

Global Survey Report on Research Labs

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During the initial months of the pandemic last year, scientific research conducted by researchers across the global had to be paused indefinitely. However, fast forward a year later, as the situation is gradually returning to normalcy in many countries, the overall research situation has also slowly but steadily improved, including the re-opening of research laboratories (labs).

Re-opening research labs is not an easy task though, especially amid the current pandemic. Several precautions must be kept in mind while entering, working, and leaving lab premises. Besides individual precautions, prior to re-opening, labs also have to be well prepared for any emergency that may arise when researchers restart work again. Although several labs continued to operate during the pandemic, researchers have had to keep in mind safety guidelines and social distancing protocols while continuing lab work. Some other challenges faced by researchers include unavailability of samples, delayed delivery of samples, funding issues, and so on.

Enago, a global leader in editing and publication support services, as part of its **Global Research Risk Assessment** initiative, had conducted a survey to understand how researchers all over the world are working in laboratories and highlight the changes implemented to undermine the pandemic effect. This survey aims to identify the impact this pandemic has had on research laboratories, globally. It would also enable us to have a better understanding of the preparedness of the laboratories and the modified measures taken exclusively to continue research during these times.

The survey was conducted from October 20, 2020 to February 28, 2021. Overall, the survey findings represent around **1400 researchers** across **40 countries** globally. The results of the survey are highlighted in this report.

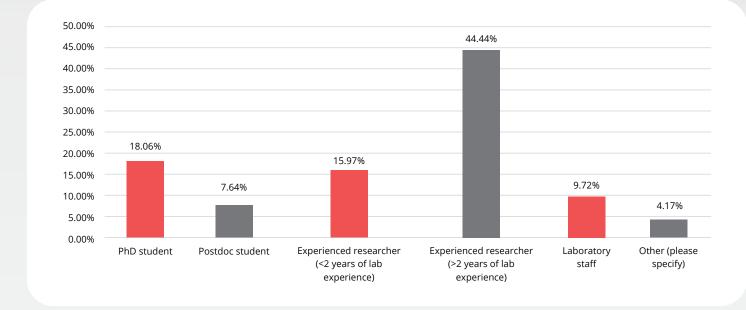


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RESEARCHER DYNAMICS

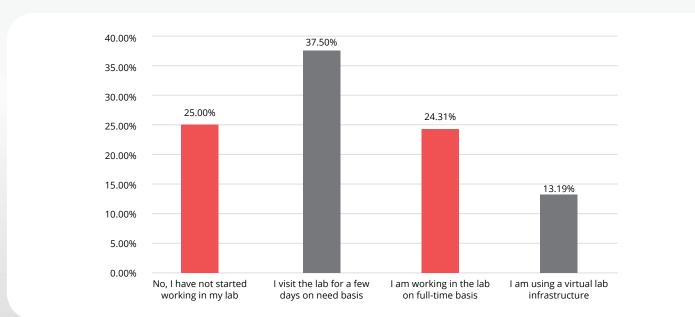


Q1: Please choose the profile that you most identify with

Over 60% of the survey respondents identified themselves as **experienced researchers with moderate to good lab experience**. About 26% of the participants were **doctoral students** (i.e. PhDs or post-doctoral fellows). The rest of the survey attendees included post-graduate students, laboratory staff, directors, and university deans.

Takeaway:

A significant number of participants belonged to the actual target user group identified for this study. This should give a fair understanding of the challenges faced by these working academics during the current global crisis.



Q2: Are you currently working in your lab as usual?

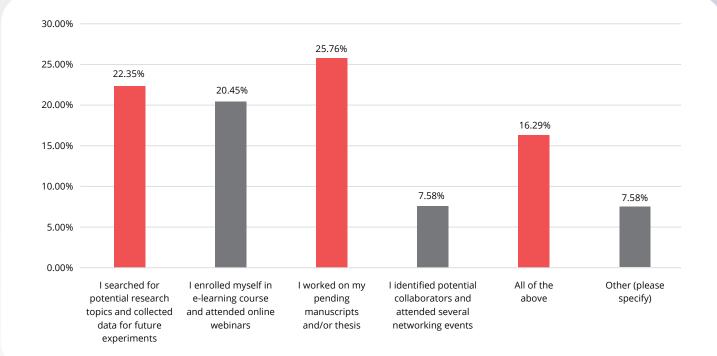


A majority of participants (62%) used their labs either on a full-time basis or on an individual-need basis for a few days. About 25% researchers have not yet resumed work in their respective labs while a small percentage of researchers (13%) continue to work remotely through virtual lab infrastructures.

Takeaway:

With the second wave of the outbreak resurfacing in many countries, the lockdown measures put in place by several governments have had an effect on the lab activities of researchers. This led to only critical research being carried out in labs under the current circumstances. Universities and research institutes, therefore, had to allow researchers to carry on their work in shifts more often than not, as a precautionary measure.

Q3: How did you use your time when research labs were non-functional? Please mark all that apply



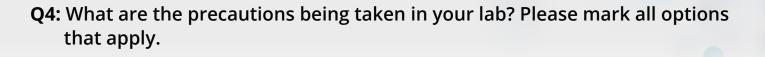
A small majority of researchers (26%) used the downtime to work on their pending manuscripts or thesis. Some other researchers utilized the time to search for potential research topics (22%), upskilled themselves through e-learning courses and online webinars (20%), identified potential collaborators and attended several networking events (7%).

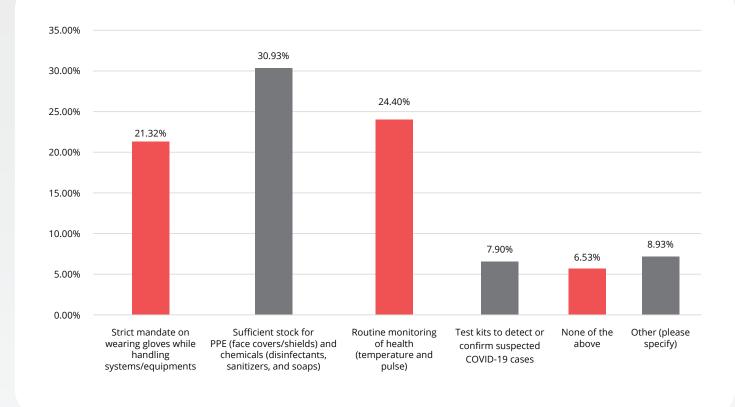
Takeaway:

Researchers across the globe used their time in different aspects of learning and publishing, although a small number of researchers in a few countries continued working in their labs without any restrictions. In a bid to stay productive despite disruptions, a few researchers contributed in peer reviewing of research papers, conducted online classes, and took care of administrative tasks.



PREPAREDNESS OF RESEARCH LABORATORIES





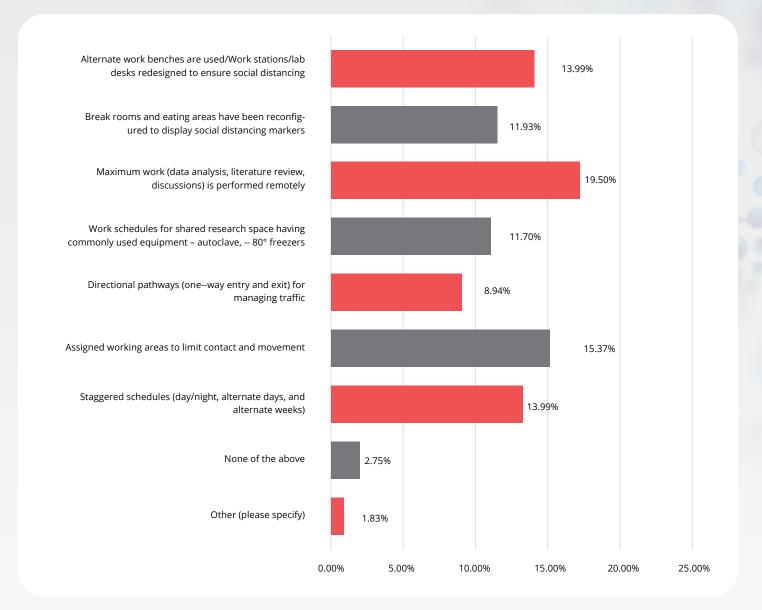
The most common precaution taken by research laboratories was ensuring that there was sufficient stock of PPE kits and sanitization materials available for researchers who continued to use the labs for research work (around 31%). Regular monitoring of researchers' health vitals like temperature and pulse (24%) was also another important precaution undertaken by laboratory management. Some other measures included remote only working, strict sanitization (hand washing and disinfection) and social distancing protocols, restricting the number of people in labs, and free COVID-19 tests for researchers to name a few (around 9%).

Takeaway:

Research laboratories that continued to function despite lockdown restrictions had to follow several stringent biosafety guidelines and protocols, which included those mentioned above to ensure the well-being of its lab members.



Q5: Which of the following initiatives has your lab taken for maintaining social distancing norms? Please mark all that apply.



A significant number of survey respondents (about 20%) continued to work and perform their daily duties remotely. Around 15% mentioned that their laboratories had marked and assigned specific work areas within the lab as a means to limit contact and movement of researchers. Approximately 14% participants stated that they had to work in staggered schedules and use alternate workstations in order to adhere to the stringent social distancing norms put in place.

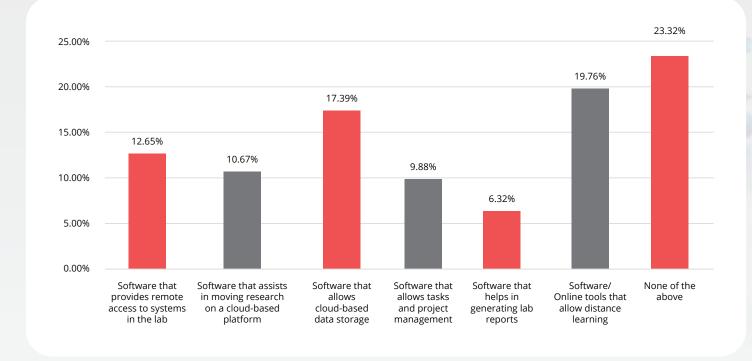
Takeaway:

Apart from the initiatives highlighted above, there were some additional measures put in place by lab management that included online registration before visiting the lab, strict usage of masks and gloves at all times, intense researcher training for biosafety standards and protocols, controlling the entry of external vendors to avoid interaction with researchers to name a few.



TRANSITIONING TO REMOTE WORK AND ASSOCIATED COSTS

Q6: What software have you installed to ease the process of lab research? Please mark all that apply.



Over 76% researchers reported using a variety of software programs in the current situation to help them continue their work remotely. About 23% participants reported that they did not use any particular software programs to assist them in the process of lab research.

Takeaway:

The pandemic has caused a massive shift from traditional working methods to the online domain. The above data shows an increased trend in the use of different software tools to continue virtual work. This may very well continue in future, with a hybrid model.

Q7: What are the names of the software programs you use for your lab work?

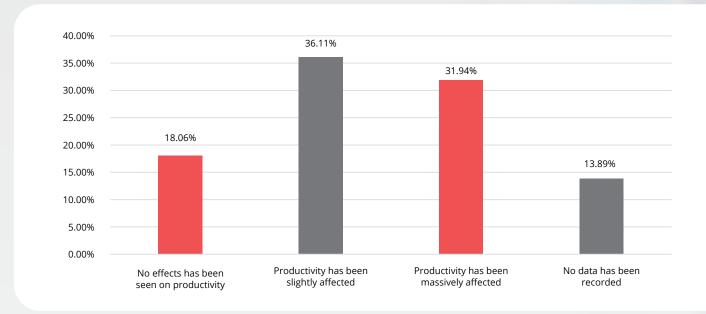
There are a number of tools being used by researchers across the globe for their lab work. Here are some of the programs as per their domains:

Remote Working: Google Meet, Zoom, Microsoft Office, Microsoft Teams, Teamviewer, WebEx, Slack

Research Tools: SPSS, NVivo, Qualtrics, DNASTAR Lasergene, OriginLab, REDCap, Python, OpenSees, SeismoStruct, Statistica, Helicon Focus, Golden Helix, SNPStats, GraphPad, Estatistica

Personal Tools: Evernote, Google Drive, Dropbox, Trello, GanttProject, ImageJ, Image Studio, SciNote, OneDrive, Google Classroom





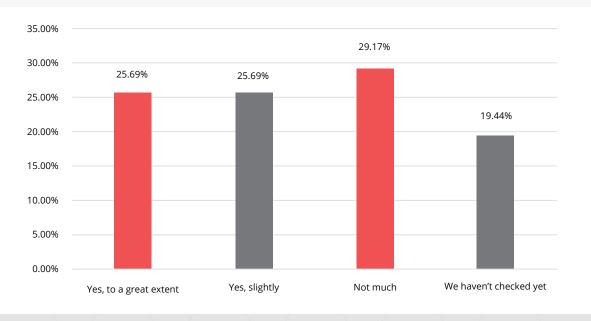
Q8: Has there been any effect on the productivity of lab researchers?

Around 32% researchers stated that there was either no drop in productivity or that no significant data was recorded in this regard. A large percentage of respondents (68%) did see productivity being negatively affected to varying degrees.

Takeaway:

This is in line with the trend noticed across the globe with frequent lockdowns being imposed over the last year that kept affecting the workflow of researchers working remotely as well as those in labs. The amount of COVID-19 focused research has been high, but other areas of research have taken a nosedive thereby affecting overall productivity of researchers.

Q9: Has there been any negative effect on the quality of research?



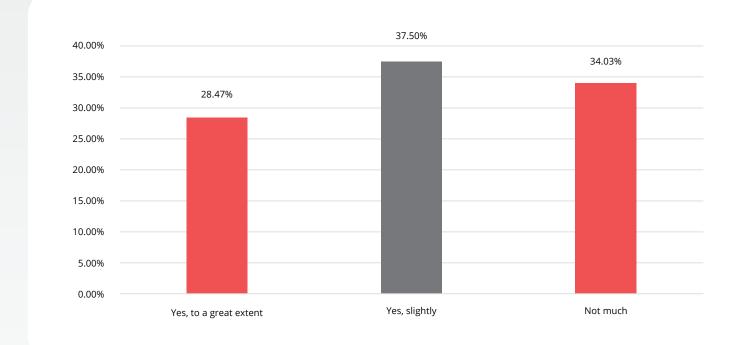




About 51% feel that this pandemic has affected the quality of research in some way. Around 29% reported no major changes in quality despite the various challenges faced by researchers. Furthermore, a sizeable number (around 19%) have not actively looked for problems or gaps in research quality. Further surveys could bring the numbers closer to either of the above two options.

Takeaway:

Over the last one year, majority of the research studies published by researchers were specifically COVID-19-related. On a few occasions, some studies that were made available online led many to question the authenticity and overall quality of the research within them. This data corroborates other similar studies that pointed out a drop in the quality of published academic research.



Q10: Has there been any effect on lab funding?

For about 66% participants, there has been an impact on lab funding to varying degrees because of the current crisis. However, 34% find no major change in funding yet.

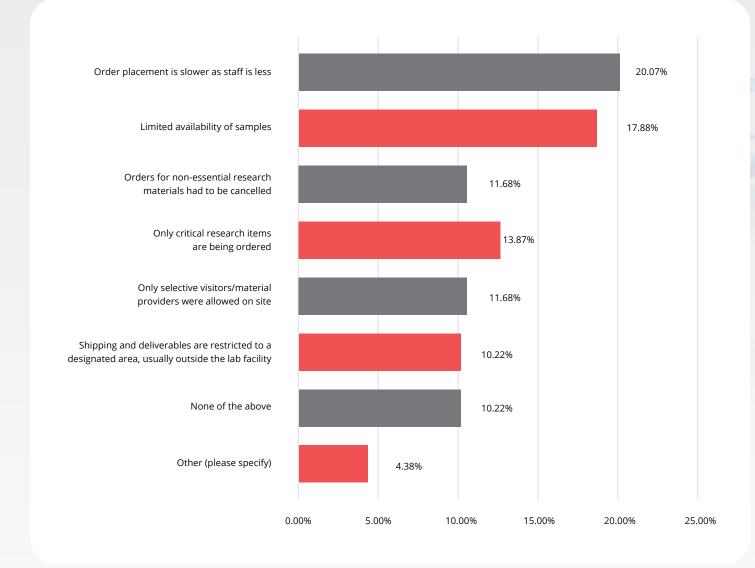
Takeaway:

Initially, at the onset of the global outbreak, many universities and research institutes did not anticipate that this would eventually have an effect on lab funding for research being conducted. Although many top universities/institutes remained relatively unaffected, most others did face budget cuts resulting in limited and restricted access to funds for labs to continue daily operations.



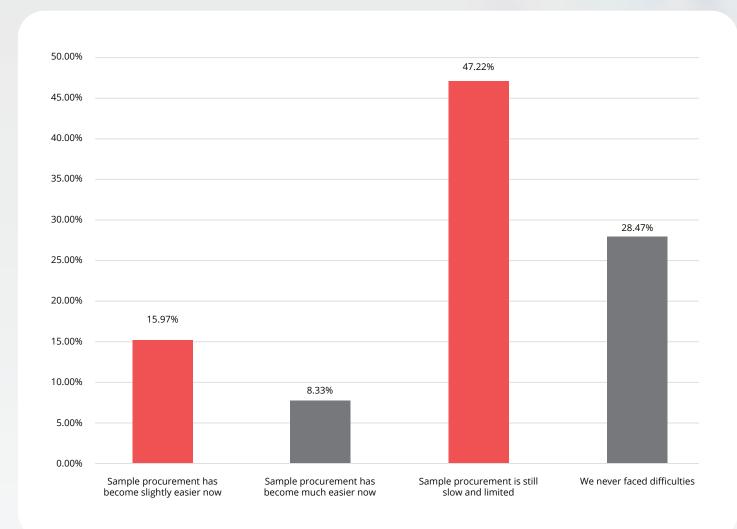
CHALLENGES WITH RESEARCH SAMPLES

Q11: How has the pandemic affected sample procurement for your lab? Please mark all that apply.



Researchers working in labs have had to face difficulties with respect to study samples during the pandemic. One of the major reasons pointed out was due to lesser staff with vendors leading to slower deliveries for orders placed (20%). Some other reasons were the limited availability of samples (over 17%), the prioritization of only critical research items being ordered (about 14%), cancellation of orders for non-essential research materials (over 11%) to name a few. A little over 10% faced no issues in procuring samples for their research. Around 4% participants belonged to other subject areas that did not require samples for their research while some others mentioned that their work was put on hold indefinitely and hence had no need for new samples.





Q12: With lockdown rules being relaxed in several countries, what is the current situation in your lab with respect to sample procurement?

47% researchers felt that obtaining samples was still severely limited and slow despite lockdown restrictions being relaxed in many countries globally. About 24% feel that it has improved and is now easier to obtain samples. Alternatively, around 28% faced no difficulties in sample procurement.

Combined Takeaway:

The pandemic did cause a number of supply chain issues for researchers looking to procure samples for their research as shown by the above data. However, as lockdown measures were relaxed in many countries globally, economies showed the trend of a slow ramp-up to normalcy, which could have led to instances of slow or limited supplies of research samples.



Q13: Is there anything else you'd like to tell us about research sample handling, procurement, processing, or analysis?

Below are some suggestions from researchers on the challenges faced with respect to research samples

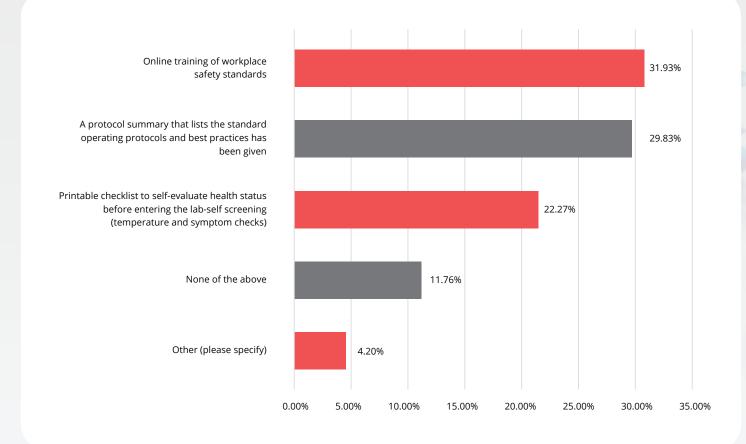
- "Many non-covid materials for lab research is hard or even impossible to come by"
- "No facilities to store samples"
- "Sample collection process has worsened"
- "Switch to as much as possible contactless measurements"
- "An optimized internal flow, sending and processing of samples arriving at the laboratory, must be prepared"
- "In general, we have received institutional support but obtaining samples if it is more difficult"
- "Delay in contracts and payments to investigators"
- "Student training was totally limited"
- "Difficulty searching for stored samples since you could not enter it in a few days"
- "The relationship with students and customers in the lab has become slower"
- "Non-COVID samples coming from hospitals could no longer be collected. We are awaiting regulatory change to continue these samplings"
- "Obtaining samples by other laboratories has been slower because of the difficulty of working in person mainly. From hospital entities, she has been detained for several periods because of the current situation where COVID patient management measures are prioritized"
- "Obtaining samples in and out of the country completely changed when coming from patients, if you do not have the clarifications by the ethics regulation more quickly. Projects with patient inclusion were greatly affected. In addition, the total cancellation of funding in Colombia for projects that do NOT have to do with COVID was enormous and its total impact"

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- "Difficulty inadequately protecting personnel involved in carrying out the tests"
- "Been awfully slow"
- "It was well organized"
- "The sample handling and procurement process has been streamlined"
- "Obtaining samples/biopsies from /as part of surgery protocols programs was almost completely paralyzed"
- "Real-time image analysis was restricted by more than one person, limiting interpretation"
- "Great difficulty in moving to take samples"
- "Difficulty transporting samples"
- "Increased costs of obtaining and transporting samples"
- "Fewer funding opportunities for non-SARS- CoV-2 samples"
- "Many research institutes in my home country are yet to operate fully, as such analyzing some samples are on hold"
- "Only that the global situation has made these steps to be very hard to complete and do properly. Due to everyone's mental exhaustion, things slowed down"
- "The Calaire Laboratory performs calibrations to air quality equipment, it has been difficult to manage for the transport of the equipment"
- "Most researchers at my faculty were dedicated to analyzing previous data, and writing pending papers, which led to an increase in the number of articles but that backup data is running low and there is a lot of anxiety about how to resume data collection work"

LABORATORY SAFETY GUIDELINES AND PROTOCOLS

Q14: How has your lab trained/educated researchers before/right after reopening? Please mark all that apply.



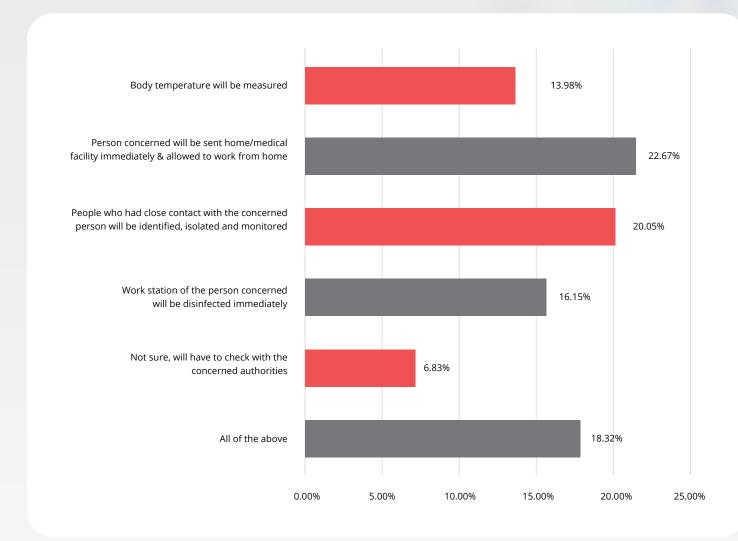
Universities and research institutes had to implement many strict protocols in order for researchers to resume working in their respective labs again. Some of these included online training of workplace safety standards (over 31%), introduction of a summary protocol that lists standard operating procedures and best practices (about 30%), and a checklist for self-evaluating one's health status before entry into the lab (around 22%). Other smaller but equally important measures included compulsory use of a "health app" by respective universities to monitor the health of its researchers and provide the necessary authorizations before entering the labs.

Takeaway:

Lab management had to take careful precautions prior to reopening by ensuring that researchers were made aware of all the necessary biosafety protocols and social distancing guidelines that had to be followed in the laboratory environment to minimize the risk of further spread of the outbreak.



Q15: What facilities are available in your lab if a person suddenly shows COVID-19 symptoms? Please mark all that apply.



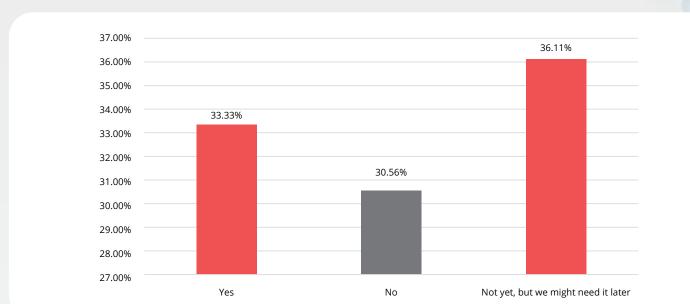
The two most common protocols followed by research labs if a person shows any symptoms of COVID-19 was to send the concerned person home or to a medical facility for treatment or be allowed to work remotely (about 23%) and identify, isolate, and monitor those who were in close contact with the affected person (22%). Another common protocol was to thoroughly disinfect the workspace of the affected person to avoid any further spread. It was also encouraging to note that a number of labs followed all of the above protocols (about 18%) in case any researcher tested positive or showed symptoms for COVID-19.

Takeaway:

This data shows that despite the short timelines to adapt to the new normal, many universities and institutes were quick to implement strong and robust protocols for preventing the further spread of the outbreak while also ensuring that their researchers are kept safe while working in their respective labs.



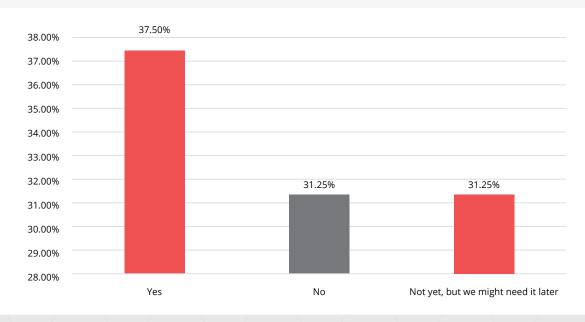
DEALING WITH RESEARCH LAB DOWNTIME



Q16: Do you need assistance in finalizing any lab research documentation for journal publishing?

Although around 67% reported having no assistance needed in finalizing lab research documentation for journal publication currently, about 36% of them felt that they would need help at a later point in time.

Q17: Does your lab need any online training or webinars on research and publishing?





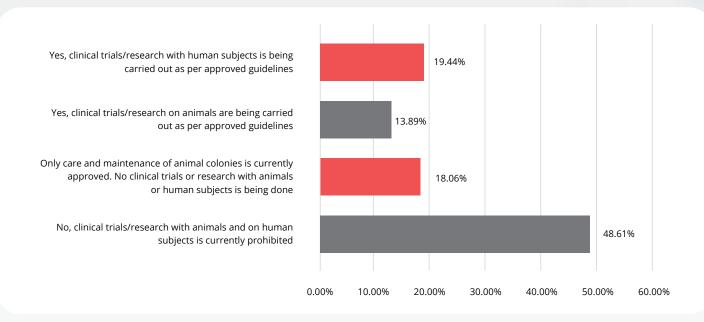
Majority of the respondents (37%) mentioned that they needed online training sessions on research and publishing during the pandemic. A few others did not feel the need for such sessions (31%) while the rest felt that these sessions could be helpful at a later point in time.

Combined Takeaway:

As the pandemic hit research labs, many researchers who had to resort to working virtually felt that they could use their time more effectively either to learn new skills through online training sessions or avail the help of various professional services to assist them in getting their lab research documentation ready for publication.

RESTARTING RESEARCH LABORATORIES

Q18: Has your lab resumed clinical trials/animal studies/research on human subjects?



For the most part, no clinical trials or research on animals and human subjects was carried out (above 66%) in many research labs across the globe. In some other labs (around 33%), research on animals and human subjects continued with strict protocols and as per approved guidelines.

Takeaway:

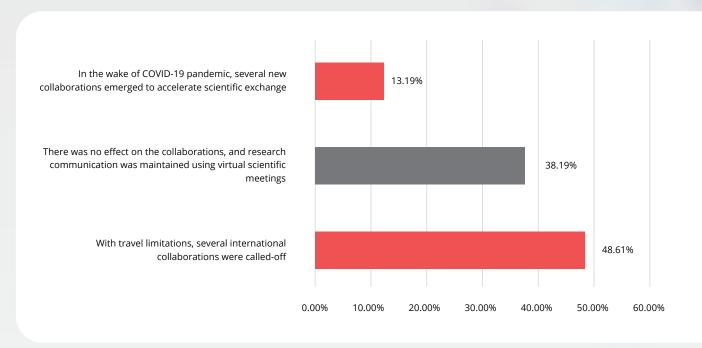
Across major research labs globally, only critical research studies were allowed to be carried out by researchers as per approved guidelines. All other research work was put on hold indefinitely until the crisis improved significantly.



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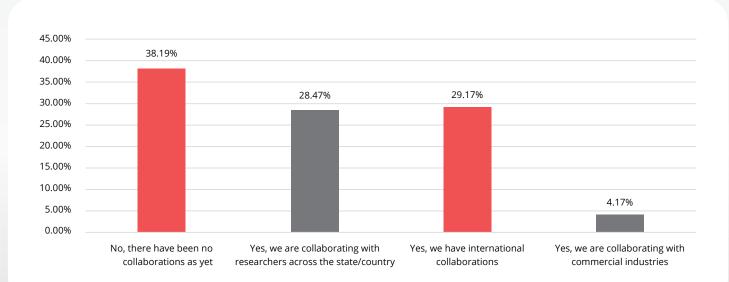
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Q19: What was the effect of the pandemic on pre-existing/established collaborations?



With several countries closing down borders along with travel restrictions and social distancing protocols to be followed, many international collaborations were severely affected and had to be called-off (over 48%). Other researchers did not see the conditions having an impact on their collaborations as most of the communication was now being done virtually (38%). Conversely, a small number of researchers (13%) saw an accelerated growth in scientific exchange and collaborations because of the pandemic.

Q20: Are there any new collaboration plans in sight?



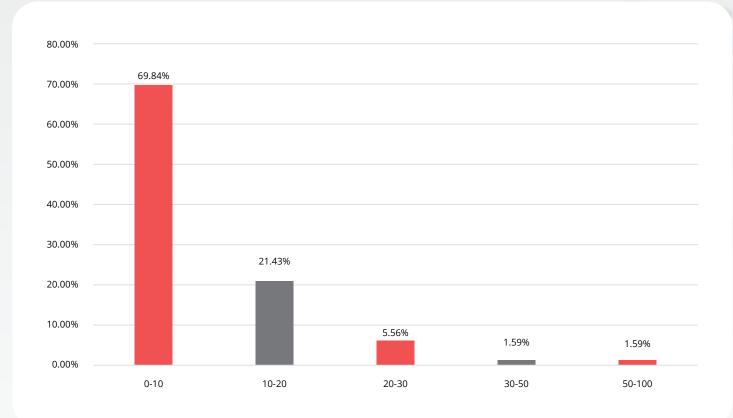


Over 61% researchers agreed that they were eagerly looking to collaborate again either with local researchers or international partners or with commercial industries. Only around 38% felt that there were no concrete plans for collaborations as of now.

Combined Takeaway:

In the initial days of the outbreak, researchers did find their regular workflows and scientific collaborations being significantly affected, however, the current data shows no significant changes with respect to research collaborations despite several initial challenges being faced by researchers globally as they transitioned to an online format.

Q21: Number of people working in your lab currently



Most respondents (about 70%) mentioned that they had mostly less than 10 people currently working in their labs. The next group mentioned that no more than 20 people were working together in a lab (21%).

Takeaway:

This is in line with the restricted number of researchers being allowed to work together in labs with all the safety precautions being adhered to by the researchers.



Q22: It would be great if you could share with us your experiences as a researcher in this year (50-100 words).

Below are some of the thoughts shared by the researchers that participated in this survey to help us get a better idea of their experiences over the last one year of this pandemic:

Learning to Adapt & Innovate

The existence of this pandemic has actually brought the research community closer in many ways, including research. With current conditions, researchers continued to innovate and collaborate between disciplines. Despite this being a difficult phase that dampened the morale of many researchers globally, the transition to an online format was relatively quick across the academic community.

Despite the stressful circumstances, researchers adapted and innovated new ways to establish research studies virtually to stay productive as well as maintain a good mental health. Lab heads continued to encourage their lab members to stay focused and helped them drive their projects to completion. Working in defined shifts became a norm for those researchers who were allowed to continue working in their respective labs with adherence to all safety guidelines.

The flexibility of the scientific process and the possibilities of hybrid modes of operation allowed researchers working remotely to utilize their time in a number of ways such as data collection, analysis, focusing on new ideas and future projects, literature surveys, writing manuscripts/theses, identifying new collaborations, training, preparation of research proposals etc. to name a few.

Challenges Faced by Researchers



Researchers faced a number of challenges in the last one year of the pandemic. Some of them are listed below:

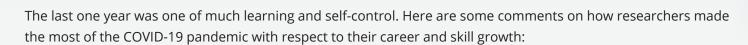
- Lab heads found it difficult to recruit people for their new projects.
- For researchers working in labs, several new precautionary guidelines and social distancing protocols were implemented and enforced to avoid new infections with the virus.





Career Upskilling

- The procurement of chemicals, consumables, equipment, and supplies became difficult. Delivery timelines for most items were slow and delayed. Movement was limited from one place to the other. Chemical companies and related stores were locked down and there were no good facilities to store important samples.
- Although some universities and institutes restarted their labs towards the end of 2020, the second wave of cases forced many of them to stop conducting experiments and work remotely again.
- International collaborations took a major hit for many researchers.
- The search for funding was very limited, as a lot of work had been done on international funding because national funding in most countries was exclusively limited to COVID-19. In 2020, the calls for funding focused only on COVID-19 research and that puts at risk the research of all those who did not work with the virus.
- The psychological repercussions of the current situation on several members in a research group were often not easily managed. Likewise, the promotion of job offers with better wage conditions contributed to the filing of resignations among lab groups.



- "In some ways, it has been exciting to learn to create virtual surveys. It certainly has not been what I imagined, and I do miss the idea of having a community space to work on data entry and analysis with team members."
- "The year started with high expectations but was altered with the advent of Covid. Nevertheless, I was privileged to attend online trainings on writing publication and I attended a conference in person with a team member. I am presently working on publishing a journal publication on an industrial enzyme."
- "I also applied for my PHD program in Biochemistry to increase my knowledge, skill and experience on an enzyme of interest. I am also trying to learn how to use RSM for optimization."
- "I am a researcher is Computer Science. I have been preparing for internships before the pandemic hit. After the pandemic, I have been doing virtual internships and have been collaborating with a few professors in the meantime. All the meetings that I have are virtual and sometimes a lot of meetings leads to fatigue."
- "I'm very happy to share my opinion with you. There is a need for online seminars on the publication of scientific articles, as well as on the organization of scientific projects on an international basis."
- "We also encouraged our fellow lab members to take up online lessons related to STEM."

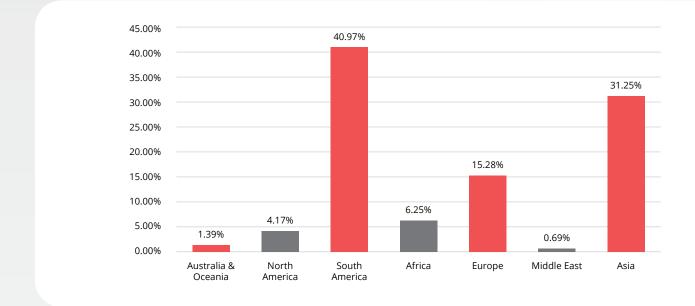




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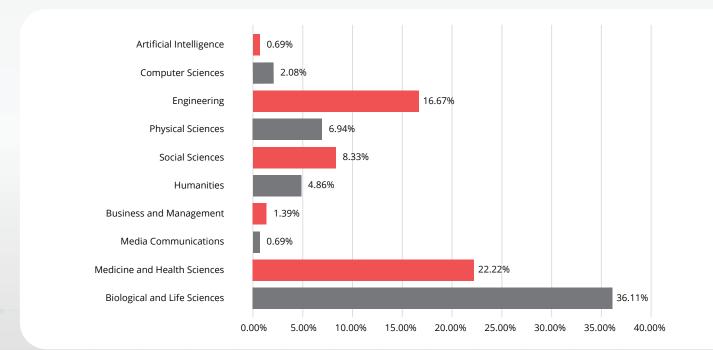
SURVEY DEMOGRAPHY



Q23: In which country are you based?

Our survey attracted a diverse audience group and we received responses from participants across **40 countries** worldwide. The majority (72%) of our respondents belonged to Asia and South America. Regions with the least representation include Middle East and Australia/Oceania followed by North America (total 6%). As next steps, we plan to conduct additional surveys specifically in these regions to derive a comprehensive conclusion.

Q24: What is your primary field of research? Please choose the most appropriate/closest option.





Over 84% of the survey respondents were from a STEM background while 13% were from Humanities and Social Sciences. Additionally, we also had 2% participants coming from non-science fields like Media Communications and Business/Management. This diversity in survey participants should help us identify the challenges faced by researchers across different subject areas.

Takeaway:

This data highlights that most lab work is primarily conducted in the STEM domain. It also sheds light on the differences in lab practices among researchers from other fields and the impact of the pandemic on the daily operations of researchers from these subject areas.

CONCLUSIONS AND NEXT STEPS

- The results of this survey provide interesting insights into the functioning of research labs and the impact of COVID-19 on them. These findings highlight the need to continue exploring further collaborations with universities and institutes to drive a smoother transition as and when most labs restart for normal operations.
- Most researchers that were allowed in labs despite lockdown restrictions had to adhere to strict protocols and guidelines and could conduct their research a few days on need basis only.
- Working remotely provided researchers with the time to catch up on various pending projects and tasks, which as discussed in the report was optimally utilized to make the most of the lab downtime.
- This online format of work also allowed researchers to enhance their skills and aid in their career growth. This was done through participation in several online webinars and scientific conferences where there is a higher opportunity to network with industry experts and possibly identify research collaborators.
- Universities and research institutes were compelled to put in place stringent measures before allowing researchers to restart working in their respective labs. These measures included use of facemasks and PPE kits, social distancing protocols, regular tracking and monitoring of the health of researchers working in the labs, etc.
- An insightful finding from this survey was the impact of the lockdown restrictions in many countries on the supply and procurement of various lab and research samples. This led to difficult times for many researchers who were unable to receive samples in time for when their labs restarted.
- In order to understand the key strategies that will be effective in the post-COVID world, further research is needed. This survey report also highlights the fact that more work needs to be done in driving the visibility of the above challenges faced by researchers and labs in the last year among the scholarly community. In addition, considering the suggestions for improvements by our participants, we find that there is scope to conduct more in-depth analysis on this subject in the coming months.



SURVEY METHODOLOGY

The survey was designed by Enago Academy and made available to users globally in English, Portuguese, Japanese, Korean, Simplified Chinese, Traditional Chinese, Turkish, Russian and Spanish. It comprised 28 questions, including demographic ones, and had a completion time of about 5 minutes.

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Author

Education

(Workshops, Webinars,

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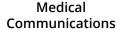


2 million+ authors assisted in 125 countries

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19.4+ years

experience



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