	1 124 366	852 856	996 778	977 489	1 008 671	1 396 655	1 223 066	1 604 536
Applied sciences and technologies	296 162	475 568	356 409	369 603	474 058	538 072	499 354	459 679	533 407	547 687
Engineering sciences	1 107 289	1 016 283	1 171 287	849 940	1 171 031	1 176 104	1 233 584	1 112 718	1 360 795	1 225 393
Biological sciences	144 341	138 673	169 717	87 630	138 416	113 597	124 691	200 105	218 892	226 967

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Agricultural sciences	1 043 494	1 067 146	989 974	898 199	886 212	790 931	822 351	956 286	1 186 740	1 294 285
Medical and health sciences	775 858	836 967	1 021 905	984 580	885 544	1 048 315	1 347 929	1 343 960	1 382 014	1 432 254
Environmental sciences	240 075	343 218	267 495	212 887	283 782	181 584	186 033	221 953	250 450	257 683
Material sciences	133 231	122 130	143 684	114 491	151 654	111 190	117 631	134 549	112 745	114 572
Marine sciences	42 747	77 173	28 207	102 913	137 894	122 922	15 524	20 141	21 560	59 956
Division 2: Social sciences and humanities	254 050	246 721	200 370	129 191	136 007	100 554	157 145	240 711	249 836	199 889
Social sciences	223 966	239 011	192 200	123 414	136 007	100 554	157 145	240 711	249 836	199 889
Humanities	30 084	7 710	8 170	5 777	0	0	0	0	0	0
Total	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 320	7 919 687

Table C.120: Proportional science council sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	95.6	96.0	96.8	97.6	97.8	98.3	97.5	96.6	96.8	97.5
Mathematical sciences	0.9	0.8	1.0	3.3	2.5	0.7	0.7	0.3	0.8	0.8
Physical sciences	7.3	7.2	8.0	7.5	7.4	7.2	7.0	7.1	6.2	5.5
Chemical sciences	1.2	1.1	1.2	0.9	1.5	1.0	1.0	1.1	1.1	1.0
Earth sciences	3.2	4.1	3.1	3.7	3.7	3.6	4.5	4.9	7.0	4.8
Information, computer and communication technologies	17.0	16.3	17.8	15.7	16.1	16.6	15.9	19.9	15.9	20.3
Applied sciences and technologies	5.2	7.8	5.6	6.8	7.6	9.1	7.9	6.5	6.9	6.9
Engineering sciences	19.3	16.6	18.6	15.6	18.9	19.9	19.4	15.8	17.7	15.5
Biological sciences	2.5	2.3	2.7	1.6	2.2	1.9	2.0	2.8	2.8	2.9
Agricultural sciences	18.2	17.4	15.7	16.5	14.3	13.4	12.9	13.6	15.4	16.3
Medical and health sciences	13.5	13.6	16.2	18.1	14.3	17.8	21.2	19.1	18.0	18.1
Environmental sciences	4.2	5.6	4.2	3.9	4.6	3.1	2.9	3.2	3.3	3.3
Material sciences	2.3	2.0	2.3	2.1	2.4	1.9	1.9	1.9	1.5	1.4
Marine sciences	0.7	1.3	0.4	1.9	2.2	2.1	0.2	0.3	0.3	0.8
Division 2: Social sciences and humanities	4.4	4.0	3.2	2.4	2.2	1.7	2.5	3.4	3.2	2.5
Social sciences	3.9	3.9	3.0	2.3	2.2	1.7	2.5	3.4	3.2	2.5
Humanities	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.121: Science council sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	826 261	754 207	915 281	536 553	715 553	630 997	552 826	674 838	762 239	480 747
Defence	826 261	754 207	915 281	536 553	715 553	630 997	552 826	674 838	762 239	480 747
Division 2: Economic development	2 529 244	2 471 163	2 625 282	2 140 026	2 419 541	2 178 829	2 317 530	3 084 061	3 252 316	3 409 796
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	396 612	396 536	368 829	339 896	290 267	258 061	319 184	351 482	398 223	434 422
Animal production and animal primary products	247 883	247 835	230 518	212 435	207 333	184 329	191 131	213 760	268 166	176 699
Mineral resources (excluding Energy)	265 006	255 226	274 778	287 423	303 480	294 486	330 010	317 316	334 666	352 184
Energy resources	5 063	8 108	6 682	5 568	21 334	20 002	55 770	60 775	62 338	64 263
Energy supply	0	0	1 468	1 499	4 072	4 065	0	22 019	23 239	24 515
Manufacturing	146 395	170 040	179 215	138 141	147 634	147 455	149 384	149 669	155 389	157 394
Construction	60 828	67 003	70 943	65 389	69 621	71 721	91 572	94 679	98 502	99 841
Transport	0	0	0	0	0	0	7 611	8 236	8 654	8 986
Information and communication services	419 252	410 724	462 785	386 839	499 564	455 370	503 252	889 281	923 080	948 239
Commercial services	5 671	7 756	2 937	2 998	0	0	0	0	0	0
Economic framework	664 440	571 815	713 045	419 073	559 622	467 458	400 333	668 848	570 828	578 438
Natural resources	318 094	336 119	314 082	280 766	316 614	275 882	269 284	307 995	409 231	564 813
Division 3: Society	977 159	1 074 539	978 471	1 053 871	1 254 643	1 041 731	1 573 279	1 179 414	1 202 812	1 228 592
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	552 314	613 932	632 851	722 673	653 443	727 194	843 323	937 494	964 716	1 019 795
Education and training	374 704	145 215	98 348	70 575	93 081	50 329	53 431	89 344	79 279	61 543
Social development and community services	50 141	315 392	247 273	260 622	508 119	264 208	676 525	152 576	158 816	147 254
Division 4: Environment	455 404	852 597	782 034	610 761	423 727	389 939	317 858	598 094	617 472	590 350
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	426 582	466 312	434 251	304 725	373 973	344 017	218 392	513 087	528 281	497 217
Environmental aspects of development	14 179	17 451	13 215	13 493	0	0	32 980	35 690	37 501	38 940
Environmental and other aspects	14 644	368 834	334 567	292 543	49 754	45 922	66 486	49 318	51 690	54 192

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 5: Advancement of knowledge	952 830	983 677	1 012 276	1 102 675	1 384 899	1 660 917	1 592 806	1 486 900	1 861 481	2 210 202
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	620 283	692 258	708 020	723 871	1 074 410	1 260 670	1 263 423	1 203 355	1 215 292	1 568 347
Social sciences and humanities	332 547	291 419	304 256	378 804	310 489	400 247	329 382	283 545	646 189	641 855
Total	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 319	7 919 687

Table C.122: Proportional science council sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	14.4	12.3	14.5	9.9	11.5	10.7	8.7	9.6	9.9	6.1
Defence	14.4	12.3	14.5	9.9	11.5	10.7	8.7	9.6	9.9	6.1
Division 2: Economic development	44.1	40.3	41.6	39.3	39.0	36.9	36.5	43.9	42.3	43.1
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	6.9	6.5	5.8	6.2	4.7	4.4	5.0	5.0	5.2	5.5
Animal production and animal primary products	4.3	4.0	3.7	3.9	3.3	3.1	3.0	3.0	3.5	2.2
Mineral resources (excluding Energy)	4.6	4.2	4.4	5.3	4.9	5.0	5.2	4.5	4.3	4.4
Energy resources	0.1	0.1	0.1	0.1	0.3	0.3	0.9	0.9	0.8	0.8
Energy supply	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.3	0.3
Manufacturing	2.6	2.8	2.8	2.5	2.4	2.5	2.4	2.1	2.0	2.0
Construction	1.1	1.1	1.1	1.2	1.1	1.2	1.4	1.3	1.3	1.3
Transport	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Information and communication services	7.3	6.7	7.3	7.1	8.1	7.7	7.9	12.7	12.0	12.0
Commercial services	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Economic framework	11.6	9.3	11.3	7.7	9.0	7.9	6.3	9.5	7.4	7.3
Natural resources	5.5	5.5	5.0	5.2	5.1	4.7	4.2	4.4	5.3	7.1
Division 3: Society	17.0	17.5	15.5	19.4	20.2	17.6	24.8	16.8	15.6	15.5
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	9.6	10.0	10.0	13.3	10.5	12.3	13.3	13.3	12.5	12.9
Education and training	6.5	2.4	1.6	1.3	1.5	0.9	0.8	1.3	1.0	0.8

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Social development and community services	0.9	5.1	3.9	4.8	8.2	4.5	10.6	2.2	2.1	1.9
Division 4: Environment	7.9	13.9	12.4	11.2	6.8	6.6	5.0	8.5	8.0	7.5
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	7.4	7.6	6.9	5.6	6.0	5.8	3.4	7.3	6.9	6.3
Environmental aspects of development	0.2	0.3	0.2	0.2	0.0	0.0	0.5	0.5	0.5	0.5
Environmental and other aspects	0.3	6.0	5.3	5.4	0.8	0.8	1.0	0.7	0.7	0.7
Division 5: Advancement of knowledge	16.6	16.0	16.0	20.3	22.3	28.1	25.1	21.2	24.2	27.9
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	10.8	11.3	11.2	13.3	17.3	21.4	19.9	17.1	15.8	19.8
Social sciences and humanities	5.8	4.7	4.8	7.0	5.0	6.8	5.2	4.0	8.4	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.123: Science council sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Eastern Cape	269 658	273 509	279 550	183 931	206 142	189 604	202 745	246 369	266 760	391 600
Free State	59 953	60 149	59 300	110 995	94 188	85 089	59 246	151 060	69 078	63 219
Gauteng	2 998 643	3 221 705	3 350 135	3 053 440	3 624 098	3 467 734	3 500 581	3 600 017	4 281 279	4 325 514
KwaZulu-Natal	575 016	477 823	540 084	427 585	448 070	437 452	558 627	686 654	706 710	690 217
Limpopo	111 649	114 852	107 457	80 249	65 682	59 687	72 253	82 761	119 192	152 532
Mpumalanga	122 432	128 883	118 267	171 535	148 618	134 637	143 892	127 429	159 026	170 980
North West	153 676	108 010	97 730	43 764	57 117	50 771	109 872	179 675	59 216	75 866
Northern Cape	218 317	223 524	236 797	601 757	634 734	651 793	691 351	792 186	814 467	800 342
Western Cape	1 231 555	1 527 729	1 524 025	770 631	919 714	825 647	1 015 731	1 157 157	1 220 592	1 249 417
Total	5 740 897	6 136 183	6 313 344	5 443 885	6 198 363	5 902 414	6 354 298	7 023 307	7 696 319	7 919 687

Table C.124: Proportional science council sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Eastern Cape	4.7	4.5	4.4	3.4	3.3	3.2	3.2	3.5	3.5	4.9
Free State	1.0	1.0	0.9	2.0	1.5	1.4	0.9	2.2	0.9	0.8
Gauteng	52.2	52.5	53.1	56.1	58.5	58.8	55.1	51.3	55.6	54.6
KwaZulu-Natal	10.0	7.8	8.6	7.9	7.2	7.4	8.8	9.8	9.2	8.7
Limpopo	1.9	1.9	1.7	1.5	1.1	1.0	1.1	1.2	1.5	1.9
Mpumalanga	2.1	2.1	1.9	3.2	2.4	2.3	2.3	1.8	2.1	2.2
North West	2.7	1.8	1.5	0.8	0.9	0.9	1.7	2.6	0.8	1.0
Northern Cape	3.8	3.6	3.8	11.1	10.2	11.0	10.9	11.3	10.6	10.1
Western Cape	21.5	24.9	24.1	14.2	14.8	14.0	16.0	16.5	15.9	15.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.125: Science council sector R&D personnel headcount and full-time equivalents by occupation (2015/16 to 2024/25)

Year	Headcount				Full-time equivalents (FTEs)			
	Total	Researchers	Technicians	Other R&D personnel	Total	Researchers	Technicians	Other R&D personnel
2015/16	5 162	2 072	1 839	1 251	4 361.2	1 827.2	1 683.7	850.4
2016/17	4 955	2 189	1 818	948	4 421.4	1 940.5	1 676.0	804.9
2017/18	4 866	2 053	1 885	928	4 294.9	1 792.1	1 745.4	757.4
2018/19	4 514	1 951	1 728	835	3 941.8	1 697.0	1 579.6	665.2
2019/20	4 070	1 858	1 505	707	3 562.8	1 619.4	1 403.7	539.7
2020/21	4 111	1 774	1 555	782	3 606.0	1 549.2	1 440.3	616.5
2021/22	4 190	1 735	1 528	927	3 838.5	1 594.4	1 451.0	793.1
2022/23	4 117	1 749	1 556	812	3 784.1	1 558.9	1 467.0	758.2
2023/24	4 185	1 707	1 638	840	3 839.1	1 517.3	1 545.8	776.0
2024/25	4 410	1 687	1 629	1 094	4 033.8	1 496.6	1 538.4	998.8

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.126: Science council sector R&D personnel headcount and full-time equivalents by occupation and gender (2022/23, 2023/24 and 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
2022/23							
Researchers	1 749	893	856	1 558.9	791.1	767.8	89.1
Technicians directly supporting R&D	1 556	839	717	1 467.0	788.7	678.3	94.3
Other personnel directly supporting R&D	812	392	420	758.2	360.9	397.3	93.4
Total	4 117	2 124	1 993	3 784.1	1 940.7	1 843.4	91.9
2023/24							
Researchers	1 707	869	838	1 517.3	766.1	751.2	88.9
Technicians directly supporting R&D	1 638	886	752	1 545.8	834.9	710.9	94.4
Other personnel directly supporting R&D	840	397	443	776.0	353.5	422.5	92.4
Total	4 185	2 152	2 033	3 839.1	1 954.5	1 884.6	91.7
2024/25							
Researchers	1 687	855	832	1 496.6	750.5	746.1	88.7
Technicians directly supporting R&D	1 629	857	772	1 538.4	809.1	729.3	94.4
Other personnel directly supporting R&D	1 094	514	580	998.8	458.2	540.6	91.3
Total	4 410	2 226	2 184	4 033.8	2 017.8	2 016.0	91.5

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.127: Science council sector R&D personnel headcount by occupation, qualification, population group and gender (2024/25)

Occupation and qualification	Total	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers	1 687	855	832	404	429	56	62	46	77	227	212	122	52
Doctoral degree or equivalent	861	442	419	174	158	28	34	18	38	124	143	98	46
Master's, honours, bachelor or equivalent	789	392	397	222	260	22	28	28	38	96	65	24	6
Diplomas	37	21	16	8	11	6	0	0	1	7	4	0	0
Technicians directly supporting R&D	1 629	857	772	550	566	70	45	46	43	170	112	21	6
Doctoral degree or equivalent	75	45	30	13	11	1	3	0	3	21	12	10	1
Master's, honours, bachelor or equivalent	1 021	517	504	333	370	32	21	39	35	102	74	11	4
Diplomas	533	295	238	204	185	37	21	7	5	47	26	0	1
Other personnel directly supporting R&D	1 094	514	580	357	401	49	78	34	36	61	56	13	9
Doctoral degree or equivalent	76	39	37	24	15	3	2	6	5	3	10	3	5
Master's, honours, bachelor or equivalent	588	263	325	178	244	19	21	17	22	40	34	9	4
Diplomas	430	212	218	155	142	27	55	11	9	18	12	1	0
Total	4 410	2 226	2 184	1 311	1 396	175	185	126	156	458	380	156	67

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.128: Science council sector overview (2023/24 to 2024/25)

Science councils	2023/24				2024/25			
	R&D expenditure	Researchers	Basic research	Capital expenditure	R&D expenditure	Researchers	Basic research	Capital expenditure
	R'000	FTEs	R'000	R'000	R'000	FTEs	R'000	R'000
Agricultural Research Council	1 072 665	379.0	214 533	140 442	1 177 993	403.0	176 699	102 753
Council for Scientific and Industrial Research	3 295 166	426.0	201 664	66 438	3 383 175	393.0	132 620	77 659
Council for Geoscience	288 468	155.0	57 694	66 095	299 541	155.0	59 908	69 728
Human Sciences Research Council	450 151	134.0	67 523	6 867	477 094	120.0	71 564	5 283
Medical Research Council	1 172 536	218.0	703 522	17 821	1 141 732	219.0	685 039	30 676
Mintek	387 317	102.5	263 376	12 733	408 585	102.5	277 838	13 433
National Research Foundation	1 030 016	102.8	365 496	265 782	1 031 567	104.1	363 682	251 538
Total	7 696 319	1 517.3	1 873 807	576 178	7 919 687	1 496.6	1 767 351	551 070

C.2.5. Higher education sector

Table C.129: Higher education sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Basic research	5 395 693	6 679 585	7 243 562	7 463 879	8 145 359	6 979 245	7 308 509	7 419 273	8 277 895	8 620 534
Applied research	3 176 685	3 466 381	4 264 753	4 303 881	4 497 102	4 423 435	4 633 761	5 093 466	4 952 245	5 408 333
Experimental development research	1 304 245	1 513 291	1 501 561	1 415 358	1 536 500	2 383 056	2 289 858	2 384 810	2 564 360	2 684 606
Total	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

Table C.130: Proportional higher education sector R&D expenditure by type of research (2015/16 to 2024/25)

Type of research	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Basic research	54.6	57.3	55.7	56.6	57.4	50.6	51.4	49.8	52.4	51.6
Applied research	32.2	29.7	32.8	32.6	31.7	32.1	32.6	34.2	31.4	32.4
Experimental development research	13.2	13.0	11.5	10.7	10.8	17.3	16.1	16.0	16.2	16.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.131: Higher education sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Capital expenditure	1 141 349	1 092 704	1 386 695	683 592	706 929	565 762	800 757	647 559	564 872	896 288
Land: Buildings & other structures	198 032	616 761	874 171	257 899	220 810	90 184	115 363	163 931	3 931	303 939
Total: Vehicles, plant, machinery, equipment and software	943 317	475 943	512 524	425 693	486 119	475 578	685 394	483 628	560 941	592 349
Vehicles, plant, machinery, equipment	943 317	475 943	512 524	425 693	465 711	335 047	676 116	467 601	553 494	548 961
Capitalised computer software*	N/A	N/A	N/A	N/A	20 408	140 531	9 278	16 027	7 447	43 388
Current expenditure	8 735 274	10 566 554	11 623 181	12 499 527	13 472 031	13 219 974	13 431 371	14 249 990	15 229 627	15 817 185
Labour costs	3 576 140	4 315 989	5 080 369	5 579 653	6 054 648	6 323 292	6 310 941	6 499 444	6 111 465	6 100 868
Total cost of R&D postgraduate students	1 926 301	1 928 108	1 889 065	1 938 984	1 969 872	1 895 876	1 989 659	2 048 469	2 207 254	2 262 533
Other current expenditure#	3 232 833	4 322 457	4 653 747	4 980 889	5 447 511	5 000 806	5 130 771	5 702 078	6 910 908	7 453 784
Total	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

* Capitalised computer software data only collected from 2019/20 onwards.

Includes specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) costs from 2016/17 onwards.

Table C.132: Proportional higher education sector R&D expenditure by accounting category (2015/16 to 2024/25)

Type of expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Capital expenditure	11.6	9.4	10.7	5.2	5.0	4.1	5.6	4.3	3.6	5.4
Land: Buildings & other structures	2.0	5.3	6.7	2.0	1.6	0.7	0.8	1.1	0.0	1.8
Total: Vehicles, plant, machinery, equipment and software	9.6	4.1	3.9	3.2	3.4	3.4	4.8	3.2	3.6	3.5
Vehicles, plant, machinery, equipment	9.6	4.1	3.9	3.2	3.3	2.4	4.8	3.1	3.5	3.3
Capitalised computer software*	N/A	N/A	N/A	N/A	0.1	1.0	0.1	0.1	0.0	0.3
Current expenditure	88.4	90.6	89.3	94.8	95.0	95.9	94.4	95.7	96.4	94.6
Labour costs	36.2	37.0	39.1	42.3	42.7	45.9	44.3	43.6	43.0	36.5
Total cost of R&D postgraduate students	19.5	16.5	14.5	14.7	13.9	13.8	14.0	13.8	14.0	13.5
Other current expenditure [#]	32.7	37.1	35.8	37.8	38.4	36.3	36.1	38.3	39.4	44.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Capitalised computer software data only collected from 2019/20 onwards.

[#] Includes specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) costs from 2016/17 onwards.

Table C.133: Higher education sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Biotechnology	553 562	531 958	529 948	552 583	701 411	1 051 272	1 176 323	1 181 200	761 554	716 632
Nanotechnology	505 380	431 558	319 610	420 500	477 909	1 168 384	1 063 508	1 108 611	981 881	803 863
Total	1 058 942	963 516	849 558	973 083	1 179 319	2 219 656	2 239 831	2 289 812	1 743 435	1 520 495
Higher education expenditure on R&D	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

Table C.134: Proportional higher education sector expenditure on multidisciplinary areas of R&D (2015/16 to 2024/25)

Multi-disciplinary area of R&D	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Biotechnology	5.6	5.6	4.6	4.1	4.2	4.9	7.6	8.3	7.9	4.3
Nanotechnology	4.7	5.1	3.7	2.5	3.2	3.4	8.5	7.5	7.4	4.8
Total	10.3	10.7	8.3	6.5	7.4	8.3	16.1	15.7	15.4	9.1

Table C.135: Higher education sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Environment-related	583 723	883 069	1 112 755	1 369 351	1 503 980	1 693 912	1 635 364	1 618 855	1 379 946	1 057 350
Open-source software	125 883	164 097	196 300	202 026	220 567	310 748	295 344	396 103	339 631	358 459
New materials	462 962	449 336	252 340	355 152	421 202	304 415	625 956	79 381	166 690	159 544
TB, HIV/AIDS, malaria	944 490	1 082 645	1 308 224	1 374 952	1 582 666	1 558 253	1 361 066	1 674 622	1 291 440	1 397 606
Space science*	N/A	264 712	258 472	247 276	296 166	348 616	384 300	379 345	191 289	221 590
Total	2 117 058	2 843 859	3 128 090	3 548 757	4 024 580	4 215 944	4 302 031	4 148 306	3 368 996	3 194 549
Higher education expenditure on R&D	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

* Space science data only collected from 2016/17 onwards.

Table C.136: Proportional higher education sector R&D expenditure on selected areas of interest (2015/16 to 2024/25)

Area of interest	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Environment-related	5.9	7.6	8.6	10.4	10.6	12.3	11.5	10.9	8.7	6.3
Open-source software	1.3	1.4	1.5	1.5	1.6	2.3	2.1	2.7	2.2	2.1
New materials	4.7	3.9	1.9	2.7	3.0	2.2	4.4	0.5	1.1	1.0
TB, HIV/AIDS, malaria	9.6	9.3	10.1	10.4	11.2	11.3	9.6	11.2	8.2	8.4
Space science*	N/A	2.3	2.0	1.9	2.1	2.5	2.7	2.5	1.2	1.3
Total	21.4	24.4	24.0	26.9	28.4	30.6	30.2	27.8	21.3	19.1

* Space science data only collected from 2016/17 onwards.

Table C.137: Higher education sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Natural sciences, technology and engineering	6 340 905	6 976 302	7 941 477	7 580 936	8 172 232	7 366 884	7 695 481	8 096 239	8 845 754	9 763 404
Mathematical sciences	458 068	512 534	614 391	540 054	605 557	549 049	600 854	624 574	773 563	836 882
Physical sciences	287 830	356 090	427 400	376 229	397 447	357 722	301 613	314 117	400 966	455 708
Chemical sciences	386 300	472 883	362 105	452 369	520 849	406 563	419 953	347 539	370 615	400 366
Earth sciences	271 814	327 638	349 553	356 360	333 039	281 443	301 410	305 748	330 162	354 424
Information, computer and communication technologies	322 406	378 763	295 577	487 825	489 190	505 675	517 445	521 356	591 993	675 108
Applied sciences and technologies	272 429	139 046	76 434	155 627	199 427	211 761	195 209	155 266	117 041	117 832
Engineering sciences	891 532	926 463	907 241	1 082 308	1 107 713	896 415	883 144	987 939	1 190 059	1 336 184
Biological sciences	846 897	788 716	912 256	1 020 774	1 060 541	916 723	977 599	1 008 870	1 126 616	1 147 697

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Agricultural sciences	326 296	440 433	644 885	535 299	517 978	573 725	697 034	708 957	663 454	743 028
Medical and health sciences	2 089 591	2 412 996	2 554 061	2 409 084	2 759 378	2 515 304	2 586 897	2 963 922	3 110 360	3 512 834
Environmental sciences	79 430	128 784	760 600	110 409	135 137	104 655	150 344	125 104	121 068	129 718
Material sciences	93 871	67 707	6 751	12 407	5 921	6 000	13 374	15 073	39 054	41 863
Marine sciences	14 441	24 249	30 223	42 192	40 056	41 851	50 605	17 775	10 804	11 761
Division 2: Social sciences and humanities	3 535 718	4 682 956	5 068 399	5 602 183	6 006 728	6 418 852	6 536 647	6 801 310	6 948 745	6 950 069
Social sciences	2 855 673	3 770 136	4 209 945	4 668 015	4 984 831	5 404 627	5 534 476	5 746 648	5 734 855	5 759 818
Humanities	680 046	912 820	858 454	934 167	1 021 897	1 014 225	1 002 171	1 054 662	1 213 890	1 190 250
Total	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

Table C.138: Proportional higher education sector R&D expenditure by research field (2015/16 to 2024/25)

Main research field	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Natural sciences, technology and engineering	64.2	59.8	61.0	57.5	57.6	53.4	54.1	54.3	56.0	58.4
Mathematical sciences	4.6	4.4	4.7	4.1	4.3	4.0	4.2	4.2	4.9	5.0
Physical sciences	2.9	3.1	3.3	2.9	2.8	2.6	2.1	2.1	2.5	2.7
Chemical sciences	3.9	4.1	2.8	3.4	3.7	2.9	3.0	2.3	2.3	2.4
Earth sciences	2.8	2.8	2.7	2.7	2.3	2.0	2.1	2.1	2.1	2.1
Information, computer and communication technologies	3.3	3.2	2.3	3.7	3.5	3.7	3.6	3.5	3.7	4.0
Applied sciences and technologies	2.8	1.2	0.6	1.2	1.4	1.5	1.4	1.0	0.7	0.7
Engineering sciences	9.0	7.9	7.0	8.2	7.8	6.5	6.2	6.6	7.5	8.0
Biological sciences	8.6	6.8	7.0	7.7	7.5	6.6	6.9	6.8	7.1	6.9
Agricultural sciences	3.3	3.8	5.0	4.1	3.7	4.2	4.9	4.8	4.2	4.4
Medical and health sciences	21.2	20.7	19.6	18.3	19.5	18.2	18.2	19.9	19.7	21.0
Environmental sciences	0.8	1.1	5.8	0.8	1.0	0.8	1.1	0.8	0.8	0.8
Material sciences	1.0	0.6	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.3
Marine sciences	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.1	0.1	0.1
Division 2: Social sciences and humanities	35.8	40.2	39.0	42.5	42.4	46.6	45.9	45.7	44.0	41.6
Social sciences	28.9	32.3	32.4	35.4	35.2	39.2	38.9	38.6	36.3	34.5
Humanities	6.9	7.8	6.6	7.1	7.2	7.4	7.0	7.1	7.7	7.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.139: Higher education sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 1: Defence	8 330	10 899	13 792	12 592	14 392	13 602	14 603	16 133	20 604	22 508
Defence	8 330	10 899	13 792	12 592	14 392	13 602	14 603	16 133	20 604	22 508
Division 2: Economic development	2 850 018	3 375 098	4 044 376	4 344 693	4 417 475	4 253 957	4 311 790	4 391 077	4 759 118	4 927 151
Economic development unclassified	0	0	0	0	0	0	0	0	0	0
Plant production and plant primary products	282 188	358 551	551 241	473 094	519 167	451 434	508 770	514 630	513 645	539 440
Animal production and animal primary products	199 545	288 114	390 549	341 481	368 539	338 612	378 745	377 203	401 051	512 823
Mineral resources (excluding Energy)	131 141	115 367	157 215	161 069	162 124	129 226	135 226	146 013	160 863	169 598
Energy resources	84 862	68 184	98 739	100 429	121 081	67 507	84 276	75 033	73 692	94 198
Energy supply	237 993	225 645	247 610	289 618	307 754	248 977	248 077	241 621	266 820	280 782
Manufacturing	380 258	444 203	478 631	557 911	518 485	466 422	456 904	486 061	561 250	611 196
Construction	111 437	177 750	223 367	257 483	184 267	174 602	173 922	187 448	216 057	228 058
Transport	47 577	72 250	101 938	47 056	72 113	67 299	82 662	77 461	91 044	109 618
Information and communication services	232 257	191 378	240 992	351 560	355 508	348 737	391 270	396 265	406 755	444 141
Commercial services	125 771	182 456	199 639	262 863	317 151	281 074	298 091	299 106	325 618	354 631
Economic framework	544 118	612 373	703 369	968 057	933 506	1 049 281	989 437	1 046 477	1 166 558	1 090 318
Natural resources	472 871	638 827	651 085	534 072	557 782	630 786	564 410	543 759	575 765	492 347
Division 3: Society	2 820 755	3 266 113	3 540 172	2 988 330	3 750 653	3 703 025	3 941 413	4 179 090	4 185 908	4 380 057
Society unclassified	0	0	0	0	0	0	0	0	0	0
Health	1 375 861	1 652 001	1 730 300	1 273 726	1 915 131	1 882 024	2 033 842	2 152 499	2 140 098	2 316 516
Education and training	925 245	912 877	1 041 714	1 057 301	1 297 282	1 272 888	1 310 373	1 273 539	1 262 114	1 291 947
Social development and community services	519 649	701 234	768 158	657 303	538 240	548 113	597 198	753 052	783 695	771 594
Division 4: Environment	614 011	737 262	780 436	1 070 418	1 105 385	1 139 091	1 094 682	1 069 396	1 093 297	1 125 321
Environment unclassified	0	0	0	0	0	0	0	0	0	0
Environmental knowledge	246 804	331 243	341 909	469 090	452 706	423 839	443 038	448 651	458 103	491 770
Environmental aspects of development	212 879	233 609	233 947	317 976	353 870	356 402	347 753	341 358	361 598	378 073
Environmental and other aspects	154 328	172 411	204 580	283 352	298 809	358 850	303 890	279 387	273 596	255 478

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Division 5: Advancement of knowledge	3 583 508	4 269 886	4 631 099	4 767 086	4 891 055	4 676 061	4 869 640	5 241 854	5 735 572	6 258 436
Advancement of knowledge unclassified	0	0	0	0	0	0	0	0	0	0
Natural sciences, technologies and engineering	2 262 831	2 887 227	3 269 179	3 373 533	3 346 297	3 197 657	3 323 014	3 566 849	3 743 566	4 319 087
Social sciences and humanities	1 320 677	1 382 659	1 361 920	1 393 552	1 544 758	1 478 404	1 546 626	1 675 005	1 992 006	1 939 350
Total	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

Table C.140: Proportional higher education sector R&D expenditure by socio-economic objective (2015/16 to 2024/25)

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Division 1: Defence	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Defence	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Division 2: Economic development	28.9	28.9	31.1	33.0	31.2	30.9	30.3	29.5	30.1	29.5
Economic development unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plant production and plant primary products	2.9	3.1	4.2	3.6	3.7	3.3	3.6	3.5	3.3	3.2
Animal production and animal primary products	2.0	2.5	3.0	2.6	2.6	2.5	2.7	2.5	2.5	3.1
Mineral resources (excluding Energy)	1.3	1.0	1.2	1.2	1.1	0.9	1.0	1.0	1.0	1.0
Energy resources	0.9	0.6	0.8	0.8	0.9	0.5	0.6	0.5	0.5	0.6
Energy supply	2.4	1.9	1.9	2.2	2.2	1.8	1.7	1.6	1.7	1.7
Manufacturing	3.9	3.8	3.7	4.2	3.7	3.4	3.2	3.3	3.6	3.7
Construction	1.1	1.5	1.7	2.0	1.3	1.3	1.2	1.3	1.4	1.4
Transport	0.5	0.6	0.8	0.4	0.5	0.5	0.6	0.5	0.6	0.7
Information and communication services	2.4	1.6	1.9	2.7	2.5	2.5	2.7	2.7	2.6	2.7
Commercial services	1.3	1.6	1.5	2.0	2.2	2.0	2.1	2.0	2.1	2.1
Economic framework	5.5	5.3	5.4	7.3	6.6	7.6	7.0	7.0	7.4	6.5
Natural resources	4.8	5.5	5.0	4.1	3.9	4.6	4.0	3.6	3.6	2.9
Division 3: Society	28.6	28.0	27.2	22.7	26.5	26.9	27.7	28.1	26.5	26.2
Society unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health	13.9	14.2	13.3	9.7	13.5	13.7	14.3	14.4	13.5	13.9
Education and training	9.4	7.8	8.0	8.0	9.1	9.2	9.2	8.5	8.0	7.7

Socio-economic objective	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Social development and community services	5.3	6.0	5.9	5.0	3.8	4.0	4.2	5.1	5.0	4.6
Division 4: Environment	6.2	6.3	6.0	8.1	7.8	8.3	7.7	7.2	6.9	6.7
Environment unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental knowledge	2.5	2.8	2.6	3.6	3.2	3.1	3.1	3.0	2.9	2.9
Environmental aspects of development	2.2	2.0	1.8	2.4	2.5	2.6	2.4	2.3	2.3	2.3
Environmental and other aspects	1.6	1.5	1.6	2.1	2.1	2.6	2.1	1.9	1.7	1.5
Division 5: Advancement of knowledge	36.3	36.6	35.6	36.2	34.5	33.9	34.2	35.2	36.3	37.4
Advancement of knowledge unclassified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural sciences, technologies and engineering	22.9	24.8	25.1	25.6	23.6	23.2	23.3	23.9	23.7	25.8
Social sciences and humanities	13.4	11.9	10.5	10.6	10.9	10.7	10.9	11.2	12.6	11.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.141: Higher education sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Eastern Cape	975 099	1 002 978	1 017 383	1 027 996	1 123 901	1 190 432	1 161 879	1 216 878	1 192 784	1 235 373
Free State	523 782	625 646	894 118	803 727	847 104	624 925	620 362	652 324	655 670	658 921
Gauteng	3 305 576	4 105 237	4 269 020	3 730 236	4 188 428	4 474 214	4 112 581	4 435 871	4 731 738	4 580 015
KwaZulu-Natal	903 664	1 157 722	1 428 653	1 646 915	1 514 301	1 377 646	1 471 778	1 496 220	1 509 636	1 485 765
Limpopo	229 364	301 809	358 543	384 346	466 703	540 991	576 400	580 675	515 903	640 785
Mpumalanga	190 716	148 981	155 430	170 553	213 914	220 654	584 924	428 361	313 528	588 651
North West	444 135	469 171	449 196	833 635	856 833	555 118	642 430	662 862	763 690	820 163
Northern Cape	164 487	188 515	180 632	161 714	169 999	52 337	74 812	81 581	89 860	98 124
Western Cape	3 139 800	3 659 198	4 256 902	4 423 997	4 797 779	4 749 419	4 986 962	5 342 777	6 021 690	6 605 676
Total	9 876 623	11 659 258	13 009 876	13 183 119	14 178 960	13 785 736	14 232 128	14 897 549	15 794 499	16 713 473

Table C.142: Proportional higher education sector R&D expenditure by province (2015/16 to 2024/25)

Province	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
	%	%	%	%	%	%	%	%	%	%
Eastern Cape	9.9	8.6	7.8	7.8	7.9	8.6	8.2	8.2	7.6	7.4
Free State	5.3	5.4	6.9	6.1	6.0	4.5	4.4	4.4	4.2	3.9
Gauteng	33.5	35.2	32.8	28.3	29.5	32.5	28.9	29.8	30.0	27.4
KwaZulu-Natal	9.1	9.9	11.0	12.5	10.7	10.0	10.3	10.0	9.6	8.9
Limpopo	2.3	2.6	2.8	2.9	3.3	3.9	4.0	3.9	3.3	3.8
Mpumalanga	1.9	1.3	1.2	1.3	1.5	1.6	4.1	2.9	2.0	3.5
North West	4.5	4.0	3.5	6.3	6.0	4.0	4.5	4.4	4.8	4.9
Northern Cape	1.7	1.6	1.4	1.2	1.2	0.4	0.5	0.5	0.6	0.6
Western Cape	31.8	31.4	32.7	33.6	33.8	34.5	35.0	35.9	38.1	39.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table C.143: Higher education sector R&D personnel headcount and full-time equivalents by occupation (2015/16 to 2024/25)

Year	Headcount				Full-time equivalents (FTEs)			
	Total	Researchers*	Technicians	Other R&D personnel	Total	Researchers*	Technicians	Other R&D personnel
2015/16	25 612	19 217	2 616	3 779	7 147.1	4 701.9	1 000.3	1 445.0
2016/17	28 658	22 302	2 227	4 129	7 652.9	5 220.4	804.2	1 628.3
2017/18	31 467	24 942	2 484	4 041	8 459.4	6 040.6	838.0	1 580.8
2018/19	31 230	24 618	2 272	4 340	8 873.3	6 007.2	924.5	1 941.6
2019/20	32 524	25 727	2 160	4 637	9 122.3	6 165.9	849.2	2 107.2
2020/21	32 168	25 651	2 267	4 250	9 099.6	6 034.1	1 021.5	2 044.0
2021/22	33 134	26 759	2 043	4 332	8 824.6	5 896.4	882.9	2 045.3
2022/23	32 100	25 648	2 021	4 431	8 667.9	5 686.4	894.3	2 087.3
2023/24	35 259	28 311	2 078	4 870	8 330.1	5 558.0	834.6	1 937.5
2024/25	35 520	28 452	2 310	4 758	8 263.9	5 254.0	909.7	2 100.2

* Excludes doctoral students and post-doctoral fellows.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.144: Higher education sector R&D personnel headcount (including doctoral and post-doctoral fellows) and full-time equivalents by occupation and gender (2022/23, 2023/24 and 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
2022/23							
Researchers*	53 059	27 557	25 502	21 424.6	11 180.4	10 244.1	40.4
Technicians directly supporting R&D	2 021	1 168	853	894.3	505.9	388.4	44.2
Other personnel directly supporting R&D	4 431	1 395	3 036	2 087.3	675.7	1 411.6	47.1
Total	59 511	30 120	29 391	24 406.1	12 362.0	12 044.1	41.0
2023/24							
Researchers*	58 280	30 295	27 985	21 494.5	11 261.1	10 233.4	36.9
Technicians directly supporting R&D	2 078	1 172	906	834.6	468.2	366.4	40.2
Other personnel directly supporting R&D	4 870	1 458	3 412	1 937.5	587.1	1 350.4	39.8
Total	65 228	32 925	32 303	24 266.6	12 316.3	11 950.3	37.2
2024/25							
Researchers*	58 765	30 123	28 642	20 739.1	10 690.9	10 048.2	35.3
Technicians directly supporting R&D	2 310	1 270	1 040	909.7	508.9	400.8	39.4
Other personnel directly supporting R&D	4 758	1 478	3 280	2 100.2	632.6	1 467.6	44.1
Total	65 833	32 871	32 962	23 749.0	11 832.3	11 916.6	36.1

* Includes doctoral students and post-doctoral fellows, as well as specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.145: Higher education sector R&D personnel headcount and full-time equivalents by occupation and gender (2022/23, 2023/24 and 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)			
	Total	Male	Female	Total	Male	Female	FTEs as % of headcount
2022/23							
Researchers*	25 648	13 386	12 262	5 686.4	2 984.6	2 701.7	22.2
Technicians directly supporting R&D	2 021	1 168	853	894.3	505.9	388.4	44.2
Other personnel directly supporting R&D	4 431	1 395	3 036	2 087.3	675.7	1 411.6	47.1
Total	32 100	15 949	16 151	8 667.9	4 166.2	4 501.7	27.0
2023/24							
Researchers*	28 311	14 914	13 397	5 558.0	2 892.4	2 665.6	19.6
Technicians directly supporting R&D	2 078	1 172	906	834.6	468.2	366.4	40.2
Other personnel directly supporting R&D	4 870	1 458	3 412	1 937.5	587.1	1 350.4	39.8
Total	35 259	17 544	17 715	8 330.1	3 947.7	4 382.4	23.6
2024/25							
Researchers*	28 452	14 714	13 738	5 254.0	2 733.7	2 520.3	18.5
Technicians directly supporting R&D	2 310	1 270	1 040	909.7	508.9	400.8	39.4
Other personnel directly supporting R&D	4 758	1 478	3 280	2 100.2	632.6	1 467.6	44.1
Total	35 520	17 462	18 058	8 263.9	3 875.2	4 388.7	23.3

* Excludes doctoral students and post-doctoral fellows but includes specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.
Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.146: Higher education sector R&D postgraduate headcount by qualification and gender, and full-time equivalents by qualification (2022/23, 2023/24 and 2024/25)

Occupation	Headcount			Full-time equivalents (FTEs)	
	Total	Male	Female	Total	Total FTEs as % of total headcount
2022/23					
Post-doctoral fellows	2 718	1 567	1 151	2 500.8	92.0
Doctoral students	24 693	12 604	12 089	13 237.4	53.6
Master's students (full research master's)	27 909	12 621	15 288	12 792.7	45.8
Master's students (coursework plus thesis with research component)	28 318	13 092	15 226	7 717.9	27.3
Total	83 638	39 884	43 754	36 248.9	43.3
2023/24					
Post-doctoral fellows	3 487	2 100	1 387	3 096.0	88.8
Doctoral students	26 482	13 281	13 201	12 840.6	48.5
Master's students (full research master's)	28 882	12 289	16 593	13 521.2	46.8
Master's students (coursework plus thesis with research component)	29 803	12 808	16 995	8 865.3	29.7
Total	88 654	40 478	48 176	38 323.1	43.2
2024/25					
Post-doctoral fellows	3 550	2 099	1 451	2 991.2	84.3
Doctoral students	26 763	13 310	13 453	12 494.0	46.7
Master's students (full research master's)	28 344	12 009	16 335	13 494.6	47.4
Master's students (coursework plus thesis with research component)	28 473	11 875	16 598	8 922.8	31.5
Total	87 130	39 293	47 837	37 902.5	43.5

Table C.147: Higher education sector R&D personnel headcount by occupation, qualification, population group and gender (2024/25)

Occupation and qualification	Total	Subtotal		African		Coloured		Indian/Asian		White		Non-SA	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Researchers*	28 452	14 714	13 738	5 554	4 999	816	1 035	1 042	1 364	4 151	5 046	3 151	1 294
Doctoral degree or equivalent	15 816	8 786	7 030	2 675	2 118	407	452	525	611	2 681	2 877	2 498	972
Master's, honours, bachelor or equivalent	10 381	4 835	5 546	2 438	2 452	329	460	433	596	1 189	1 799	446	239
Diplomas	2 255	1 093	1 162	441	429	80	123	84	157	281	370	207	83
Technicians directly supporting R&D	2 310	1 270	1 040	606	451	239	138	60	43	248	233	117	175
Doctoral degree or equivalent	160	65	95	14	11	5	10	1	4	25	44	20	26
Master's, honours, bachelor or equivalent	1 207	585	622	332	281	41	62	20	22	120	132	72	125
Diplomas	943	620	323	260	159	193	66	39	17	103	57	25	24
Other personnel directly supporting R&D	4 758	1 478	3 280	822	1 483	219	812	42	133	284	763	111	89
Doctoral degree or equivalent	417	189	228	83	81	9	25	6	10	58	94	33	18
Master's, honours, bachelor or equivalent	2 072	631	1 441	369	683	76	269	18	58	122	385	46	46
Diplomas	2 269	658	1 611	370	719	134	518	18	65	104	284	32	25
Total	35 520	17 462	18 058	6 982	6 933	1 274	1 985	1 144	1 540	4 683	6 042	3 379	1 558

* Excludes doctoral students and post-doctoral fellows but includes specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.148: Higher education sector overview (2023/24 to 2024/25)

Universities	2023/24					2024/25				
	R&D expenditure	Researcher headcount*	Researcher FTE*	Postgrad headcount#	Postgrad FTE#	R&D expenditure	Researcher headcount*	Researcher FTE*	Postgrad headcount#	Postgrad FTE#
	R' 000					R' 000				
Private universities	162 828	105	35.8	394.0	143.9	53 453	171	39.9	413.0	150.0
Public universities	14 234 444	23 617	4 821.0	26 822.0	14 250.1	15 136 048	23 008	4 530.4	27 001.0	13 699.1
Nelson Mandela Metropolitan University	505 992	1 033	159.4	682.0	351.3	587 779	1 129	189.3	687.0	348.5
North-West University	716 413	1 692	399.6	2 404.0	1 411.8	760 040	1 696	373.1	1 683.0	881.3
Rhodes University	322 352	369	73.8	569.0	420.8	331 583	359	71.8	571.0	322.2
Sefako Makgatho Health Sciences University	227 873	777	155.4	171.0	119.7	231 791	569	56.9	221.0	140.7
University of Cape Town	2 450 032	1 059	437.9	2 511.0	1 578.7	2 885 673	1 268	453.6	2 542.0	1 604.7
University of Fort Hare	156 937	309	46.4	386.0	270.2	102 598	298	41.6	389.0	194.5
University of Johannesburg	905 867	2 333	404.4	2 447.0	1 461.6	997 088	2 371	404.0	2 705.0	1 473.7
University of KwaZulu-Natal	1 042 251	2 471	538.2	3 108.0	1 340.9	944 923	2 665	540.6	3 073.0	1 236.0
University of Limpopo	331 530	702	175.5	340.0	122.0	336 082	728	145.6	419.0	293.3
University of Mpumalanga	62 714	167	28.0	33.0	33.0	342 878	173	29.5	56.0	56.0
University of Pretoria	1 230 233	2 688	368.9	2 981.0	1 359.7	1 248 374	2 579	378.4	2 949.0	1 329.8
University of South Africa	937 801	2 010	379.8	3 264.0	1 662.4	792 403	2 094	306.5	3 910.0	1 985.4
University of Stellenbosch	2 784 355	2 074	481.8	2 255.0	1 420.2	3 041 678	1 750	497.9	1 949.0	1 110.6
University of the Free State	467 835	703	195.5	1 263.0	623.4	449 565	751	215.7	1 298.0	664.1
University of the Western Cape	700 618	1 047	230.2	1 398.0	653.0	687 859	990	203.5	1 544.0	683.6
University of the Witwatersrand	1 281 107	3 854	697.0	2 603.0	1 207.6	1 282 916	3 248	563.1	2 636.0	1 179.7
University of Zululand	110 536	329	49.4	407.0	214.0	112 818	340	59.2	369.0	195.0

Universities	2023/24					2024/25				
	R&D expenditure	Researcher headcount*	Researcher FTE*	Postgrad headcount#	Postgrad FTE#	R&D expenditure	Researcher headcount*	Researcher FTE*	Postgrad headcount#	Postgrad FTE#
	R' 000					R' 000				
Universities of (science) and technology	1 397 227	4 589	701.2	2 753.0	1 542.5	1 523 973	5 273	683.7	2 899.0	1 636.1
Cape Peninsula University of Technology	220 077	723	125.3	378.0	161.0	196 211	1 395	81.7	421.0	166.3
Walter Sisulu University of Technology and Science	137 736	902	90.2	129.0	77.4	139 845	910	91.0	73.0	49.0
Central University of Technology	105 202	277	52.8	233.0	100.9	113 058	304	55.9	221.0	91.8
Durban University of Technology	184 848	751	131.8	869.0	432.5	253 554	763	133.6	979.0	455.3
Mangosuthu University of Technology	35 310	243	30.0	14.0	14.0	56 371	190	31.5	14.0	14.0
Tshwane University of Technology	491 483	855	171.0	720.0	498.0	513 534	922	177.1	779.0	591.8
University of Venda for Science and Technology	125 525	485	48.5	255.0	178.5	151 238	442	66.3	247.0	179.5
Vaal University of Technology	97 047	353	51.6	155.0	80.3	100 161	347	46.7	165.0	88.3
Total	15 794 499	28 311	5 558.0	29 969.0	15 936.5	16 713 473	28 452	5 254.0	30 313.0	15 485.1

* Excludes doctoral students and post-doctoral fellows but includes specific categories of R&D personnel (e.g., professors emeritus, research fellows, etc.) from 2016/17 onwards.

#Missing personnel data supplemented from the HEMIS database. Collected personnel data may differ from HEMIS data in some cases due to definitional differences in personnel categories. Where no data was provided, a statistically generated estimate was created.

Note: Headcount includes non-SA R&D personnel from 2016/17 onwards. Non-SA R&D personnel are those not holding South African citizenship.

Table C.149: Gross domestic product and employment (2015/16 to 2024/25)

Reference year	Survey year	GDP level (current values)	GDP level (constant 2015 values)	Employment
		R' 000	R' 000	(000)
2015	2015/16	4 420 793	4 420 793	15 675
2016	2016/17	4 759 555	4 450 171	16 212
2017	2017/18	5 078 190	4 501 702	16 378
2018	2018/19	5 363 190	4 571 783	16 291
2019	2019/20	5 625 207	4 583 667	16 383
2020	2020/21	5 562 760	4 300 904	14 995
2021	2021/22	6 206 842	4 509 870	14 914
2022	2022/23	6 666 581	4 602 690	16 192
2023	2023/24	7 037 674	4 639 792	16 745
2024	2024/25	7 352 449	4 664 608	16 787

Note: Data source: Stats SA (2025, 2026)

D. DESCRIPTION OF SURVEY METHODOLOGY

D.1. Survey design and planning

The South African National Survey of Research and Experimental Development (R&D Survey) is one of the tools used to monitor and evaluate the performance of South Africa’s national system of innovation (NSI).

The R&D Survey can be thought of as three survey instruments covering the four main sectors described in the Frascati Manual: business enterprise, government, private not-for-profit and the higher education sectors. In South Africa, science councils are distinct from the government sector and reported separately, thus constituting a fifth sector.

The scope of the survey includes all units that perform R&D, whether continuously or occasionally. Output tables are agreed in advance of the survey between HSRC-CeSTII and the DSTI as a standard.

The survey collects data in accordance with the guidelines recommended by the OECD in the Frascati Manual (OECD, 2015). This helps to maintain coherence and international comparability. The System of National Accounts (EC, IMF, OECD, UN and the World Bank, 2009) and the national system of innovation (NSI) differs in the identification of target units and definitions.

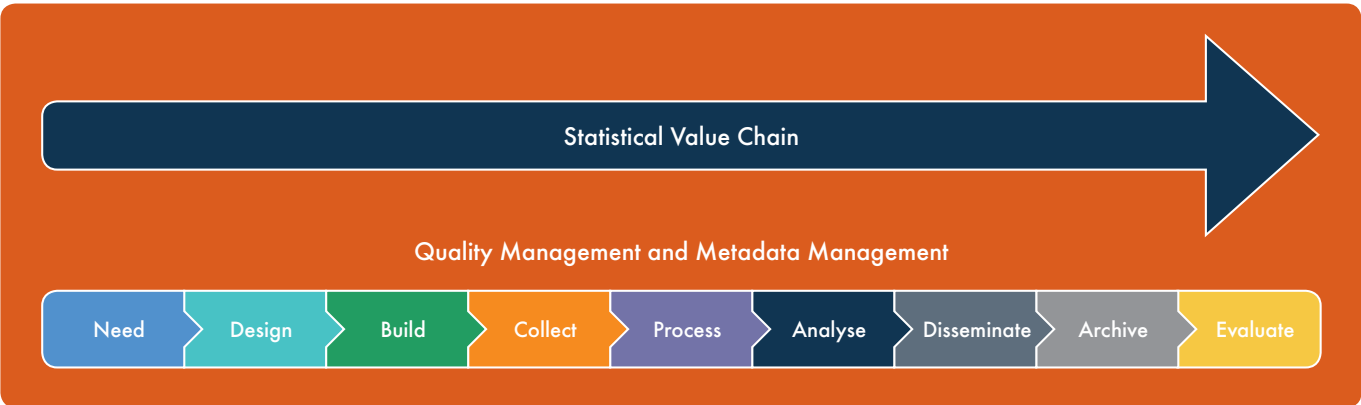
In the interests of coherence of its data with other South African economic survey data, the South African R&D Survey adheres to the standards and methods applied or recommended by Statistics South Africa (Stats SA). Concepts and definitions are aligned as far as possible with those in use by the National Statistical Organisation (NSO) (Stats SA, 2010a). Indicators that use external data are sourced from Stats SA surveys. These are:

- Gross domestic product values for the 2024 annual reference period taken from the quarterly Stats SA GDP statistical release P0441 (Stats SA, 2026); and
- Employment level value for the first quarter of 2025 obtained from the Stats SA Quarterly Labour Force Survey statistical release P0211 (Stats SA, 2025).

The survey also uses the SIC codes for business sector industrial classifications employed by Stats SA (Stats SA, 2004).

Overall, HSRC-CeSTII performs quality management in line with practices recommended by Stats SA in the South African Statistical Quality Assessment Framework (SASQAF) (Stats SA, 2010b). The survey was conducted according to a project plan aligned with the phases of the statistical value chain (SVC) illustrated in Figure D1, modelled on the practice of Stats SA.

Figure D.1: Statistical Value Chain in quality and metadata management



D.2. Frame, sample selection and fieldwork

Three questionnaires were used in the survey for the business sector, the higher education sector, and government departments, research institutes, museums, science councils and NPOs.

R&D performers in sectors were defined as any units that had R&D expenditure or were likely to have had it in 2024/25. Table D.1 describes the fieldwork periods employed by the sector and provides their respective reference periods. All sectors were surveyed as a census.

Table D.1: Description of sectors, respective reference periods, sampling methods and fieldwork periods

Sector	Description	Reference period	Method of surveying	Fieldwork and follow-up period
Business	Large, medium and small (micro) business enterprises, including state-owned enterprises.	1 April 2024 to 31 March 2025 or the nearest complete financial year.	A census approach was used for the register of the business sector. This involves the inclusion of all R&D performing businesses. The frame was selected from the business register and has been developed and maintained by HSRC-CeSTII since 2002. All known and likely R&D performers were targeted including those that were on the current frame.	23 October 2025 to 31 July 2026
Not-for-profit	Non-governmental and not-for-profit entities. Those registered as section 21 companies.	1 April 2024 to 31 March 2025 or the nearest complete financial year.	A census approach was used for the register of the NPO sector. All known and likely R&D performers were surveyed following an investigation of a list of registered non-governmental and NPOs including those that were on the current frame.	28 October 2025 to 29 July 2026
Government	National and provincial departments, local government, museums, research institutes and other research units with R&D components.	1 April 2024 to 31 March 2025 or the nearest complete financial year.	Government departments were surveyed using a census approach. All government departments, associated research institutions and museums performing R&D at national, provincial and local levels were included in the government sector.	23 October 2025 to 31 July 2026
Science councils	The nine science councils established through Acts of Parliament.	1 April 2024 to 31 March 2025 or the nearest complete financial year.	Seven statutory science councils were surveyed.	23 October 2025 to 31 July 2026
Higher education	All public higher education institutions as well as private higher education institutions that performed R&D. Teaching hospitals were also included in this sector.	Calendar year (ending 31 December 2024)	Higher education institutions, namely universities, universities of science and technology, institutes of education and private higher education institutions were included in the higher education sector frame. All public R&D performing higher education institutions were surveyed.	23 October 2025 to 31 July 2026

D.3. Fieldwork

The R&D data were collected through questionnaires sent to the units in each sector by electronic mail or by use of an online submission system first piloted in 2021. All five sectors were surveyed between 23 October 2025 and 31 July 2026.

The online submission platform could be obtained at <https://rdisurveys.hsrc.ac.za/login> for registered R&D performers activated by researchers who confirmed the presence of R&D activity.

A unit was considered as a response if:

- The unit completed and returned a questionnaire with non-zero in-house R&D expenditure,
- If the unit's in-house R&D expenditure, headcount, and source of funds data as a minimum were reported by the respondent without a fully completed questionnaire, or,
- If data were confirmed by the respondent after being imputed based on secondary data sources.

The data sources used for imputation included previous R&D survey responses as well as other private and public data sources such as the Higher Education Management Information System (HEMIS) and Support Programme for Industrial Innovation (SPII).

For each sector, a list of R&D-performing units was identified from existing lists and intelligence-gathering operations. These units were verified as R&D performers to determine which units to survey before collection began.

Changes to the 2016/17 R&D Survey collection instruments on the R&D personnel tables for all sectors were maintained in the 2024/25 R&D Survey. This was done to report on foreign employees who could not be categorised into a population group in previous surveys. The R&D personnel changes included an additional classification of the R&D personnel population group as non-South African.

Business sector

HSRC-CeSTII has developed a register of known or likely R&D performers in the business sector from several information sources, including the Johannesburg Stock Exchange (JSE) Top 100 Companies, Technology Top 100, desktop research based on business intelligence, and either online or physical investigations at techno-parks. A list of 624 companies was investigated. A total of 428 business sector units were selected for the 2024/25 survey period. Of this cohort, 208 units were reported as in scope (R&D performers) and 31 as out of scope (non-R&D performers). A total of 108 units were imputed to account for non-response of in-scope units.

Non-response during the 2024/25 Survey may be attributed to several factors, including resistance among respondents to participating in the survey and to newly appointed individuals being assigned to R&D survey responsibilities within their companies.

Steps were implemented to improve the quality of the survey through new business coverage expansion activities, including the Business Sector Coverage Improvement Project, continued traditional business intelligence efforts, and cleaning existing registers, all aimed at expanding coverage by adding new units to the frame to boost response rates.

The business intelligence strategies implemented for the 2024/25 R&D Survey included:

1. Cleaning the existing frame and removing units that were out-of-scope.
2. Frame-building activities through business intelligence and investigating survey lists of innovation studies for possible inclusion or investigation of business units.
3. Identifying events to improve the visibility of the R&D Survey and networking to identify entities likely to perform R&D.
4. Sectoral engagements with R&D performers.

The 2024/25 Survey also included several virtual engagements with respondents as well as face-to-face meetings. This worked well in overcoming resistance to participating in the survey and in obtaining more complete questionnaires from respondents in all sectors.

Science council sector

Seven R&D-active science councils responded to the survey questionnaire. One of these was surveyed at the level of its constituent units, resulting in a total of 11 reporting units for the 2024/25 financial period.

Not-for-profit sector

The fieldwork staff investigated a list of 108 units in the not-for-profit sector, comprising well-known and likely R&D performers. Fifty-nine units were deemed in-scope and selected to compile statistics for the 2024/25 R&D Survey. The register is cleaned annually because of periodic R&D performers, given that most units are not regular R&D participants. These units, which included those that had advised of no R&D for three years or longer, as well as those that had been imputed for three years or longer, were recognised and eliminated from the frame by researchers.

Government sector

The government sector team investigated a list of 64 units, including national and provincial departments, municipalities, research centres, and museums. Fifty-three possible R&D performing units were selected to be surveyed for the 2024/25 survey cycle. The government sector register also underwent a cleaning process. The previous survey cycle excluded confirmed out-of-scope units (3), as well as units that engage in periodic R&D. Periodic R&D performing units do not engage in R&D activity every year due to dependency on budgetary allowance and skilled personnel. These units were identified and removed from the frame (including units that had reported no R&D for three years or more, or units that were imputed for three years or more).

Higher education sector

In the 2024/25 R&D Survey, the survey frame for the higher education sector comprised 37 institutions, made up of 12 private and 25 public universities.

These estimates include research chair funding and specific higher education personnel (emeritus professors, research fellows, and honorary associates), as recommended by the Frascati guidelines. Although they are unsalaried, their associated time and resource costs are recorded under other current expenditure. Additionally, since the 2016/17 R&D Survey, master's students have been split into two reporting categories: comprehensive research and coursework with a research thesis.

D.4. Methodological note on measures to improve fieldwork for the 2024/25 R&D Survey

The sampling frame deployed in prior R&D survey cycles contained 39 out-of-scope units. Excluding periodic R&D performers inherently reduces the frame size, as systemic data cleaning across all sectors remains an essential procedural step. This contraction occurs because the database must continuously filter out intermittent R&D performers to ensure that only consistently active research entities are captured, thereby maintaining the structural integrity of the longitudinal data.

Concurrent frame-building initiatives were implemented using new source data to detect potential R&D-performing organisations, particularly by investigating techno parks. Furthermore, by isolating periodic R&D units that did not qualify for the active sample, these efforts reduced the overall sampling frame compared to the 2024/25 R&D Survey. Suspended R&D units are kept on the register for evaluation in future iterations.

In addition to frame maintenance measures, resistance to participation in the R&D survey (across several sectors) led the R&D survey project team to implement strategic, focused measures to counteract it. These included:

- 1. Extending fieldwork:** Fieldwork for the R&D Survey 2024/25 commenced in October 2025 and was scheduled to end on 30 May 2026 but was extended by two months due to a lack of responses. Large units that returned beyond this date were accepted to boost the sectoral and overall response and collection rates of the survey.
- 2. Targeting the top 200 firms:** The Frascati Manual (OECD, 2015) states that an R&D survey must cover businesses of all sizes. Since a few large corporations account for the majority of R&D spending, we make a deliberate effort to engage them. To focus our fieldwork, our teams identified and targeted the top 200 South African companies, in addition to our standard survey list.
- 3. Segregating firms in the business sector:** The business sector is categorised into ten industrial sectors according to SIC codes. Researcher expertise tailored to specific industrial sectors was ascertained to focus solely on these industries, based on the responding units' business frameworks. This ensured a higher quality of R&D frame maintenance by including organisations that conduct R&D and assessing the quality of received data based on expertise specific to the sector. In the context of business, researchers have obtained specialised knowledge related to state-owned enterprises, and the pharmaceutical sector.

4. Pre-populated questionnaires based on statistical imputation techniques: Using historical data submissions, a statistically calculated GDP inflation factor, and annual reports for new or incomplete respondents, researchers constructed pre-populated questionnaires. Upon receipt of the questionnaire, respondents can review it, make any necessary adjustments, and then sign and approve it. This method was applied across all sectors with exceptionally large outstanding units, and only when there was evidence that the unit remained operational. If there was no response or change made, the imputation would be recorded as a regular impute/estimated value imputation.

5. Digital meetings: Whenever possible, virtual meetings with respondents were organised as a means of boosting response rates. As they did not necessitate travel, virtual meetings suited the participants' busy schedules. Increased response rates and enhanced data quality were achieved through the frequency of these sessions and the chance for senior HSRC-CeSTII staff to connect with respondents.

6. Face-to-face visits with respondents: Face-to-face visits were conducted with business, not-for-profit, government, and science councils sector respondents to garner improved rates, especially from respondents who had difficulty returning the survey data. During the data collection period, face-to-face visits were conducted in Cape Town Metro and Winelands (Nov–Dec 2025), Cape Town Metro and Winelands round two (Jan–Feb 2026), Johannesburg and Pretoria/Gauteng (March 2026), Limpopo (April 2026) and Cape Town Metro and Winelands round three (June 2026).

Across four rounds of fieldwork, the team logged 120 engagement attempts resulting in 65 successful contacts across 90 unique localities in the Cape Town and Gauteng regions. The targeted organisations were predominantly from the business sector (100), followed by NPOs (10), government (8), and science councils (2). Success rates improved over time as the team shifted from unscheduled cold calling to structured, appointment-based strategies. Scheduled rounds in Cape Town (November 2025–February 2026) and Johannesburg/Pretoria (March 2026) yielded high visit rates, whereas the June 2026 cold-calling round faced significant operational barriers, including contact unavailability, strict IT/e-mail security restrictions, and corporate closures.

D.5. Quality indicators of survey coverage, fieldwork and analysis

Questionnaire response rates dropped from 53.0% in 2023/24 to 49.5% for the 2024/25 survey. This lack of response meant outstanding questionnaires had to be calculated to substitute missing data for mostly the business sector.

Given the nature of R&D, a firm's R&D-performing business unit may only have a small number of active projects in a given year. According to field reports, these projects typically last about three years. Once a project concludes, the firm's R&D expenditure for the specific reference period may drop to zero, thereby classifying the firm as out of scope under current HSRC-CeSTII operational procedures, despite the potential for future R&D activities. Therefore, both collection rates and questionnaire response rates are key quality indicators for the R&D survey during the SVC collection phase.

*Non-response*² was defined as failure to obtain a measurement for one or more units selected for the survey. These include out-of-scope units. *Out-of-scope units* are defined as units that should not be included in the survey frame because they did not belong to the target population in the reference period. Entities that returned a questionnaire stating nil in-house R&D expenditure for the survey reference period were counted as out-of-scope for the 2024/25 R&D survey. *In-scope units*³ were defined as units performing in-house R&D or with likely in-house R&D activity.

² Adapted from Sarndal, Swensson and Wretman (1992).

³ This is the HSRC-CeSTII operational definition.

Questionnaire responses were defined as those units not classified as non-responses within the set of all questionnaires sent out. The questionnaire response rate was calculated using the following formula:

$$\text{Questionnaire response rate} = \frac{\text{Responses}}{(\text{Responses} + \text{Non-response}) - (\text{Out-of-scope})}$$

Collection rate was defined as the proportion of completed questionnaires received for the survey compared to the total number of actively-reporting sample units on the sample registry.

$$\text{Collection rate} = \frac{\text{Responses} + \text{Out-of-scope} + \text{Refusals}}{\text{Active reporting units}}$$

The weighted response rate is a measure of the fraction of R&D expenditure collected from responses. It was calculated as

$$\text{Weighted response rate} = \frac{\text{R\&D expenditure obtained from responses}}{(\text{R\&D expenditure from responses} + \text{Unit imputations})}$$

The survey unit imputation rate was defined as the number of eligible non-responding units that had all data imputed as a fraction of eligible units. It was calculated using the following formula:

$$\text{Survey unit imputation rate} = \frac{\text{Unit imputations}}{(\text{Response} + \text{Non-response}) - (\text{Out-of-scope})}$$

Table D.2: Quality indicators of survey coverage by sector (2024/25)

Sector	Number of units investigated	Number of units selected to collect statistics	Non-response	Out-of-scope	Responses	Questionnaire response rate	Collection rate	Unit imputation rate	Weighted response rate	Number of units used to compile statistics
Business	586	428	250	31	178	44.8%	56.3%	27.2%	80.4%	428
Not-for-profit	108	59	33	4	26	47.3%	52.5%	12.7%	96.9%	59
Government	64	53	15	4	38	77.6%	81.1%	14.3%	94.9%	53
Science councils	11	11	0	0	11	100.0%	100.0%	0.0%	100.0%	11
Higher education	139	37	18	0	19	51.4%	51.4%	24.3%	88.1%	37
Higher education: Public	25	25	8	0	17	68.0%	68.0%	32.0%	88.2%	25
Higher education: Private	114	12	8	0	2	16.7%	16.7%	8.3%	36.7%	12
Total	908	588	318	39	272	49.5%	58.7%	23.9%	88.6%	588

D.6. Imputation

The unit imputation rate increased from 20.0% in 2023/24 to 23.9% in 2024/25 (Table D.2).

Imputation is a procedure for assigning a value to a specific data item when the response is missing or unusable. Imputation is a statistical data-cleaning process, whereas commutation is an administrative or financial adjustment to an entire unit.

The R&D survey aims to keep imputation rates as low as possible while including all likely sources of R&D activity in the final estimates. Since 2012/13, imputation rates have been reported, along with the age of the data used for imputation (Table D.3). Imputations are used only after verification from respondents or when available information confirms continued R&D activity. The survey mostly employs an estimation procedure that uses data from a previous return adjusted by a GDP inflation factor. A unit is selected for imputation only if sector leaders have convinced themselves that R&D activity exists in that unit. Where it was not possible to obtain company confirmation, individual fieldworkers were responsible for providing evidence of ongoing R&D activity to qualify units for imputation. The survey employed varying degrees of imputation. In some cases, a total R&D expenditure figure reported by the respondent (via e-mail or telephone) was used to impute the remaining data items with a model that employed available sector R&D profiles. In other cases, publicly available data were used. Lastly, an R&D profile for a unit was generated based on its known historical R&D profile, adjusted by a 4.5% inflation factor for 2024/25. The GDP inflation factor is calculated by taking everything a country produced in a year (2024/25) valued at current store prices (Nominal GDP), dividing it by what those same goods would cost using prices from a fixed past year (Real GDP), and multiplying by 100. The reason this is done is to strip away the illusion of price hikes so we can see how much an economy is actually growing. Without this adjustment, it is impossible to tell if a country is genuinely manufacturing more wealth or if things just became more expensive. This inflation factor is included in all expenditure items in the survey, and the use of this method is tracked for quality purposes, as shown below.

Table D.3: Number of units and age of data used in the imputation models by sector

Age of data	Business	NPO	Government	Science councils	Higher education	Total
Imputed (data from current reference period)	0	0	0	0	0	0
Imputed (data from previous year)	0	0	0	0	0	0
Imputed (data more than one year old)	0	0	0	0	0	0
Committed (data from previous year)	44	2	3	0	0	49
Committed (data more than one year old)	64	5	4	0	9	82
Total	108	7	7	0	9	131

Personnel data for non-responding higher education institutions were imputed from personnel data obtained from HEMIS. R&D expenditure for these units was imputed from a mathematical model or left unchanged from previous estimates.

Details of the imputation methods are available on request.

D.7. Data processing and analysis

Data was collected using two primary methods: the web-based Research, Development, and Innovation (RDI) online tool, as well as PDF and Excel questionnaires featuring built-in data validation.

Experienced researchers reviewed the responses to the PDF questionnaires, including the summaries and percentage calculations. The data were then manually entered into the R&D Survey Management System (RDSMS). The same quality checks were applied to data submitted via the online platform. Summary data were drawn from the system, and anomalies were identified by cross-checking results and returned to sector leaders for verification and correction.

Data tables were drawn from the data in the form of outputs agreed upon by HSRC-CeSTII and the DSTI at the start of the survey project process. These included time-series data that were added from previous surveys for multi-year comparison. Final data quality checks were performed using the time-series data by looking for consistency with expectations, checking other sources of data, and also taking into account the economic environment and external data sources.

D.8. Dissemination

The 2024/25 R&D Survey reports will be disseminated to all respondents as well as other users of the R&D statistics. This report is available on request from HSRC-CeSTII and the DSTI.

The report can be downloaded from the HSRC-CeSTII and DSTI websites:

- <https://www.dsti.gov.za/resource-hub?category=sti-surveys&sub=r-d-survey-reports>
- <https://hsrc.ac.za/about-cestii/measuring-rd-activity-in-south-africa/>

Care is taken to ensure the confidentiality of respondent information, and the data presented in the report are therefore anonymised.

Data from 2001 onwards is available from HSRC-CeSTII on request. The guidelines for accessing data may be downloaded from:

- <https://data-request.hsrc.ac.za/>

Data extractions in response to users' special data requests are generally provided free of charge, unless substantial analytical work is required to meet the request. Such data extractions are done in accordance with the approved data access protocol.

Access to the online data collection platform and several additional resources for online registered R&D performing users are available at:

- <https://rdisurveys.hsrc.ac.za/login>

D.9. Storage and archiving

Data from the R&D survey series is archived according to established HSRC-CeSTII procedures. Hard copies of the data from the two most recent surveys are kept in secure storage at HSRC-CeSTII, while data from older surveys are kept in secure off-site storage. All data are stored electronically on secure servers, and daily database backups are generated.

Data is curated by the HSRC and archived in accordance with the HSRC's policies on archiving and curation. Curated datasets and the conditions under which these are available may be found at:

- <https://hsrc.ac.za/about-cestii/accessing-cestii-data/> and
- <https://hsrc-repository.figshare.com/search?q=R%26D%20datasets&itemTypes=3>

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F. R&D SURVEY QUESTIONNAIRE

(Business Enterprises Sector)



**R&D
SURVEY**

Investment ■ Insight ■ Impact



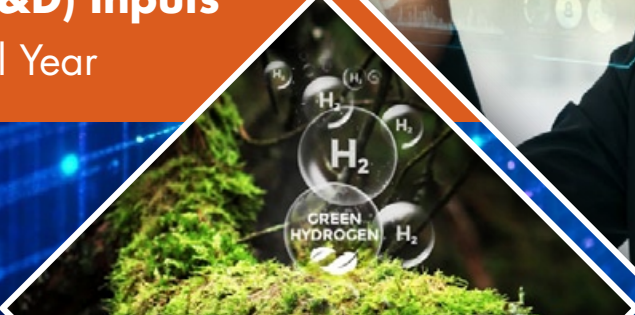
4IR



Hand holding a flask with blue liquid



Person wearing a VR headset



GREEN HYDROGEN

**National Survey of
Research and Experimental
Development (R&D) Inputs
2024/25 Financial Year**

Business Enterprises

Organisation contact details

Organisation name

Address line 1

Address line 2

Province

Postal code

Strictly confidential



Science, Technology
and Innovation
Statistics South Africa



HSRC
Human Sciences
Research Council

Mandate

The Centre for Science, Technology and Innovation Indicators (CeSTII), within the Human Sciences Research Council (HSRC), conducts the National Survey of Research & Experimental Development (R&D) Inputs 2024/25 Financial Year on behalf of the Department of Science, Technology and Innovation (DSI). **The Survey is conducted in terms of the Statistics Act No. 6 of 1999.** Organisations are therefore legally required to respond by providing accurate data on R&D performance. All data gathered for this survey are confidential. Only the survey team have access to individual organisation data. The HSRC and DSI will not disseminate any information identifiable with an organisation without their consent.

Purpose and scope

The R&D survey collects data on the inputs into **intramural (in-house)** R&D activities performed in South Africa by all organisations (including Business, Government, Science Councils, Not-for-Profit and Higher Education). The data is used for planning and monitoring purposes and to support decisions about strengthening South Africa's competitiveness. Previous survey results may be viewed at <http://www.hsrc.ac.za/en/departments/cestii>. This survey covers the **financial year 1 March 2024 to 28 February 2025 (or your nearest complete financial year).**

Due date

Kindly complete and return this questionnaire via email by _____. You may also submit your data using the online portal at <https://rdisurveys.hsrc.ac.za/login>.

Record keeping

PLEASE KEEP A COPY OF THIS QUESTIONNAIRE FOR YOUR RECORDS.

Assistance and feedback

If you need assistance please contact one of the business sector survey team:

Name	Contact Number	E-mail
Dr Jerry Mathekga (Sector Leader)	021 466 7811	jmathekga@hsrc.ac.za
Dr Kgabo Ramoroka	021 466 8004	khramoroka@hsrc.ac.za
Mr Theodore Sass	021 466 7872	tsass@hsrc.ac.za
Mr Rory Liedeman	021 466 7860	rliedeman@hsrc.ac.za
Ms Zikhona Ngqula	021 466 7834	zngqula@hsrc.ac.za

A feedback section is located on the back page of this questionnaire. We welcome your comments and suggestions.



National R&D Survey Project Leader

Dr Nazeem Mustapha, Research Director: CeSTII

nmustapha@hsrc.ac.za | Tel: 021 466 7887

Details of person completing the questionnaire (please print):

Name (with title)		Tel	
Designation		Cell	
Signature		E-mail	
		Date	

In order for HSRC-CeSTII to meet our obligations to produce national STI indicators on behalf of the DSI, we collect information about R&D from various organisation types: businesses, not-for-profit organisations, science councils, government departments and higher education institutions. We store this information in a secure database that is part of a data management system within the HSRC secure server environment. This information is retained in line with S14(1) and (2) of POPIA.

The following definitions are important in the completion of the survey questionnaire:

What is R&D?

Definition

This survey follows the approach of the Organisation for Economic Co-operation and Development (OECD), which defines research and experimental development (R&D) as:

“Creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.”

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the commonly used knowledge and techniques in the area concerned.

The R&D activity must be:

- Novel
- Creative
- Uncertain
- Systematic
- Transferable and/or reproducible.

All five criteria are to be met, at least in principle, every time an R&D activity is undertaken whether on a continuous or occasional basis.

Examples

- Investigating electrical conduction in crystals is basic research; application of crystallography to the properties of alloys is applied research.
- New chip designs involve development.
- Investigating the limiting factors in chip element placement lies at the border between basic and applied research, and increasingly involves nanotechnology.
- Much services R&D involves software development where the completion of the project is dependent on a scientific or technological advance and the aim of the project is the systematic resolution of a scientific or technological uncertainty.

Scope of survey

- The survey requests data on **intramural** R&D performed by your organisation on the national territory of South Africa.
- Intramural (or in-house) R&D expenditures are all current expenditures (including labour and other costs) plus gross fixed capital expenditures (such as for land, buildings, machinery and equipment) for R&D performed within a reporting unit during a specific reference period, whatever the source of funds. A reporting unit is a unit that supplies the data for a given survey instance.

- Part five asks some questions on **extramural** R&D. Extramural (or outsourced) R&D are the amounts of money spent on R&D that is performed outside a statistical unit.

R&D includes – but is not limited to:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D
- Management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support to those performing R&D
- Software development where the aim of the project is the systematic resolution of a scientific or technological uncertainty
- Research work in the biological, physical and social sciences, and the humanities
- Social science research including economic, cultural, educational, psychological and sociological research
- Research work in engineering and the medical sciences
- R&D projects performed for other parties
- Feedback R&D directed at solving problems occurring beyond the original R&D phase, for example technical problems arising during initial production runs.

R&D excludes:

The following routine activities are excluded, except where they are an essential part of in-house R&D activity:

- Scientific and technical information services
- Engineering and technical services
- General purpose or routine data collection
- Standardisation and routine testing
- Feasibility studies (except into R&D projects)
- Specialised routine medical care, for example routine pathology services
- The commercial, legal and administrative aspects of patenting, copyrighting or licensing activities
- Routine computer programming, IT systems work or software maintenance where there are no technological uncertainties to be resolved
- Market research
- Feasibility studies and pilot projects.

Key



Definition



Instruction

Part 1: General Information

1a. Registered name of company

1b. Trading as (if applicable)

2a. If you are reporting R&D for subsidiary companies (e.g. as a head office with several subsidiary companies), please list the companies below (append a page if required)

2b. List the principal activities and/or Standard Industrial Classification (SIC) code (see Appendix A in codes book) from which your company derives its main income

Activities	SIC	Company Income Obtained (%)
		%
		%
		%
Must sum to 100%		%

3a. Parent company (if applicable) with % ownership

Affiliate Company Name	% Ownership
	%

3b. Indicate country where parent company is located and % ownership

Affiliate Company Name	% Ownership
	%

4. Is this company a state-owned enterprise (SOE)? Yes ☐ No ☐



Definition

SOEs are public corporations owned by the South African government mainly engaged in market production and sale of the kind of goods and services often produced by private enterprises.

5. Financial year (dd/mm/yyyy)
for which you are reporting
in this survey

From	D	D	M	M	Y	Y	Y	Y
To	D	D	M	M	Y	Y	Y	Y

6. Total number of all employees
(include staff on contract for six months or longer)

7. Gross sales revenue or turnover
(R'000 excl. VAT)

8a. Did the company claim
for the R&D tax incentive
allowance?

Yes ☐

No ☐

If yes state the date of the return (mm/yy)

Continue to Question 8b

8b. Did the company perform any intramural R&D in South Africa during the 2024/25 financial year?



Definition

- Intramural (or in-house) R&D refers to R&D performed by the reporting unit on its own behalf or on behalf of others.
- Intramural R&D expenditures are all current expenditures (including labour and other costs) plus gross fixed capital expenditures (such as for land, buildings, machinery and equipment) for R&D performed within a reporting unit during a specific reference period, whatever the source of funds.
- It excludes R&D projects funded by this organisation but carried out by others using their own facilities.

Please tick as appropriate

Yes ☐ No ☐

Do you think your organisation will perform intramural R&D in the future?

Please tick	2025/26	2026/27	2027/28
Yes	☐	☐	☐
No	☐	☐	☐

8c. Did your company have extramural (outsourced) R&D expenditures during the 2024/25 financial year?

Yes ☐ No ☐



Instruction

- If you have conducted intramural (or in-house) R&D in the 2024/25 financial year please continue to Part 2.
- Only R&D performed within the borders of South Africa should be recorded.
- If you have conducted only extramural (or outsourced) R&D in the 2024/25 financial year, please continue to Part 5.
- If you have indicated **no intramural** or **extramural R&D** in Questions 8b and 8c, please tick below and return the questionnaire via post or email.

No **intramural** or **extramural** R&D – Nil return

☐

Part 2: Intramural R&D Personnel



Instruction

Report for all R&D personnel, permanent and contract (six months or longer)

Internal R&D personnel

Persons employed by the reporting unit who contribute to the unit's intramural R&D activities.

Researchers

Researchers are professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, theories, models, techniques, instrumentation, software or operational methods. This category must include **Research Managers** and other **Research Executives**.

Technicians directly supporting R&D

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

Other personnel directly supporting R&D

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

Note: All foreign headcounts should be recorded in the non-South African category

Do not include personnel indirectly supporting R&D

Typical examples are transportation, storage, cleaning, repair, maintenance and security activities, as well as administration and clerical activities undertaken not exclusively for R&D (such as the activities of central finance and personnel departments). Allowance for these should be made under overheads in R&D expenditure (**Other Current Expenditure – Question 11D**) but such persons should not be included as R&D Personnel.

9. Headcount of R&D Personnel

Provide the headcount of all R&D personnel according to categories below.

Researchers (incl. Research Executives and Research Managers)

Personnel Categories & Highest Qualification	African		Coloured		Indian/Asian		White		Non-SA		Subtotal		Total
	M	F	M	F	M	F	M	F	M	F	M	F	
Doctorates													
Master's/Hons/Bachelor's or equivalent													
Diplomas and other qualifications													
Researcher Total													

Technicians and equivalent staff directly supporting R&D

Personnel Categories & Highest Qualification	African		Coloured		Indian/Asian		White		Non-SA		Subtotal		Total
	M	F	M	F	M	F	M	F	M	F	M	F	
Doctorates													
Master's/Hons/Bachelor's or equivalent													
Diplomas and other qualifications													
Technician Total													

Other personnel directly supporting R&D

Personnel Categories & Highest Qualification	African		Coloured		Indian/Asian		White		Non-SA		Subtotal		Total
	M	F	M	F	M	F	M	F	M	F	M	F	
Doctorates													
Master's/Hons/Bachelor's or equivalent													
Diplomas and other qualifications													
Other Personnel Total													

Carry subtotals
over to Q10 ↓

10. Headcounts, Full-Time Equivalents (FTEs) and Labour Cost of R&D Personnel

Provide an estimate of **Person Years of Effort (or Full-Time Equivalents) on R&D**, according to the categories below.



Instruction

CALCULATING FULL-TIME EQUIVALENT (FTE)

NOTE: For the purpose of this survey, an employee can work a maximum of **one FTE in a year**.

The following equation can be used to calculate FTE / effort on R&D:
(Person/s employed) x (Portion of their job spent on R&D) x (Portion of the year employed) = FTE on R&D

For example:

- a full-time employee who devotes 100% of their time to R&D
1 x 1 x 1 = 1 FTE on R&D
- a full-time employee spending 40% of their time on R&D during half of the survey year
1 x 0.4 persons x 0.5 years = 0.2 FTE on R&D
- a part-time employee working 40% of a full-time year doing only R&D
1 x 0.4 x 1 = 0.4 FTE on R&D
- 20 full-time researchers spending 40% of their time on R&D during the survey year:
20 x 0.4 x 1 = 8 FTE on R&D

NOTE: please calculate FTEs for all R&D personnel

R&D Personnel Categories	Headcounts (From Q9)			Total Full-Time Equivalents (FTEs)			Average annual labour cost per person	Calculated labour cost of R&D
	M	F	Total	M	F	Total (A)	R'000 (excl. VAT) (B)	R'000 (excl. VAT) (A x B)
Researchers (incl. Research Executives & Research Managers)								
Technicians directly supporting R&D								
Other personnel directly supporting R&D								
Total Labour Cost of R&D								

Carry over total calculated labour cost of R&D personnel to Question 11C ↓

Part 3: Intramural R&D Expenditure

11. Allocation of Intramural R&D Expenditure

CAPITAL EXPENDITURE ON R&D



Definition

- Capital R&D expenditures are the annual gross amount paid for the acquisition of fixed assets that are used repeatedly or continuously in the performance of R&D for more than one year.
- The full value of capital expenditure must be reported in the year of purchase (do not depreciate).
- If the asset has been/will be used for more than one activity, include an estimate of the portion used for R&D.

Including - but not limited to:

- Expenditure on fixed assets used in the R&D projects of your business.
- Capitalised software includes acquisition of software for R&D, including fees, rights and licences expected to be used for more than one year, or separately identifiable software (systems or applications) and their descriptions and supporting materials.
- Purchase of databases expected to be used for more than one year.
- Major repairs and improvements on land and buildings used for R&D.

Excluding:

- Other repairs and maintenance expenses not used for R&D.
- Depreciation provisions.
- Proceeds from the sale of R&D assets.

	R'000 (excl. VAT)
Vehicles, plant, machinery and equipment	
Capitalised computer software	
Total: Vehicles, plant, machinery and equipment and software	A
Land, buildings and other structures	B

LABOUR COSTS OF R&D

	R'000 (excl. VAT)
Labour Costs of R&D (to match Question 10)	C

OTHER CURRENT EXPENDITURE ON R&D



Definition

- Current expenditures are composed of labour costs of R&D personnel and other current costs used in R&D.
- Services and items (including equipment) used and consumed within one year are current expenditures.
- Annual fees or rents for the use of fixed assets should be included in current expenditures.

Including - but not limited to:

- Materials, fuels, water, electricity and other inputs (i.e. all overheads/running costs).
- Repair and maintenance expenses.
- Rents for research facilities: all fees and rents associated with R&D.
- Payments to outside organisations for use of specialised testing facilities.
- Payments to outside organisations for analytical work, engineering or other specialised services in support of R&D performed by your business.
- Commission/consultant expenses for research projects carried out by your business.
- Other R&D expenses and indirect costs not specified in 11 A, B or C.

Excluding:

- R&D activities where research is outsourced.
- Payments for purchases of technical know-how.
- Payments for patent searches.
- Depreciation provisions.

	R'000 (excl. VAT)
Other Current Expenditure	D
Total R&D Expenditure (A + B + C + D = E)	E

12. Sources of Funds of Intramural R&D

Provide a breakdown of the total R&D expenditure (as reported in Question 11) according to sources of funds.

INTERNAL SOURCE OF FUNDS

Company

R'000 (excl. VAT)

Own funds

EXTERNAL SOURCE OF FUNDS

Government (includes Science Councils e.g. CSIR, Departments and Institutes)

Government support programmes for R&D
(including: Grants; Tax incentive; SPII; Innovation Fund; etc)

Contracts to perform R&D

Other Local Businesses (including Trade Associations)

Contracts to perform R&D

Other South African Sources

Not-for-Profit Organisations* / NGOs/Trusts/Foundations
(contracts for research)

Individual donations/NGOs/Trusts/Foundations
(donations for research without the obligation for a product or service)

Higher Education

Rest of the World

All sources (complete Question 13)

R'000 (excl. VAT)

Total R&D Expenditure (to equal Question 11)

*Not-for-Profit organisations primarily serving households. Funding from non-profit organisations primarily serving Business, Higher Education or Government should be allocated to these sectors.

13. Sources of Funds from the rest of the World (in R'000s) for Intramural R&D

If your organisation received R&D funding from the rest of the world, provide percentage contribution by sector and region.

Funding of R&D from the rest of the world		Percentage of Expenditure							
Category	DATA CHECK	Africa (outside SA)	Middle East	Europe	USA/ Canada	Central & South America	China	Rest of Asia	Other
Business*	%	%	%	%	%	%	%	%	%
Not-for-Profit Organisations**	%	%	%	%	%	%	%	%	%
Foundations	%	%	%	%	%	%	%	%	%
Government	%	%	%	%	%	%	%	%	%
Higher Education	%	%	%	%	%	%	%	%	%
Total	%	Total must sum to 100% (of total funding from the rest of the world Q12)							

* Including affiliated company, trade associations (affiliated denotes parent or subsidiary organisation)

** NPOs serving households only. Funding from non-profit organisations primarily serving Business, Higher Education or Government should be allocated to these sectors. Donations from individuals should be recorded under this category.

14. Provincial Expenditure on R&D

Please state the location where your company carried out R&D activities and the percentage of the total R&D expenditure.


Instruction

Specify where R&D is actually performed, rather than where it is managed/financed from.

Eastern Cape		%	Mpumalanga		%	
Free State		%	Northern Cape		%	
Gauteng		%	North West		%	
KwaZulu-Natal		%	Western Cape		%	
Limpopo		%	Total	(must sum to 100%)		%

Part 4: Categories of Intramural R&D Expenditure

15. Intramural R&D Expenditure by type of R&D

Specify the percentage of total **intramural R&D expenditure** by **type of R&D**.

Basic Research



Definition

- Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
- The analysis of properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws.
- The results of basic research are usually published in peer-reviewed scientific journals.

Percentage

%

Applied Research



Definition

- Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective.
- Activities that determine the possible uses for the findings of basic research.
- The results of applied research are intended primarily to be valid for a single or limited number of products, operations, methods or systems.
- Applied research develops ideas into operational form and may be published in peer-reviewed journals or subjected to other forms of intellectual property protection.

Percentage

%

Experimental Development



Definition

- Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

Percentage

%

Total

(must sum to 100%)

%

16. Classify R&D according to Standard Industrial Classification (SIC)

(See Appendix A in the codes book) with associated percentage expenditure.

 **Definition**

SICs indicate the classification that best describes the company's R&D according to the intended use of the product.

SIC Codes		Percentage	SIC Codes		Percentage
SIC		%	SIC		%
SIC		%	SIC		%
SIC		%	SIC		%
SIC		%	SIC		%
SIC		%	SIC		%
Total				(must sum to 100%)	%

17. Research Field (RF)

Classify R&D according to Research Fields (RF) with associated percentage expenditure.
(See Appendix B in the codes book.)

 **Definition**

The RF Codes are based on recognised academic disciplines and emerging areas of study.

RF Codes		Percentage	RF Codes		Percentage
RF		%	RF		%
RF		%	RF		%
RF		%	RF		%
RF		%	RF		%
RF		%	RF		%
Total				(must sum to 100%)	%

18a. Multidisciplinary Areas of R&D

Please estimate the percentage of R&D expenditure allocated to biotechnology and nanotechnology.



Instruction

Multi-disciplinary R&D combines several research fields or disciplines. If your organisation performs R&D, as described below, please provide the applicable percentage of total R&D expenditure.

Note that the percentages will most likely not total 100%.



Definition

Biotechnology is application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

Nanotechnology is the understanding and control of matter at dimensions of roughly 1 to 100 nanometers, where unique phenomena enable novel applications. Encompassing nanoscale science, engineering and technology; nanotechnology involves imaging, measuring, modelling, and manipulating matter at this length scale.

Multidisciplinary Area of R&D	% of R&D expenditure
Biotechnology	%
Nanotechnology	%

No R&D in these areas ☐ ← **Tick** if no such R&D is done

18b. R&D in Specific Areas of Interest

Please estimate the percentage of R&D expenditure allocated to the following specific areas of interest.



Definition

Open source software – computer software with its source code made in which the copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose.

Space science – any of several scientific disciplines, such as communications, transport, engineering or health that specifically studies phenomena occurring in the upper atmosphere, in space, or on celestial bodies other than Earth.

Environment/sustainability R&D – any of several fields wherein research focuses on human, economic and societal impact on the environment investigating its contemporary and future impact on society.

New materials – materials science and engineering, involves the discovery and design of new materials, with an emphasis on solids.

Specific Areas of Interest	% of R&D expenditure
Open source software	%
Space science	%
Tuberculosis (TB), HIV/AIDS, Malaria	%
Environment and sustainability R&D	%
New materials	%

No R&D in these areas ☐ ← **Tick** if no such R&D is done

19. Classify R&D according to Socio-Economic Objectives with percentage expenditure

(See Appendix C in codes book.)

**Definition**

The SEO classification provides an indication of the **main beneficiary of your R&D activities**.

	SEO Codes	Percentage		SEO Codes	Percentage
S		%	S		%
S		%	S		%
S		%	S		%
S		%	S		%
S		%	S		%
Total				(must sum to 100%)	%

20. Collaborative R&D

20a. Does your company collaborate on R&D with persons/organisations outside your own organisation?

Yes ☐ Continue with Question 20b

No ☐ Go to Question 21

20b. With whom is R&D conducted in partnerships, alliances or collaboration?



Instruction

Note: In the table below a single collaborative R&D project with several partners may be ticked in several places. Collaborative R&D may be intramural or extramural. R&D collaboration can occur without expenditure – please note zero expenditure in such cases.

Tick as appropriate	South Africa	Foreign	Rest of the world consisting of... (tick as appropriate)							
			Africa (outside SA)	Middle East	Europe	USA/ Canada	Central & South America	China	Rest of Asia	Other
Higher Education Institutions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Science Councils (e.g. CSIR, Mintek, MRC, ARC etc.)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Government Research Institutes	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Members of own organisation/Affiliated* organisations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other Companies (including specialist consultants, business and trade associations)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Not-for-Profit Organisations**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

* Affiliated denotes parent or subsidiary organisation.

** NPOs serving households only. Funding from non-profit organisations primarily serving Business, Higher Education or Government should be allocated to these sectors.

Part 5: Extramural R&D (Outsourced/Contracted Out)



Definition

- Outsourced or extramural expenditures being the amounts a reporting unit paid or committed to pay to another organisation for the performance of R&D during a specific period.
- This includes acquisition of R&D performed by and/or grants given to other organisations for performing R&D.

R'000 (excl. VAT)

21a. State value of extramural R&D inside South Africa

21b. Please indicate the name of the organisation(s) that conducted the extramural R&D with the associated expenditure inside South Africa

Outsourced to:	Approximate Value R'000 (excl. VAT)

R'000 (excl. VAT)

22a. State value of extramural R&D outside South Africa

22b. If you have indicated extramural R&D outside South Africa in Question 22, kindly provide the approximate percentage by sector and geographic location

Percentage Extramural R&D Outside South Africa									
Category	DATA CHECK	Africa (outside SA)	Middle East	Europe	USA/ Canada	Central & South America	China	Rest of Asia	Other
Business*	%	%	%	%	%	%	%	%	%
Not-for-Profit Organisations**	%	%	%	%	%	%	%	%	%
Foundations	%	%	%	%	%	%	%	%	%
Government	%	%	%	%	%	%	%	%	%
Higher Education	%	%	%	%	%	%	%	%	%
Total	%	TOTAL must sum to 100% (of total extramural R&D outside SA funding Q22)							

** NPOs serving households only. Funding from non-profit organisations primarily serving Business, Higher Education or Government should be allocated to these sectors.

Your feedback matters

Please use this section to provide general feedback or data notes to the Survey Team

[illegible]

Thank you for your time and effort



Science, Technology
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G. USER SATISFACTION SURVEY

SOUTH AFRICAN NATIONAL SURVEY OF RESEARCH AND EXPERIMENTAL DEVELOPMENT:
STATISTICAL REPORT 2024/25

In order to improve the quality and relevance of the R&D statistics, it would be useful to receive the views of users of this publication. It would therefore be appreciated if you could complete the following questionnaire and return by e-mail to innovation@hsrc.ac.za.

1. Name and address of respondent:

Name and title

Designation/occupation

Name and address of organisation or enterprise

2. Which of the following describes your area of work? Mark with 'X'.

☐ Government

☐ Private enterprise

☐ Public enterprise

☐ Academic or research institution

☐ International organisation

☐ Media

☐ Not-for-profit organisation

☐ Other, specify

3. In which country do you work?

4. What is your assessment of the contents of this publication?

☐ Excellent

☐ Good

☐ Average

☐ Satisfactory

☐ Poor

5. How useful is this publication for your work?

☐ Extremely useful ☐ Very useful ☐ Useful ☐ Partly useful ☐ Not at all useful

6. How accurate is the picture of R&D in your sector or research field/s as presented in this publication?

☐ Very accurate ☐ Fairly accurate ☐ Unsure ☐ Not very accurate ☐ Not at all accurate

7. How easy was it to find specific information that you required in the publication?

☐ Extremely easy ☐ Very easy ☐ Easy ☐ Not very easy ☐ Not at all easy

8. What information (i.e. tables, text or figures) were of most interest to you? Please be as specific as possible e.g. provide table, page or figure numbers.

9. What did you like best about the publication?

10. Provide any comments or recommendations for the improvement of the publication.

Thank you for completing the survey.



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ISBN: 978-0-621-52195-5



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