

Postdoctoral research fellows at South African public universities: Key findings from a national study

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NITheCS Colloquium

20 May 2024

Characteristics of postdoc positions

(American Universities Committee on Postdoctoral Education, 1998)

- require the **recent** award of a **PhD** or equivalent doctorate
 - be a **temporary** position
 - substantially involve full-time **research or scholarship**
 - adequately **prepare** someone for a full-time academic and/or research career
 - require the **supervision** of a senior scholar or a department/laboratory, etc.
 - provide the appointee with sufficient freedom and support to **publish** the results of his/her research or scholarship during the period of the appointment
- 

The Postdoc Landscape

The Invisible Scholars

History and Evolution of
the Postdoctoral Scholar
in the United States

“Although it is **unclear** exactly when postdoctoral scholars as an entity first came into existence, we can assume it was **some time after the first Doctor of Philosophy degrees** were granted in Germany in the **mid-17th century**” (Micoli & Wendell, 2018).



SA: first introduced in the late 1990s

Main themes in policy discourse on postdocs in SA, post-2000

- **‘Competitive edge’**: to establish themselves **internationally**, and thereby to promote internationally competitive research
- Building **research capacity** in academia (esp. among designated groups)
- ‘Augmenting’ **supervisory capacity**
- Increasing **‘output’** (established researchers’ output considered **insufficient**)



science & innovation

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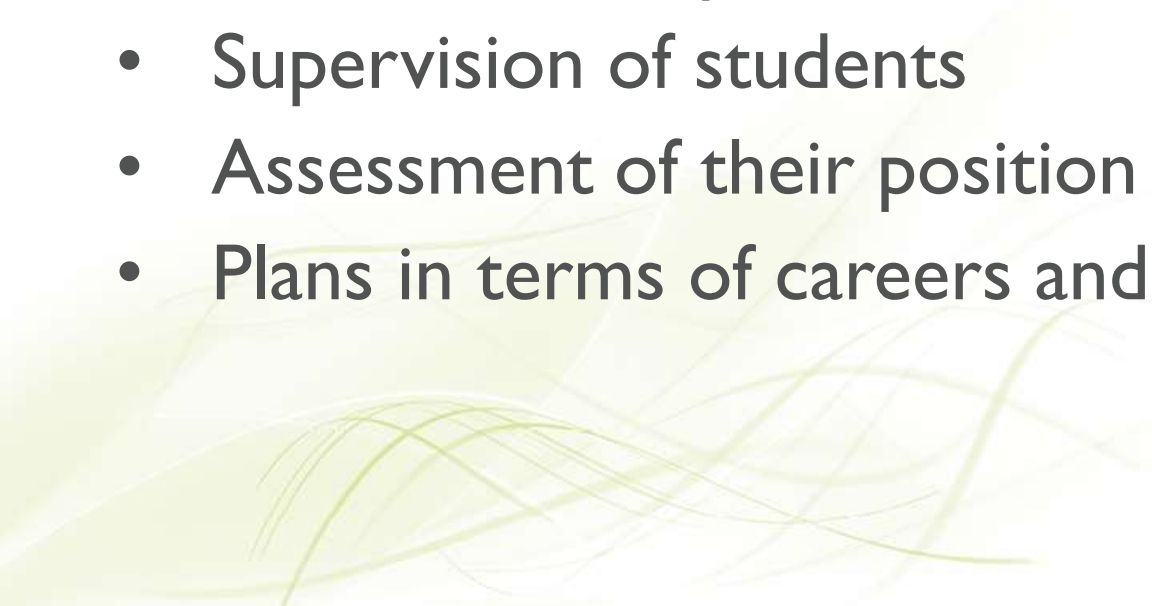
higher education
& training

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Research
Foundation

Structure of the presentation

- Trends in the number and profile of postdocs
 - Prior career trajectories and reasons for taking a postdoc position
 - Funding and conditions of service
 - Publication output
 - Supervision of students
 - Assessment of their position and supervisor
 - Plans in terms of careers and migration
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Data sources

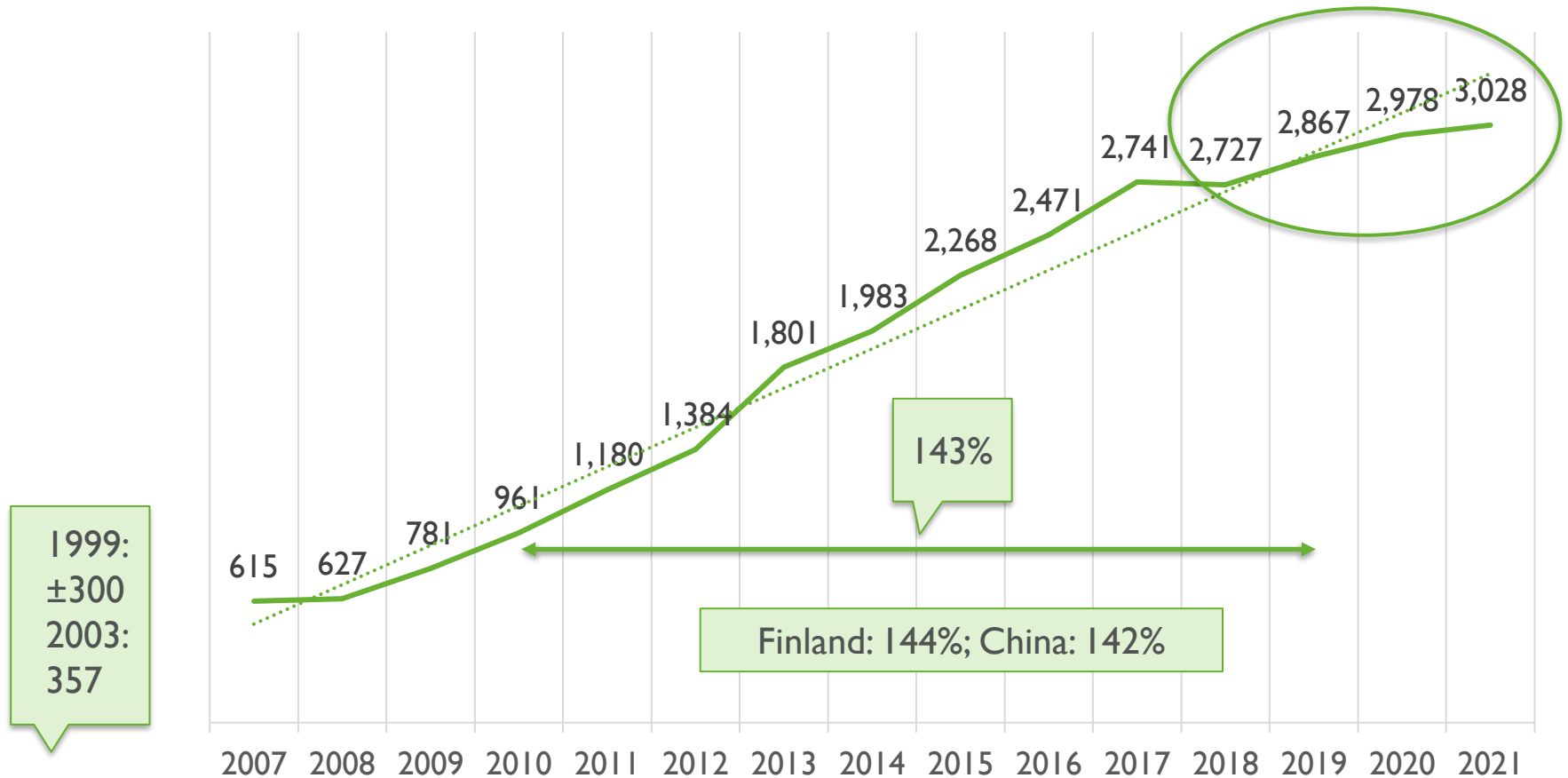
- R&D surveys; HEMIS; NRF funding data and policy documents
- Institutional data collection (**21** universities)
- National survey of postdocs (Oct. 2022–Feb. 2023)
 - **2 260** individual recruitment emails sent to postdocs affiliated in **2022** with **21** SA public universities
 - **503** valid responses (**22%** response rate)
 - Mostly **structured** survey questionnaire
 - Final item: additional comments/remarks (n=241; “**qualitative data**”)
- Bibliometric study
 - Clarivate Analytics™ Web of Science
 - SA Knowledgebase

- R&D surveys
- HEMIS
- Institutional data collection (21 universities)
- NRF funding data

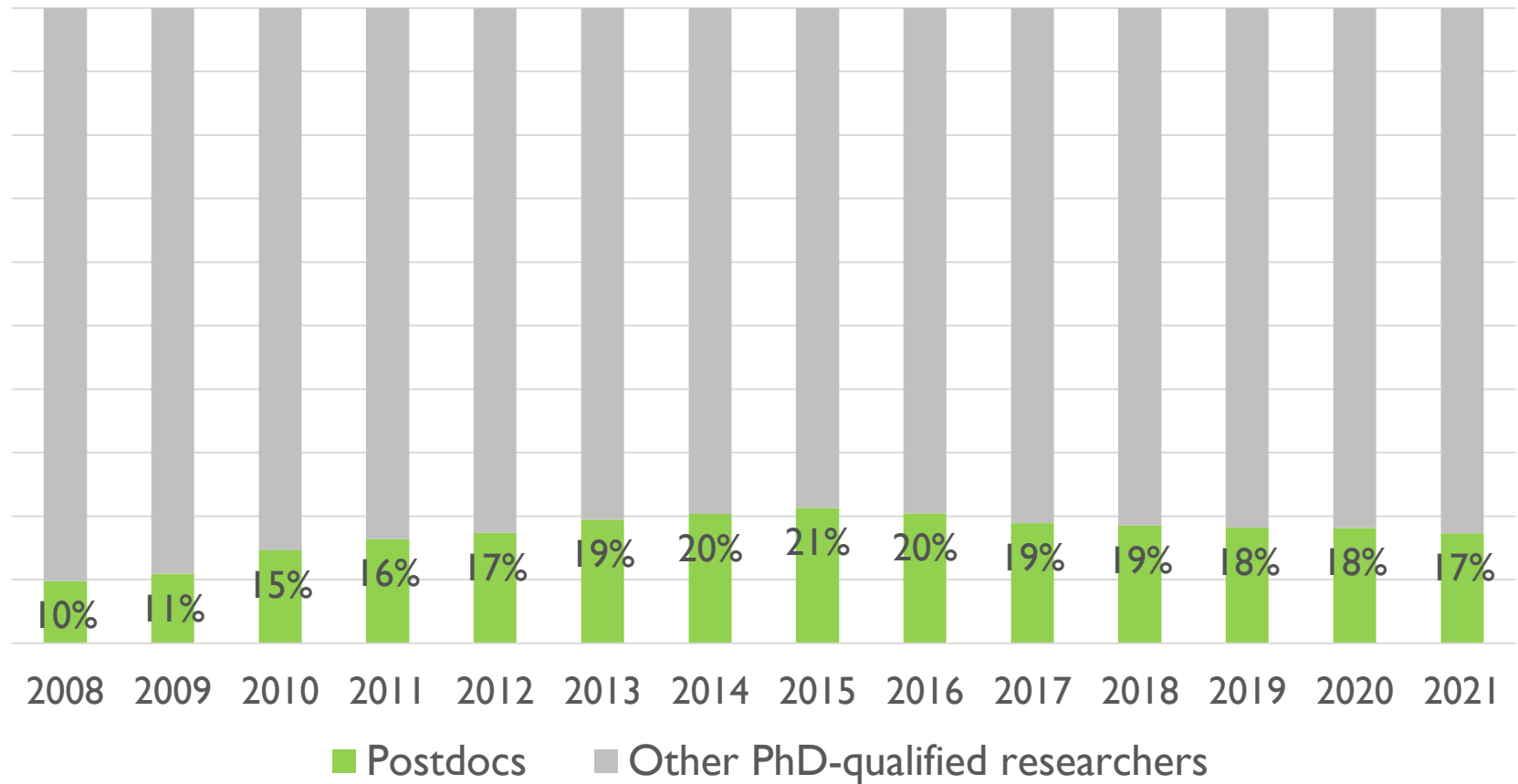
Trends in the number and profile of postdocs in the SA public HE sector during the past 15 years



Number of postdocs in 1999, 2003 & 2007–2021

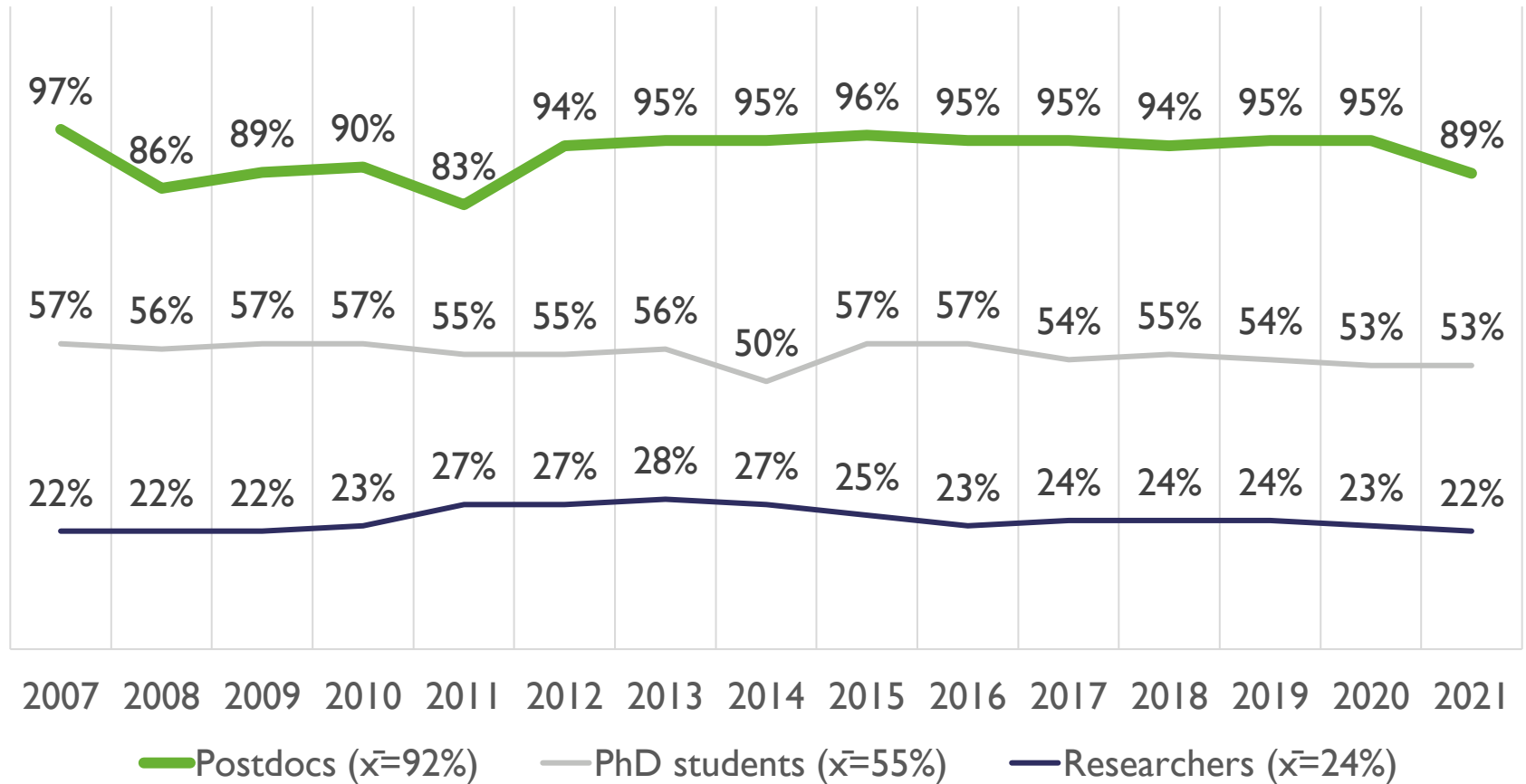


Postdocs as a % of PhD-qualified researchers*, 2008–2021



*Include permanent and contract (6 months or longer) staff, as well as emeritus professors and honorary fellows

Research FTEs as % of HCs* for PhD students, postdocs, and researchers, 2007–2021



*A measure of time spent on research

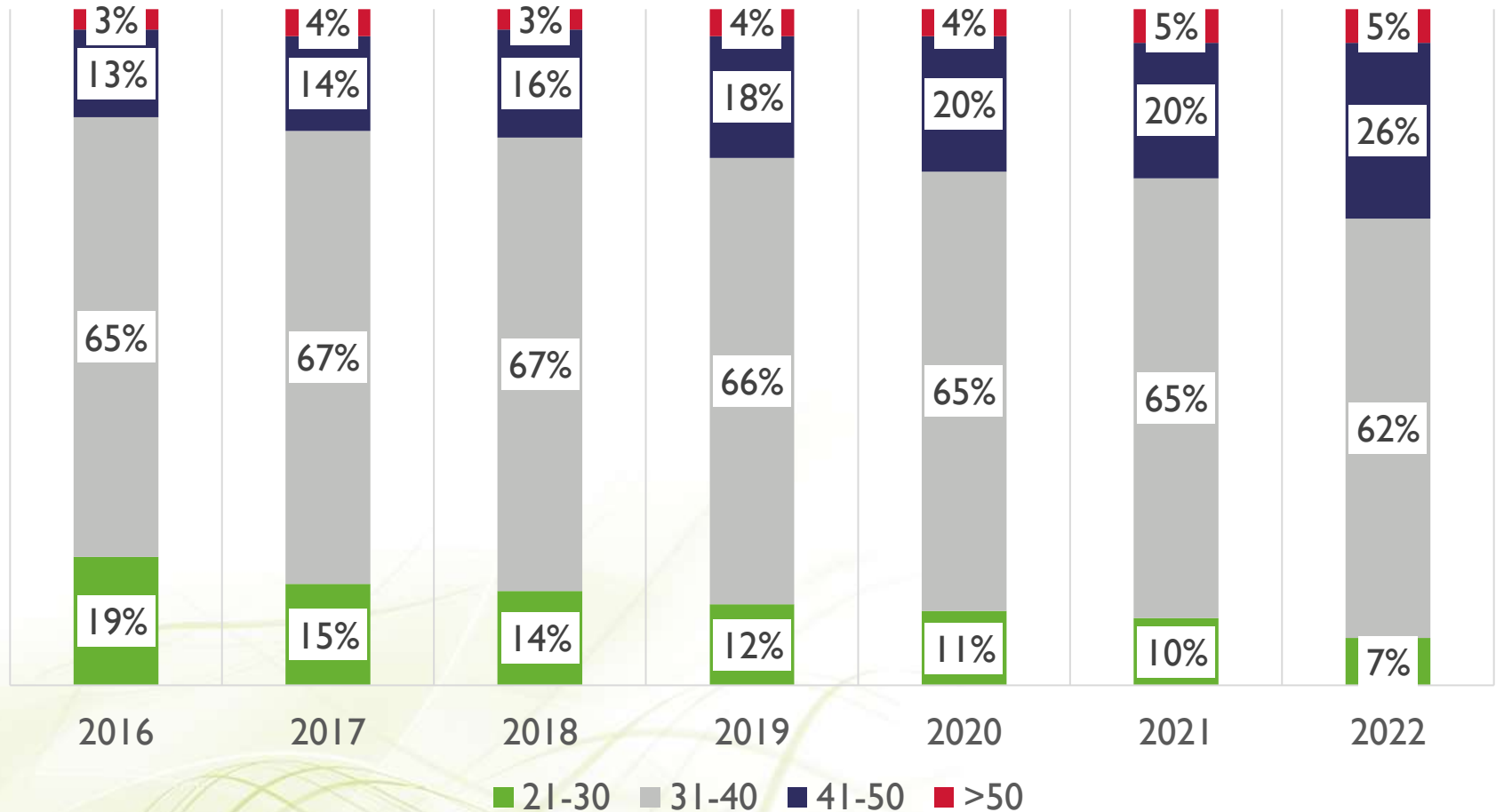
The majority (60%) of PhD students in SA study part-time

Academic capitalism and resource dependence theory

- **Competition** among universities for public funds
- Dependence on **external sources** of funding
- Postdocs' relatively **low labour cost** provides a competitive **advantage**
 - Labour over which universities have 'leverage' (not as **protected** by legislation; no long-term **commitment**)
- Postdocs as a **surplus** supply of labour
 - Increases in **PhD graduates**, and an inadequate labour **market demand** for their skills
 - **Credential inflation**



Postdocs by chronological age, 2016–2022 (institutional data)



Postdocs as ‘canaries in the coal mine’



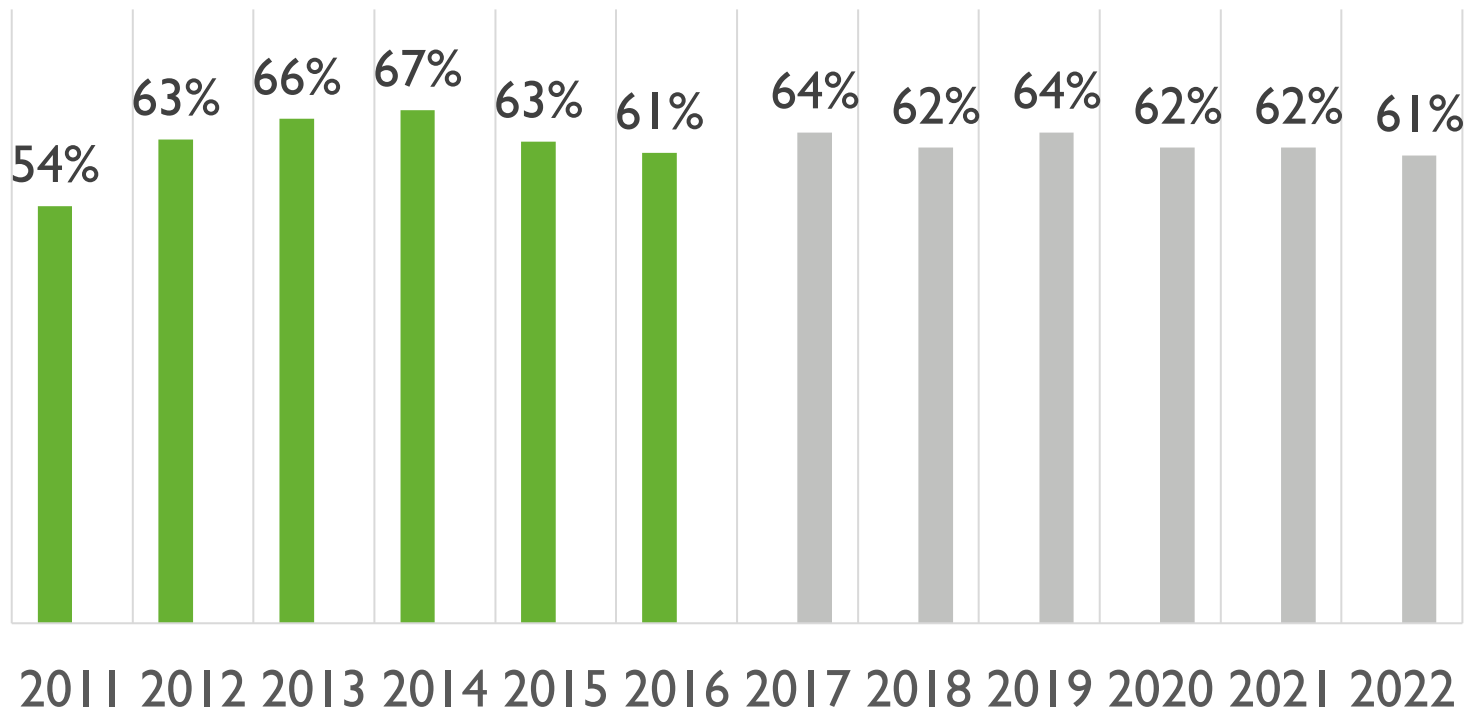
- **Casualisation** of academic labour
 - Potential **loss of knowledge**
 - Switch from one contract to another, or exit research career paths altogether
 - Gendered?
- A recent **deceleration** in the growth of postdocs
 - Decline in the growth in **international** postdocs?

The Creation of Postdoctoral Fellowships and the Siting of American Scientific Research

ALEXI ASSMUS

“In the 1920s, [American postdoctoral] fellowships were often used by their recipients **to study in Europe**, where they acquired a knowledge of **theory** and of **quantum science**, in both of which the American universities were relatively **weak**” (Assmus, 1993).

Percentages of postdocs who are not SA nationals, 2005–2022



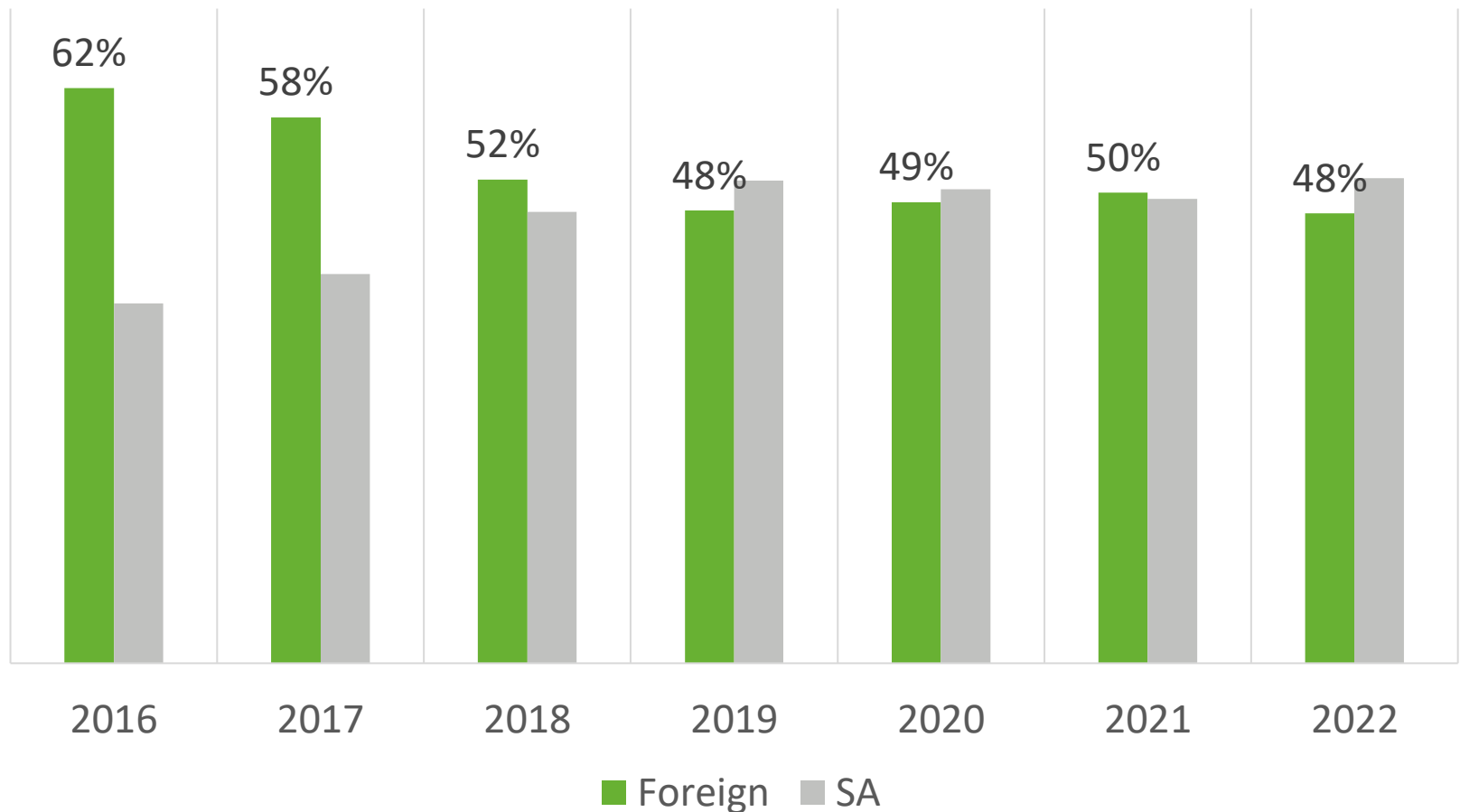
2005–2010:
63%

■ R&D surveys (average: 62%)

■ Institutional data (average: 63%)

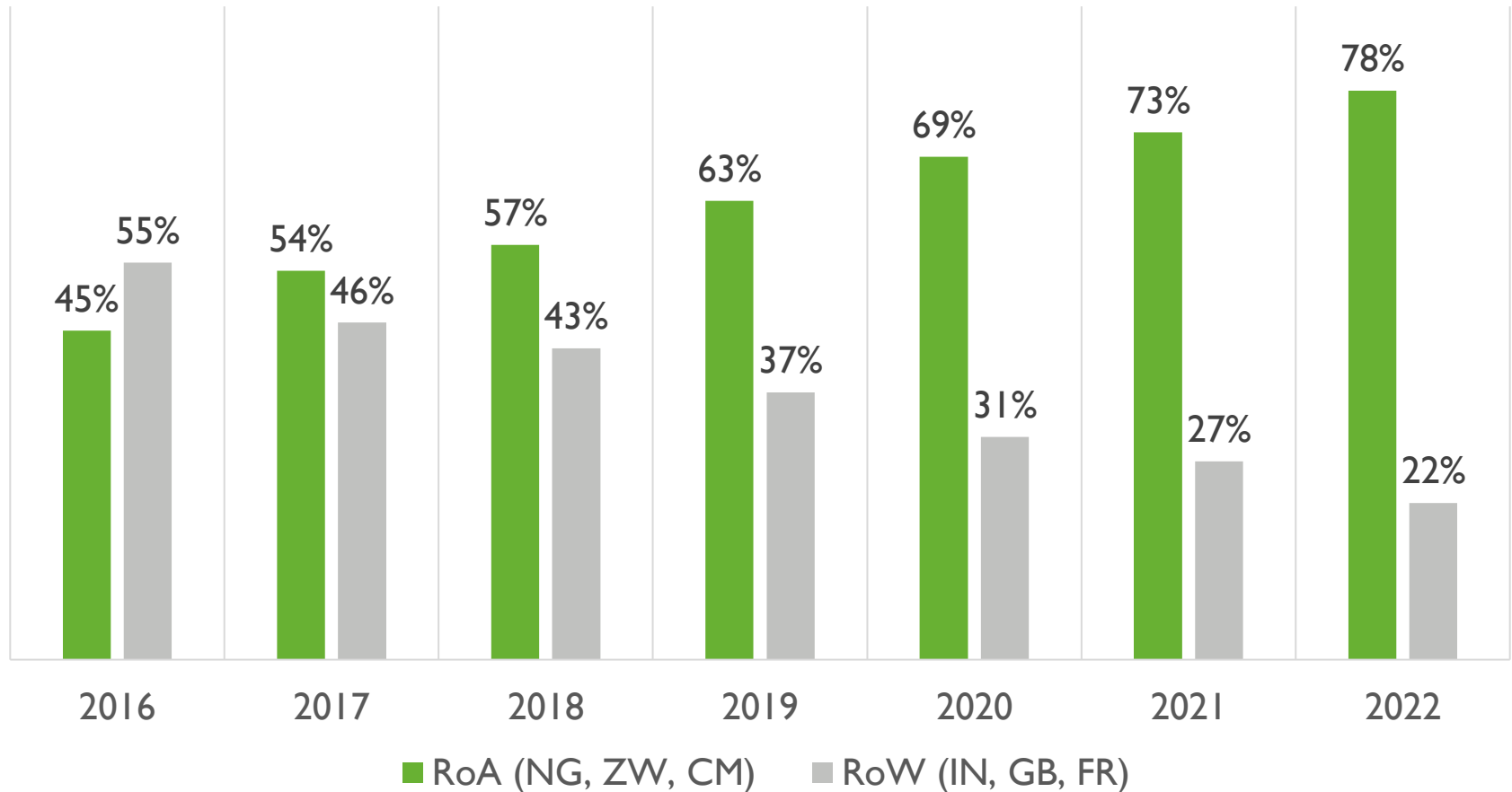
61% of respondents a 2020 global (*Nature*) survey reported that they were **not** undertaking a postdoctoral fellowship in their native country.

Change in percentage of NRF-funded* SA and 'foreign' postdocs, 2016–2022

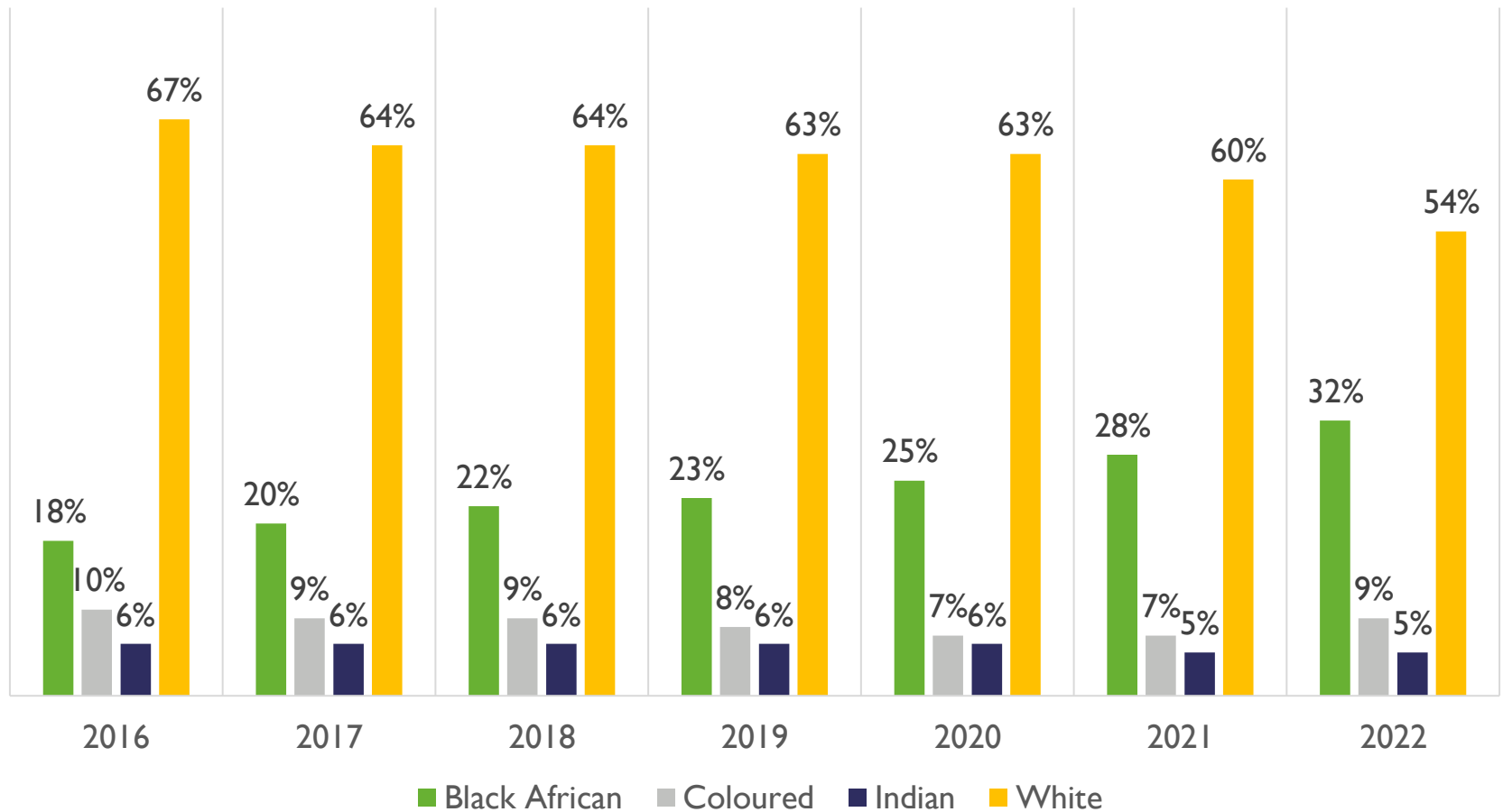


*On average 17% of postdocs at SA universities are directly funded by the NRF

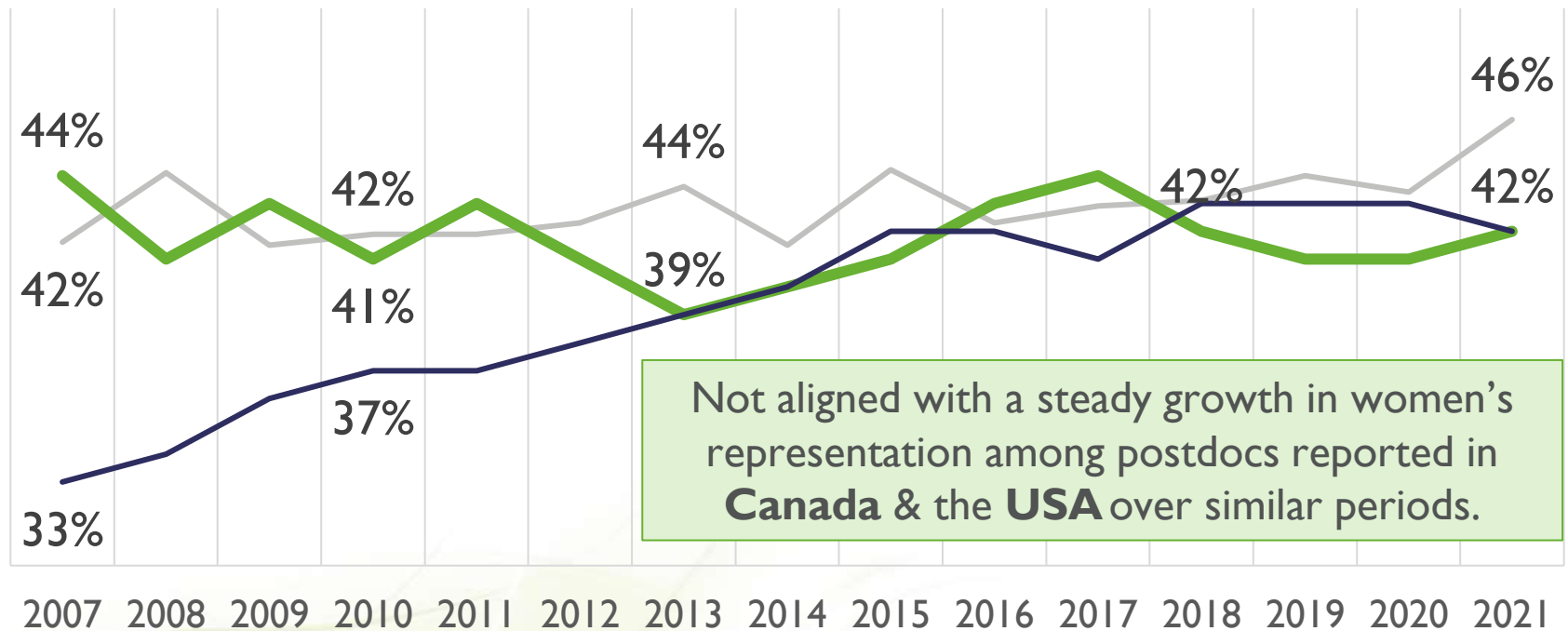
Change in % of 'foreign' postdocs' country or birth, 2016–2022 (institutional data)



Postdocs by race, 2016–2022 (institutional data and SA nationals only)



Percentage of women among PhD graduates, postdocs & researchers with a PhD, 2007–2021



— % women among doctoral graduates (average: 42%)

— % women among postdocs (average: 42%)

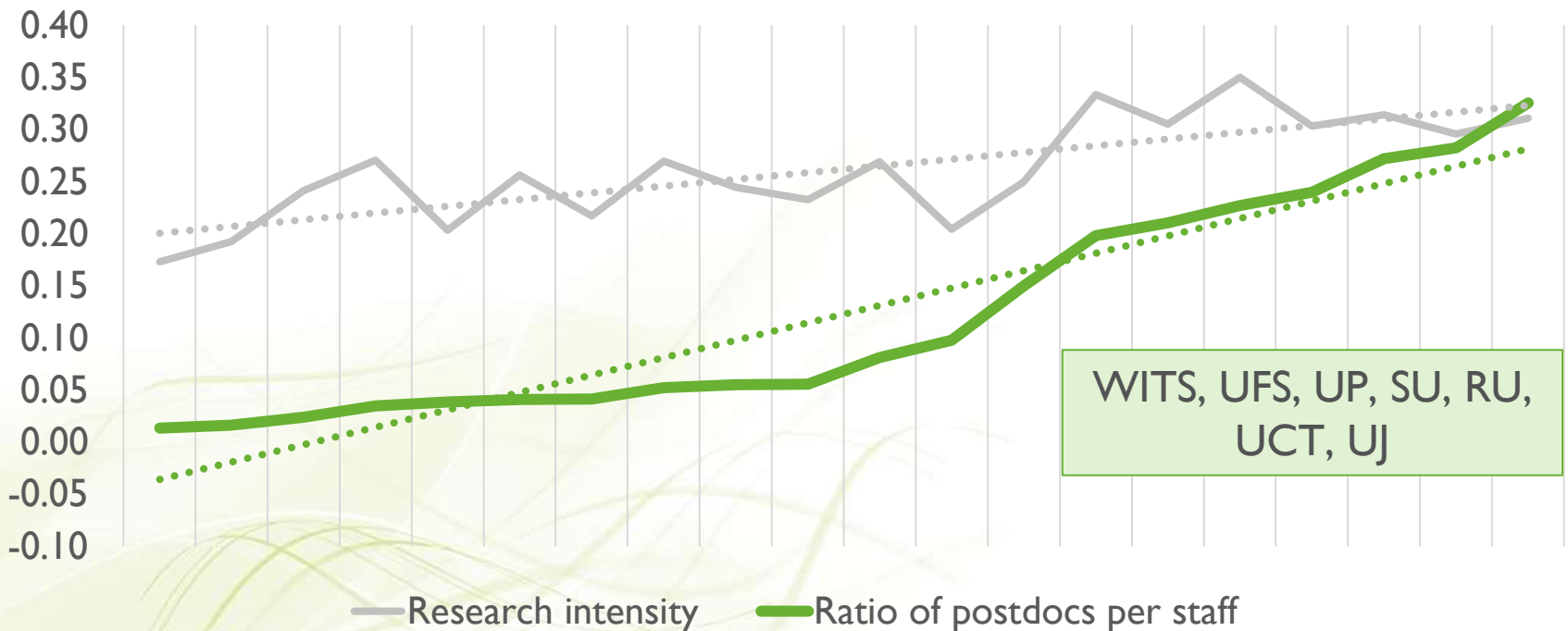
— % women among researchers with a PhD (average: 39%)

“Postdoctoral fellowships [...] contributed markedly to **raising the standard of research** in American universities. The fellowships [...] **increased the amount of research** done in the universities. In doing so, they **made research a normal component** of the activities of a university” (Assmus, 1993).

Postdocs' distribution across universities

Permanent staff per postdoc: range: 3–76; mean: 7

Is the ratio of postdocs to permanent academic staff related to research intensity? (20 universities)

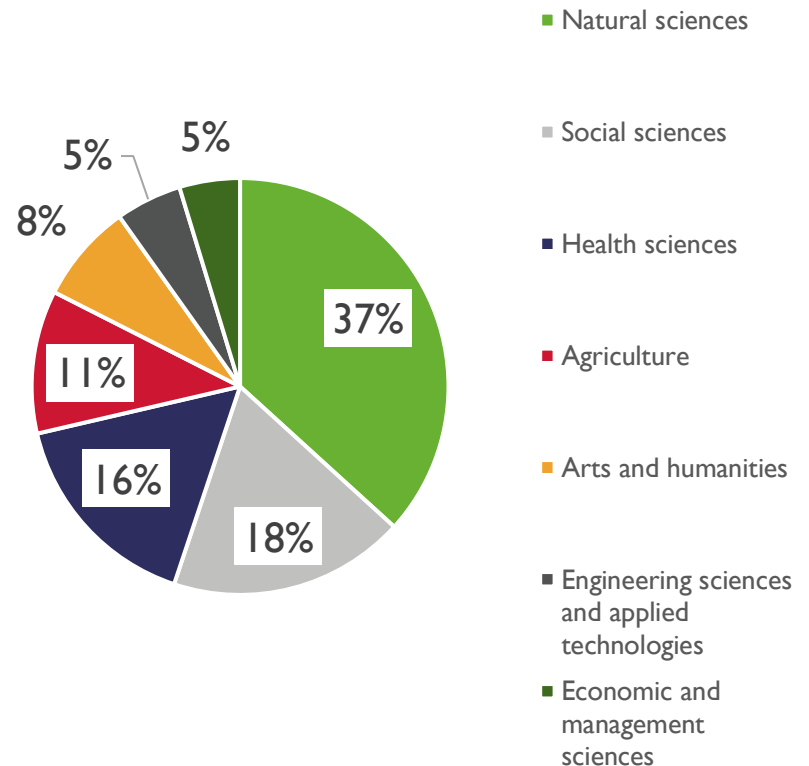


A profile of the survey respondents: University and main scientific domain in 2022

University

- Eight hosted 5% or more (up to 20%) of respondents
 - Together, they hosted 80%
 - Ordered from highest to lowest percentage: UP, UJ, UCT, SU, UFS, RU, UNISA & WITS
- 5 universities' postdocs did not participate

Science domain

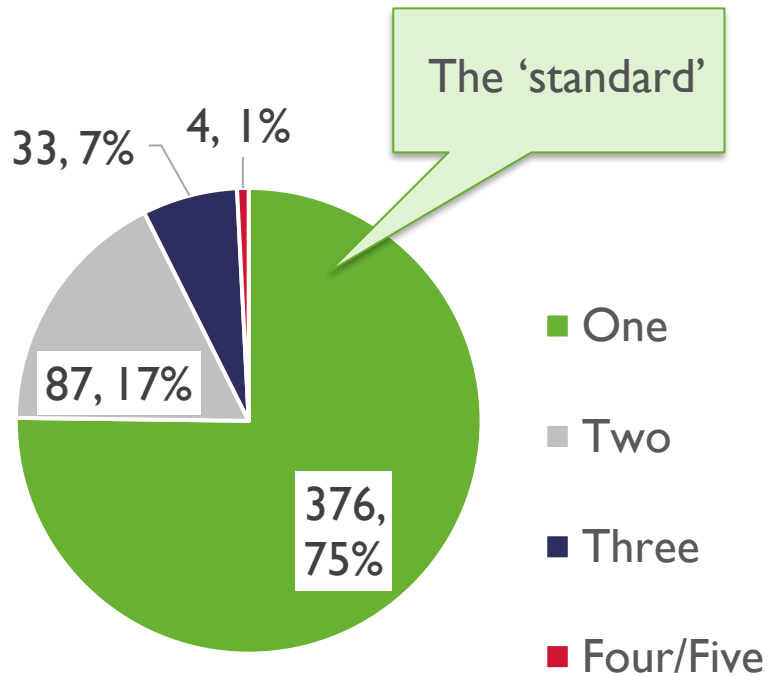


National survey

Prior career trajectories and reasons for taking a postdoc position



No. of postdoc positions since completing PhD



Primary reasons for taking a postdoc position

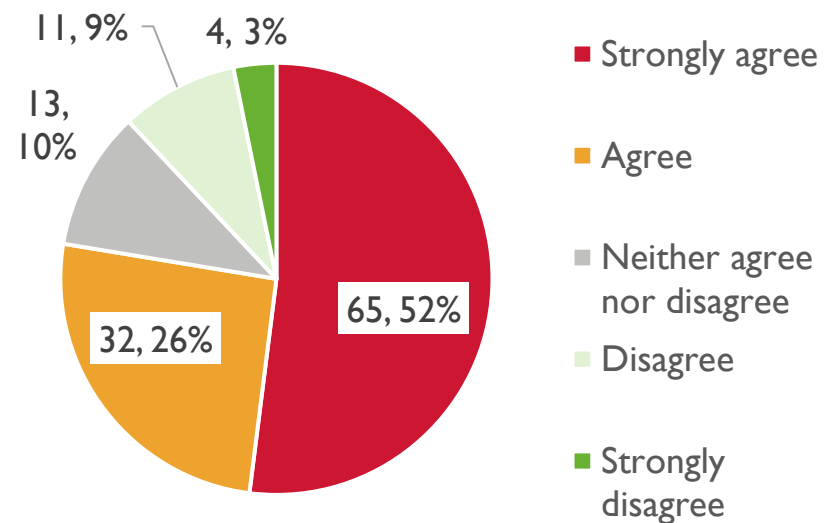
Enhance future employment prospects within a university / research institute	27%
Develop research portfolio through focussed research	25%
Gain additional research training / experience in PhD field	17%
Unable to find a different, suitable position	15%
Gain research training / experience in a different field of research	9%
A necessary step to obtain a desired permanent position	8%

The 'serial' postdoc

Total number of years in postdoc positions, by the end of 2021

	<i>N</i>	%	<i>Cum. %</i>
One	32	28%	
Two	27	23%	51%
Three	21	18%	69%
Four	12	10%	79%
Five	10	9%	88%
Six	6	5%	93%
Seven	3	3%	96%
Eight	1	1%	97%
Nine	2	2%	98%
Ten	1	1%	99%
Eighteen	1	1%	100%
Total	116	100%	

For **78%**, poor job prospects led to them holding more than one postdoc position since their PhD



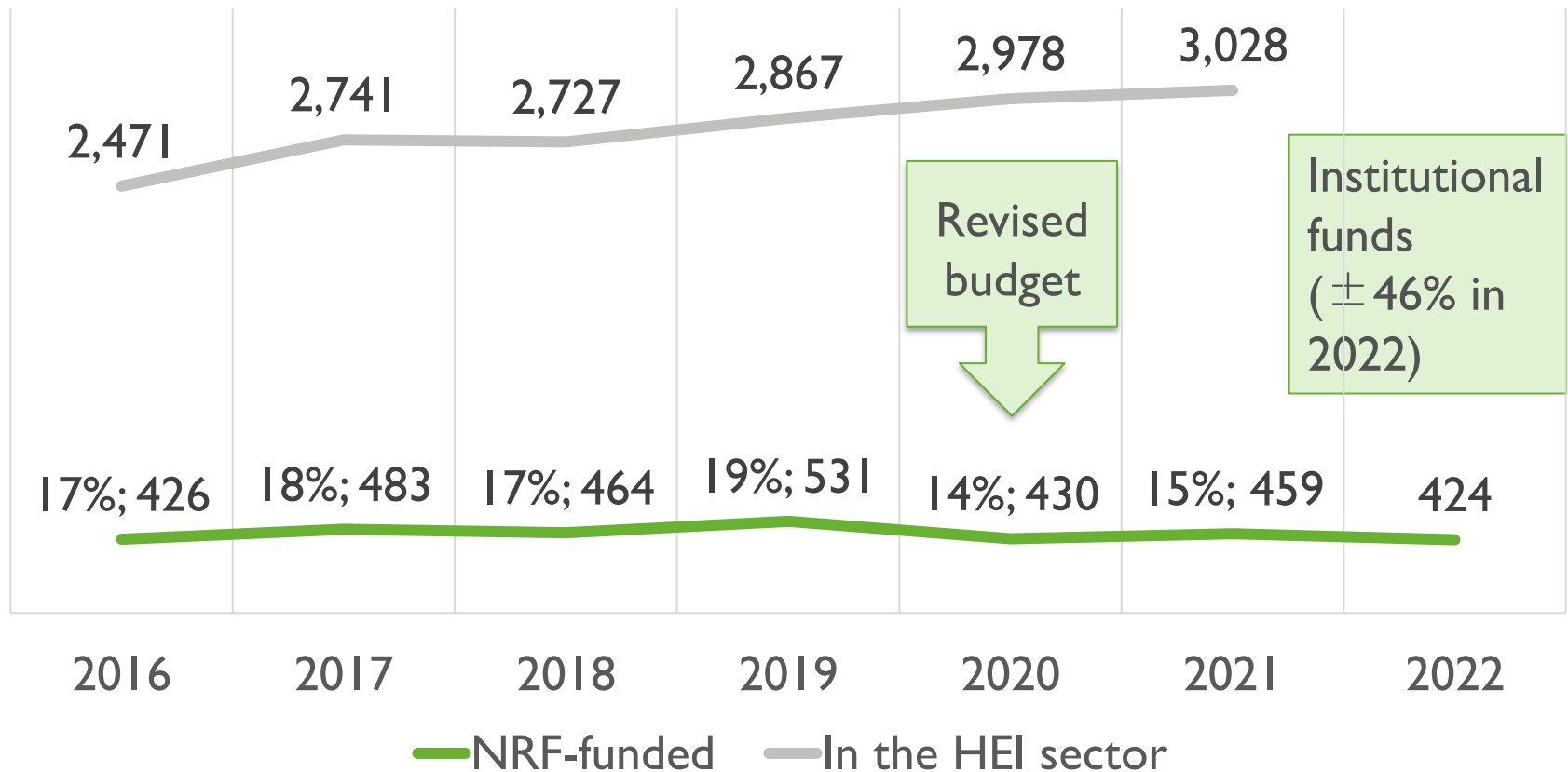
Some interpretations

- Average year-on-year increase in numbers, 2007–2021
 - PhD graduates: 8%
 - **Postdocs: 12%**
 - Lecturers: 2%
- The absorptive capacity of universities to **employ** PhD graduates and postdocs has reached a point of **saturation**
 - Steep increase in the numbers of PhD graduates in the country (esp. 2009+)
 - **NDP's target** of producing more than 100 doctoral graduates per one million of the population by 2030
 - Reduction in the **DSI's budget** for research funding and support
 - Low **investment by business in R&D**: in 2020, it was at its lowest level since 2001
 - Market **demand** for PhDs and postdocs does not match **supply**
- DST (2016): Increased PhD output should be 'complemented' with an **increase in postdoc fellowships**

- Institutional data collection
- NRF funding data
- National survey

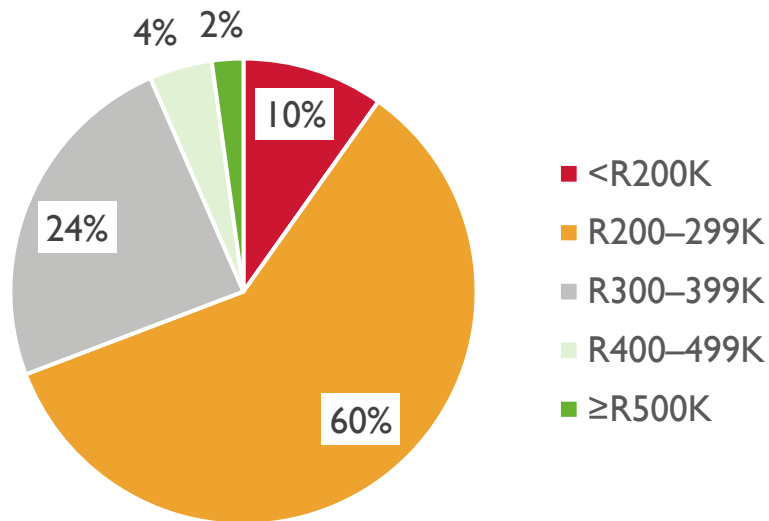
Funding and conditions of service

Percentage of NRF-funded postdocs at universities, 2016–2021



Remuneration amount

Individual, gross, annual income



NRF funding p.a.

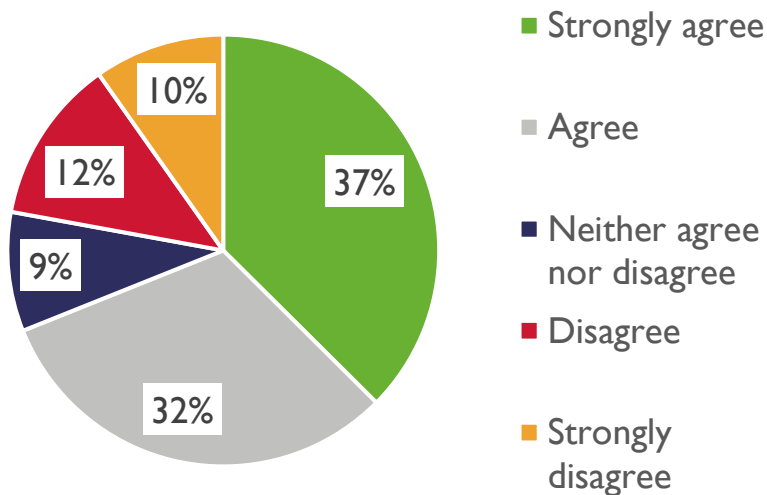
- Average 2016–2022 = **R200K**
- Remained stagnant from 2021
- Adjusted in **2024** to **R320K**

- No statistically significant differences among **fields/domains**
- Income **inadequate** for close to 60%
- 78% **unable** to save
- Qualitative data (± 80 responses)
 - **Low rate** of remuneration
 - Limits the **attractiveness** of postdoc positions
 - Has negative effects on the **wellness** of postdocs, particularly those that have **families** to support
 - **Variation** in remuneration was strongly criticised

Reliability of payment

Received pay due on time and without bureaucratic problems?

22% did not

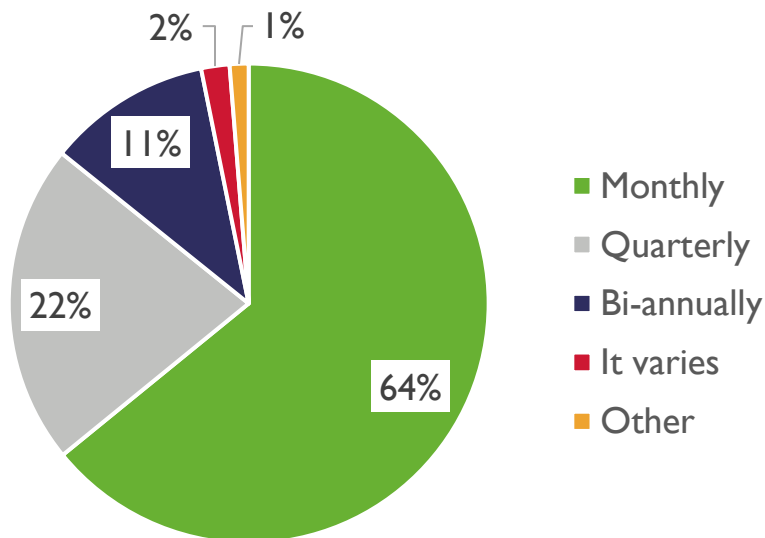


Explanations (qualitative data)

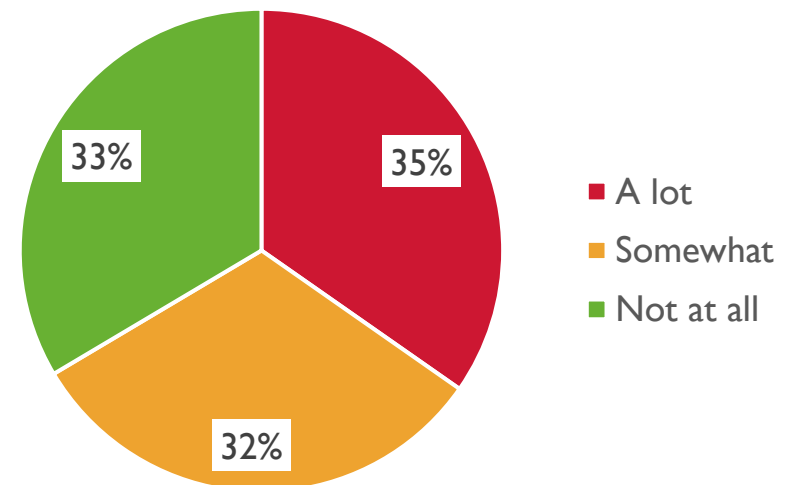
- Delays in **visa** approvals
- Inadequate **funding**
- Poor **communication** from host institutions on regulations

Frequency of payment

More than a third (**36%**) **did not** receive their remuneration **monthly**



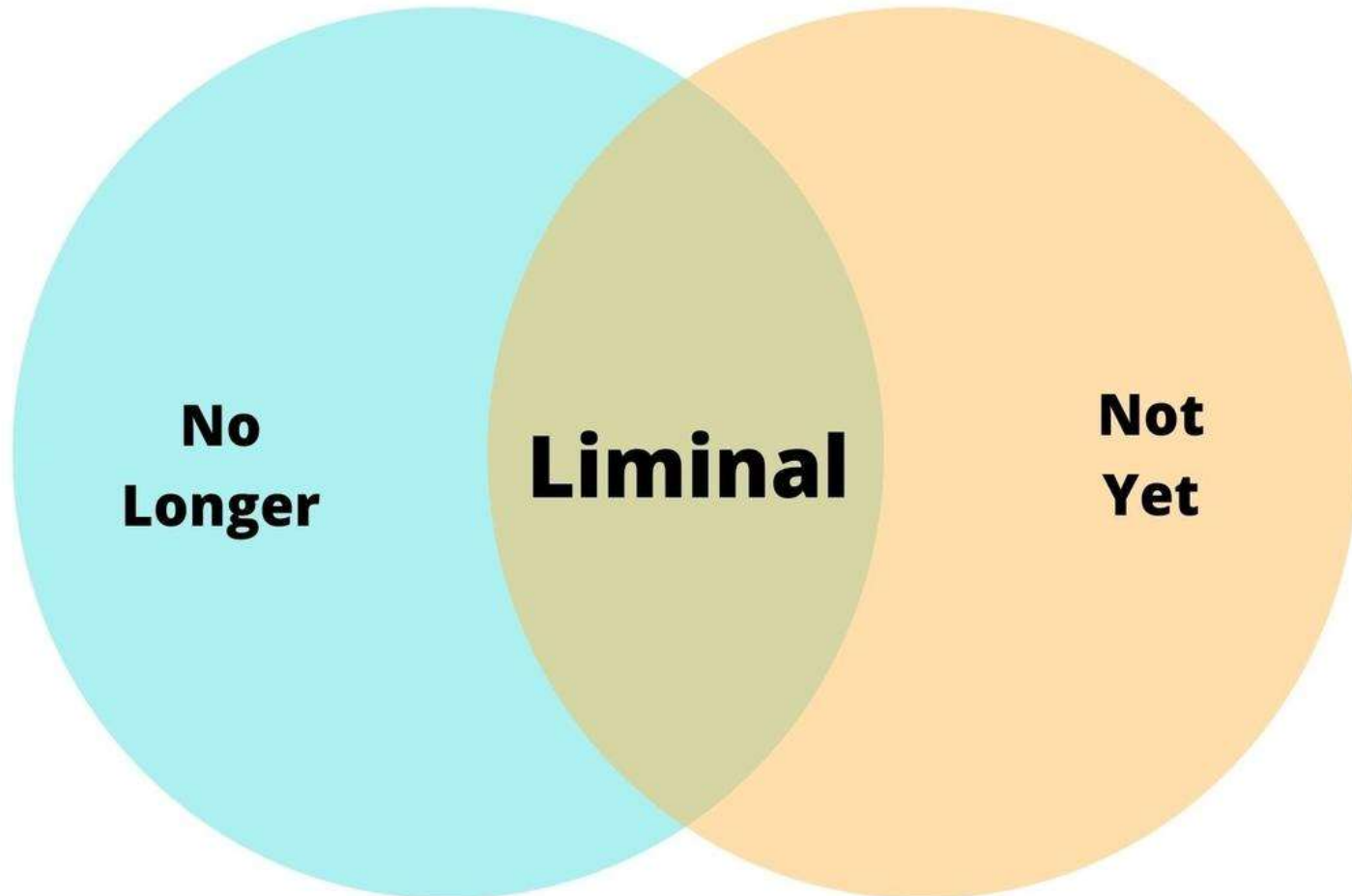
For **67%** of the 170, it posed at least some **challenges** to them, personally



Preference regarding tax-paying status

- If they had a **choice**:
 - **45%** would keep their **tax-exempt** status (more net pay, but no access to benefits)
 - **40%** would change their status to **tax-paying employee** (less net pay, but access to benefits)
 - **15%** were **unsure**
- Qualitative data
 - Having a tax-exempt status limited **access to financial products and services**
 - Being **treated “like a student”**
 - Especially by host institutions
 - A broader issue of concern (raised repeatedly)


In the 'grey zone': postdocs are neither students nor staff members




Employment benefits: some were available, but only to a minority

	N	%
Paid vacation (“annual”) leave	88	17%
Paid sick leave	83	17%
Exemption from tuition fees	71	14%
Medical scheme	64	13%
Paid maternity / parental leave	42	8%
Paid family or “compassionate” leave	42	8%
Relocation costs	25	5%
Retirement fund / Pension plan	23	5%
Transport allowance	21	4%
Disability benefits / Workplace insurance	12	2%
Group life insurance scheme	7	1%
Subsidised childcare	3	1%

Qualitative data

- A lack of suitable **medical insurance** was a particular point of concern
 - Criticism of variation in institutions' **covering of research costs** (viewed as a benefit), in particular conference attendance
- 

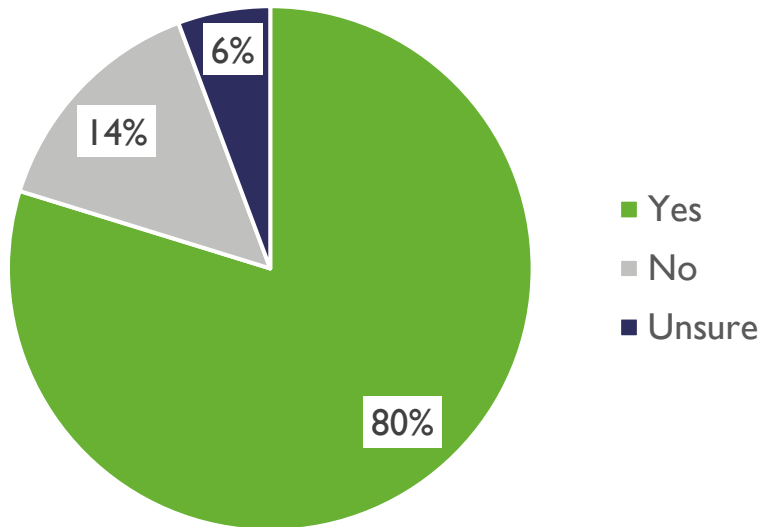
Recommendations

- **Standardisation** of **income** and other financial incentives (e.g., for research outputs)
 - **NRF** Annual Performance Plan (2024/25): **recognition** of variation in value of postdoc fellowships across funding instruments and need for standardisation
 - **Standardisation** of host institutions' covering of **research costs**
 - An **increase** in remuneration to match
 - ...rising cost of living and inflation
 - ...their high level of qualification and work expectations
 - A **steady** income that is paid on a **monthly** basis
 - **Longer** postdoc **contracts** (e.g., to allow for publication)
- 

- Bibliometric study
- National survey

Publication output

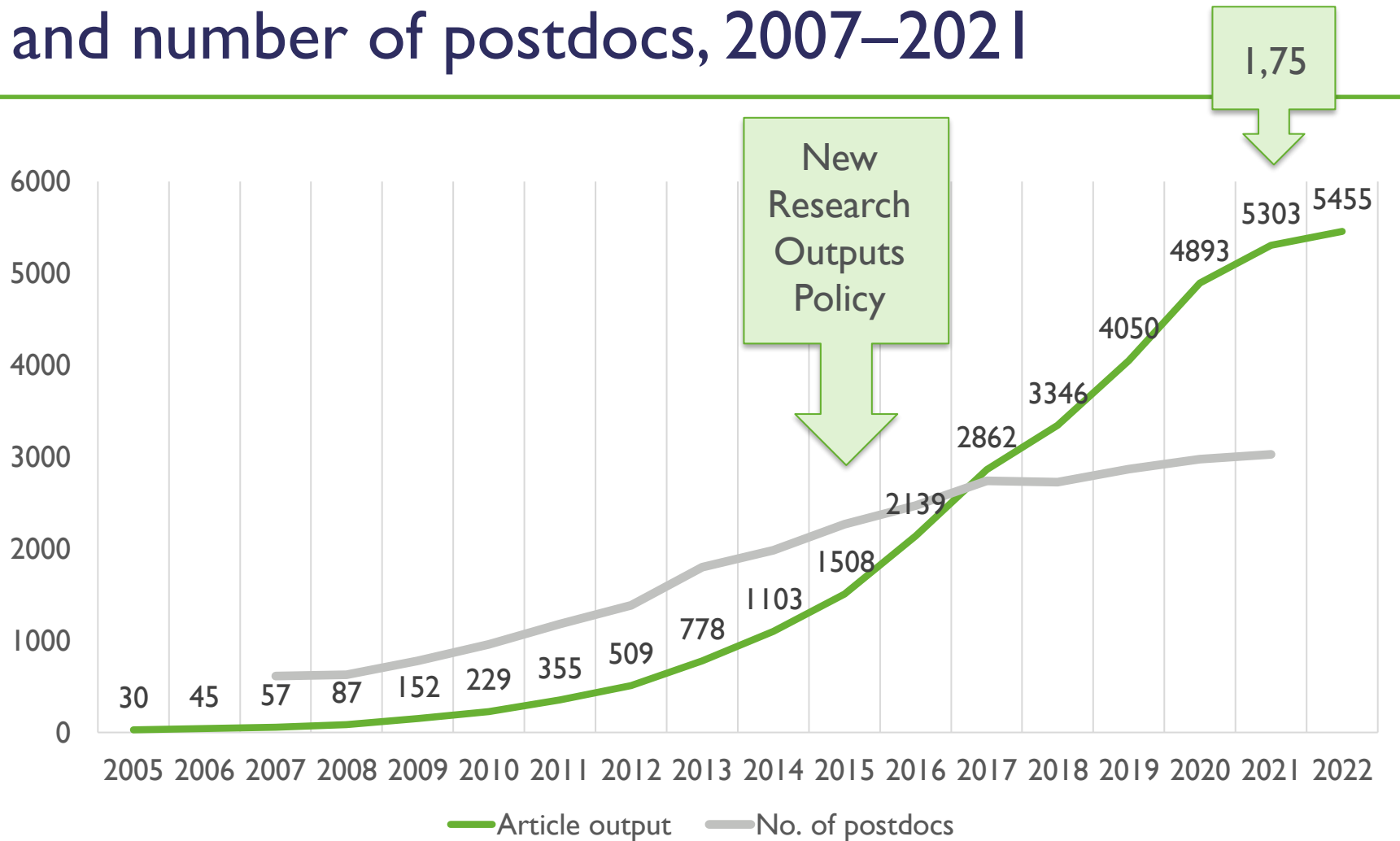
Requirement (formally/informally) to produce a certain number of peer-reviewed journal articles p.a.



Number required
(2–3, on average)

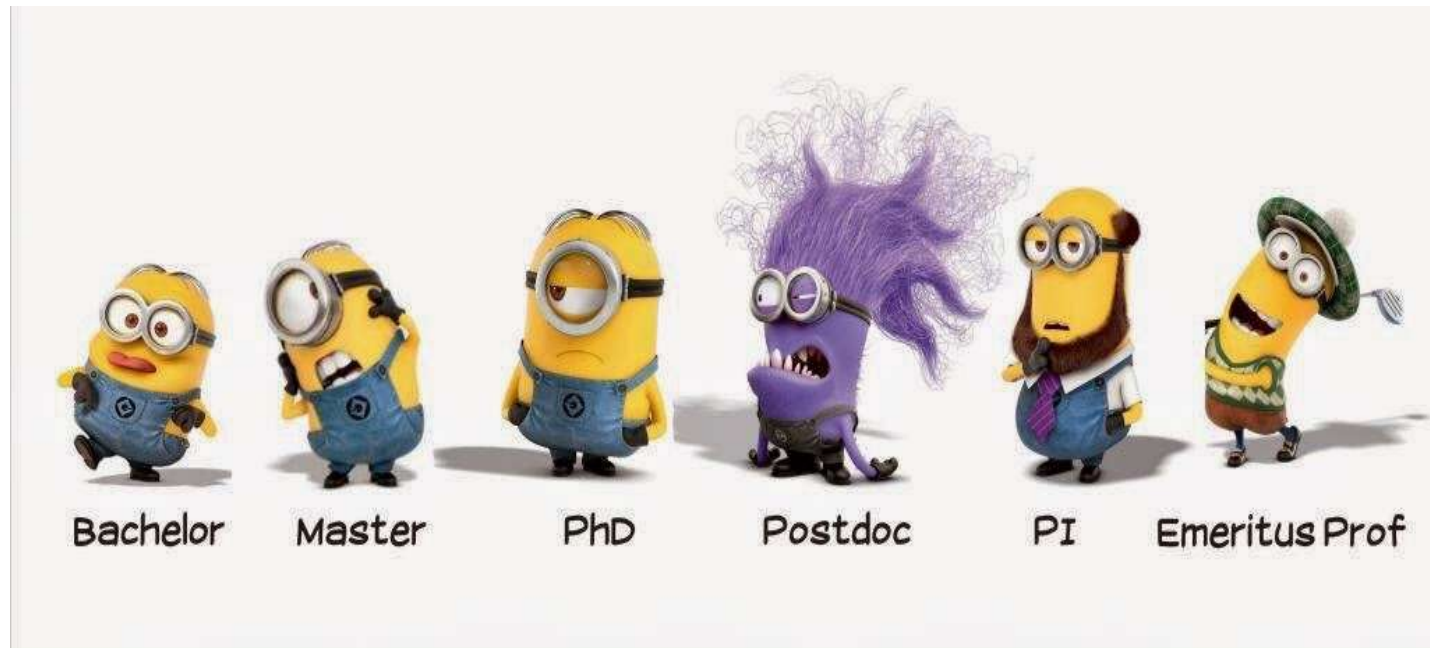
	N	%
One	50	14%
Two	185	53%
Three	57	16%
Four	34	10%
Five	16	5%
Six	5	1%
Seven	2	1%
Eight	1	0%
Ten	1	0%
Twelve	1	0%
Total	352	100%

Journal-article output of postdocs, 2005–2022 and number of postdocs, 2007–2021



Qualitative survey data

- Requirements were viewed by some postdocs as **unrealistic**
 - **Work-role** conflict
 - Delays in **feedback** from co-authors (including supervisors) and/or during the peer-review process



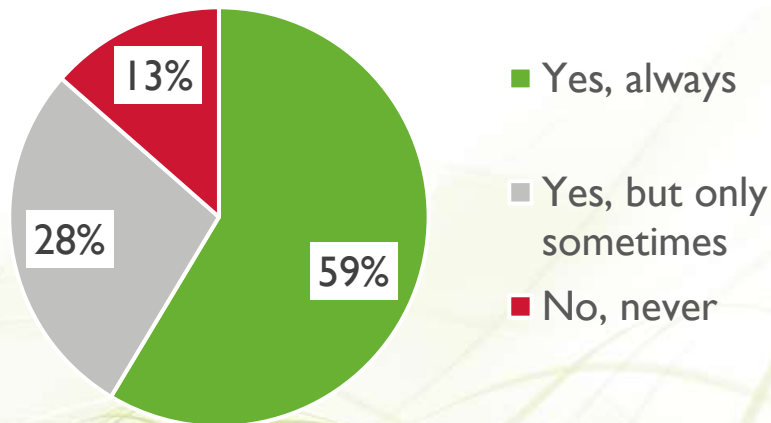
“With professors busy with teaching and administration, and travel to conferences, the postdoctoral fellow was an important element in the training of graduate students” (Assmus, 1993).

National survey

Supervision of students

Master's students

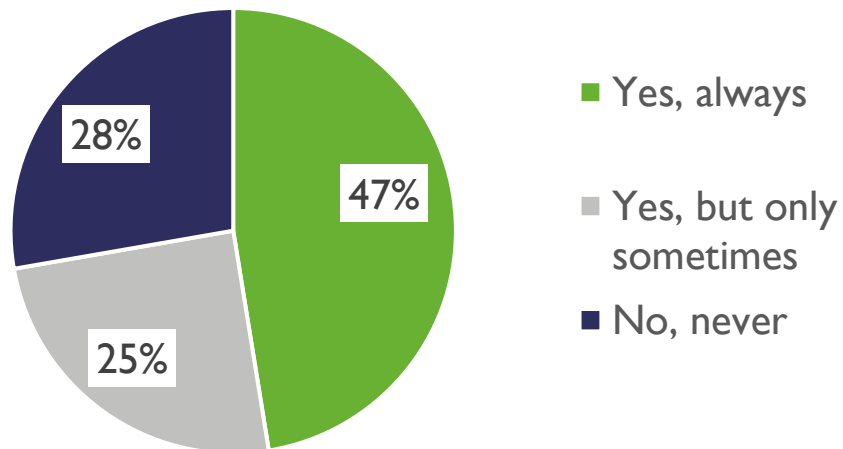
- 73% were allowed to at least co-supervise
- 54% had contributed to formal supervision
 - But only 59% of them were always formally acknowledged (SSH more likely than STEM)



89% were sure they wanted to supervise master's students (STEM more likely than SSH)

PhD students

- 58% were allowed to at least co-supervise
- 30% had contributed to formal supervision
 - But only 47% of them were always formally acknowledged



80% were sure they wanted to supervise PhD students

National survey

Assessment of their position and supervisor

Level of satisfaction with the postdoc position

Tend to be more satisfied with their **supervisor** than with their **position**



Qualitative data

- Most support the quantitative results: **lack** of
 - ...**integration** into the university (academic community and support services)
 - ...clarity on **job** opportunities
 - ...**networking** opportunities
 - ...**skills** development; mentoring
 - ...**career-development plan**
 - Perceptions of host institutions as **uncaring** or even **exploitative**
- 

American Postdoctoral Education

By NATHAN ISRAELI

A Field Which Needs More Intensive Cultivation

“Quite a few universities **remain unaware of postdoctoral needs**. It is probably **assumed** that the PhD degree is a sign of recognized ability for **independent** research and scholarship and that no educational provisions beyond the doctorate need to be made. **This is a wasteful situation**” (Israeli, 1944).

IT'S NATIONAL

POSTDOC APPRECIATION WEEK!

Celebrate
The Middleman of Academia™

POSTDOCS ARE:

MENTORS!

Don't become a postdoc.

GLAD TO HAVE ANOTHER TWO YEARS TO PUT THEIR THESIS IN PUBLISHABLE FORM!

INDEPENDENT SCHOLARS!

Write this proposal for me.

And this paper. And this review.

ESSENTIAL COGS IN THE GRANT SCHEME OF ACADEMIA!



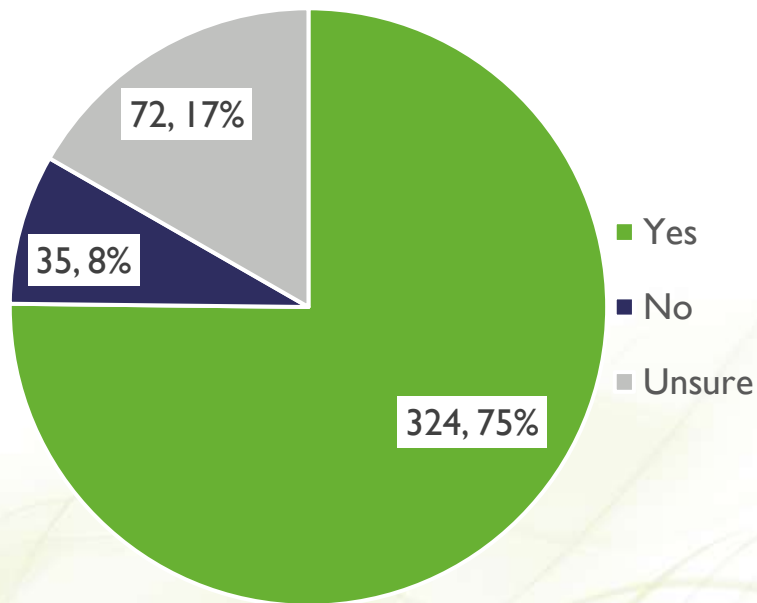
NEXT WEEK: BACK TO BEING UNDERAPPRECIATED!

National survey

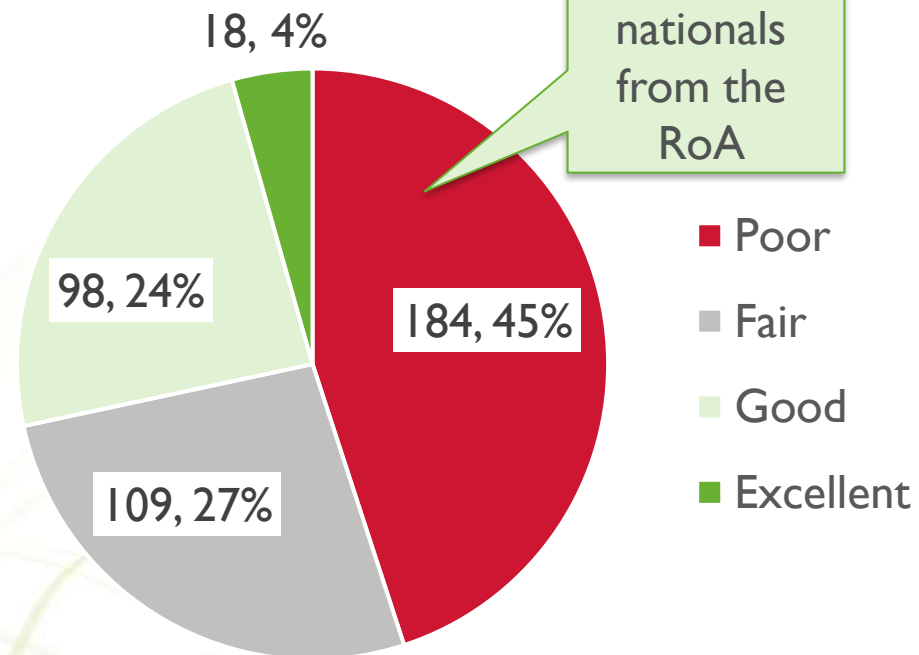
Plans in terms of career and migration

Career plans and perceptions of the job market

Only **8%** did **not** hope to pursue an **academic career**



Only **28%** perceive the job market in their field as **good / excellent**

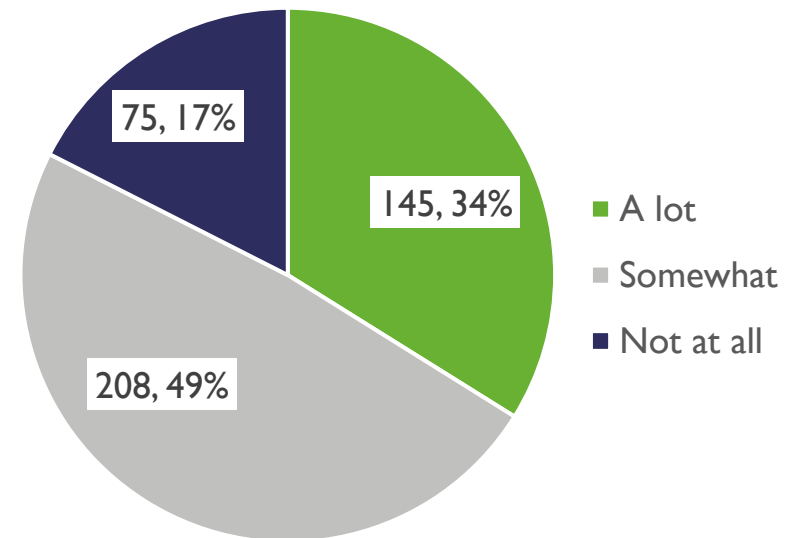


Assessment of postdoc training received up to the time of the survey

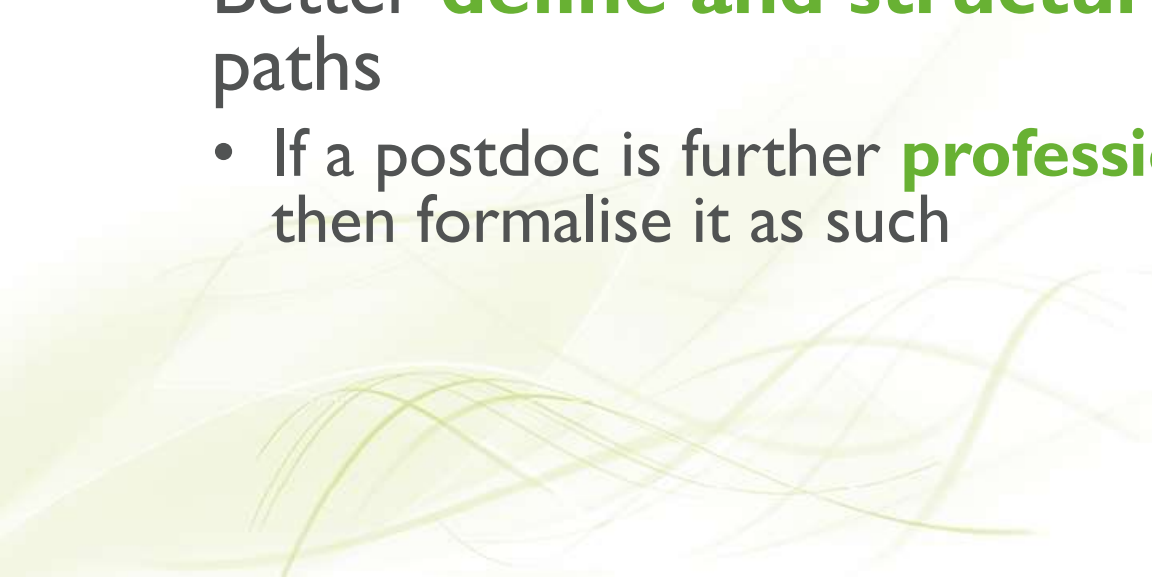
A lack of relevant **skills** was a career-related challenge for **very few** postdocs



Prepared for **non-academic** career opportunities ?

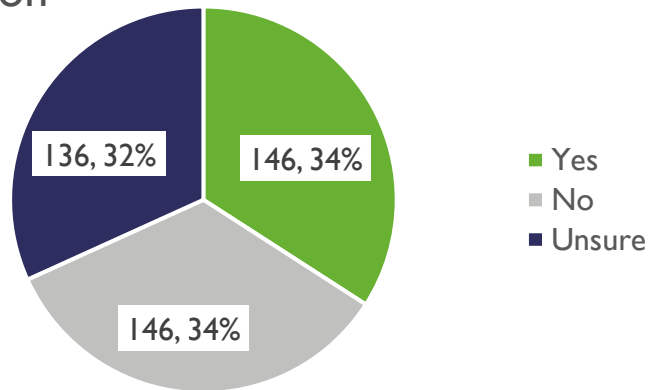


Some recommendations

- More **support** from relevant **administrative** divisions in host institutions
 - **Induction** into a postdoc position
 - The intake of postdocs should be **managed** to ensure that they can be **supported** by the available capacity of a university
 - Better **define and structure** postdocs' career paths
 - If a postdoc is further **professional development**, then formalise it as such
- 

Plans to leave South Africa

A third were **sure** that they will be leaving SA upon completion of their position



...mostly (**95%**) for



	N	% yes
Better/more job opportunities elsewhere	75	51%
Prefer to stay but cannot because of immigration rules / visa issues	52	36%
Financial reasons	37	25%
Variety of experience / exposure to new people and ideas	35	24%
Lack of support (e.g., funding) for R&D in South Africa	34	23%
Personal reasons	27	18%
Better facilities/technology/researchers elsewhere	23	16%
Other reasons	31	21%

Immigration rules and visa-related issues:

Qualitative data

- Immigration rules prevent non-SA postdocs from **attaining permanent positions** in the country
 - Especially those who are **nationals of the RoA**
- Major **delays or difficulties** in obtaining a visa
- Visa restrictions on **family members** visiting the country
- Recommendations
 - Relevant government departments and/or universities to liaise with the **DHA**
 - **Extend contracts** to at least two years
 - Reconsider **tax-exempt status** of postdocs

Lack of (job) opportunities for non-South Africans and perceptions of xenophobia

- “South Africa is presenting [as] a **discriminating** country with the loss of the spirit of ‘**Ubuntu**’”
- “The current political climate in South Africa is very **unwelcoming** to foreign nationals”
- “There is a very thin section of the South African society that is **not Afrophobic**”
- My host institution, “like South Africa in general, is **institutionally xenophobic**”
- “The effect of xenophobia is still much pronounced, [both] within the university and the society, therefore one must continually **watch over one’s shoulder to move freely** in towns, malls, and campus”
- “In South Africa, Africans are [...] discriminated against. **Afrophobia** is very much **institutionalised**”

Acknowledgments

- Postdocs that responded to the survey
- HEIs that provided data and participated in the policy dialogues
- National Research Foundation as the funder
- Members of the project team and support staff at CREST

Thank you