

## Enhancing information for the National Research & Development Survey



## Content

1. Background - The National R&D Survey
2. Survey data collection methods for the HE sector
3. Possible enhancements (Outcome of July 2016 HE sector workshop on R&D Survey):
  - Cycle and timing of data collection
  - Calculation of Headcounts (HC) and full-time equivalents (FTE)
  - Enhancing uniformity of data provided by institutions
  - Easing burden on respondents



## Purpose of this presentation

1. To exchange experiences/perspectives on how best to enhance data collection, quality and use of national R&D statistics.
2. To explain proposed improvements on the calculation of headcounts (HC) and full time equivalents (FTEs) data.
3. To communicate changes arising from the Frascati Manual (7<sup>th</sup> edition, 2015) & implications for the R&D survey.



## The national R&D survey

- The survey estimates resources devoted to R&D, i.e. R&D personnel and R&D expenditure.
  - Indicators such as R&D intensity (GERD/GDP) and Researchers per Capita are important benchmarks for national competitiveness.
- Survey forms part of “official statistics”:
  - Must meet multiple user needs, i.e. policy makers, researchers, national accountants, international benchmarking, etc.
  - R&D statistics serve as reference in the NDP, MD(S)Gs, Africa’s Agenda 2063, OECD, UNESCO, and for various sector reports, e.g. mining, agriculture, ICT, etc.
- Key indicators include:
  - Gross domestic expenditure on research and development (GERD).
  - R&D expenditure by R&D-performing sectors.
  - Sources and flows of funding for R&D.
  - R&D by field of research, socio-economic objectives & industrial sectors.
  - R&D personnel by occupation (researchers, technicians and support staff) & FTEs.



## Why do we measure HERD?

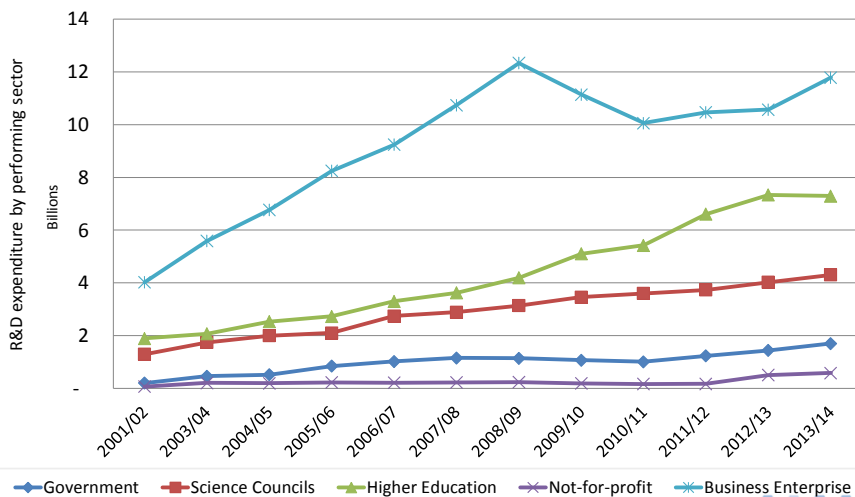
- R&D is crucial in the acquisition of new knowledge – modern economies and societies thrive on knowledge (accumulation, diffusion and application) for their sustained development.
- ❖ **HE is one of the R&D performing sectors.**
- HE sector plays a significant role in the national R&D system – by training R&D personnel, performing research and also supporting other sectors in these aspects.
- Connections between HE and other sectors is becoming more sophisticated. Indicators to assess HE contribution are evolving. The international dimension is also receiving increased attention.
- Increasingly, HEs are incorporating/formalising a role to utilise results of their research output – spinning out IP and start-up companies and advising government, etc.

*For HE and Science Councils – the target is 100% in terms of coverage and key data items*

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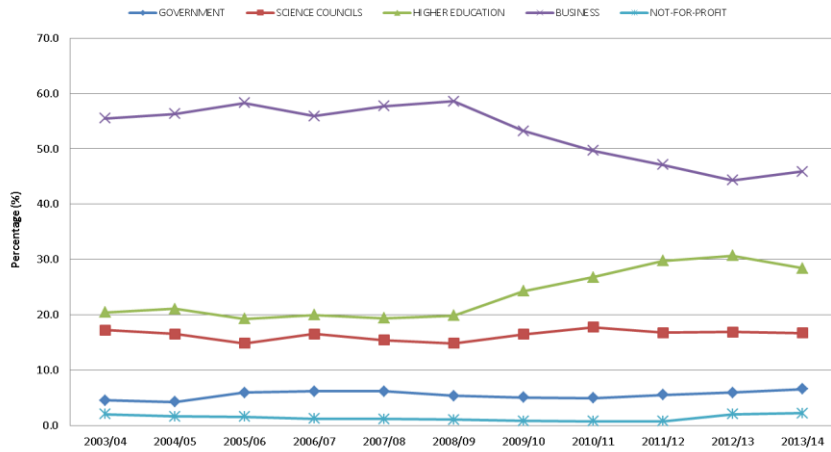
## R&D expenditure in nominal Rand terms (2013/14 R&D Survey)

To qualify as R&D the activity must be: Novel; Creative; Uncertain; Systematic; Transferable and/or reproducible.

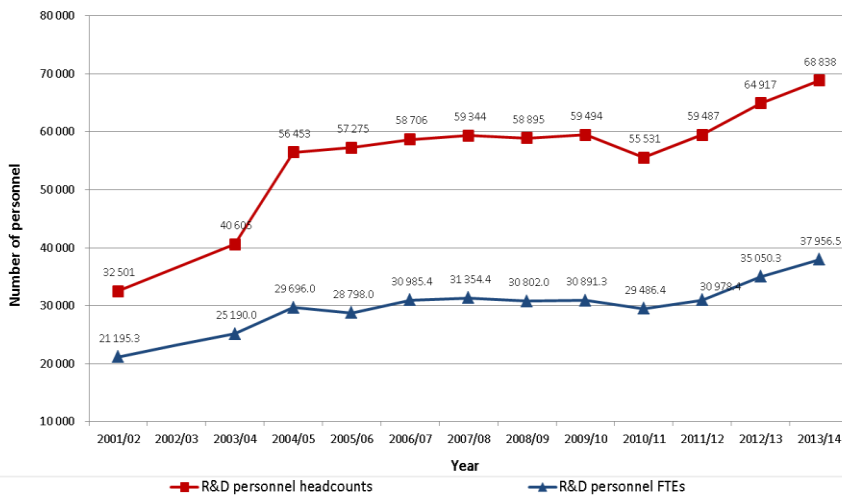


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## R&D expenditure % contribution per sector (2003/04 to 2013/14)



## R&D Personnel (Headcount and FTEs), 2001/02 to 2013/14





## R&D survey data collection methods

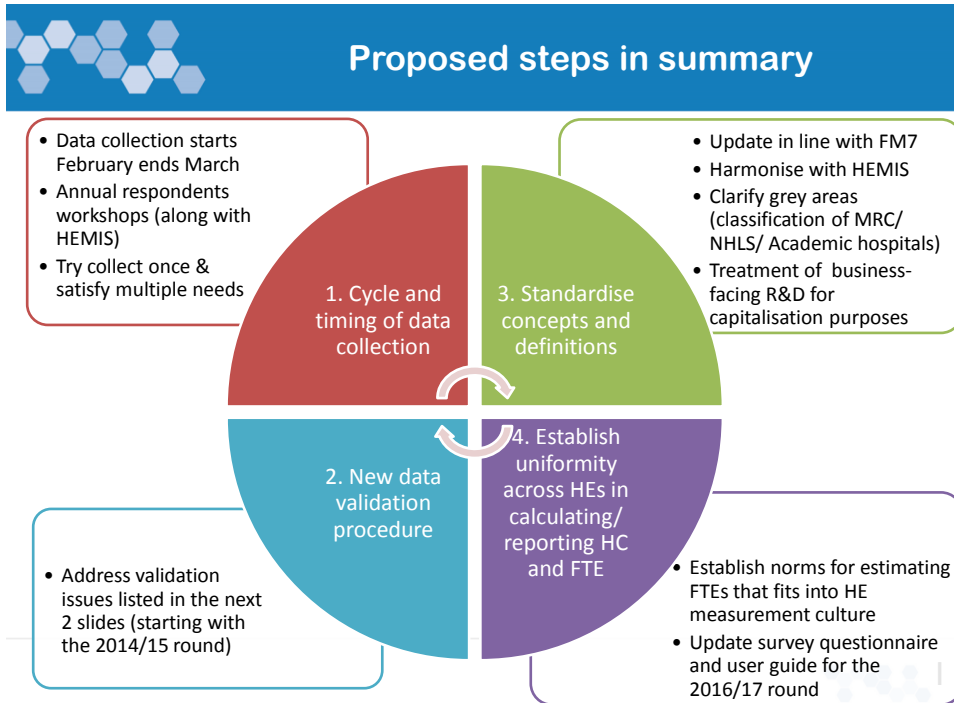
- **R&D Survey is conducted annually**
- **Data collection process:**
  - HSRC/ CeSTII contact the research office.
  - Research office obtains data various sources at the institution.
  - Research office submits final collated (or per faculty) to CeSTII.
  - CeSTII Reviews data – refers back to respondents if information seems inconsistent, shows major increases/ decreases or has missing data.
  - CeSTII receives HEMIS data tables – Uses HEMIS data to verify HEI info; supplements missing data and also check against other data on institutional profile.



### **Possible improvements**

- **Proposals arising from July 2016 HE sector workshop on R&D Survey**





## Data validation: Key areas needing attention

1. Calculation of headcounts and FTEs
  - Researcher and Technician numbers tend to be stable – this is OK!
  - Inability of HEs to provide other support personnel data – CeSTII uses estimates from HEMIS to populate missing data.
2. Student data is consistent with HEMIS data.
3. HEMIS data vs data submitted directly to the R&D survey.
4. Fluctuation when reporting Masters student data - all Masters are included one year and the next year only Masters with at least 40% research component is included (as recommended).
5. FTEs affect the calculated labour cost (inflated or very low).



## Data validation: Key areas needing attention

6. Other current expenditure – find fluctuations within institutions, many institutions under report (especially HEIs who submit via faculty - faculties don't always have this info readily available.
7. Sources of funds – some institutions report entire income and not only funds allocated to R&D; Major year-on-year changes in some institutions – when is this normal changes or perhaps an anomaly?
8. RF Codes – left blank (use HEMIS data to supplement), mistaken use of SEO codes.




## Concepts and definitions (Frascati manual 7<sup>th</sup> edition)

**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.**

- Academic staff, Managers and administrators - engaged in the planning and management of the scientific and technical aspects of a researcher's work. Academic staff involved in research and also studying towards a Masters or Doctoral degree should be included as research staff (not students).

**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.



## Concepts and definitions (Frascati manual 7<sup>th</sup> edition)

**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.**

- Activities range from administrative and secretarial work to the provision or the management of materials and devices needed to run an R&D project. Executives, managers and administrators dealing mainly with financial and personnel matters and general administration insofar as their activities are a direct service to R&D, are included as “other supporting staff”.

**The FTE of R&D personnel is defined as the ratio of working hours actually spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group.**

- By convention it is noted that no one person can account for more than one FTE in a single year and hence cannot perform more than one FTE on R&D on an annual basis.



## Uniformity across institutions in calculating/reporting R&D data

- **Creation a small team consisting of CeSTII, HE respondents & HEMIS to address several points including the following:**
  - Create an expanded dictionary/ user guide to provide clarity on several matters, e.g. defining researcher, technician and other personnel.
  - Harmonise with HEMIS on:
    - Who are counted as ‘instruction and research staff’.
    - Do they count contract staff; part-time;
    - Differences in definitions of personnel categories used by R&D survey vs HEMIS.
    - How is the FTE compiled/checked.

HE has own measurement culture, e.g. national funding formula, CHE, CESM, SAQA, RIMS, etc.







## Uniformity across institutions in calculating/reporting R&D data

- Clarify grey areas in institutional classification –
  - MRC/NHLS/Academic hospitals (where are the people and the costs counted?)
  
- Establish “norms” in terms of FTE for personnel and students –
  - Consideration for undertaking a diary study
  - Expand and update definition notes in the questionnaire on other current expenditures.
  - Mapping of CESH codes vs RF Codes – how to proceed going forward.



**Thank you**

