



Summary of the Workshop

Background

In many countries, the working conditions of academic researchers are deteriorating, especially for the increasing number of postdoctoral researchers on fixed-term contracts and with limited continuous employment prospects. While the majority of early career researchers display a strong intrinsic motivation and ambition for long-term academic careers, this precarity can have significant negative consequences on the motivation, behaviours and well-being of these researchers that in turn affect the nature and quality of scientific outputs. At the same time, there is widespread concern about the capacity of countries to retain their best national talent and attract good foreign researchers to the academic research endeavour. In some countries and research fields, the problem is evident even upstream of the research pipeline, with it being difficult to attract the best candidates into doctoral education. Precarity and insecurity of research careers is also a major obstacle to ensuring gender equality and social diversity in the research workforce. On top of this, Covid-19 is making matters worse for many in the research precariat. Responses to the OECD Science Flash Survey 2020 suggest that the pandemic is having detrimental effects on job security and career opportunities in science, research funding and time available for doing research. Younger researchers and women are more vulnerable to these effects. Addressing the problem of precarity will help improve the resilience of science systems, and better prepare them to address future shocks.

The workshop was an opportunity to discuss the findings of the project on reducing the precarity of research careers, share the main lessons learned, and best practices that can be implemented with a wider audience. The results of the discussion will inform the final report of the project and future OECD work on research careers.

The project on [Reducing the Precarity of Research Careers](#) is part of the programme of work of the OECD Global Science Forum (GSF), Science and Technology Policy Division, Directorate for Science, Technology and Innovation.

The workshop was organised by the [OECD Global Science Forum](#) and the Observatory for Research and Scientific Careers of the [Fund for Scientific Research – FNRS](#), French Community of Belgium. It is part of a series of events related to the [Science, Technology and Innovation Outlook](#), 2021 (STIO 2021). The aim of these events is to bring together different stakeholders to discuss the challenges and needs identified in STIO 2021 and to inform OECD STI work in this area.

The workshop was attended by ~140 participants, including many stakeholders who had participated in national panel interviews as part of the GSF Precariat project, as well as a number of GSF delegates.

Introduction

Gabriele Fioni, Chair of GSF, Regional Commissioner for Higher Education, Research and Innovation for the Auvergne Rhône-Alpes region, France, chaired the workshop.

Andrew Wyckoff, OECD Director for Science, Technology and Innovation introduced the background and objectives of the workshop.

Valérie Glatigny, Minister for Higher Education, Research and Youth, and Véronique Halloin, Secretary-General of the National Fund for Scientific Research (F.R.S-FNRS), French Community of Belgium, welcomed participants to the workshop.

The evidence base and insights from the OECD project on reducing the precarity of research careers

Moderator: Vitalba Crivello, Policy Analyst, European Science Media Hub of the European Parliament

- **Insights from the OECD project on reducing the precarity of research careers**, Cláudia Sarrico, OECD GSF Secretariat, policy analyst and project manager of the project
Presented evidence on the increasing share of doctorate level attainment in the OECD and the increasing scale of precarity in academic research. Presented the contextual factors for precarity, its effect on the well-being of researchers, the attractiveness of the research career, the quality of research and the diversity of the research workforce. Discussed the enablers and barriers to reduce the precarity of research career. Concluded with policy options for countries to improve the evidence base on the working conditions and career trajectories of doctorate holders, and in particular on postdoctoral researchers on fixed-term contracts, to better inform policy on research careers.
- **Tracking the careers of doctorate holders (CDH): Some insights from universities**, Alexander Hasgall, Head, Council for Doctoral Education, European University Association
Raised the question of whether there are too many doctorate holders, if it is worth pursuing doctoral education, and for which careers are doctorate holders destined. Presented an overview of studies on the career tracking and career development of doctoral holders. Discussed the reasons for tracking the career of doctoral candidates, the methods used, their advantages and limitations in relation to the EUA-CDE [report on tracking the careers of doctorate holders](#).
- **Understanding temporary research positions: the Korean CDH and further efforts**, Kawon Cho, Research Fellow, Science Technology Policy Institute (STePI), Korea
Presented results of the Korean CDH surveys in 2012 and 2016 in relation to those working as postdocs, the length of their contracts, the reasons for pursuing postdoctoral training, the precarity of their contracts, and the reasons for leaving research work. Presented a new census of postgraduate students and postdocs modelled on the US Survey of Graduate Students and Postdoctorates in Science and Engineering, and an early career survey of doctorate holders modelled on the US Survey of Earned Doctorates and Survey of Doctorate Recipients, to be launched in 2021.
- **The national survey on careers of doctorate holders led by the French ministry of Higher Education, Research and Innovation: A large partnership**, Géraldine Seroussi, Head of the Department of Statistical Studies of Research, Ministry of Higher Education, Research and Innovation, France
Presented on the survey of the career of doctorate holders one and three years after graduating in France, residing in the country or abroad. It includes disaggregated data by discipline, nationality, sector of employment, employment status, and stability of employment. Finished by presenting the policy initiatives included in the recent multi-annual research programming law of 2020, which aim to make research careers more attractive, including the creation of a postdoctoral contract for recent doctorate graduates with a maximum duration of four years.

Discussants:

➤ **Insights from the activities of the OECD Working Party on Science and Technology Indicators (NESTI)**, Fernando Galindo-Rueda, Senior Economist, Directorate for Science, Technology and Innovation

Precurity is a complex, multi-dimensional construct. There are some lessons to be learned from the last 10 years of the survey of the Career of Doctoral Holders ([CDH](#)). The lack of good international comparable data reflects also the lack of good evidence at national level, and the fact that defined methodological guidelines are not equally implemented within countries. At the OECD, initiatives such as the International Survey of Scientific Authors (ISSA) can provide some pointers but not fully answer questions on research careers and their precarity.

Making the case for tracking the career of doctorate holders: can learn from the best-practice examples, such as the experience of the United States, referred to in Dr. Cho's presentation. This type of survey helps to demonstrate the economic and social impacts of research careers and compare the careers of doctorate holders to the rest of the population.

Making things happen: the subject of the career of doctorate holders tends to fall through the cracks, between education and research, between the statistical space and the policy space, difficult to tackle both at the national and international level. In difficult moments, this is an area likely to be cut, which was the case with CDH survey after the financial crisis of 2008. It is good that the ongoing GSF project makes the case for continuing this work, if we are to better understand and tackle the issues of the precarity of research careers.

Lessons learned: as pointed out by Dr. Hasgall, there are implications of different approaches to collect data, with advantages and limitations.

What would be a sustainable approach: the examples of France and Korea converge in the focus of capturing early careers in all sectors, not just academia. This approach has synergies with the motives of universities, as described by Dr. Hasgall, that want to demonstrate the value added of doctoral education to master's graduates and policy makers. A sustainable infra-structure at national level, from the outset, can support the development of international comparable data, which is of interest given the global nature of research careers and the phenomenon of precarity. From past experience of CDH a lot of interesting and useful findings for countries emerge from the comparison of international data.

➤ **Insights from the activities of the OECD Working Party of Indicators of Education Systems (INES)**, Marie-Hélène Doumet, Senior Policy Analyst, Directorate for Education and Skills.

[INES](#) has been looking at the topic of doctorate holders for the last two years. The evidence gaps are real. The first gap is on the characteristics and working conditions of researchers themselves, the doctorate holders, but there are also gaps on the context for precarity: e.g. public and private funding, available positions. The second evidence gap, occurs when looking at academic staff: those that work in higher education institutions whose primary function is either teaching or research or both. There are several issues of international comparability. The first one is the identification of doctoral candidates. Countries have difficulty distinguishing them from academic staff, as their employee status varies across institutions and countries, which raises issues of international comparability and interpretation of indicators. Another issue is that it is difficult to obtain information on the share of working time academics spend on teaching and on research. A third issue is the reporting of casual staff (i.e. those that are not continuously employed) – including many postdocs - on short-term and fixed-term contracts. Only half of the countries surveyed by INES can report this type of information, which means that total academic staff are underestimated in statistics, and only a couple of countries can estimate the average duration of contracts.

Main takeaways from the discussion

- Currently, we know that precarity is an issue, but due to a lack of good evidence we do not know the real extent of the problem.
- There is a need for valid, reliable and international comparable data, based on solid methodologies, on research careers, including on the precarity phenomenon.

- Institutions that employ academic researchers ought to compile more data on their staff, including postdoctoral researchers, and be more transparent about their employment practices.
- There is need for better data on the demographic characteristics of academic researchers, not just on gender, but other characteristics, such as socio-economic background, ethnicity, country of origin, etc.
- The model of doctoral education and postdoctoral training should be changed to facilitate the employability of doctorate holders in a diversity of careers, not limited to academic research, but also in industry, government and other sectors.

Working conditions and wellbeing

Moderator: Elisabeth Pain, Contributing Correspondent, Science Careers

- **Policy options to improve working conditions and wellbeing of researchers**, Luis Sanz Menéndez, Research Professor, CSIC Institute of Public Goods and Policies, Ministry of Science and Innovation, Spain, co-chair GSF of the expert group of the project (EG)

Presented the emerging policy options from the GSF project that funders and institutions can potentially adopt to improve the working conditions of researchers.

- **Working conditions and wellbeing – the initiatives of Wellcome**, Anne-Marie Coriat, Head of UK and Europe Research Landscape, Wellcome, UK

Presented on the work of Wellcome to understand the research system, and the findings of the recent report on [What Researchers Think about the Culture They Work in](#). Researchers are passionate and proud about their work, but have concerns about job security. Poor research culture is leading to unhealthy competition, bullying and harassment, and mental health issues. There is a disconnect between researchers' perception of their management skills and their abilities in practice. The system favours quantity over quality, and creativity is often stifled. "Excellence" should encompass not just ideas and the outputs of research, but also how research is done. There is a need to reform the postdoc experience, and the way funders fund research must also have a positive impact on research culture.

- **Research Careers: Working Conditions and Their Attractiveness**, Anneleen Mortier, Senior Researcher and Project Manager at the Department of Work, Organization and Society of Ghent University, and Katia Levecque, Professor of Labour Relations and Social Dialogue at Ghent University, Mediator in Labour Relations and Director of the Centre for Research and Development Monitoring, Belgium

Reported on a [study in Flanders](#) that sought to answer the following questions: How precarious are research careers inside and outside academia? Is a research career attractive? Do research careers differ from non-research careers? Do academic research careers differ from non-academic research careers? Are there difference by gender? A research career outside academia can result in a less precarious job compared to non-research careers outside academia. Precarity of research careers is more prevalent for women. Precarious research careers are more common inside academia: both in terms of job contract and perceived satisfaction of work life balance and workload. [The case of Ghent University](#), which recently established a framework for fair working conditions for contract research staff, was an interesting good practice example.

- **Eurodoc work on working conditions and wellbeing of early-career researchers (ECR)**, Giulia Malaguarnera, President of Eurodoc, the European Council of Doctoral Candidates and Junior Researchers

Presented on the advocacy work of Eurodoc to promote the quality of training, well-being, and employment conditions of ECR. Results of a recent [Eurodoc survey](#) indicate that covid-19 is exacerbating the effects of precarity. Eurodoc advocates a number of policy recommendations: provide sustainable career prospects for ECRs via long-term funding, funding for career transitions, and career tracking systems; provide career advice and mental health support in institutions; change research assessment to acknowledge open science; put more emphasis on skills training and recognition.

Main takeaways from the discussion

- There is a need to change research culture through changing the way research and researchers are assessed and funded.
- Assessment by funders and institutions, when they recruit or promote researchers, needs to include other criteria beyond research excellence, such as the open dissemination of the research outputs, responsible research practice, and leadership. There is a need to develop robust methodologies for doing so.
- Power asymmetry between postdoctoral researchers and senior researchers generates the possibility of abuse of power by senior researchers.
- Need to counter the idea among early-career researchers that a move from academia to another sector is a failure, and communicate early on that other careers can be as, or more, rewarding.
- Need to change the culture also among PIs that they have failed as supervisors if their students and staff don't continue in academia.
- Need to better communicate to non-academic employers the value of the skills of doctorate holders and involve them more in doctoral education and postdoctoral training.
- Need to promote the collaborative aspect of research and to curb extreme individualism in research.

Professional development and career support

Moderator: Janet Metcalfe, Head of Vitae, UK

- **Policy options to improve professional development and career support**, Verity Elston, Head of Careers Advice for Doctoral and Postdoctoral Researchers, Université de Lausanne, Switzerland, EG member

Presented on policy options emerging from the project to promote the professional development of postdoctoral researchers, to improve human resources management practices in institutions and the governance and coordination of academic research careers.

- **Professional development and career support for postdoctoral researchers in Australia**, Alastair McEwan, Convenor of the Australian Council of Graduate Research and Dean of the Graduate School at the University of Queensland, Australia

Presented on opportunities and challenges for early career researchers in Australia and how to better support research and researchers in the future. Covid-19 exposed weaknesses in the system, and highlighted the need to change the traditional academic research career model. For that to happen changes in structures and behaviours are required. Career development of postdoctoral researchers need to be a core requirement for PIs. Postdoctoral researchers need support in career development to consider other options beyond academic research, and need to be provided with opportunities to spend time working with business. Government needs to invest in research and researchers, and there needs to be an economic model that values research and innovation.

- **Better support for researchers**, Anjali Shah, Co-Chair of the UK Research Staff Association, and Epidemiologist & Researcher Developer at the University of Oxford, UK

Described her personal experience of doing a series of postdoc positions, and then becoming a Researcher Developer. Becoming a Professor is the exception and not the rule. We need to create career pathways and more stable funding for Staff Scientists and Senior Postdocs within academia. As described in the [Researcher Development Concordat](#) researchers need to be given time for professional development and to develop their research identity and broader leadership skills. We need to make transitions in and out of academia and industry easier. We also need to encourage researchers to consider the option of leaving academia at an earlier stage. We need to educate employers about the value of a PhD and experience as a postdoc. She also described some initiatives implemented by the University of Oxford Careers Service.

- **Professional development and career support in academic capitalism**, Peter Ullrich, Senior Researcher, Centre for Technology and Society, Technische Universität Berlin, Network for Decent Labour in Academia (NGAWiss), Germany

Presented a criticism of the structure of higher education employment in Germany that he characterised as academic capitalism driven by marketization and competition, with neo-feudal structures of personal dependency between junior academics and professors, and the illusion of a pseudo-meritocracy. Fixed-term contracts are widespread for those under 45, an important share of which are short-term and often part-time; childless status and risk of depression is significantly higher than in comparison groups; and mobility is often forced by precarity rather than a choice. A vision of progress would include a reduction of short-term funding, an end to the overproduction of PhDs, availability of permanent positions with tenure after the PhD, a culture change from competition to human resources development, and the abolishment of the chair system and the introduction of democratic department structures.

Main takeaways from the discussion

- Institutions can do a lot to improve human resources management practices, but the overarching legal frameworks within which they operate are still important to address.
- Competitive funding should not be used for continuous, long-term research requirements, and its use induces employment strategies that result in precarity.
- Postdoctoral researchers on fixed term contracts should have a minimum degree of continuity to avoid salary gaps (e.g. minimum 3-year contracts)
- The postdoc phase should explicitly add to generic skills developed during PhD education to enhance preparation for a wide range of careers.
- Enact annual performance assessments and take them seriously. Require supervisors to conduct annual assessment that go beyond the research being performed and focus on the researcher and his/her development.
- Have good professionalised career services in institutions, because senior academics are not the best people to provide advice on diverse careers beyond academia to early-career researchers. Encourage researchers to find a range of academic and non-academic mentors.
- There is disagreement on whether there is an overproduction of PhDs and whether putting an end to it would be a solution to the precarity of postdoctoral researchers. A liberal view would be that PhDs are not professionals prepared for a specific career, and that there is too much emphasis on technical and disciplinary skills, instead of a focus on their valuable advanced transferable skills.
- New money coming into the research system should not be spent mostly on PhD education and short-term postdoctoral positions, but instead spread across all career stages.
- Many systems encourage the production of PhDs through their funding and assessment mechanisms, and this should be taken into account in the discussion on the overproduction of PhDs.

Equal opportunities and diversity

Moderator: David Payne, Managing Editor, Careers, Nature

- **Policy options to improve equal opportunities and diversity**, Roseanne Diab, Emeritus Professor, University of KwaZulu-Natal, South Africa, and Director, GenderInsite, co-chair EG

Started by giving relevant background statistics: women are over-represented in teaching-oriented institutions rather than research-oriented institutions and women are less internationally mobile than men, etc. Precariat is an issue that is pervasive, particularly for postdocs, but women and other minority groups tend to be more vulnerable. Policy options fall under three major themes: (1) transparency during recruitment and promotion process; (2) promoting a research culture through institutional

structural change that creates a conducive working environment for women and minorities; and (3) publishing disaggregated data not only by gender but by other criteria, such as socio-economic background, ethnicity, and citizenship, to inform policies.

- **A Survey on the Situation of Researchers under the Age of 45 in Hungary**, Katalin Solymosi, Founding member of the Hungarian Young Academy and Board member of the Young Academy of Europe, Hungary

Started by presenting a survey on the situation of researchers in Hungary under the age of 45. Highlighted the situation of parents and female researchers: women in science tend to delay parenthood and parents, especially women, find it very challenging to balance parenthood and scientific career, mostly due to lack of time. Women with children perceived more discrimination than men related to parenthood, the extent of this being highest for STEM fields. Concluded with several suggestions for the future: continue the survey; publish a white paper; dialogue with research funding agencies about science evaluation methods; lobby for the availability of credit for childcare; propose a reintegration grant to reintegrate researchers after a childcare career break; and, provide babysitting during meetings.

- **Equal opportunities & diversity: Finland**, Charles Mathies, Academy of Finland Research Fellow in the Finnish Institute for Educational Research at the University of Jyväskylä, Finland

Started by presenting the higher education system in Finland and the extent of precarity in the system (~70% of Finnish academic & research staff in fixed-term employment). Presented the distinct differences that exist between men and women in their academic careers and the work tasks. Emphasised the importance of parental background: doctorate holders whose parents have a Master's or a PhD degree themselves are more likely to obtain a professorship and at a younger age. Finished the presentation by considering internationalisation and its impact on women academics in particular (women often exclude lengthy mobility periods due to family considerations) and on academic staff in general.

- **Initiatives at Max Planck Society to support diversity in research**, Ilka Schießler-Gäbler, Senior consultant, Programmes and Networks Unit, Department for Human Resources Development & Opportunities, Max Planck Society, Germany

Started by presenting facts and figures about the Max Planck Society, its missions and guiding principles. Discussed the importance of internationalisation for research. Presented how young researchers are supported through doctoral and postdoctoral networks, and how in every career phase there is systematic human resources development through various services, such as training, coaching, and mentoring. Highlighted The Planck Academy, which offers its employees further training and personal career development. Finished by presenting further example of support services for researchers, such as Minerva-FemmeNet mentoring programme for women.

Main takeaways from the discussion

- Discrimination related to parenthood is a problem, especially for women.
- Researchers may need more support to reintegrate back into the system after maternity and paternity leave.
- Gender discrimination is being addressed, but there is still a need for systemic changes.
- Socio-economic background is an important factor to succeed in research careers and needs to be further studied.
- Researchers from different groups can be supported through mentoring programs and career coaching.
- The integration of foreign researchers is of concern in several countries.
- Important to acknowledge and better understand intersectionality, e.g. being a woman and a refugee.

- Funding agencies can play a role in improving diversity by attaching conditions to funding, by including diversity criteria, and by ensuring diversity in evaluation committees.

International and inter-sectoral mobility

Moderator: David Payne, Managing Editor, Careers, Nature

- **Policy options to promote inter-sectoral and international mobility**, Neda Bebiroglu, Observatory of Research and Scientific Careers, F.R.S.-FNRS, Belgium, EG member

Discussed the importance of inter-sectoral mobility and how inter-sectoral mobility can help reduce the precarity of researchers. Doctorate holders are a primary source of knowledge - they enhance an organisation's ability to exploit external information and they play a connective role between universities and other sectors. Presented policy options to promote inter-sectoral mobility and international mobility.

- **Marie Skłodowska-Curie Actions**, Bodo Richter, Deputy Head of Unit, "Marie Skłodowska-Curie Actions", Directorate General for Education, Youth, Sport and Culture, European Commission

Started by presenting the main Marie Skłodowska-Curie Actions (MSCAs): the individual fellowships, and co-funding of regional, national and international programmes that provide organisations with support for their own researcher training and career development programmes. Presented various measures to reduce precarity: support to individuals to resume research in Europe after a career break, direct return to and long-term reintegration of researchers in Europe, facilitate mobility between the academic and non-academic sectors and career opportunities outside academia, and promote open recruitment and attractive working and employment conditions. Presented further measures in higher education (i.e., eligibility based on the scientific age of researchers, further emphasis on career development plan of researchers). Presented the objectives of the New European Research Area (ERA). Presented the MSCA for Researchers at Risk support refugee scientists.

- **The Third Way: Academia, Industry, and Entrepreneurship**, Javier Garcia Martinez, Founder of Rive Technology and Professor of Chemistry at the University of Alicante, Spain

Presented his personal journey from academic work at MIT, founding his own company, selling it, and going back to academia. Back in Spain, he started a foundation to promote entrepreneurship, because the ecosystem he found at MIT does not exist in Spain. Presented the gap that exists between scientists and society as very few people work across different sectors. Presented his vision of a scientific entrepreneur, a scientist taking discoveries to the market, so that they can meet the urgent needs of society. He finished his presentation by emphasizing the need for scientists to leave their ivory tower, even though it is safe, because being a scientific entrepreneur made him become a better scientist, a better educator and a more complete person.

- **On Mobility**, Gonçalo Velho, President SNESUP (National Union of Higher Education), Portugal

Provided an historic perspective, highlighting how universities came from collective action, which was important in determining working conditions, such as contracts and careers. Presented some challenges of mobility and emphasized that we need to understand institutional arrangements to address them. Highlighted that for mobility to happen, researchers need incentives, such as security, better integration in the host country and host institution, career development, and collaboration.

Main takeaways from the discussion

- We need to better understand how institutions function and the impact they have on contracts and careers.
- We need to provide better incentives such as security, career development, and collaboration to promote mobility.
- We need to better support some scientists to become entrepreneurs. Scientists should learn to leave their ivory tower to become better scientists as well.

- The multi-functional researcher should not be the sole model in academia, and there should be space for different profiles, with implications in terms of incentives and assessment.
- Universities and funding agencies need to recognise skills obtained in industry. Focus on publications as the major criteria in evaluation precludes inter-sectoral mobility.
- Society is constantly changing, the academic career and universities should be better prepared to evolve as well. Accordingly, there is a need to rethink doctoral education and postdoctoral training.
- The academic career is in a state of evolution and this reflects the wider social context. Need to think how it should evolve, including taking into consideration the risk to academia itself of promoting good careers outside academia. The current academic employment landscape is already discouraging many young people from considering an academic career.
- Need to consider the potential conflicts of interest and conflicting missions and values between academia and the business sector when considering inter-sectoral mobility.
- Doctoral education and postdoctoral training need to be re-thought in line with societal needs. The postdoctoral phase should evolve from being a safety net while waiting for an academic position to opening up other options.
- A binary distinction between academic and non-academic positions is not helpful, and broad training for many roles should be provided.
- The key distinctive role of the doctoral education is to develop a 'substantial original contribution to knowledge'. This is beneficial to society. It can (and is often) done in collaboration. But there needs to be more structural initiatives to further encourage exchange and co-creation with society.

Protecting the research pipeline in the aftermath of covid-19

Moderator: Karen Kaplan, Senior Careers Editor, Nature

- **Protecting the Research Pipeline Post COVID-19 in the United States**, Sam Howerton, Deputy Director, Office of International Science and Engineering, National Science Foundation, United States, GSF bureau member

Gave an overview of the work of the National Science Foundation. Described the impact of the pandemic to the research pipeline, in terms of research outputs of existing grants being delayed, increasing time to graduate, funding shortfalls due to reallocation, undergraduate enrolment down and graduate enrolment up. NSF's response included re-budgeting existing grants, extending submission deadlines, providing funding to projects to address the pandemic situation, and a dedicated scheme for recent doctorate graduates in computing and related fields. Finished by raising questions about: the impact on new assistant professorships in the next couple of years; support for continuing in research for PhD students finishing their grants; the number of STEM graduate research students that universities will be able to admit; the provision of summer research experience to undergraduates; and how institutions will take into account the differential impact on early-career faculty research productivity.

- **Protecting the research pipeline in the aftermath of Covid-19 in the European Union**, Apostolia Karamali, Head of Unit, Academic R&I, Directorate General for Research and Innovation, European Commission

Presented on the severe disruption of the pandemic to teaching, learning, research, and mobility. The global challenges are aggravated by the pandemic and it is essential to improve researchers' careers and the flow-through of R&I talents. For that the EU envisages building a stronger European Research Area. An important component is a European framework for research careers, which includes employment and social policy, a charter and code, institutional and professional aspects. The aim of the frameworks is to nourish talent and improve the overall attractiveness of the research profession.

- **Researchers experiences during Covid-19: Lessons for the future**, Katie Wheat, Head of Engagement and Policy, Vitae, UK

Presented on a UK survey of doctoral researchers and early-career research staff on the early impact of lockdown conditions, and a 2nd survey of researchers and research group leaders on the impact of covid-19 on research activity. Researchers anticipated deterioration of working conditions resulting from decreased funding, concern for their jobs and concern about their publication records. Wellbeing and mental health have been considerably affected. A variety of practical suggestions were proposed to ameliorate the situation: increase access to research facilities by extending normal hours, encourage collaboration across research groups to make the most of limited equipment, extend projects and funding, recognise and make concessions for reduction in outputs, provide equipment and access to e-resources to work from home.

Main takeaways from the discussion

- The flexibility that funders and programme managers have is, and will be, used to adjust grants and fellowships in light of covid-19, but it is still unresolved how to address the loss of time on field work (e.g. time in a vessel, time in a telescope, etc.) and impaired mobility between jurisdictions.
- Instead of lab work or field work, some people have been using their time for writing publications and grant applications.
- The European Research Area is 20 years old. One of the building blocks to move it forward is to develop research talent. In order to address precarity it is important to have a recognised, coherent way for career development of researchers. It starts with the recognition of the research profession and the skills and competences associated with it. The EU launched an action to develop such a framework.
- An important element to facilitate international mobility in the EU is to develop the portability of rights, including social security and pensions.
- Another building block to improve the research framework in Europe is to have recognised standards across the EU, for instance the standardised use of tenure-track track, open and transparent recruitment, diversification of research careers, without neglecting scientific excellence and publications, embracing all other aspects of research and innovation, and translating that into the assessment systems.
- Addressing the mobility of talent will be done by increasing mobility schemes, especially focusing on inter-sectoral mobility.
- There are bottom-up positive examples of local support for researchers during the pandemic, including those with caring responsibilities. For instance, efforts to upskill by managers and supervisors to be good mentors and support the wellbeing of their staff.
- Need to make sure that top-down measures match the bottom-up initiatives, for instance through narrative CVs being used by funders that allow researchers to explain their circumstances and why they have not been as productive as envisaged, but also how they have grown and developed under the circumstances.
- Need to embrace a broader concept of researcher and what success is, moving away from the output based measures of productivity. This could be a positive thing to take forward from the pandemic.

Concluding remarks

Carthage Smith, Senior Policy Analyst - Lead co-ordinator, OECD Global Science Forum, highlighted the main take away messages of the conference and how it relates to follow up work by GSF on the research workforce of the future.

- *Evidence.* The evidence base is very piecemeal. We need more systematic data collection. If we want to make the case for more PhDs or maintain the current level, then we need more evidence on what is really happening with the PhDs, particularly with the postdoc cohort.
- *Wellbeing.* There is a lot of evidence showing there are serious mental health issues and stress among researchers in precarious employment conditions. At the same time, there are positive actions taking place that can be built on.
- *Professional development.* What can we do for the “permadoes”, and if the research system is too hierarchical and too inward looking how can this be addressed? There are some positive actions: career advice services, good practices at some institutions, but again we need the data to monitor their effectiveness, as currently there is a gap in terms of knowing what is effective.
- *Equal opportunities.* A lot of the discussion was on gender biases, a familiar discussion but the issue remains to be fully addressed, which calls for a more systemic approach, as some of the drivers are embedded in academic institutions. There are other diversity issues beyond gender, such as the diversity of academia in terms of social background. Again, there are positive examples of good practice, such as self-support networks, fellowships, and mentoring schemes.
- *Mobility.* A lot of discussion about alternative career paths. Revisited the discussion on whether there are too many PhDs, and the answer appears to be there are too many for academia, but not necessarily for society, but the case needs to be made more strongly with industry, the public sector, and others that use research, and with that comes the need to diversify the career expectations and aspirations of PhDs. However, academics are not the best people to impart these expectations on postdoctoral researchers, as many have never worked outside academia themselves. The change cannot just be implemented top-down. However there is an important role for policy, in a nudging sense, using incentives whilst recognising that research performing organisations are autonomous, and researchers are independent, and there is a long-established rationale for that.
- *Impact of covid-19.* Covid has made more explicit the tensions and flaws in the system, and those in precarious conditions are affected the most, especially women and those from already disadvantaged groups.

At the start of each session the preliminary policy options coming out of the project were presented. They were tested out during the workshop, and there was a lot of input to the project that will allow for the enrichment of those recommendations. There were a lot of good practices that contribute to peer learning and that can be used to illustrate policy options in the final report.

It came out very strongly throughout the workshop the idea of alternative careers, but alternative is the wrong word, we should talk about diverse career options for doctorate holders. There is a lot more analysis that needs to be done in what is actually happening in this domain, what are the good practices, what policies can be enacted, to push this idea of doctoral education and postdoctoral training from a purely academic endeavour, to one that opens many options. This is a project that countries have already agreed that GSF should develop further, and that links well with the impact of covid-19 and how its impact on the research workforce can be mitigated in the short and long term. Industry, at least SMEs, are cutting down on investment on research, and the idea of exchange between academia and industry is something that needs to be thought about more. There is a lot that needs to be done, but there is also a lot being done that countries can learn from.

Precurity is a very complex issue but there is a way forward, and countries and institutions already have initiatives, and the final report can empower countries to move forward on this problem.

Marc Vanholsbeek, Director for Scientific Research, French Community of Belgium, gave the closing remarks, and highlighted some cross-cutting themes:

- *Precarity is a very complex and multi-dimensional notion.* It relates to job stability and professional prospects, but should also be considered in terms of the very fragile professional identity of postdocs, between apprenticeship and professional independence. They are in a double bind between the “neo-feudal university” and their dependence on more experienced and prestigious peers, and the “managerial university” based on individual performance assessed by bibliometrics. Some potential solutions have been advanced: allow early-career researchers and postdocs to develop more independence and introduce more collegiality in their career development, provision of open-ended positions, grants for un-tenured postdocs to work as PIs, PIs could also be evaluated on their contribution to the career development of their postdocs.
- *Need to improve the information systems.* Policy makers need to be well informed. There is a need to improve the methodologies to track the career of doctorate holders. Need to be able to disaggregate data with regard to social class, ethnicity, and gender. Inside institutions, information also needs to be improved to permit ECRs to make better informed career decisions, in or outside academia. Positive initiatives that were presented include: formalisation of networks that provide information to ECRs, professionalisation of career advice services to ECRs.
- *Need to train postdocs for academic careers but also non-academic jobs.* Should avoid overloading ECRs with one-size-fits-all training sessions, treating them as “permadoes”, i.e. permanent students, but adapt training to individual career aspirations, including beyond academia. Should equip them with skills that foster their capacity to be knowledge brokers, to be able to translate research from academia into society, such as skills in public engagement, entrepreneurship, science communication, and open science. Open science improves simultaneously the quality of science and the relevance to society – covid-19 is the perfect illustration.

Postdocs and ECRs are eager to engage in open science. However, they are the most dependent on the definition of excellence that is based on the prestige of the journals in which they publish. They are often interested in the societal impact of their research, but there is no incentive in the academic career to explore this. This needs to change.

Beyond the immediate problem of the precarity of postdocs, which needs to be addressed, the most pressing issue is that collectively we need to consider academia as an open environment in interaction with citizens, industry and policy makers. The academic space should promote a circulation within and between sectors rather than constraining it. Academia should remain a centre of excellence where research can be conducted independently, freely and in an autonomous way, but people who leave after a few years of research should not be considered a failure but rather as the best channels for knowledge exchange and integrating scientific approaches into society more broadly.