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Reflecting on the Challenges and Suggesting Ways Forward

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African Women Scientists' COVID-Related Experiences

Reflecting on the Challenges and Suggesting Ways Forward

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Abstract

The COVID-19 pandemic has intensified the traditional gender power inequalities faced by women daily and has left humanity sad and overwhelmed with fear. Before our very eyes, most countries are confused and frequently shutting down outdoor activities such as schools, colleges, universities, places of worship, and markets, leaving people with no choice but to work from home. The situation has particularly adversely affected the Women Scientists at the forefront of discoveries and innovations through science. This article reveals the experiences and challenges faced by Women Scientists due to the pandemic outbreak, more especially burdened with additional roles of taking care of others besides themselves. Furthermore, the work reflects how African women can be encouraged to enter and remain in their scientific careers. African female scientists make up approximately 31 percent of researchers on the continent. They, therefore, have critical roles in Africa's development. The review suggests various ways in which African governments, international organizations, African universities, and communities could develop programs and initiatives to address multiple issues raised so that women could pursue careers in the sciences—and remain in these careers to advance development on the continent.

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Olubukola Oluranti Babalola, Stephenie Chinwe Alaribe, Olabimpe Ajoke Olatunji, Pendo Nandiga Bigambo, Sunday Samson Babalola, Adenike Eunice Amoo, Mercy Olajumoke Kutu, Inutu Katoti, Hazel Tumelo Mufhandu, and Helen Orisaghe Imarfidor, "African Women Scientists' COVID-Related Experiences: Reflecting on the Challenges and Suggesting Ways Forward," in "African Universities and the COVID-19 Pandemic," special issue, *Alliance for African Partnership Perspectives* (2021): 89-100.

African Women Scientists' COVID-Related Experiences

The Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) outbreak, the virus responsible for COVID-19, has currently become the world's major health problem. It quickly spread across most of the globe in a short time, leading the World Health Organisation (WHO) to declare it a pandemic on March 11, 2020 (Cucinotta and Vanelli 2020). When writing this article in early January 2021, more than 89 million people have been infected, with over 1.9 million deaths reported worldwide (Coronavirus Resource Centre 2020). The pandemic has forced millions of people across the globe to work from home, with most schools, colleges, universities, places of worship, and markets closing.

In the scholarly context, standard funding opportunities and publishing pipelines have also slowed down or shifted priorities (Organization for Women in Science for the Developing World [OWSD] 2020). Yet, it appears that these challenges have affected women researchers more than men, having immense effects on their career development (Fathima et al. 2020). These challenges arise from a recent finding that the global socioeconomic repercussions from the pandemic have significant effects on women, and the traditional gender power imbalances women face every day are intensified by the pandemic (Care International, 2020). The pandemic has come to expand the challenges women face and will most likely widen gender inequality as women are burdened with more roles, such as taking care of themselves and others, because of the emotional burdens, depression, and trauma associated with COVID-19 (de Paz et al. 2020; United Nations 2020).

Prior to the COVID-19 outbreak, female scientists in Africa, who make up approximately 31 percent of the continent's researchers, have been confronted with

structural challenges, increased mental pressure, and inadequate academic exchanges, among other things (Palt 2020). Apparent demotivating life experiences in the pursuit of Science, Technology, Engineering, and Mathematics (STEM; Babalola, Du Plessis, and Babalola 2021) before housekeeping assignment rests on them. About 50 percent of the members of OWSD surmise that since the commencement of the COVID-19 pandemic, they have spent more hours on household chores than their research (Palt 2020), and studies indicate that women are not sufficiently represented in COVID-19 research as with other scientific fields (Palt 2020; Pinho-Gomes et al. 2020; Viglione 2020). Women scientists in Africa would be significantly endangered if this situation continues, because the "publish or perish" rule is the custom in scientific fields (Palt 2020). The women scientists in Africa seem devalued due to less acceptance than men, intimidation, insubordination, culture, conspiracy, prejudice, and biased stances (Babalola et al. 2021). To explore this issue, we first reflect on our experiences as women scientists at different universities in different African countries and how the pandemic has affected our abilities to engage in our research work. Despite these challenges, though, African women have also been called "a powerful untapped economic force" (Ernst & Young 2011) and are integral to addressing Africa's development challenges, in particular those brought about by the pandemic. For instance, at present, African women constitute most informal economy workers, and only about one third of women across the continent participate in formal economic activity (Boserup 1970; Harris 1975). Thus, in the second part of this article, we will reflect on how more African women can be encouraged to enter and remain in scientific careers that make strides in science and technology research.

Female Scientists' Double Duty of Home and Work Responsibilities

Prior to the pandemic, early-career women scientists faced barriers to academic achievements due to the overlap with their prime reproductive years (Cardel et al. 2020a). For example, during the early stage of their careers, women are often expected to and want to attend to important family responsibilities, such as marrying, having children, and caring for aging parents. In most countries, especially in African countries, women tend to have heavier burdens than their male partners with regard to childcare (Cohen and Venter 2020; Zamarro and Prados 2020). These responsibilities can take women away from the activities that can advance their careers, including attending conferences and work-related travel (Cardel et al. 2020a; Jolly et al. 2014). As a result, trying to balance these often stressful situations can, in some cases, result in women scientists leaving their careers to focus solely on looking after their children and taking care of other household responsibilities (Cardel et al. 2020a).

With the current COVID-19 pandemic, where millions of people are obligated to work from home, the issue of academic gender disparity has become more glaring, in particular for women with young children. With the closing of many schools across the globe, women have had to spend more of their time fulfilling domestic responsibilities, such as cleaning, cooking, engaging in childcare, and home-schooling compared to their male counterparts (Vincent-Lamarre, Sugimoto, and Larivière 2020). A report of a survey done by OWSD on the impact of COVID-19 of its 1,470 women scientist members revealed that women were spending much more time doing household chores, providing childcare, and home-schooling their children than before the

pandemic (OWSD 2020). For instance, the amount of time women spent on household chores increased from 52 percent before the pandemic to 58 percent, whereas the time spent providing childcare rose from 51 percent to 66 percent (Giurge, Whillans, and Yemiscigil 2021).

In addition, women scientists reported being responsible for 69 percent of their children's home-schooling requirements. These findings illustrate that women scientists' time spent in research work, research grant writing, publishing, and overall academic productivity was significantly lower during the pandemic period. The lower proportion of women first authors on articles in the medical research area and mainly in COVID-19 has already been reported in recent research (Andersen et al. 2020). March 2, 2020, immediately after the press release of the first COVID-19 case in South Africa, marked the beginning of a hectic daily schedule for virologists. Several scientists, including women scientists, began receiving requests to share COVID-19 information on national radio stations, social media platforms, and public lectures (via online platforms). COVID-19 information sharing occurs almost every other day, making women virologists busy and focused on the pandemic's daily global updates with little time to care for their families, especially children or perform other office and lab-related tasks. The work-life imbalance is always in tandem with work-related stress. These have been a challenge from time past and recently documented in a study by Fathima and colleagues (2020) where work-related stress accounted for 71.5 percent and work-life imbalance accounted for 46 percent of the challenges faced by female scientists. Household management and safe child-care facilities are recommended as options for female scientists to achieve work-life balance

African Women Scientists' COVID-Related Experiences

(Boussemart 2016). However, with the spread of COVID-19 during seasonal peaks, when the waves of the spread of infections reach high numbers, as seen in countries such as South Africa during the first and the second wave, the child-care facility option is not favored. In most societies, women, by default, have to assume a caregiver's role for circumstances such as caring for the elderly and during any sickness in the family (Sharma, Chakrabarti, and Grover 2016), and this is worse in the current COVID-19 pandemic in highly affected countries. Activities of this nature affect work performance and the research focus of female scientists. Yet, women scientists have a critical role in Africa's development, particularly in combating the COVID-19 pandemic, treating patients, and carrying out assessments on the social and economic impact of the pandemic on various sectors of the society, as well as other key global issues, such as overpopulation and food production challenges. Women scientists are underrepresented compared to their male counterparts in core research, patents, copyrights, authorship of research papers, among other things. Still, their participation is critical at this time.

Travel Bans and Restrictions of Movement

The rigid lockdown and national and international restrictions on travel that have emerged due to COVID-19 have affected research and slowed down research efforts and progress. This outbreak resulted in the regulation of movement and traveling both at local and international levels, which inevitably affected the educational and research activities in most countries of the world. The travel bans have also affected various student exchange programs planned for student training and support

across different laboratories, nationally, and internationally. The travel bans have a devastating effect on research work and studies, as many researchers were unable to travel for conferences, workshops, and training programs. There were restrictions on visits to and the use of laboratories, offices, and fieldwork locations, which made it difficult to effectively collaborate with colleagues. A particularly painful experience by one of the authors was a delay—and almost denial—of collaborative and exchange studies in Europe from Nigeria due to restrictions on travel unless it was crucial, of which research studies are not considered. This was frustrating because sophisticated equipment was needed to further the research studies supported with a national equipment grant that was not available in their own country.

In addition, the COVID-19 pandemic has highlighted the inadequacies and weaknesses of Africa's overdependence on external supplies for its internal research needs, because both pharmaceutical and nonpharmaceutical disciplines rely almost exclusively on international companies to provide products, chemicals, and most other scientific reagents and tools for their labs. The COVID-19 outbreak shut down production and trading activities in most countries. Thus, shipment of research supplies was slowed dramatically or lost in transit, and those that were received often arrived in poor condition due to delays in delivery. This affected the progress of scientific work on the continent: preventing one's ability to perform experiments on schedule, delaying publications, and reducing motivation and interest in work. In general, African women scientists, in the western and eastern parts of the continent in particular, feel helpless and frustrated because they could contribute their skills to tackle most of these identified challenges—if the continent was

technologically sound.

In addition, some early-career scientists who were pregnant prior to the pandemic have also been severely affected by the travel restrictions—some work in countries different from where their families reside. As a result of the travel ban, most of them went through childbirth alone and took care of their newborns while still trying to continue with their research.

Lockdown of Schools, Research Institutions, and Academic Institutions

In most countries, COVID-19 resulted in the closure of many institutions of higher education to minimize the spread of SARS-CoV-2 on campuses and reduce country-level incidences. In Tanzania, for example, colleges and universities were closed from April to June 2020; in Kenya, Uganda, and South Africa, colleges and universities were closed for more extended periods. These closures have disrupted academic activities and scientific work in Africa, as well as disrupting the position of women scientists, who have been forced to work from home, which reduces their access to research laboratories, equipment, and instruments, which in turn delays the collection of preliminary data. Hence, principal investigators, and junior and postgraduate researchers have less time to generate data. Delays to studies may result in them having to pay more for bench space in labs to complete their research. Most women postdocs whose contracts were ending during the pandemic may not have the financial means to conduct their research, resulting in a permanent loss of these people for the talent pool. Some researchers in foreign labs may have had to discontinue their studies due to the new COVID-19 regulations and lack of funds

because some funders were badly affected by the pandemic. Furthermore, the time to prepare manuscripts for publication is prolonged because the collection of more data to support or verify existing studies has been suspended or delayed. Independent publication is needed for early-career researchers to remain competitive in the search for external grants. Those who cannot finish their education for this session or year will be rolling over into an even more crowded space next year as more students enter the institutions.

Reduced Access to Research Grants

Following the outbreak of COVID-19, certain research funding organizations began directing their funding to research activities related to COVID-19, so other areas of research were not funded. Unfortunately, many researchers who had research funding before the pandemic have reported delays or suspension of their financing (OWSD 2020). Although this issue affects both male and female scientists, such problems can have particular impact on female researchers' work because they tend to concentrate on other clinical topics, including fertility and reproduction (Hoppe et al. 2019). Lack of financial support for women scientists could negatively affect their career development, in particular their promotion rate. Likewise, some may leave their careers, resulting in continuation of the leaky pipeline (a metaphor used to describe how women have come to be underrepresented in STEM; Sheltzer and Smith 2014). The leaky pipeline continues to affect ongoing efforts for gender equality in the world of science and academia in general.

African Women Scientists' COVID-Related Experiences

Ways Forward: Advancing African Female Scientists Despite COVID-19

In economic terms, COVID-19 has brought about a significant decline in the demand for Africa's raw materials and commodities within and outside the continent. The continent's access to industrial components and manufactured goods from other countries has been hampered due to lockdowns and travel restrictions. A recent report from the United Nations Economic Commission for Africa (2020) indicated that 2.5 percent of African's gross domestic product is at risk during each month of the lockdown. Despite these challenges, this is the time for African leaders to devise policies that can support their manufacturing sectors and encourage the use of natural resources on the continent. No country develops without placing colossal value on its natural resources and manufacturing sector. In turn, such attention would lead to the need to invest in these nations' science and technology sectors by providing their scientific communities with state-of-the-art facilities and equipment to support activities that would improve national production capacities. Such improvements would lead to reduced reliance on external supplies.

Within these suggested initiatives, African governments must also ensure that cultural and social norms support women's involvement in science (United Nations Department of Economy and Social Affairs 2019). These efforts can be realized by ensuring post-COVID-19 policies and strategic plans related to research, innovation, and development explicitly take women scientists' needs into consideration. Direct consideration can only occur if female scientists are fully involved in the policy-making processes.

An essential tool to promote African

women scientists' participation in research will be for African governments to invest in research funding rather than rely on financing from foreign organizations, such as OWSD. Such an initiative will directly address the issues the pandemic has caused in slowing down the progress of African women scientists' careers. These investments are important because, although many African governments already have substantial grant facilitation programs in place, these programs often have gender-blind policies that either maintain the status quo or, in some instances, even reinforce gender inequalities. Increasing the funding opportunities targeted for women scientists and extending submission deadlines for different research grants could reduce the gap between men and women receiving research grants. Research funding opportunities to promote women's participation in science do exist. For instance, the Italian-based OWSD, which supports early-career women scientists in developing countries by providing them with research funding and networking opportunities (OWSD 2010). However, these types of organizations are small in number, and an increase in these type of initiatives are needed to ensure women scientists' numbers are significantly increased, in particular in the Global South.

A key area of research going forward will be developing effective vaccines and medicine to treat COVID-19 (Maeda and Nkengasong 2021) and devising various ways to manage socioeconomic problems associated with COVID-19. Although, as discussed earlier, women's participation in this area has been limited thus far to a few female researchers, in particular those on the continent who have been involved in this research. For example, Africa's latest and third COVID-19 vaccine trial was launched with two women leading the team to

investigate how to protect those who contract the virus (Mbunge 2020; WHO 2020). In this case, the South African Medical Research Council participated in the trial while joining the Department of Science and Innovation to support community engagement concerning vaccine development. In the United States, an African American woman is among the scientists working to develop and produce the COVID-19 vaccine. She has been praised by top infectious disease experts for her role in the development of the vaccine (Mbunge 2020). Thus, to encourage more women on the continent and women of color to participate in this critical area, the international community is urged to invest more efficiently into improving girls' equal access to quality, relevant, and inclusive education at all levels, in particular in STEM. UNESCO has identified barriers to and opportunities for women's full engagement in the sciences, and organizations need to determine methods and programs that can be implemented to address these barriers.

Individual academic and research institutions on the continent can also enact programs and initiatives to help female scientists. For example, educational institutions should consider recruiting more women academics and strive to retain them. Retention efforts by institutions could include devising and implementing mentorship programs, in particular for early-career women scientists, to ensure they remain in academia. In cases where mentors are not available at a specific institution, external mentors could be invited to conduct seminars and workshops with the early-career women scientists. Institutions should also consider women's perspectives during workload distribution, in particular concerning their teaching and administration loads. One way to do this would be to offer female scientists flexible working arrangements, because women are often required to look

after their families while contributing to their institutions' development. Furthermore, the institutions should consider providing child-care resources and facilities within their proximity to increase the women scientists' productivity while schools and other child-care facilities are closed.

Within the education sector, virtual learning has a great deal of promise to overcome many of the challenges discussed in this article. For instance, the South African's decision to subsidize internet facilities for students and teachers to access education platforms is an example of investing in virtual learning (National Science Foundation and Technology Forum 2021). In most higher institutions of education in South Africa, modules are taught online, with some research projects involving the use of software to implement ideas that could otherwise have been produced with hardware. With exposure to such software, modelling can be a great tool to help men and women alike. Software like MATLAB, Mbed, and Eagle are examples of software that can be used to model physical devices and systems, which will reduce the time required for a product to go from testing in the laboratories to its final creation in manufacturing industries. The use of software simulations will be beneficial to female scientists and, if appropriately implemented, will bring about an acceleration of technological advancement in Africa. It can also assist women who may be working from home for various reasons.

Even outside academia, aspiring female scientists need access to supportive networks and mentors, and need to have negotiating power within their households and local communities to enable them to pursue scientific careers. There is a need for older women to mentor and encourage younger ones who may be going through some frustrating moments in their careers.

African Women Scientists' COVID-Related Experiences

As suggested by Fatoki and Kobiowu (2015), the sharing of housework responsibilities could be helpful. Women should be able to make time to attend workshops and meetings because doing this could help build networks. They should also develop coping mechanisms such as speaking out and taking care of themselves before becoming overwhelmed. As illustrated in this article, the constraints women have faced due to COVID-19 lockdown issues from the household's private sphere to the public sphere are a significant drag to the African continent's economic development. Yet, there are various ways in which governments, international organizations, universities, and communities could develop programs and initiatives to address these issues to ensure women pursue careers in the sciences—and remain in these careers to advance development on the continent.

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References

- Andersen, Jens Peter, Matthias Wullum Nielsen, Nicole L. Simone, Resa E. Lewis, and Reshma Jagsi. 2020. "COVID-19 Medical Papers have Fewer Women First Authors than Expected." *eLife* 9: e58807. <https://doi.org/10.7554/eLife.58807>.
- Babalola, Olubukola O., Yvonne du Plessis, and Sunday Samson Babalola. 2021. "Insight into the Organizational Culture and Challenges Faced by Women STEM Leaders in Africa." *Social Sciences* 10 (3): 105. <https://www.mdpi.com/2076-0760/10/3/105#>.
- Boserup, Ester. 1970. *Women's role in economic development*. George Allen and Unwin.
- Boussemart, Lise. 2016. "Woman, Mother, and Scientist: Aiming to Fulfill a Career in Research while Maintaining a 'Good-Enough' Work–Life Balance." *International Journal of Women's Dermatology* 2 (3): 74–76. <https://doi.org/10.1016/j.ijwd.2016.06.003>.
- Cardel, Michelle I., N. Dean, and D. Montoya-Williams. 2020a. "Preventing a Secondary Epidemic of Lost Early Career Scientists: Effects of COVID-19 Pandemic on Women with Children." *Annals of the American Thoracic Society* 17 (11): 1366–70. <https://doi.org/10.1513/AnnalsATS.202006-589IP>
- Cardel, Michelle I., Emily Dhurandhar, Ceren Yazar-Fisher, Monica Foster, Bertha Hidalgo, Leslie A. McClure, Sherry Pagoto, Nathaniel Brown, Dori Pekmezi, Noha Sharafeldin, Amanda L. Willig, and Christine Angelini. 2020b. "Turning chutes into ladders for women faculty: A review and roadmap for equity in academia." *Journal of Women's Health* 29 (5): 721–33. <https://doi.org/10.1089/jwh.2019.8027>.
- Care International. 2020. "New Study: COVID-19 Condemns Millions of Women to Poverty When They Could Be a Solution to Prosperity." <https://www.care-international.org/news/press-releases>.
- Cohen, Jennifer, and Willem D. F. Venter. 2020. "The Integration of Occupational- and Household-Based Chronic Stress among South African Women Employed as Public Hospital Nurses." *PloS One* 15(5): e0231693. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0231693>.
- Coronavirus Resource Centre. 2020. Baltimore, MD: Johns Hopkins University and Medicine. <https://coronavirus.jhu.edu/>
- Cucinotta, Domenico, and Maurizio Vanelli. 2020. "WHO Declares COVID-19 a Pandemic." *Acta Bio Medica Atenei*

- Parmensis* 91 (1): 157–60. <https://doi.org/10.23750/abm.v91i1.9397>
- de Paz, Carmen, Miriam Muller, Ana Maria Munoz Boudet, and Isis Gaddis. 2020. "Gender Dimensions of the COVID-19 Pandemic." *World Bank*. <https://openknowledge.worldbank.org/handle/10986/33622>.
- Ernst & Young. 2011. *Women of Africa: A Powerful Untapped Economic Force for the Continent*. Ernst & Young Africa. <https://books.google.co.za/books?id=ARGPnQAACAAJ>
- Fathima, Farah Naaz, Phyllis Awor, Yi-Chun Yen, Nancy Angeline Gnanaselvam, and Fathiah Zakham. 2020. "Challenges and Coping Strategies Faced by Female Scientists: A Multicentric Cross-Sectional Study." *PLoS One* 15 (9): e0238635. <https://doi.org/10.1371/journal.pone.0238635>.
- Fatoki, F., and S. V. Kobiowu. 2015. "Family and Work Responsibilities and Coping Strategies of Women Academics." *European Scientific Journal* 11 (34): 309–22.
- Giurge, Laura M., Ashley V. Whillans, and Ayse Yemiscigil. 2021. "A Multicountry Perspective on Gender Differences in Time Use during COVID-19." *PNAS* 118(12): e2018494118; <https://doi.org/10.1073/pnas.2018494118>.
- Harris, Richard L. 1975. *The Political Economy of Africa*. London: Halstead Press.
- Hoppe, Travis A., Aviva Litovitz, Kristine A. Willis, Rebecca A. Meseroll, Matthew J. Perkins, B. Ian Hutchins, Alison F. Davis, Michael S. Lauer, Hannah A. Valentine, James M. Anderson, and George M. Santangelo. 2019. "Topic Choice Contributes to the Lower Rate of NIH Awards to African-American/Black Scientists." *Science Advances* 5(10): eaaw7238. <https://doi.org/10.1126/sciadv.aaw7238>.
- Jolly, Shruti, Kent A. Griffith, Rochelle DeCastro, Abigail Stewart, Peter Ubel, and Reshma Jagsi. 2014. "Gender Differences in Time Spent on Parenting and Domestic Responsibilities by High-Achieving Young Physician-Researchers." *Annals of Internal Medicine* 160 (5): 344–53. <https://doi.org/10.7326/M13-0974>.
- Maeda, Justin M., and John N. Nkengasong. 2021. "The Puzzle of the COVID-19 Pandemic in Africa." *Science* 371 (6524): 27–28. <https://doi.org/10.1126/science.abf8832>.
- Mbunge, Elliot. 2020. "Effects of COVID-19 in South African. Health System and Society: An Explanatory Study." *Diabetes and Metabolic Syndrome* 14 (6): 1809–14. <https://doi.org/10.1016/j.dsx.2020.09.016>.
- National Science Foundation and Technology Forum. 2021. "Lessons about Pandemics: NSTF Discussion Forum on 'Preparing for Epidemics in South Africa—Human and Animals.'" National Science Foundation and Technology Forum, February 25–26, 2021.
- Organization for Women in Science for the Developing World (OWSD). 2020. "The Impact of COVID-19 on Women Scientists from Developing Countries: Results from an OWSD Member Survey." <https://owsd.net/news/news-events/impact-covid-19-women-scientists-developing-countries-results-owsd-member>.
- . 2010. Statutes and Rules of Procedure. https://owsd.net/sites/default/files/OWSD_Statutes_Final_June2010.pdf.
- Palt, Alexandra. 2020. "COVID in Africa: A Chance to Boost Female Scientists." *The Africa Report*, November 27. <https://>

African Women Scientists' COVID-Related Experiences

www.theafricareport.com/51939/covid-in-africa-a-chance-to-boost-female-scientists/.

Pinho-Gomes Ana-Catarina, Sanne Peters, Kelly Thompson, Carinna Hockham, Katherine Ripullone, Mark Woodward, and Cheryl Carcel. 2020. "Where are the Women? Gender Inequalities in COVID-19 Research Authorship." *BMJ Global Health* 5(7): e002922. <https://doi.org/10.1136/bmjgh-2020-002922>.

Sharma, Nidhi, Subho Chakrabarti, and Sandeep Grover. 2016. "Gender Differences in Caregiving among Family-Caregivers of People with Mental Illnesses." *World Journal of Psychiatry* 6(1): 7–17. <https://doi.org/10.5498/wjp.v6.i1.7>.

Sheltzer, Jason M., & Joan C. Smith. 2014. "Elite Male Faculty in the Life Sciences Employ Fewer Women." *PNAS* 111(28): 10107–112. <https://doi.org/10.1073/pnas.1403334111>.

United Nations. 2020. "Policy Brief: The Impact of Covid-19 on Women." <https://reliefweb.int/sites/reliefweb.int/files/resources/policy-brief-the-impact-of-covid-19-on-women-en.pdf>.

United Nations Department of Economy and Social Affairs. 2019. "World Population Prospect 2019." <https://population.un.org/wpp>.

United Nations Economic Commission for Africa. 2020. "COVID-19 for Africa: Lockdown exit strategies." <https://www.uneca.org/covid-19-africa-lockdown-exit-strategies>.

Viglione, Giuliana. 2020. "Are Women Publishing Less during the Pandemic? Here's What the Data Say." *Nature* 581: 365–66. <https://doi.org/10.1038/d41586-020-01294-9>.

Vincent-Lamarre, Philippe, Cassidy R. Sugimoto, and Vincent Larivière. 2020.

"The Decline of Women's Research Production during the Coronavirus Pandemic." *Nature Index*, May 19. <https://www.natureindex.com/news-blog/decline-women-scientist-research-publishing-production-coronavirus-pandemic>.

World Health Organisation (WHO). 2020. "Modes of Transmission of Virus Causing COVID-19: Implications for IPC Precaution." *World Health Organisation*, March 29. <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>.

Zamarro, Gema, & María J. Prados. 2021. "Gender Differences in Couples' Division of Childcare, Work and Mental Health during COVID-19." *Review of Economics of the Household* 19(1): 11–40. <https://link.springer.com/article/10.1007/s11150-020-09534-7>.

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Olabimpe Ajoke Olatunji is a lecturer at the Federal University, Oye-Ekiti, Ekiti State, Nigeria. She holds a PhD degree in developmental psychology. She served as the head of the Department of Psychology between the years 2016 and 2018. Her research interest spans the developmental period of adolescents (teenagers, youth, and emerging adults), emphasizing the biological and socio-emotional processes that interact with adolescents' development. Her research also focuses on some collaborative research in adulthood (early, mid, and late adult life) development. The importance of gender issues, particularly women and the psychosocial factors surrounding them, is of utmost concern in her research.

Pendo Nandiga Bigambo is a lecturer and researcher in textile technology and material sciences. She has a PhD and master's degree in textile technology from the University of Leeds and the University of Manchester, UK, and a bachelor of science in mechanical engineering from the University of Dar es Salaam in

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Sunday Samson Babalola has a doctorate in industrial/organizational psychology with over 20 years in teaching, research, and administration in higher educational institutions in three African countries. Besides that, he has teaching experience in research methodology and statistics. Babalola is an NRF-rated scientist with extensive peer-reviewed publications in organizational behavior, work attitude, and human capital management. His research benefited from a solid background in quantitative analysis, with working knowledge in qualitative analysis. His focus is on applying psychological processes to diverse work behaviors with contributions to theory building and methodology.

Adenike Eunice Amoo's work intersects the disciplines of microbial ecology and terrestrial ecosystem ecology. She works on plant-microbe interactions in terrestrial biomes and how these interactions promote plant growth. She is also interested in how spatiotemporal heterogeneity influences ecosystem functioning.

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African Women Scientists' COVID-Related Experiences

Inutu Katoti is a scientist pursuing an MSc in electrical engineering and renewable energy systems at the University of Leeds in the UK. At undergraduate level, she studied for a BSc in physics at the Copperbelt University in Zambia. Her passion for the progress of science and technology is what motivates her to take on the aforementioned courses, and she has keen interest in green energy. Part of her undergraduate research paper was used at an interdisciplinary workshop on renewable energy solutions for rural Zambia at the University of Zambia in November 2019 with Oxford University, University of Capetown, Kwame Nkrumah University, Mulungushi University, Copperbelt University, and the host university. Her current software-based project is to model and simulate a hybrid DC/AC microgrid with a focus on control strategies.

Hazel Tumelo Mufhandu is a medical virologist, senior lecturer and microbiology deputy subject group leader at the North-West University (NWU), South Africa. Her research area is currently focused on HIV/AIDS, Hepatitis, and COVID-19 research. She has co-authored several peer-reviewed scientific publications and has reviewed many dissertations and theses from various universities, grant applications, manuscripts, and book chapters for publication houses such as Elsevier-Heliyon, Journal of Water and Health, and CRC Press—Taylor & Francis Group. She is also a recipient of several awards including: Clinical Excellence Merit Award at the 6th South African AIDS Conference, presentation distinction at the 5th International AIDS Society Conference, and Namibia's top publication of the year in 2004. She serves on the South African Health Products Regulatory Authority (SAHPRA) for Quality Manufacturing and Control of Complementary Medicine.

Helen Orisaghe Imarfidor is a member of the Organization for Women in Science for the Developing World (OWSD, National). She is a graduate of the University of Portharcourt, Rivers State, Nigeria. She was a director of community service, University of Portharcourt (2016–2020) and a member of the editorial board for the agriculturist journals. She received the best graduating student award in 92 and 2003 classes. She won the MacArthur Foundation fellowship (2005). Her dissertation was on the effects of the Nematodes (*Radopholus similis* and *Meloidogyne incognita*) on Bananas (*Musa* sp.) Cv agbagba. She is a commonwealth scholar (titular fellowship) 2012.