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NeuroView

COVID-19, stress, and inequities in (neuro)science

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The COVID-19 pandemic has posed major challenges for diversity, equity, and inclusion (DEI) efforts in research and academia. As chairs of the ALBA Network, we reflect on how the pandemic has exacerbated, and also shone a spotlight on, inequalities in science and society.

Introduction

We are writing this piece almost 1.5 years since many countries went into lockdown in March 2020 in response to the coronavirus disease 2019 (COVID-19) outbreak. The pandemic has brought major disruption to research programs and higher education, as well as to the daily lives of researchers and academics. The shock of such an unprecedented crisis also brings high stress levels, and its consequences are not equitably distributed throughout society.

The ALBA Network

The ALBA Network is committed to improving equity and diversity in brain sciences. It was created in 2018 in recognition of the long-standing problem of underrepresentation of women and racial, ethnic, and other minorities in the global neuroscience community (<https://www.alba.network/>). The name was given to evoke dawn (the meaning of “alba” in several Latin languages), the emergence of a new light and energy capable of promoting a collective change toward a bright diverse, equitable, and inclusive (DEI) future in brain sciences. ALBA was founded within the context of the Me Too and Black Lives Matter movements and the growing awareness and discussion of contributing factors to underrepresentation. It also emerged in recognition of the fact that although the specifics of underrepresentation vary by scientific field and by geography, equity and diversity are a global issue. Initially developed and embedded within the Federation of European Neuroscience Societies (FENS), we subsequently partnered additionally with the Society for Neuroscience

(SFN) and the International Brain Research Organization (IBRO). ALBA was created by brain scientists in part to focus on inequities within neuroscience itself but also because of the unique perspective that neuroscientists bring to the topics of cognitive biases, social behavior, and mental health aspects of DEI.

ALBA was created as a network, with the goal of fostering personal and professional links for women and underrepresented individuals working in brain research. Establishing long-term connections with colleagues is important for career development in general, and particularly for neuroscientists, given the growing level of interdisciplinarity in our field. Our work is rarely the result of isolated efforts; it requires collaboration and exchanges of knowledge with other scientists.

Very early after its inception, ALBA's goals expanded beyond fulfilling this networking mission to develop a structured association aimed at developing a broad set of actions toward promoting equity and diversity in the brain sciences. The network was officially launched at the FENS Regional meeting in Belgrade in July 2019. In 2019 and early 2020, ALBA hosted several networking events at major neuroscience conferences; created a series of webinars and videos discussing global diversity issues and highlighting success stories of individuals and organizations; established international awards for DEI efforts; engaged in advocacy with policy makers, funders, and institutions; and curated a centralized resource of existing data on bias, underrepresentation, and effective strategies.

And then the pandemic hit.

Consequences of the pandemic for neuroscientists

The COVID-19 pandemic came at a critical time when the voices of minorities and underrepresented groups in research and academia were progressively becoming stronger, and it brought with it considerable new obstacles for these communities. Research productivity and career development have been jeopardized by “painful” and long-lasting restrictions to laboratory access and essential resources imposed from the early days of the pandemic. Many lengthy projects had to be aborted, animals sacrificed, clinical studies interrupted, amounting for countless losses and, eventually, leading to critical funding shortages. The pandemic has been especially detrimental to bench scientists and to scientific domains, including neuroscience, which rely on longitudinal experiments and/or model organisms that require lengthy breeding schemes. Even within neuroscience, however, the consequences of this unprecedented crisis have not been equitably distributed.

It is now clear that the pandemic has taken disproportionate tolls on underrepresented researchers in science, hampering their work productivity and career development well beyond the 24% average productivity loss estimated for United States- and Europe-based medical research overall (Myers et al., 2020). Several studies have indicated that women—especially those with family care responsibilities—have been substantially more affected than men in their ability to submit papers and grant



proposals, comply with deadlines (Myers et al., 2020), and attend conferences. Similar effects have been reported for scientists from racial and ethnic minorities (Carr et al., 2021). These challenges are likely to have been further amplified for those at the intersection of multiple underrepresented identities (e.g., women of color).

The differential impact of the pandemic largely reflects a magnification of existing baseline inequalities. The pandemic has exacerbated pre-COVID baseline inequalities in funding, mentorship, and networking opportunities (Carr et al., 2021). The loss of work and resources imposed by halted projects has particularly endangered the fate of the smaller research programs that researchers from underrepresented groups tend to run (for a report on the US NIH racial and ethnicity funding gap, see <https://diversity.nih.gov/building-evidence/racial-disparities-nih-funding>). Salary cuts and hiring freezes triggered by the pandemic have also particularly affected the capacity of these researchers to continue their academic careers. Furthermore, an “infrastructure divide” is further contributing to global inequity. Remote working during COVID-19 brings an expectation that individuals possess access to high-speed internet and sufficient space and computer resources at home to be able to accommodate needs from the whole family. This has put researchers from developing countries and underprivileged socioeconomic backgrounds at an obvious disadvantage. Even the potential benefits associated with increased numbers of online talks, conferences, and virtual networking opportunities are not necessarily truly accessible to all.

Another cause for this disparity in productivity lies in the outsized share of non-research tasks that women and minority researchers undertake—an imbalance that has expanded during the pandemic. This has been clearly the case at home, where women have been disproportionately exposed to additional duties during the extended, challenging periods of home working and schooling, on top of their already larger share of caregiving and household duties. In addition, many of us have experienced an even higher load of “service” demands in the workplace (e.g., in the form of men-

toring, committee serving) than usual, compounding the existing workload disparity, or so-called “minority tax,” experienced by underrepresented scientists (Guarino and Borden, 2017). In particular, because of the early detection of this disproportionate impact of the pandemic, many women and minorities have devoted increased time to DEI activities, multiplying the already high load that this “double duty” impinges on underrepresented scientists. Unfortunately, the inequitable time invested is not the only problem here, as these community services are typically underappreciated for career evaluations and promotion. In order to cope with all these additional commitments over and above our primary duties, such as running the lab and adapting to online teaching or conference participation, many of us have been devoting substantial overtime, even beyond our crazy pre-COVID schedules, resulting in accumulated stress and fatigue. Ultimately, these burdens on time and energy not only are detrimental for productivity and career progression but also can have major consequences on health and well-being.

Stress

The potential negative impact that stress, prompted by the pandemic, may have not only on individuals but on diversity, equity, and inclusion in scientific research in general is a major concern. Stress can affect cognition and behavior, including decision making and social behaviors (Sandi and Haller, 2015). It is, therefore, a critical factor in how we respond, both as individuals and collectively, to the pandemic. Although in the short term the (neuro) physiological changes triggered by stress can help us to activate energy resources to cope with all the added demands, when long-lasting, stress can trigger or exacerbate physical and mental health problems (e.g., from cardiovascular disorders to anxiety and depression).

Since the beginning of the pandemic, society at large has been continuously exposed to new and constantly changing stressors: the threat of infection by the SARS-CoV-2 virus itself; COVID-19 illness for many, sometimes involving long symptoms; enduring periods of isolation or limited social contact; restricted mobility; etc. Furthermore, uncertainty it-

self is an important source of stress and, over time, leads to anxiety. The pandemic has brought unprecedented uncertainty: uncertainty regarding working arrangements and the progression of the pandemic, uncertainty with regards to our own health and of those close to us, and uncertainty elicited by newly emerging SARS-CoV-2 variants. At the moment, despite the improvement that rapid vaccine deployment has brought to our social and working lives, the fate of the pandemic and the future ahead is still not clear. We are currently in the middle of a race between global vaccination campaigns and the emergence of new, highly transmissible, and potentially more dangerous variants. Thus, despite the optimism generated by the effectiveness of the vaccines, we again find ourselves amid considerable uncertainty as to what the fall and winter—and then the upcoming years—will bring. Consequently, mental health problems are rising in the general population and are expected to continue to rise in the future (Holmes et al., 2020). Importantly, stress affects individuals differently.

There is evidence that minority communities are experiencing enhanced psychological distress, anxiety, and depression during the pandemic (Gonzales et al., 2020). This is likely due to both higher stressor load and increased vulnerability. Anxiety is a strong risk factor for the development of stress-related disorders (Weger and Sandi, 2018). Owing to discrimination or other causes, women, ethnic minorities, and lesbian, gay, bisexual, transgender, and asexual (LGBTQA+) individuals generally show higher rates of anxiety and depression and, accordingly, a particular vulnerability to life stressors (Yarns et al., 2016; Mekawi et al., 2021). Importantly, stress undermines self-confidence particularly in highly anxious individuals (Weger and Sandi, 2018), which may contribute to a competitive disadvantage in work-related settings.

Moreover, as discussed in the previous section, underrepresented researchers have been subjected to additional, different, and tougher threats and, therefore, exposed to a higher stressor load. The stress engendered by these challenges, demands, working hours, and fatigue can lower the capacity to progress

with complex tasks, such as project management and grant proposal and paper writing, that require dedicated time and concentration, contributing to a perpetual feeling of under-accomplishment that many recognize as a new part of our “new normal.”

A sense of urgency for ALBA

Like organizations worldwide, the ALBA Network itself was dramatically affected by the pandemic. Initially, we scrambled to convert previously planned events, including sessions at major 2020 conferences, to online formats. It also soon brought new opportunities, as global adoption of virtual meetings and talks substantially expanded ALBA’s global reach, along with the accessibility of global science, for many. The opportunity to connect in depth with ALBA members and global partners and communities all over the world also underscored shared global challenges.

By late spring of 2020, it became clear that the pandemic’s impact on ALBA would extend far beyond operational considerations. The unequal distribution of the societal burden of the pandemic had personal consequences for the ALBA team; at the same time, it brought a nearly frantic sense of urgency to ALBA’s mission of making brain sciences more inclusive.

The increased focus on DEI during the pandemic reinforced the need for coordinated efforts to combat global inequities and promote inclusion and diversity worldwide. In an attempt to crystallize ideas that had become part of mainstream DEI thinking in many places but were still controversial in others, in January 2021, with our homeschooled children in the background, we launched the ALBA Declaration on Equity and Inclusion (<https://www.alba.network/declaration>). Originally conceived at an ALBA team meeting in early 2019, the declaration was drafted as a collective effort, in coordination with many individuals and groups of neuroscientists active in DEI. The goal

was to create a single, brief document that was both actionable and general enough for global relevance. Its highlights include best practices for making hiring practices more equitable, the importance of identifying concrete goals and data-driven approaches to monitoring progress toward them, and strategies for establishing transparent career structures. Although it is not binding, the hundreds of institutional and individual signatories of the ALBA declaration have publicly signaled their commitment to achieving equity, diversity, and inclusion within their communities. Importantly, the declaration not only emphasizes resources to overcome barriers imposed by implicit biases and increase diversity by the numbers but also provides a set of guidelines for establishing healthy and inclusive workplace cultures—a crucial aspect in improving the lived experiences of underrepresented individuals in science.

Conclusion

Although there are many reasons to worry about the ways the pandemic has exacerbated inequality in science and academia, the pandemic has, ultimately, heightened awareness of DEI issues in our community, bringing them—finally, in many places—out of the fringe and into the mainstream. The visibility of powerful new movements like Black in Neuro, Queer in Neuro, and others around the world has already made a positive impact and sparked crucial dialogues. Moreover, the emphasis on networking and nurturing positive group identity that the ALBA Network and many of these organizations provide may serve a protective role and contribute to reducing stress and anxiety (Williams et al., 2012). One concrete consequence that has already emerged is the implementation by several leading organizations of rapid measures—such as creation of DEI committees and offices where they did not exist; redefining hiring and promotion guidelines to improve diversity; establishing diversity-targeted funding programs—to acknowledge and dismantle

barriers and biases and improve career opportunities for underrepresented scientists. There is hope that these positive actions, if accompanied by sustained, coordinated commitments of institutional leadership and resources, may ultimately promote real, structural change.

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