

Shaping the Future: a systemic focus on early career academics

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DISCLAIMER

- The views expressed in this presentation may not be in keeping with latest developments in South African Higher Education;
- Retired from university administration in 2013;
- Retired academic since 2018;
- My focus over the last 10 years has been mainly on the mathematical sciences;
- Over the last N years I haven't actively followed or kept abreast of research in higher education;
- I haven't kept up to date with policy developments within the National System of Innovation;
- The presentation is not meant to be a generalization or oversimplification of complex issues. I hope it stimulates some debate.



Introduction

- Since 1995, there has been a plethora of initiatives launched within the National System of Innovation (mainly by public sector partners) aimed at early career academics;
- **Question:** what are the dimensions that have been addressed by such interventions? For example, transformation in terms of race and gender andknowledgebase?;
- Are there areas that have, up to now, been neglected?
- Voices of Early Career Academics;
- An investment in Early Career Academics is an investment into a vibrant future of the National Science System; what obligations does the current leadership have in shaping that future?
- Is there a ‘summative’ report that highlights coherence or inconsistencies within or amongst these interventions?



Definitions and definitions

- **Terminology:** (a) early career academics; (b) emerging researchers; (c) early career researchers; (d) next or new generation of academics; (e) early and mid-career researchers (and scholars);
- **Qualifications:** (a) completed a PhD within the last N years where $4 < N < 11$; (b) (not) registered for a PhD (or Masters or Honours?);
- **Age:** (a) at most 35 years old; (b) at most 40 years old; (c) no age restriction;
- **Employer:** (a) within the university sector (including postdoctoral fellows?); (b) employed in Government or Industry?



Shaping the Future: examples

- National Plan for Higher Education: (2001);
- Innovation Towards a Knowledge-Based Economy: Ten-Year Plan for Science and Technology (2008 – 2018);
- National Development Plan 2030: *Our future – make it work* (2013)
- Science, Technology and Innovation Decadal Plan: 2022 – 2032;

Question: How might the National System of Innovation look like by the middle of the 21st century, i.e. by 2050?

Definition of ECA: Either/or (a) at most 40 years old; (b) completed PhD within last N years, $4 < N < 9$; including postdoctoral fellows; (b) below level of associate professor; (c) (to be) registered for a PhD.



Evolution of ideas about early career academics

- 1959 Extension of University Education Act: “You are on your own”;
- Foundation for Research Foundation Development ratings: 1983 onwards. Introduced P- and Y-ratings;
- “Grow Our Own Timber”: 1980s onwards?
- FRD Thuthuka Part One (PhD track only?): 1999/2000.
- Next Generation of Academics Programme: 2000s Higher Education South Africa;
- NRF Thuthuka Part Two: (PhD- and post-PhD tracks)
- Black Academics Advancement Programme: 2017/18;
- Future Professors Programme: 2020



Evolution of ideas about early career academics

- Research Mentoring and Exceptional Early Career Advancement Programme aka Leading Researchers and Scholars Programme: (not yet funded?);
- Pathways to a Successful Academic Career Programme: 2020/21;
- Universities South Africa Thuso Resources: 2023;
- New Frontiers Research Award: Oppenheimer Memorial Trust: August 2023.



Some characteristics of the programmes

- **New Frontiers Research Award:** *“The OMT New Frontiers Research Award recognizes the efforts of visionary early-to-mid-career researchers determined to build high-performance research teams and the South African academy. The award is intended to provide leading researchers with the freedom and flexibility to pursue their research, without bureaucratic constraints. Helping them produce significant work and gain international recognition. It is a five-year award with a monetary value of R1.5 million per annum”.*



Some characteristics of the programmes

- **Leading Researchers and Scholars Programme:** “(a) Support South African researchers and scholars, particularly African and Coloured males and females, employed at public universities and research institutions in South Africa to become **internationally leading researchers and scholars in their field**; (b) Support Exceptional Early Career and experienced Mid-career researchers and scholars that are transitioning to become internationally recognized researchers and scholars in their field; (c) Support Advanced Career Researchers and Scholars who already have considerable international recognition to transition to become internationally leading researchers and scholars in their field”.



Some characteristics of the programmes

- **Future Professors Programme:** *“The Future Professors Programme serves the best and brightest of a transformed next generation South African professoriate.....The programme is designed to complement and supplement next generation initiatives at respective universities and we aim to collaborate with such initiatives. We prepare early to mid-career academics across disciplines. Our purpose is to build capacity in the South African national science system by preparing lecturer and senior lecturer equivalent staff for the professoriate. This is a direct response to current inequality in representation in the senior ranks of the academy (associate and full professor level). This is done through strong cross-disciplinary and inter-university peer networks inside and outside the fellowship programme”.*



Some characteristics of the programmes

- **Thuso Resources:** *“.....is a national toolbox of help (thuso) resources for early career researchers and scholars developed in response to nation-wide studies which showed a need for this support platform in the interest of collaboratively building strengths. South African universities have shared instruments, resources and training offerings on this platform to inform and assist early career researchers and scholars in their career development.”*



Some characteristics of the programmes

- **Black Academics Advancement Programme:** *“This programme is a directed intervention aimed at promoting the development of Black academics, specifically Black South African citizens and academic staff with disabilities by accelerating the training of PhD and post-PhD candidates to enhance their research training and accelerate their progression to become established researchers. It is argued that a lack of resources and teaching demands are the major challenges that limit the completion of PhD degrees by academic staff and also limits them in undertaking Post-PhD research on the path to becoming established researchers. ...Ideally two (2) awards per annum will be made to each university that submits applications that meet eligibility and merit review criteria”.*



Selectivity and Excellence: NRF ratings

From BAAP concept document (March 2022): *“Of the 3 392 rated researchers in South Africa in 2015, only 26% were Black, and 31% were female. The cohort of Black NRF-rated researchers comprised of 16% African, 3% Coloured and 7% Indian academics and researchers. Black South African citizens made up only 6% of the NRF-rated researchers and only six (6) of these researchers achieved an A rating.”*

(In August 2022, there were 4452 rated researchers, of which 130 were A-rated; 797 were B-rated; 2735 were C-rated; 23 were P-rated and 767 were Y-rated).

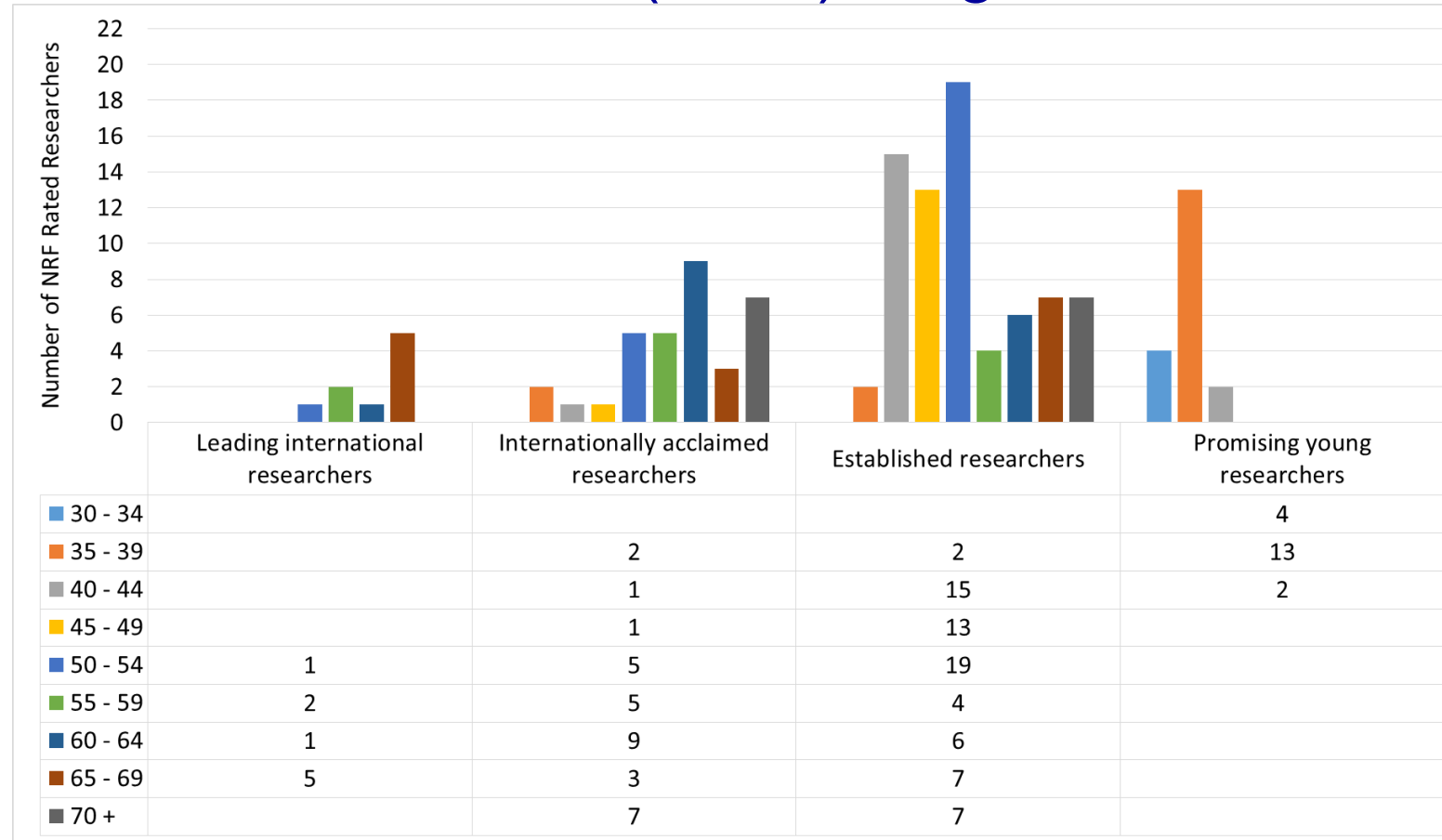
Question: what proportion of the total academic staff population do these figures represent?

Social Sciences Theorem: Selectivity may enhance excellence, but it disproportionately favours those that have enjoyed some privileges.

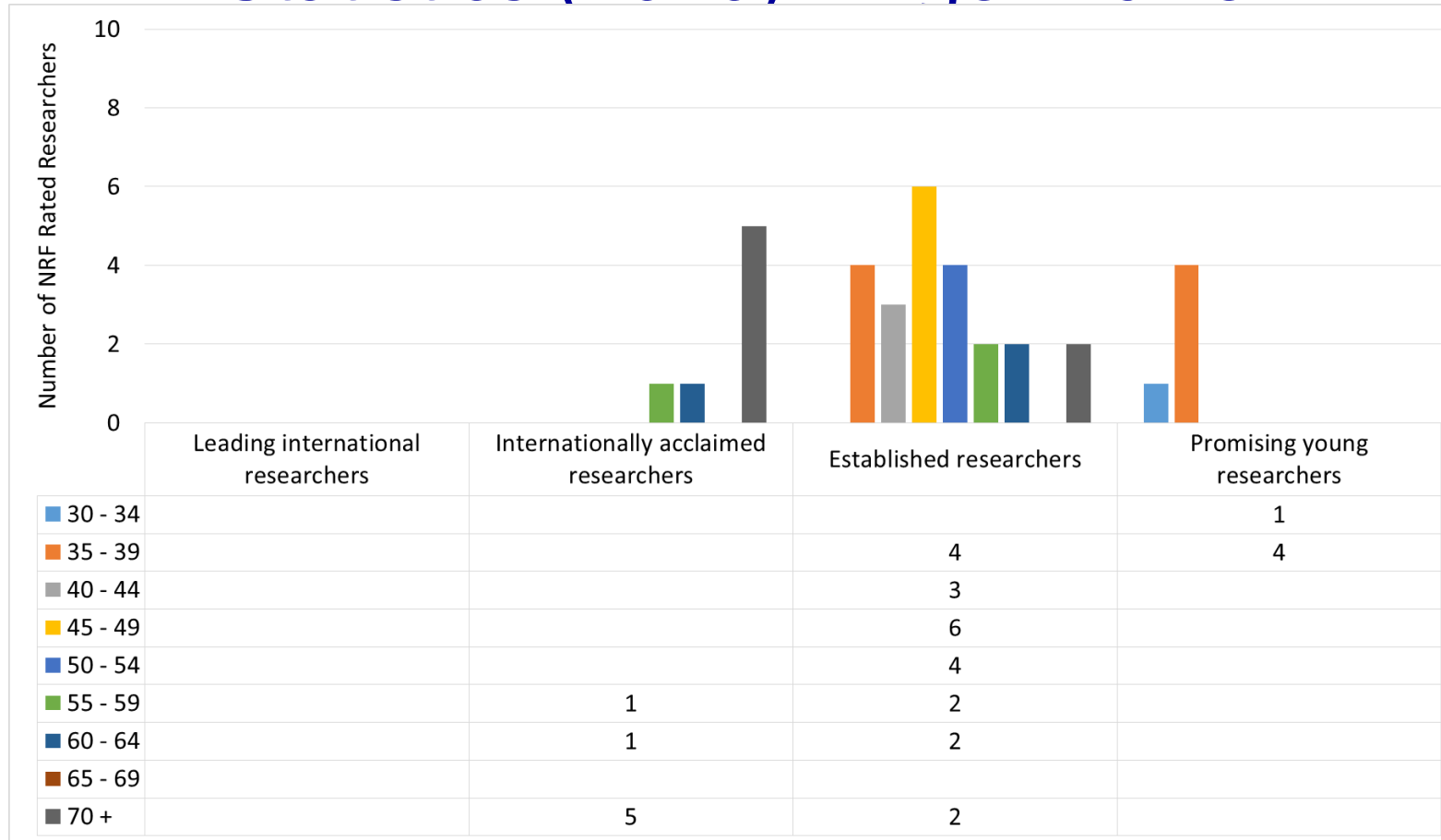
Corollary: An unintended consequence of selectivity is that it could exacerbate inequality.



Number of NRF Rated Researchers in Mathematics (2020) – Age Profile



Number of NRF Rated Researchers in Statistics (2020) – Age Profile

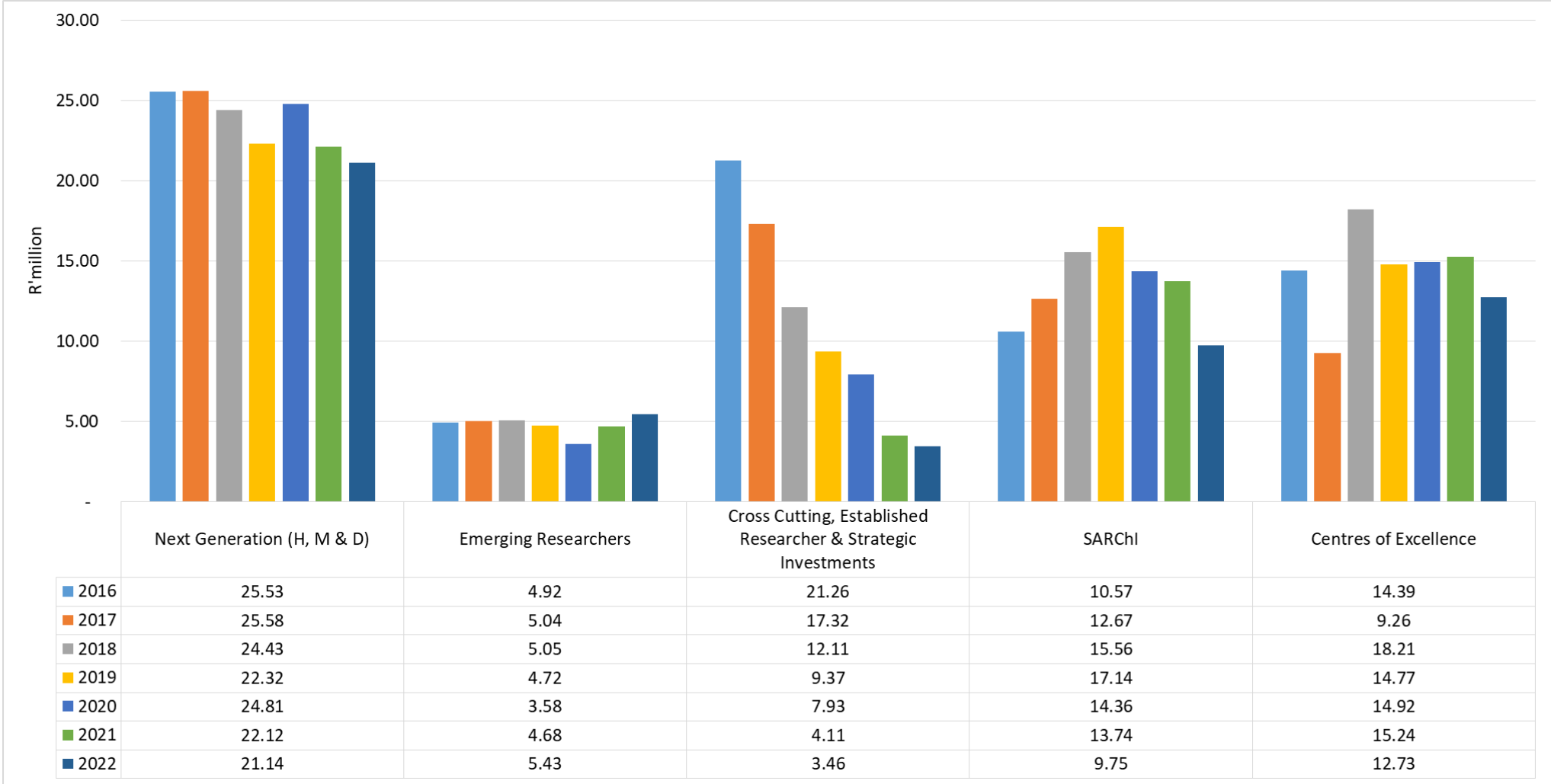


Early career mathematical scientists

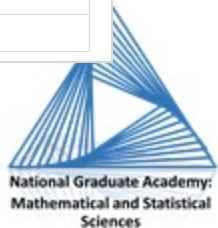
- In 2020 there were 528 mathematics academics: (approximately) 61% with a doctoral degree; 32% female; 38% White; About 42% at most 40 years old. What is their academic profile, say their qualifications and research specialisations? Are there any significant gaps in the national knowledgebase in pure or applied mathematics?
- In 2020 there were 255 statistics academics: (approximately) 45% with a doctoral qualification; 40% female; 47% White;. About 45% at most 40 years old. What is their academic profile, say their qualifications and their research specialisations? Are there any significant gaps in the national knowledgebase in the statistical sciences?
- **Mathematics:** In 2020, A-rated mathematicians constituted 1.7%; A- and B-rated (considerable international recognition) constituted 8%; and only 3.6% were deemed 'promising researchers.
- **Statistics:** In 2020, there were no A-rated researchers in statistics (at present there's only one); 2.8% were internationally acclaimed; and only 2% were deemed 'promising' researchers.



NRF Investment in Mathematics and Statistics: Researcher Pipeline and Strategic Interventions



Source:
National Research Foundation's Research and Development Information Platform (RDIP).



Reflections and discussion points

- The NRF rating is a homegrown instrument for measuring research excellence. Some interventions mentioned are designed to produce (more) internationally acclaimed or leading researchers. What proportion of GERD is this?
- In mathematics less than 8% and in statistics less than 3% have achieved the status of being internationally acclaimed or leading international researchers;
- Of the, say 220 early career mathematicians, only 19 were deemed promising. How many can achieve the status of being internationally acclaimed and what investment will be required?
- Of the, say 115 early career statisticians, only 5 were deemed promising. How many can achieve the status of being internationally acclaimed and what investment will be required?
- What about the rest? South African mathematical sciences cannot rest solely on the shoulders of those that will rise to being internationally acclaimed.



SA national science system in 2050

- By 2030, the National Development Plan set a target of 75% of academics having PhDs. “*Higher Education South Africa (HESA) has developed a detailed proposal for a National Programme to develop the Next Generation of Academics for South African Higher Education*” [NDP, Page 319].
- By 2050, the minimum qualification to teach at any South African university should be a PhD. Based on the progress so far in the implementation of the HESA Plan, can this target be attained?
- Incentivise those not keen to pursue further degrees to move to TVET colleges or high schools where there’s a shortage of highly qualified teachers and lecturers;
- By 2050, the SA university system needs to have transformed the national knowledgebase in order to respond to pressing 21st century challenges (for example, see **Science, Technology and Innovation Decadal Plan 2022 – 2033**).



SA national science system in 2050

- By 2050, all current and future early career academics will have been provided with the opportunities to become established and successful academics who have realized their full potential.
- The (emerging) consensus can be found in (a) Thuso resources; (b) “How to become a scholar: what every new academic needs to know”: Jonathan Jansen & Daniel Visser (eds).
- USAf should run Masterclasses on the topics identified in the examples given above. A “HELM-like” national programme for early career academics;
- Universities should consider revisiting their internal HR policies which may lead to benign unconscious neglect of early career academics : workloads; grant allocation; sabbatical or research leave; developmental opportunities.
- Securing competitive international grant is a proxy for international recognition. Provide matching funding for internationally acclaimed researchers.
- National programmes funded by DSI and DHET and aimed at early career academics should be open to all and not be ‘selective’.
- “ECA, you are NOT on your own”.



Thank You



National Graduate Academy:
Mathematical and Statistical
Sciences

