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MAJOR CHALLENGES BEFORE LIFE SCIENCES RESEARCH COMMUNITY IN THE WAKE OF THE COVID-19 PANDEMIC

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Abstract : Life Sciences Research has played a pivotal role in addressing the health issues of society since the inception of human civilization. In the 21st century, the onset of COVID-19 pandemic has taken the world by storm. The challenges are galore, amidst which the human beings struggle to save their lives. The pandemic has paralysed the normal public life and functioning of different institutions including academia and research. The research community feel stressed as their professional life has been disrupted. Major research activities have been put on hold and alternatives are being explored for timely completion of scientific projects. The funding institutions have changed their priorities and COVID related research is being sought for funding. Non-covid related research suffers. Women researchers have majorly been relegated to the receiving end as their research and publications work have suffered heavily. Covid-19 isn't just altering everyday's life, it is also pitching human brain's exploration, As universities across the countries go virtual, researchers are groping to save their samples and data. In a rush for data, thousands of articles, news reports and blogs have been published, though maximum lack scientific credibility. History has proven time and again that research in life sciences has laid the foundation for treatment of various diseases. The onus is now on the Life science researchers, scientists and medical professionals to navigate the pathway for drug/vaccine discovery and save humanity from this deadly disease.

Key words: Life Sciences research, Covid-19, pandemic, challenges, women researchers, research funding.

INTRODUCTION

Life Science is the branch of science which deals with the study of living organisms inhabiting the earth. Today, Life science research has unravelled multiple facets of life existing on this earth and thus this area of study and research has been divided into various branches: Cell biology, Ecology, Biochemistry, Microbiology, Biotechnology, Molecular Biology, Chemistry, Developmental Biology, Environmental management system, Physiology, Bioinformatics, Evolution, Immunology, Zoology, Anatomy, Biophysics, Genomics, Biodiversity, Bioengineering, Botany, Applied Biology and Genetics. The growing needs of the ever increasing population of the world provided an impetus for an extensive research in the field of Life Sciences. When we look back into the past we find that Life Science has been the foundation of human life since the dawn of civilization. From using animals as food to cultivation of crops, Man explored yeasts for making bread to the fermentation techniques for brewing & cheese making, embarking in the field of biotechnology. The output of research in life- sciences shows the inquisitive nature of human beings to explore its environment for its own and the well- being of society.

Scientists of the 21st century found Biotechnology- a branch of life science, as a dynamic area in which unique capabilities of living organisms are applied to solve contemporary societal problems. The research in biotechnology and other allied areas of life- sciences were moving ahead in a fast pace until COVID-19 pandemic shook the world and brought it to a halt. A peek into the historical records shows that the infectious diseases turning into a pandemic have threatened humans since neolithic age (around 12, 000 years ago), the period when human hunter-gatherers settled into villages to domesticate animals and cultivate crops (Dobson and Carper, 1996). The change in man's living from hunter- gatherers to agrarian societies have promoted the spread of infectious diseases. The expansion in cities, territories, trade leading to increased travels have raised the chances of emergence and spread of infectious diseases leading to outbreaks, epidemics and pandemics (Lindahl and Grace, 2015).

The pandemic Covid-19 or the coronavirus disease caused by the virus SARS-CoV-2 has spread like a fire and the governments across the world have been forced to impose lockdowns as a preventive measure to control the spread of this disease. The pandemic has presented unparalleled challenges to public health, food systems and function of various institutions of the world, one of them being academia and research. The current paper highlights the challenges before the academia and research community of Life

Sciences in the wake of COVID-19 pandemic.

MAJOR CHALLENGES

2.1 Research and Publication:

Research in life-sciences involves wet lab, clinical trial and field experiments. Owing to the lockdown, the institutions and labs had to be closed and the scientist's movements have been restricted to their shells. Although, interventions in research is primarily required to fight off this pandemic, however, most research groups around the world have had to either stop or modify their activities (Mendoza et al., 2020). Due to distancing and disease transmission issues, most non-covid clinical research had to be suspended. It has been reported that during the initial months of the COVID-19 pandemic, the rate of clinical trials that were stopped increased significantly compared with pre-pandemic era (Gaudino et al., 2020). This was a great cause of concern. Clinical trials are one of the most significant part of any life science research.

Even the wet lab experiments faced challenges. The social distancing guidelines limited the presence of more number of researchers at the same time in a laboratory and it is difficult for researchers to work from home. Absence of skilled personnels at core facilities and instrumentation centres like sequencing, NMR/Mass spectrometry, scanning/transmission microscopy, plant tissue culture, animal care facilities have posed major issues. There was an apprehension that suspension of such activities may result in stress and other psychological problems of the scientists. Completion of a particular project, the finances associated with it and related future career opportunities are some of the major challenges a researcher was confronted with. In the life science research community, there were reports that life science research related hiring has been stopped because of the pandemic and the travel restrictions associated with it. This was disheartening for the young life science researcher whose future aspirations in research was de-escalated. It was therefore appealed to the academia and scientific community across the globe to utilise the time of lockdown in writing articles for journals, getting the pending articles published and to do research and write articles related to COVID-19 for the cause of the society (Brown et al., 2020). The Wellcome Trust called upon publishers, funding agencies and scholarly societies to support concerted efforts of scientists and researchers who share urgent research related to pandemic (<https://wellcome.org>). Lit Covid, an open resource literature hub has been developed to curate the most comprehensive collection of international research papers so far on the new coronavirus disease COVID-19 (Chen et al., 2020).

2.2 Gender Disparity

Gender disparity has been observed in the first wave of COVID-19. There has been a significant decline in women's research production during coronavirus pandemic (Vincent et al., 2020). A study by women economists have reported a 12% drop in production of pre-prints and registered reports in March 2020 and a 20% reduction in April. Reports indicate that male authors on popular pre-print repositories, arXiv and bioRxiv increased at a greater rate than women authors who were submitting during these months (Gabster et al., 2020). A similar trend has been reported in submission of data by Journal editors. Lower rates of submission from women researcher for March and April, 2020 were observed than the preceding two months in 2020 and the same two months of 2019. Women in first author positions have experienced a larger reduction than their last author counterparts.

Covid related research is the best indication of work that has been rapidly conducted in response to the pandemic. It is here where one can gauge the greatest loss of early career women, as demonstrated by their lower contribution on this topic. For many researchers, the relaxation from teaching and administrative activities owing to lockdown means more time for independent work. Such situation for male researchers were favourable, however, the same does not apply to women researchers. Being confined to home, the women were loaded with household chores and taking care of their children, as the schools were running in virtual mode. Hence, it is likely that women researchers might not have found enough time for paper writing. Many parents wrote letters to the journal, 'Science' highlighting the constraints on mothers who pursue academic careers. The academics with young children are experiencing tough times and it is the women who is carrying the major load. Gender inequity in science is an urgent issue (Shannon et al., 2019) and Covid-19 has only magnified this problem. Even under normal circumstances, the women scientists faces particular bias and Covid has further elevated it. The U.N. Policy report published in April 2020 states that the pandemic has deepened pre-existing inequalities, exposing vulnerabilities in social, political and economic systems. At home, the task of household chores, childcare, preparing food for the youngsters who would normally be at school, looking after sick family members falls disproportionately on women.

Increasing the participation of women researchers is crucial to fight against the virus as science has always benefitted by active participation of both gender. Extending support like extension of project deadline, special grants for female researchers, relaxation from administrative duties are some of the steps which the institutions may adopt for encouraging women scientists.

2.3 Funding

The global impact on the economy owing to the outbreak of Covid-19 may significantly affect the research funding. The funding agencies may prioritise pro- Covid research and give less importance to non-Covid research.

With the imposition of lockdown and suspension of trade and business worldwide, the governments across the world are already facing budget constraints. In these pandemic times, the public health system needs utmost attention. Hence, it is tough to pool funds in basic science research in this recession period.

The disaster and subsequent pressure built upon the health infrastructure may force the funding agencies- public and private sectors alike to support covid related research to maximum. However, it is important to realise that funding non-covid research is equally important for the benefit of science and humanity. The basic science research infrastructure has suffered and there has been a massive loss of research samples, plant culture, microbial cultures etc. Maintenance and continuation of experiments, recording of data, subcultures, field transfer, acclimatization and many similar experiments have been suspended. Recovering those samples and starting the experiments afresh requires fresh infusion of funds. If not more than pro-covid research related topics, at least the existing allocation of funds should be maintained.

It is anticipated that the Government, other public and private funding agencies will delve deep into the outcome of various facets

of life sciences research in face of challenges posed by COVID-19 and provide financial support for the same.

2.4 Conferences, Seminars and Workshops

Conferences, Seminars and Workshops provide a platform for interacting with researchers and scientists from different parts of the world. They provide an opportunity for collaborations and developing interpersonal linkages amongst the researchers. The exchange of ideas and discussion on multiple area of research, broadens the thinking horizon of a scientist and provides an impetus for further research. The confidence, motivation and awareness which is gained in conference, workshops, seminars is unparalleled. Covid-19 pandemic has suspended all the aforesaid activities. The researchers and scientists have explored the opportunities in Information Technology and tried to bring the researchers across the world on a single platform through webinars. Though, the webinars cannot replace the physical conferences, seminars and workshops, however, they have provided an alternative in times of pandemic. The webinars have helped the researchers to connect virtually and remain in touch with the research community.

CONCLUSION

Covid-19 has thrown multiple challenges before humanity. However, challenges often can be converted into opportunities. It is undoubtable that Wet Lab research has suffered but this moment can be utilised to look around in our surroundings and explore our nature. There are multiple facets in our ecosystem which needs to be explored. Research needs deep thinking and reasoning. The current lockdown period gives the busy scientist a moment to pause and think over the existing problems in our society. Information Technology is to be utilised maximum to remain interconnected with the research consortia. Gender Equality in science, medicine and global health has always remained a challenge. COVID-19 has further augmented it. Special grants should be given to women scientists to pursue further research in Life Sciences. The scientific society has to learn to survive in this tough time of pandemic and explore alternatives and innovations to protect all living beings for a viable and balanced ecosystem.

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