

# 20 years of measuring South African science and innovation indicators (CeSTII)

## Marking 20 years of R&D Surveys at the HSRC

Countries invest in research and development (R&D) to grow their economies, create jobs and generate better human development outcomes. The HSRC, in collaboration with the South African Department of Science and Innovation and Statistics SA, has been measuring R&D investment in the public, private and higher education sectors for more than 20 years. These flagship HSRC surveys inform policy development to support innovation and competitiveness in the country. *By Nazeem Mustapha, Glenda Kruss, Jacqueline Borel-Saladin, Gerard Ralphs*

The proportion of GDP that a country spends on research and development (R&D) is one of the key indicators of its competitiveness and a gauge of knowledge-intensive innovation activity in its economy. A representative annual survey of R&D activity yields vital information for a country's statistics, contributing to evidence-informed innovation policy.

The HSRC began measuring research and experimental development on behalf of the then South African Department of Science and Technology (DST) 20 years ago, in 2003.

Each year, the HSRC's South African National Survey on Research and Experimental Development Inputs (R&D Survey) reports the latest available data on R&D expenditure and performance across five sectors: higher education, science councils, government, business, and not-for-profit organisations.

The findings from this flagship survey inform science policy development and are used to set government R&D priorities and funding levels, and for monitoring and benchmarking against other countries. This long-term research helps us understand R&D in the country and map changes over time.

### **The early days of R&D Surveys in South Africa**

While the recognition of R&D as a vital driver of innovation can be traced back to the early 20th century, the systematic measurement and tracking of R&D activities [gained more prominence after World War II](#) in the United States of America. The first edition of the Organisation for Economic Co-operation and Development's (OECD) Frascati Manual, which lays out the industry standard methodology for collecting R&D data, was published in the 1960s. The first R&D Survey in South Africa based on these guidelines was conducted in 1966, and a total of 18 official surveys were conducted over the next 25 years, usually biennially.

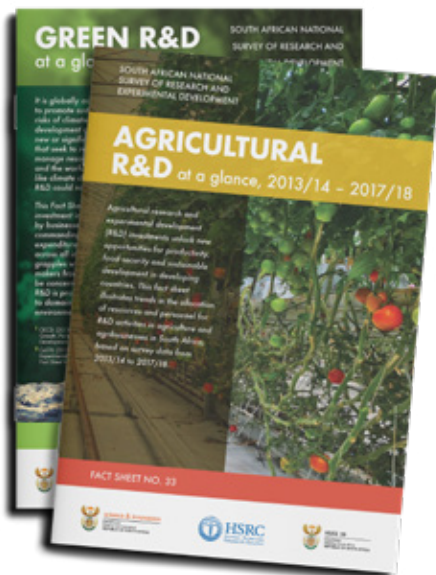
The survey was initially run by the Council for Scientific and Industrial Research (CSIR), but from

1977/78 the HSRC was brought on board to survey the social sciences (which had not been included up to that point). The survey seemed to lose momentum in the years following South Africa's transition to a fully democratic state in 1994, with several breaks in survey continuity until 2001/02. To re-establish the series of the survey, in line with OECD methodological guidance, the new HSRC Knowledge Management Group was tasked with conducting the 2001/02 survey, to serve as a new baseline and the start of an official long-term suite of internationally comparable R&D indicators (Figure 1).

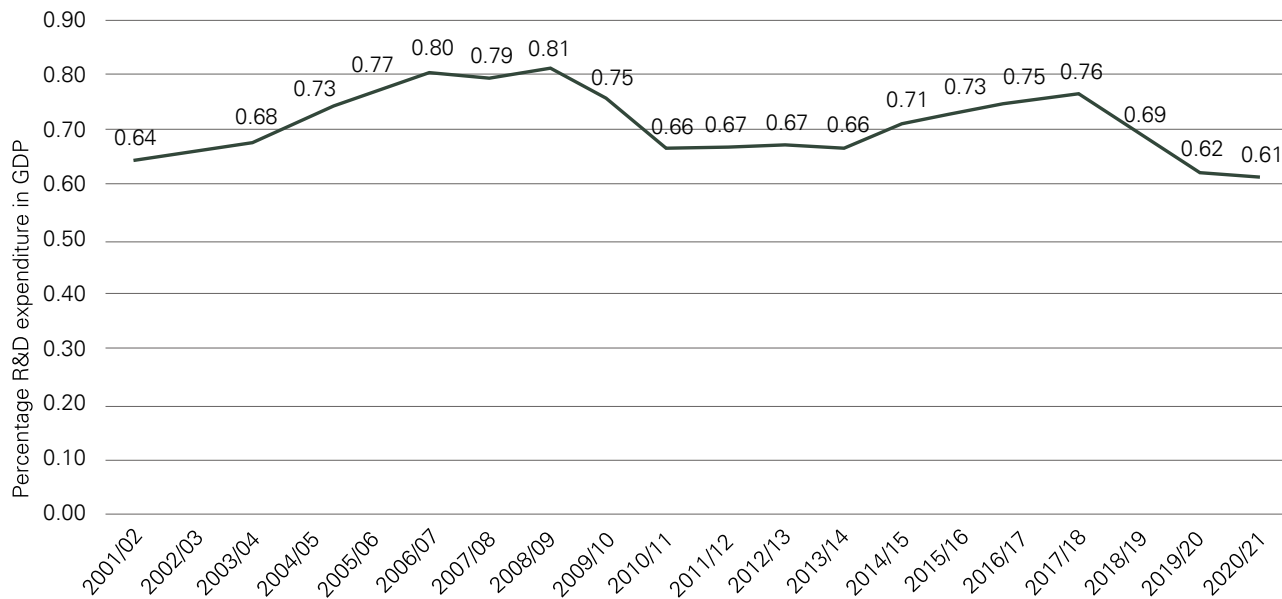
### The inception of CeSTII

The HSRC proposed a Centre for Science, Technology and Innovation Indicators (CeSTII) to the DST in September 2003, with the specific goal to produce science, technology and innovation (STI) surveys. By deciding to locate STI measurement within a public research institute like the HSRC, the DST was able to ensure that the task of conducting regular STI surveys would be part of the HSRC's mandate to use public funds to conduct research in the public interest over the long term.

Thus, CeSTII was established to help transform the STI system, and by utilising ring-fenced public funds to grow and maintain core competencies, conducts STI surveys that produce indicators used by government decision makers to this day.



**Figure 1. South Africa’s R&D Survey enables the tracking of the country’s research intensity ratio (GERD/GDP), 2001/02–2020/21**



Data source: South African R&D Survey, HSRC CeSTII

### R&D Survey: Activities, intent and impact

The annual survey project consists of data collection, data analysis and writing of reports and other outputs, such as fact sheets, policy briefs, academic journal articles and book chapters. These outputs are disseminated broadly within the STI community locally and internationally. The survey adheres to the Frascati Manual’s international measurement standards as well as those required for national statistics series by Statistics South Africa.

Data are collected on expenditures devoted to R&D within the national territory of South Africa, human resources utilised in R&D, and other indicators associated with the activity of performing R&D. Each wave of the survey includes a rigorous process of cleaning and building registers of entities likely to perform R&D to ensure improved and updated coverage.

The R&D Survey was developed to enable the growth of inputs into R&D activity (financial and human capabilities) and investment by all actors across South Africa’s national system of innovation to be tracked

over time. The statistics from the survey are publicly released every year, and there is now longitudinal R&D data available stretching across two decades.

The results of the R&D Survey are used to assist the government with strategic planning that informs policy and the allocation of funds. It is recognised at the highest levels, including by the Parliamentary Portfolio Committee on Higher Education, Science and Innovation. Data are used by stakeholders such as the National Advisory Council on Innovation, the Department of Science and Innovation, Statistics South Africa, the Reserve Bank, and many academics and researchers. The results also form part of the internationally comparable STI data for South Africa provided to the OECD and the United Nations Educational, Scientific and Cultural Organization Institute of Statistics.

With this foundation of expertise and data, the HSRC plays a leading role in facilitating the sharing of data on the continent, advising African countries on STI measurement, as well as training and building capability in STI measurement in research and policy communities across the African continent.

## Ongoing evolution: Digitalisation of the R&D Survey

Even before COVID-19 spurred digitalisation across many industrial and institutional sectors nationally and globally, the HSRC's experts anticipated that a new R&D Survey system was necessary to support new business processes and provide greater flexibility and longevity through a modern database system. In [partnership with the CSIR](#), a system was designed to support R&D Survey data collection tasks effectively and with minimal technical intervention. To enhance user experience and ease the load on survey staff, a [new digital user interface of the R&D Survey](#) was piloted in the 2020/21 survey, and full implementation was fast-tracked in response to the pandemic.

Going forward, the intention is to onboard all R&D Survey respondents to the online digital platform and, based on their user feedback, to continue to develop the system to provide even better value-added services to respondents. These include links to interact with the organisation's previously submitted data, through widgets and downloadable reports, as well as enhanced survey support through collaboration and communication tools.

## Looking forward

Over two decades the HSRC and its CeSTII have developed in-depth expertise and technological capabilities to contribute to STI measurement in the national interest. The R&D Survey's time series data, which forms part of the public knowledge commons, is a resource for a wide range of potential users, including respondents, researchers and policymakers, to develop evidence-informed decisions.



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*This article is adapted from a poster titled 'An overview of the annual National Survey of Research and Experiment Development' presented by CeSTII at the HSRC Emerging Researchers Conference in September 2023. To contact the Centre, write to [innovation@hsrc.ac.za](mailto:innovation@hsrc.ac.za). Katharine McKenzie contributed to the copy editing of this article.*

[Visit CeSTII pages on the HSRC website to learn more](#)

## Read more:

[Lessons in public sector innovation: Digitalising the R&D Survey, HSRC Review, December 2022](#)