

COUNCIL ON HIGHER EDUCATION

Number 20
March 2022

The 'Academic Precariat': postdoctoral fellows in South African higher education

Abstract

Postdoctoral research fellows, commonly referred to as postdocs, are a relatively new type of knowledge workers in the South African higher education landscape. It is estimated that in 2020 there were 2 867 postdocs in the South African public universities. This figure is based on an annual survey. There is no systematic and comprehensive data on the number of postdocs or, for that matter, on their terms and duration of employment, their demographic profiles, their contribution to the system, or the challenges they face in their precarious position as neither students nor staff. Much of what is known about postdocs is based on anecdotal information. This paper provides a summary of what is known about postdocs in South Africa and draws attention to gaps in the understanding of this category of knowledge workers. It concludes with a set of recommendations for more informed and equitable institutionalisation of postdoctoral fellows in South African higher education system.

Keywords: Academic precariat, higher education, host, mentoring, postdoctoral fellow, research

Introduction

In a previous issue of *Briefly Speaking* the age structure of academic staff in public universities in South Africa was placed under the spotlight. The focus was on senior academics, and the matter of contention was whether the country's universities were facing challenges related to an ageing professoriate. In this issue, the focus shifts to the other end of the age spectrum. Attention is paid to a particular group of relatively new and younger academics. They are neither students nor staff; typically, they are employed based on fixed-term contracts. All have doctoral degrees compared with the 48% of permanent academic staff who held the apex qualification in 2019 (Bunting *et al.* 2021; Khuluvhe *et al.* 2021). They hail from South Africa, the rest of the continent and from further abroad. They teach, train, co-supervise, collaborate, and, most valued of all, they conduct research and they publish. They are the post-doctoral fellows, or postdocs for short – a distinct category within the academic workforce at most, if not all, South Africa's public universities.

Surprisingly, relatively little is known about the postdocs in South Africa. The popular and academic literature has most often focused on the experiences of South Africa's postdocs at single

universities (see for example Drennan & Morris 2021; Hammet 2012; Kerr 2020a, 2020b; Mothapo 2021; Simmonds & Bitzer 2018; Vranas & Hendry 2013). Very little data is available at the national or system level. Systems have not been set up (or adapted) to collect the kind of information needed to provide a comprehensive account of the functions, numbers, contributions, challenges and career pathways of postdocs. The problem is not unique to South Africa. In a recent policy paper on academic research careers, the OECD (2021: 43) identifies the need for more evidence on “what is really happening with doctorate holders, particularly with the postdoctoral cohort ... [c]ountries often do not have a good understanding of the number of postdoctoral researchers, their working conditions, and their career trajectories”.

This issue of *Briefly Speaking* sets out what is known about the postdocs in South Africa and, in doing so, hopes to identify important gaps in the understanding of the unique place of the postdocs in the country’s higher education system. It does so by posing a series of questions, each of which speaks to a particular aspect of the postdocs as a relatively new addition to the academic workforce.

Who or what is a postdoc?

There is no universally accepted definition of what constitutes a postdoc. According to the Frascati Manual (cited in OECD 2015¹) a “postdoctoral researcher concerns the first grade into which a

newly qualified doctoral graduate would normally be recruited, for a fixed-term without the prospect of extension, either with an employment contract or a stipend”. postdocs are therefore distinct from those who hold permanent academic posts such as researchers or assistant professors, or posts with a fixed-term but with the prospect of permanent or continuous employment (for example tenure-track) (OECD 2021: 14).

At the institutional level, Stellenbosch University (2017: 2) defines its postdocs as “PhD graduates who are establishing their academic research careers by primarily conducting research but can also undertake other academic activities such as lecturing and co-supervision of students, under the supervision of a host at the University. The host of a postdoctoral fellow is an academic staff member in a relevant academic department, centre or institute at Stellenbosch University, who acts as supervisor and mentor to the postdoc”.

According to Van Bentham *et al.* (2020) the postdoctoral position was originally created as a short training period for doctoral graduates on the path to becoming university professors. And according to Lin and Chiu (2016), the postdoc “is a special transitional position for those with a doctoral degree and is usually regarded as an investment to accumulate the additional human and social capital needed to facilitate future job

¹ OECD (2015), Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities,

OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264239012-en>.

searches or to add to an academic reserve army of unemployed PhDs”.

In the USA, a postdoc position is seen as an expected component of an academic career (Wei *et al.* 2012). Doing a postdoc has also become more prevalent across all science domains and is no longer only typical in domains such as the natural sciences, and specifically the biological sciences.

In South Africa, public universities introduced the postdoctoral fellowship positions as far back as the 1980, and, by 1999, there were an estimated 300 postdocs, mainly at the universities of Cape Town, Pretoria, Stellenbosch, Witwatersrand and Rhodes (Vranas & Hendry 2013). It was in the early 2000s that postdocs became more common, driven, in part, by national priorities geared towards developing the nation’s knowledge capital (Holley *et al.* 2018).

While the average age of postdocs is unknown, it is likely to be in the range of 30 to 45 years, based on the available data on the average age at which holders of doctorate degrees graduate, and depending on the scientific field. Schutte *et al.* (2013) in a survey of 88 postdocs, found that the average age of postdocs was 34 years, ranging from a minimum of 26 to a maximum of 51 years. Holley *et al.* (2018) observe that postdocs are usually young scientists² who are within five years of obtaining their doctoral degree, often under the

age of 45. But as Simmonds and Blitzer (2018: 277) point out: “the envisaged age of a postdoc continues to be contested for various reasons [...] Preferring postdocs below the age of 45 needs to be viewed against the South African backdrop where, on average, doctoral candidates are between 33 (natural and agricultural sciences) and 41 (social sciences and humanities) years of age when first enrolling for a doctoral degree and can take five years completing their degrees”.

The duration of a position of postdoc typically ranges from 6 months to 3 years (Holley *et al.* 2018; Simmonds & Blitzer 2018). Schutte *et al.* (2013) found that 82% of 60 South African postdocs held positions lasting up to two years. A more recent study based on a much larger sample size, found that the bulk (68%) of postdocs were contracted for a period of between two and four years (Mouton *et al.* 2021).

What do postdocs do?

In the South African context, postdocs teach in undergraduate programmes or courses, co-supervise postgraduate candidates, and conduct research and publish (Holley *et al.* 2018; Simmonds & Bitzer 2018). It is their research and publishing activities that are highly prized by universities because postdocs improve universities’ knowledge production capacities and outputs (postgraduate supervision and publications) which, in turn, attract income via the

² ‘Scientist’ is used in its broadest sense to include all areas of knowledge enquiry, including the Arts and Humanities.

DHET policy of recognising research outputs from universities by means of providing subsidy funding. In other words, producing postgraduates and accredited publications attract guaranteed government subsidy-income for universities. In South Africa, outside of the five 'research universities' the other twenty-one public universities struggle to consistently produce high levels of recognised research outputs in some fields, and therefore having postdocs whose contract often include a requirement to 'conduct research and publish in recognised journals' assists them to address their apparent weaknesses in this regard. South African postdocs spend on average 92% of their time performing research, compared with 55% in the case of doctoral students and 24% in the case of academic staff in the university system (CeSTII 2014, 2019 & 2021).

According to Cloete *et al.* (2015), some university departments require postdocs to produce a paper for each year spent as a postdoc, while others expect postdocs to produce four journal articles per year and to assist with PhD supervision. An analysis of selected institutional postdoc policies confirms that this is the case at one of the four universities analysed (see Table 1), while it is assumed that the requirement for a minimum number publications is set out in the memoranda of understanding between postdoc and host in the case of other universities.

Globally, postdocs have become an institutionalised feature of the university landscape. As McConnell *et al.* (2018: 1) write: "The postdoctoral community is an essential component of the academic and scientific workforce."

How many postdocs are there in South Africa?

The only known publicly accessible source of data on postdocs in South Africa is the annual R&D Survey.³ The data include headcounts, disaggregated by gender and nationality for selected years, and full-time equivalents as a percentage of headcounts. The data are reported in the various main and statistical reports produced by the Centre for Science, Technology and Innovation Indicators (CeSTII) at the Human Sciences Research Council (HSRC).

According to the R&D Survey, there were 357 postdocs at South African universities in 2004. By 2020, this number had increased to 2 867 postdocs (see Figure 1). Using data for 2019, this equates to one postdoc for every seven permanent academic staff, and an average of 110 postdocs per public university, although postdocs are unlikely to be distributed evenly across the 26 public universities. Stellenbosch University alone, for example, 'registered' 323 postdocs in 2022.

³ According to a presentation made by DHET in 2014, the Higher Education Management Information System (HEMIS) consists of four

modules: students; staff; space; and postdocs. However, the postdoc data table is not publicly available on the DHET website.

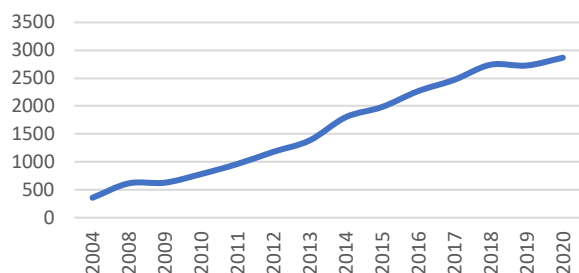


Figure 1: Number of postdocs in South African universities (head-count, 2004-2020)

Source: HSRC-CeSTII, R&D Surveys

The data show that the proportion of postdocs who are South African citizens declined from 46% in 2012 to 39% in 2017 (CeSTII 2002-2020). In other words, South African nationals have traditionally only made up approximately half of the postdocs in the country, and the proportion of non-South African postdocs has been increasing since 2012. There has also been a general decrease in the proportion of male postdocs from 63% in 2004 to 58% in 2019 (CeSTII 2002-2020).

How do the number of postdocs in South Africa compare with what is known about the number of postdocs elsewhere? According to Duncan (cited in Woolston 2020d: 183), United Kingdom (UK) Research and Innovation, the leading funder of research in the United Kingdom, supports roughly 40 000 postdocs in UK universities. Approximately 690 000 postdocs were enrolled in the United States of America between 1985 and 2011, compared with approximately 105 000 postdocs in China during the same period (Kang 2013 as cited in Ahmed *et al.* 2015).

What does policy say about postdocs?

According to McConnell *et al.* (2018:1) a “lack of data about [the postdoctoral] community has made it difficult to develop policies to address concerns about salaries, working conditions, diversity and career development, and to evaluate the impact of existing policies”.

Nevertheless, policies and policy statements directly related to postdocs appear in several national policy documents. In fact, the need to increase levels of postdoctoral research in South Africa is widely recognised. For example, the National Plan for Higher Education (NPHE) (DoE 2001) asserts that there is a competitive edge to be derived from intensive postdoctoral training. As such, South Africa needs to improve on the quality and output of its postdocs to support national research, assist with equity goals and ensure that universities and the nation at large can meet global challenges (Vranas & Hendry 2013). While not making any direct reference to postdocs, the 2002 National Research and Development Strategy (Republic of South Africa 2002) identified the need for a new generation of scientists to respond to the challenge of an ageing productive scientific population. This had led to calls for “Strategic interventions are needed to reverse these trends in order to ensure correct positioning of the country for competing in the global research and innovation arena” (NRF 2021: 3).

The Education White Paper 3 (DHET 1997: 33) under the heading ‘Research’ drew attention to the

importance of increased access of female students to postdoctoral positions as a means of increasing the pool of researchers and improving the demographic representation of staff in higher education. More recently, the 2013 White Paper for Post-School Education and Training (DHET 2013: 35) refers to postdoctoral fellows as being an important component of building the research capacity of the country's universities.

The 2018 White Paper on Science, Technology and Innovation (DST 2018) acknowledges the role of postdocs in research but focuses to a greater degree on the contribution of postdocs in alleviating bottlenecks in postgraduate supervision. The emphasis is clearly more on the mentoring role of postdocs: "postdoctoral fellows

make an invaluable contribution to the research system by mentoring postgraduate students. The number of postdoctoral fellows ... has generally increased, but their contribution has not been optimised because their status has not been defined. The DST and DHET will formalise a set of guidelines on how to optimise the contribution of postdoctoral fellows" (DST 2018: 62).

It is beyond the scope of this paper to provide a systematic analysis of all institutional policies specifically related to postdocs. Table 1 provides key information for four universities, two of which are, according to the DHET classification, traditional universities and two are comprehensive universities. These institutions were selected because they had publicly accessible policies or similar documents available on their websites.

Table 1: Selected information from the postdoc policies of four South African universities

	University of Cape Town	University of Pretoria*	University of Johannesburg	Nelson Mandela University**
Definition	"A PDRF is not a student, nor an employee, but is an academic and professional trainee, known as a postdoctoral Research Fellow [PDRF]."	"a young researcher (generally up to 40 years of age), with a doctorate, who conducts research at a university in collaboration with a senior research mentor in order to develop his/her research capabilities."	"as the context indicates"	None provided
Eligibility	Within 5 years of obtaining doctoral degree	Within 5 years of obtaining doctoral degree	Within 5 years of obtaining doctoral degree; under the age of 45 years	Within 5 years of obtaining doctoral degree; under the age of 45 years
Tenure	1 year. Maximum: 5 years (no extension)	2 years (no extension)	2 years (renewable).	6 months – 1 year. Renewable to a maximum of 2 years.
Remuneration	Not specified	Not specified	Not specified	R120,000 per annum plus an amount negotiated with the university to a maximum of R200,000 per annum
Contract type	MoU	Grant-holder	Postdoctoral Research Fellowship Agreement	MoU

Expected publication output	None specified. Presumably as per MoU.	None specified	2 units over 2 years	None specified. Presumably as per MoU.
Administrative unit	Postgraduate Centre and Funding Office	postdoctoral Fellowships Office, Department of Research Support and Innovation	Postgraduate School	Department of Research Capacity Development and Office of International Education
Last update	2020	2015	2021	Unknown

* UP specifies two types of postdoc: postdoctoral Fellowships and Senior postdoctoral Fellowships. The information provided in the table is for the 'postdoctoral Fellowship.

** NMU specifies three types of postdoc: Internal Council Funded NMU postdoctoral Fellowships; 'postdoctoral Fellowships Externally Funded; and Departmental postdoctoral Fellowships. The information provided in the table is for the Internal Council Funded NMU 'postdoctoral Fellowships. Information is from the NMMU postdoctoral Fellowship Guideline Document which makes reference to the NMMU postdoctoral Fellowship Policy, but this document could not be found online.

There is not much to draw on in terms on substantive policies related to the postdoc at the national and institutional levels. It does, however, seem apparent that recent national policy places emphasis on the transformational and mentoring contribution of postdocs to the national research system, while institutional policies (see Kerr 2020a) place greater emphasis on the research contribution of postdocs in terms of the production of knowledge and innovation.

How are postdocs funded?

The National Research Foundation (NRF) funds three types of postdoctoral fellowship: (i) the freestanding postdoctoral fellowships, (ii) the innovation postdoctoral fellowships, and (iii) the scarce skills postdoctoral fellowships. The source of funds for the freestanding and innovation fellowships is the Department of Science and Innovation, while the source of funds for the scarce skills fellowships is the National Skills Fund through the Department of Higher Education and Training (NRF 2021).

The NRF funding framework directs that each university may submit a maximum of 30 applications from candidates who wish to pursue postdoctoral training. Applications are required to be aligned with the following equity targets: 80% South African citizens and permanent residents; 80% Black; and 55% female (NRF 2021: 5). The framework has raised questions about stifling the contribution of international postdocs, and particularly postdocs from the rest of Africa, to South Africa's science system and the country's development (Van Schalkwyk *et al.* 2021). In 2019, 395 of the 799 (or 49%) NRF-funded postdocs were South Africans (DST 2019a).

However, non-government funding (such as funding from industry or donor agencies) supports the majority of postdocs at South Africa's research-intensive public universities (Mothapo 2022). In 2001, the NRF funded approximately 40% of the postdocs in South Africa (Holley *et al.*, 2019). Prozesky *et al.* (forthcoming) report that, from 2013 to 2020 the NRF funded an average of 34% of postdocs per annum, while in the most recent year, the NRF funded only 27% (780) of the

2867 postdoctoral fellows in the higher education sector.

Terms of employment and remuneration

New postdocs positions are advertised by universities as this is a requirement of the SARS Binding Class Ruling. postdocs generally apply directly to the host of the fellowship. They are retained by their universities as fellows who are recipient of bursaries; they are not registered as students nor are they offered staff contracts, whether on a temporary or permanent basis. The terms of the employment relationship between postdocs and their host institutions are set out in contracts or memoranda of understanding entered into between the postdoc and their host. As stated earlier, the term 'host' is used to refer to the academic mentor or supervisor of postdocs at a particular institution, for the duration of their fellowships.

The emoluments paid to postdocs are exempt from normal income tax on condition that all the SARS regulations regarding remuneration, as described in the SARS Binding Class Ruling issued in accordance with article 78(2) of the Tax Administration Act (No. 28 of 2011), are fully complied with. As contract 'staff', postdocs do not receive additional benefits such as a pension or health insurance. Given that the net emoluments of postdocs' are equivalent to their cost-to-employer, the financial status of postdocs could be regarded as advantageous for the host institution (Kerr 2020a, 2020b; Simmonds & Bitzer 2018).

The institutional benefits of the postdoc become more apparent when postdoc positions are externally funded, and when postdocs earn publication subsidies for their institutions. The exact quantum of this financial contribution is unknown. But if it is assumed that a postdoc publishes two single-authored journals articles per annum, then approximately R240,000 in publication subsidy income would accrue to the institution. Because postdocs are often funded by means of external funding, there are no direct costs against the publication income generated by postdocs, save for relatively low overhead costs.

In a 2020 global survey of more than 7 600 postdocs, the bulk of respondents (80%) reported gross annual earnings of USD30,000–49,999 (38%) or USD50,000–79,999 (42%) (Woolston 2020b). In current South Africa rand terms, 80% of postdocs therefore reported earning roughly between ZAR465,000 and ZAR1,2m per annum. Direct comparisons between remuneration levels in different countries are always difficult because of variations in the cost of living between countries and even between cities. In addition, the Nature survey reports pre-tax income whereas the compensation of postdocs in South Africa is exempt from tax. Nevertheless, using the NRF's approved postdoc remuneration for 2022, postdocs in South Africa can expect to earn between ZAR200,000 and ZAR265,000 per annum (NRF 2021). One university has set a minimum for postdoc remuneration of ZAR200,000 per annum and this amount is reviewed annually. There is a push at the same university for minimum of ZAR400,000 which will

fall under the tax exemption, and any additional remuneration above the minimum amount to be subject to income tax. Four postdocs at the same university earn more than ZAR900,000 per annum.

postdocs are permitted to provide additional services to their host universities for which they are entitled to be remunerated. Where postdocs earn remuneration for services rendered in addition to their 'postdoctoral research, their services may not exceed 12 hours per month and their additional remuneration is subject to employees' tax (SARS 2010).

What are the most common challenges faced by postdocs?

Khan and Ginther (2017: 90) aver that "During the past two decades, official bodies have raised concerns about the working conditions, long hours, lack of benefits, and forced geographic mobility faced by postdocs, as well as the effects of postdoc jobs on families" (see also OECD 2021).

Two common challenges for postdocs are career instability and status – postdocs do not feel that their fellowship is a form of rite of passage into full-time employment (whether in academia or elsewhere) (Holley *et al.* 2018). Half of the respondents to a global Nature survey of 'postdoctoral researchers were considering leaving academia (Nature 2020).

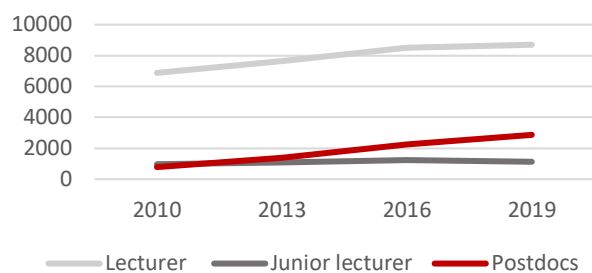
Outside of the academy, few know or understand what a postdoc is (Mothapo 2021, 2022). The

consequences of this lack of knowledge is not trivial. postdocs report how they struggle to access finance to buy property or a car, to provide surety when renting accommodation or when applying for out a cell phone contract or an internet connection. Without employment contracts or payslips, most banks and companies still treat postdocs as high-risk students.

Being neither students nor staff, postdocs occupy a liminal space. In fact, postdocs have been described as being part of the "research precariat" — those who work in positions with little job security, poor compensation and an unclear path to a permanent post (OECD 2021; Woolston 2020b).

What happens to postdocs?

While institutional policies regard the postdoc as a temporary position, there is also the expectation that at least some postdocs will draw on their experience of academic life and enter academia on a more permanent basis. If this is indeed the case, one would expect to see a steady or increasing number of junior lecturers and lecturers in relation to the number of postdocs. A less desirable outcome from a career advancement perspective would be an increase in postdocs and a declining number of permanent junior staff, suggesting that postdocs are part of a growing trend to 'casualise' the academic workforce (Kerr 2020a; Rosella *et al.* 2018). Figure 2 confirms this latter scenario at the system level.



Source : R&D Surveys (CeSTII 2002-2021); Bunting et al. (2021)

Figure 2: postdocs and permanent junior academic staff in South African higher education

According to some observers, an oversupply of ‘postdoctoral scholars relative to available faculty positions has led to calls for better assessment of career outcomes (Silva *et al.* 2016:1; see also Sauermann & Roach, 2016:663; Gibbs *et al.* 2015:1). A recent survey of 1 238 postdocs (Mouton *et al.* 2021) showed that 74% of postdocs surveyed were employed, 21% still a ‘postdoctoral fellowship, and 4% were not economically active.

Qualitative research by Simmonds and Bitzer (2018:285) found that a trademark of the South African postdoctoral fellows they studied are the “struggles [they] endured in establishing permanent employment”, leading them to turn the postdoc into a career, “at the expense of their careers that remain in limbo”. More recent survey data show that 33% of postdocs held more than one consecutive postdoc position (Mouton *et al.* 2021). This supports growing concerns about ‘serial postdocs’, also described as the ‘permadoc phenomenon’ in academia.

Conclusion

Information is one of the levers government has at its disposal to fulfil its design, implementation and

evaluation of higher education and/or science policy. In relation to research careers, this lever entails the collection, analysis and publication of system-level information on researchers and research careers (OECD 2021). This paper has provided a system-level overview of the postdoc in South African higher education. It has also made apparent the lack of comprehensive, system-level data required to make informed policy decisions at both the national and institutional levels in support of a productive and content cohort of ‘postdoctoral research fellows. It is therefore recommended that both government and universities improve the systematic collection of comprehensive data (both quantitative and qualitative) to inform future policies and plans related to the employment of postdocs in South Africa’ public universities system.

In parallel with improved data gathering and analysis, greater sensitivity and consistency need to be practised in the nomenclature used to refer to postdocs. This may seem trivial, but it is not without consequence. Referring to postdocs as students, for example, not only undervalues their qualifications and contributions, but may place them in weak positions when applying for credit or entering into housing, vehicle or communication-related contracts.

Finally, a national postdoc forum is recommended to enable the sharing of experiences across institutions and as a first step towards developing a more complete understanding of the postdoc as a relatively new type of knowledge worker in the South African higher education system. Such a

forum should work towards improving the conditions of employment for postdocs and provide greater clarity on the expected career pathways of postdocs *vis-à-vis* the university sector, commensurate with the contribution of postdocs to the country's universities.

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Disclaimer and acknowledgements

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This specific issue of *Briefly Speaking* was researched and drafted by Dr François van Schalkwyk with some inputs from Heidi Prozesky and Palesa Mothapo. The CHE expresses its sincere appreciation to them. It also expresses profound gratitude to the peer reviewers who contributed immensely to shaping this specific issue of *Briefly Speaking*.