Research Impact & COVID-19:

Federal and Institutional Perspectives

October 21, 2022

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COGR Paper (August): Financial Crisis and "Pandemic Normal" -- Contributors --

Dr. Tanju Karanfil, VPR, Clemson University and **Dr. Melur K. (Ram) Ramasubramanian,** VPR, University of Virginia, provided the conceptual framework for the Research Impact Metric (RIM) Model.

James Luther, AVP Finance & Research Compliance Officer, Duke University, and **Joe Gindhart,** AVC for Finance and Sponsored Projects, Washington University provided a financial compliance lens.

Cindy Hope, Director, Academic Contracts and Grants Administration, Georgia Institute of Technology , **Dr. Sheila Lischwe**, Director of Office of Sponsor Programs, and **Meghan Mullaney**, Director of Data Analytics in Research Division, both from Clemson University, provided editorial support.

Wendy Streitz, President, **Toni Russo,** Policy Analyst, and **David Kennedy,** COGR VP Financial Compliance, provided the COGR support for the paper.

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Financial Crisis and "Pandemic Normal"

Released by COGR: August 25, 2020

- Model for estimating research output loss and financial impact
- Challenges of doing research under the new "Pandemic Normal"
- Advocates for renewed commitment and a substantial infusion of new research investment
- Federal leaders, research institutions, and all stakeholders must rally around the longstanding Federal Government-Research Institution Partnership
- Contact: dkennedy@cogr.edu

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Why this Topic Matters

- The Research Impact Metric (RIM) Model has shown: 1) research output losses between ***20 and 40 percent***, 2) financial disinvestment in the ***hundreds of millions*** of dollars at individual institutions, and 3) potential impact in the ***tens of billions*** of dollars across the entire U.S. research enterprise.
- We are at risk of losing a whole cohort of graduate and post-doctoral students seeking training and education, which includes researchers from underrepresented groups, minorities, women, and junior researchers.
- A new "Pandemic Normal" for how research is conducted has emerged—and inefficiencies are unavoidable.
- Understanding the impact is paramount to maintaining the global competitiveness, technological leadership, and the economy of the United States.

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COVID-19 and the IMPACT COMING to the University Research Enterprise

COUNCIL on GOVERNMENTAL RELATIONS

Tanju KARANFIL
Vice President for Research
Clemson University

Oct. 21, 2020

Division of RESEARCH

Added pressures on faculty

Furloughs/ hiring freeze

International students?

Childcare/ Elderly care

Reduced facility access

Online/hyrbid courses

Funding?

at about

arch?

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Impacts on research

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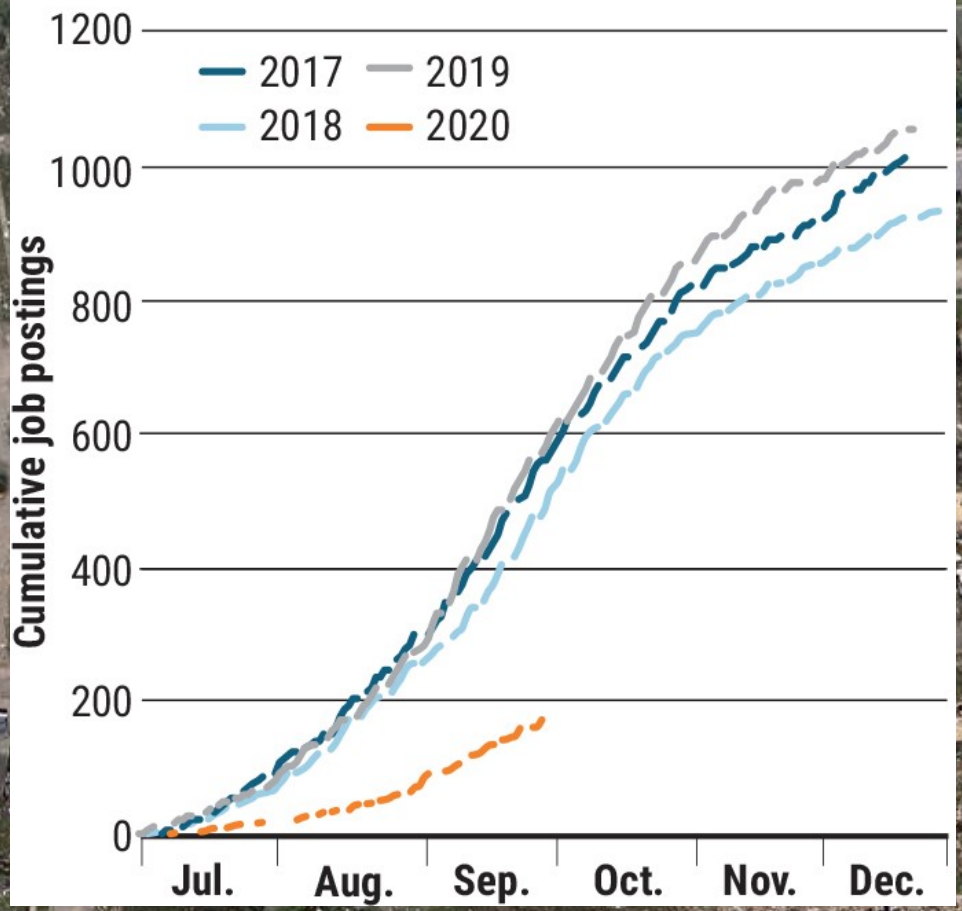
Impacts on research

A slow start

U.S. faculty openings are down 70%, according to an analysis of the *Science* Careers job board. (Gaps reflect days with no new postings.)



Science
Oct 16, 2020

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Facilities reduce operations

44% from prior year

Pre-COVID

During COVID

Revenue

120000
100000
80000
60000
40000
20000
0

January February March April May June July August

2018 2019 2020

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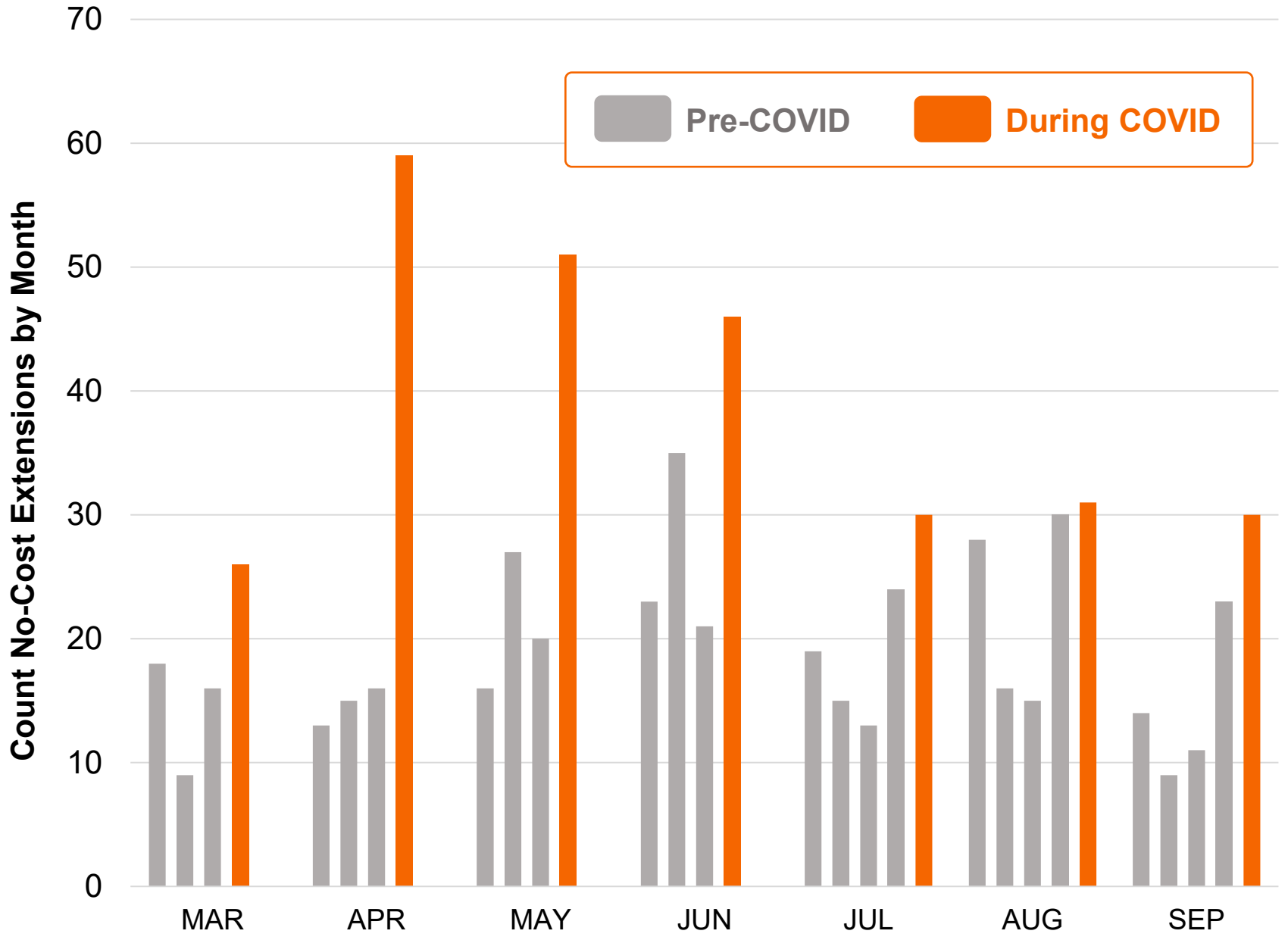
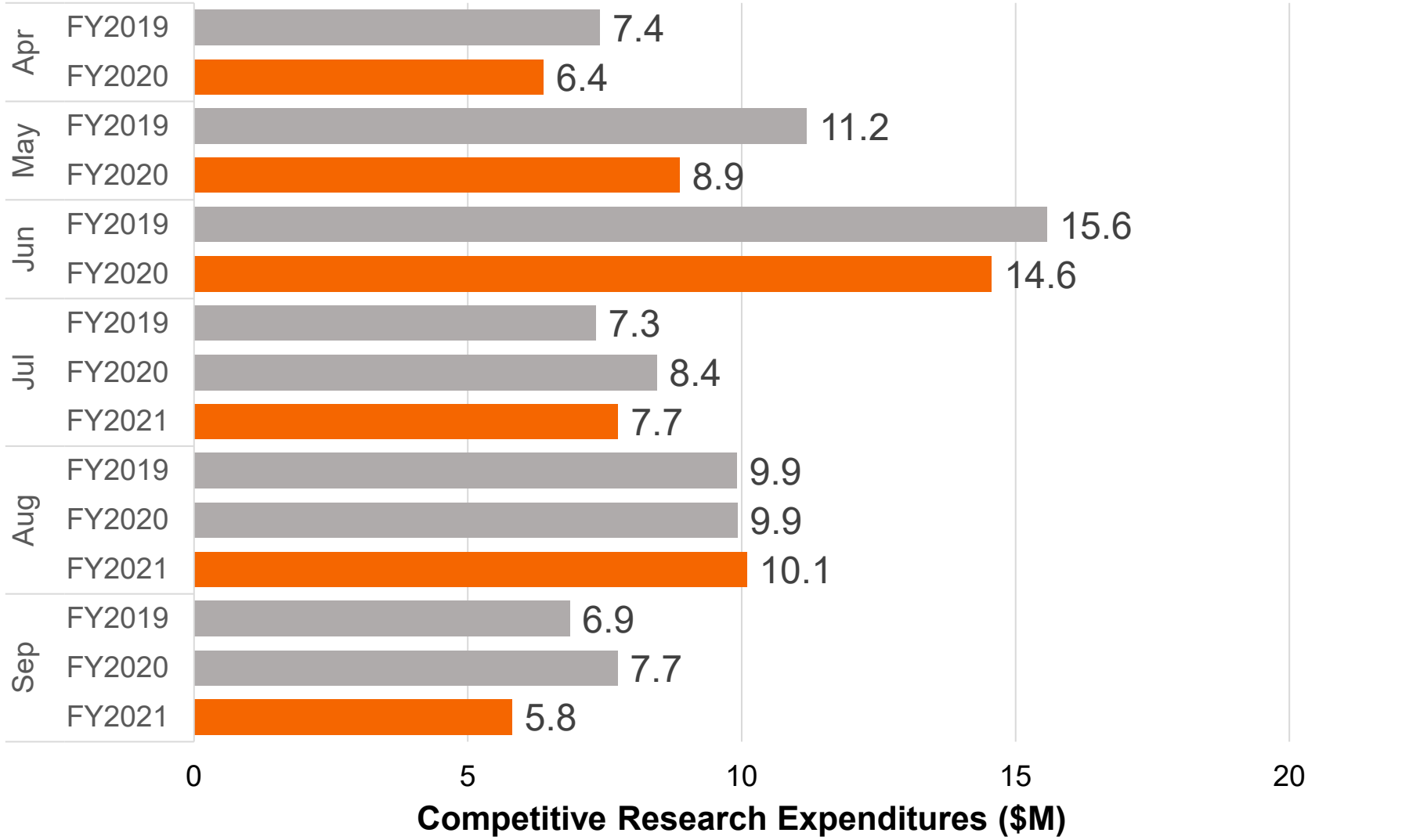
Seeking no-cost extensions



Continuing to pay personnel



Research Impact Metric (RIM)

- **Estimates financial impact and lost research output**
- **Research output lost = loss due to COVID restrictions/output under normal conditions**
- **Developed in March 2020**
- **Notes:**
  - Starting point is average month of expenditures prior to COVID-19
  - Multiple impact scenarios used, but model is flexible and can be adjusted
  - Accounts for cell lines, animal colonies, human-subjects research, other interruptions like losses to core facilities

Research Impact Metric (RIM)

Model Parameters: Evaluating Negative Impact Monthly

- Payroll and Fringe Benefits
- F&A Reimbursement
- Subrecipient Payments
- Other Costs
- Lab Supplies
- Recharges
- Financial Aid/Tuition Remission
- Professional Services
- Capital Equipment
- Travel

Research Impact Metric (RIM)

Two Scenarios: No. 1 – Continuous Ramp-Up

Month	Research Impact ($)	10% Impact ($)	25% Impact ($)	30% Impact ($)	40% Impact ($)	50% Impact ($)	60% Impact ($)	Estimated COVID Impact (%)
March 2020	1.1M	1.1M	Estimated research disruption					10%
April 2020	6.5M						6.5M	60%
May 2020	6.5M						6.5M	60%
June 2020	4.4M				4.4M			40%
July 2020	4.4M				4.4M			40%
August 2020	3.3M			3.3M				30%
September 2020	3.3M			3.3M				30%
October 2020	0.0							0%
November 2020	0.0							0%
December 2020	0.0		Assumes normal operations resume					0%
January 2021	0.0							0%
February 2021	0.0							0%

Disinvestment ($M) **$29.5M**

Research Impact Metric **23%**

Research Impact Metric (RIM)

Two Scenarios: No. 2 – Interrupted Ramp-Up

Month	Research Impact ($)	10% Impact ($)	25% Impact ($)	30% Impact ($)	40% Impact ($)	50% Impact ($)	60% Impact ($)	Estimated COVID Impact (%)
March 2020	1.1M	1.1M						10%
April 2020	6.5M						6.5M	60%
May 2020	6.5M						6.5M	60%
June 2020	4.4M				4.4M			40%
July 2020	4.4M				4.4M			40%
August 2020	3.3M			3.3M				30%
September 2020	3.3M			3.3M				30%
October 2020	4.4M				4.4M			40%
November 2020	4.4M				4.4M			40%
December 2020	4.4M				4.4M			40%
January 2021	5.5M					5.5M		50%
February 2021	5.5M					5.5M		50%
Disinvestment ($M)	**53.7M**							
Research Impact Metric	**41%**							

Disruptions continue

Research Impact Metric (RIM)

From March to Today

- We have stayed in the continuous ramp up mode
- Two approaches to further validate the RIM model:

  1) Use the competitively funded research expenditures data during the COVID-19 period with a productivity assessment in the RIM model

  2) Use the no cost extension requests data

Research Impact Metric (RIM)

Approach No. 1: Expenditure Data

- Competitively funded research expenditures during that period (March-September):
  - **$61M** (45% of which was payroll)
- Productivity impact assessment from the RIM model during the same period was 23%
- Potential financial risk: 23% of $61M = **$14M**

Research Impact Metric (RIM)

Approach No. 2: No Cost Extension data

- The projects that requested no-cost extension during the COVID period continued to spend ~$6.5 M
- These will be the projects that may need immediate support since they are on no-cost extension and COVID-19 impacts and interruptions still continue.

Closing Remarks

- "Tornado effect" on R&D and national competitiveness
- COVID impact on research is delayed
- Stimulus funds for higher education research without reducing the federal agency budgets is important for national competitiveness
- Protecting students, post-docs and faculty from COVID is essential for national competitiveness
- Need to triage the challenge to develop "people", "project" and "institutional" level solutions
- Re-evaluate cost-share requirements for projects
- RIM model can help institutes assess scale of COVID impact and calculate federal assistance needed
- Need to define "New Normal" for proposal submissions, budget preparation and research implementation

Division of

RESEARCH

Presentation to the
Council on Government Relations

COVID-19's Impact to Research - Institutional Perspective

Dr. Melur K. “Ram” Ramasubramanian
Vice President for Research, University of Virginia

October 21, 2020

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Estimation of COVID-19 related losses in Research

- Compensation without work for personnel during March-June, consistent with University policy for all employees.
- Replacement cost for unusable (expired) materials and supplies (sunk cost), non-refundable travel costs, etc.,
- Repair and recommissioning costs during ramp down and ramp up (special instrumentation, cell lines, animal colonies) that are laboratory resources used by several projects at the institution/laboratory
- Personnel costs during ramp up—inefficiencies due to social distancing, cleaning, and working in shifts.
- Support costs for graduate students when grants expired or sponsor directed-hibernation
- Institutional F&A that supports central support services that are not quickly scalable.

Expenditure data excerpts– salaries, supplies & materials trend

Comparisons:	March FY'19/FY'20 ($M)	April FY'19/FY'20 ($M)	May FY'19/FY'20 ($M)
Equipment	.9/1.3	.8/.4	.49/.19
Materials & Supplies	2.6/2.3	3.9/2.9	2.9/1.8
Faculty Salaries	7.1/7/3	6.9/7.2	7.2/7.2
GTA/GRA	1.0/1.1	1.0/1.7	1.6/1.3
Fellowships	1.0/0.77	0.8/0.8	1.2/0.9
Travel	.52/.40	0.7/0.1	0.55/0.04
F&A	6.8/7.1	6.8/7.5	7.6/6.5

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Research Impact Metric (RIM) Model

- The Research Impact Metric (RIM) Model estimates the research output loss and financial impact due to the COVID-19 pandemic and the resultant economic downturn.
  - "Research Impact under COVID-19: Financial Crisis and the "Pandemic Normal" – COGR Report, August 25, 2020.

- The RIM model has shown:
  - 1) research output losses between 20 and 40 percent
  - 2) financial disinvestment impact in the hundreds of millions of dollars at individual institutions
  - 3) potential impact in the tens of billions of dollars across the entire U.S. research enterprise.

- *Without new and sustained investment, our institutions' and the nation's research capabilities will be severely weakened.*

Questions to PIs (Survey) (I/III)

- Compensation without work for graduate students and some "non-designated" personnel (Postdocs, staff).
  - *List the names of the student or staff, the project account they were on before March 17, and until August 30th continued to receive payment without work assigned. If some work was done, what proportion of the personnel time was truly for unassigned work status?*
- Replacement costs for unusable (expired) materials and supplies (sunk cost), travel for research activities and conferences that were allowed and spent without travel actually taking place.
  - *Is this a listed item on your grant? If so, indicate what materials have to be repurchased, its quantity, and cost?*
  - *Travel you spent money that was non-refundable, but a trip you must take as part of the grant obligations? What are they and estimated cost?*

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Questions to PIs (Survey) (II/III)

- Repair and recommissioning costs for research infrastructure including equipment and instrumentation, cell lines, and animal models that have to be recreated and shared among many projects and cannot be charged to a single project.
  - *What equipment, machinery, instrumentation was shut down and what is the justification for additional funds to start up? What is the required actions and the costs associated with it?*
- Personnel costs during the ramp up period to get the labs fully operational before actual research activities can be undertaken.
  - *Estimate for how long it would take and the person hours involved with costs to ramp up to your normal 100% operation?*

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Questions to PIs (Survey) (III/III)

- Support costs for graduate students on contracts and grants that have expired or reneged by the sponsor to allow for students to make progress towards their degree.
  - *Provide details on the grant, the status of the student, project work to be completed by the student for the degree, time, and cost?*
- Institutional F&A loss associated with all the above.
  - *Provide automatic calculation.*

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PI Direct Input on Research Output Losses- A sample

(Currently at 9.4% response rate)

School	Total Compensation Charged to Grants	Calculated Total Loss on Salary & Fringe (Based on PI Input)	Calculated F&A Loss	Total Impact Loss Estimated	Response Rate
Grand Total	$79,178,569.96	$1,631,955.84	$ 905,671.95	**$2,537,627.79**	9.41%

Percent loss (Personnel Only) =3.2% (9.4% response rate)

Scaled to 100% response rate: Research Output Losses are 32% through August.

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“Pandemic Normal” in Research

- Restricted access to research buildings and research laboratories
- Social distancing within the laboratory
- Staggered shift-scheduling (i.e., 6:00 AM-2:00PM, 2:00 PM-8:00 PM, etc.), and the loss of intellectual stimulation and sharing that comes from working collaboratively
- Additional “down-time” to clean between shifts (and between equipment use cycles) requiring research personnel to clean the space (and equipment) to be in compliance with CDC guidelines
- Adjustment to working with continuous use of PPE where formerly not necessary, along with the associated inefficiencies and costs

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“Pandemic Normal” in Research

- Temporary (or permanent) loss of research personnel who test positive or display COVID-19 symptoms
- Transition to remote work if a research building or laboratory is shut down – plans to execute in short order
- Slow or compromised supply chains and associated higher costs
- Reduced lab visitors from visiting scholars and collaborators
- Interruption of or limitations on conducting in-person human subject research
- Discontinuation of conducting artistic and performing arts exhibition with live audiences
- Inclusion of undergraduates and associated challenges

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Pandemic Impact on Research-PI examples

- **Research projects on cognitive aging, cognitive and social child development, brain function and organization, and clinical psychology**
  - All of the research projects involving human participants have been delayed significantly as a result of COVID. Laboratories had to pause their research programs at a time that is often when the most significant phase of data collection occurs.
- **Global Health Research on pregnancy outcomes**
  - COVID-19 has impacted health research abroad because travel for the University researchers has been stopped, but also because researchers abroad have been unable to work at their labs or with study subjects. Longitudinal studies of pregnancy outcomes have been interrupted also since March. Researchers have been able to get some information from cell phone interviews of the subjects, but key data such as birth weights has been lost. Some of this longitudinal data unfortunately will be unrecoverable.

Pandemic Impact on Research

- **Grad student research career and thesis**
  - Many graduate students receive funding directly from federal sponsors in support of their developing academic and research career. In many instances, travel to a field site is a critical component of their fellowship. Many of these support awards have limited funding and duration; and if a graduate student was planning to travel during this past spring, their entire research thesis could be materially impacted causing them to adjust the thesis objectives materially or not be able to complete their work.
- **Seasonal travel critical to research outcomes**
  - There are various research studies that require the research team to be on site at the early seasonal onset of a disease. One example of this is malaria. If the team cannot be onsite for this critical time period, it could mean that the research is stalled for an entire year.

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COVID-19 and Research Impact: NIH Perspective

Michael Lauer, MD
Deputy Director for Extramural Research; Director, Office of Extramural Research
National Institutes of Health

Council on Governmental Relations (COGR) Virtual Meeting of October 2020
Wednesday, October 21, 2020
Virtual Meeting
Disclosures: None

Headlines…

THE WALL STREET JOURNAL.

https://www.wsj.com/articles/medical-research-is-locked-down-too-11588629492

OPINION | COMMENTARY

Medical Research Is Locked Down, Too

Clinical trials grind to a halt as patients are told to stay home and research personnel are redeployed.

By *Kevin Sheth*
May 4, 2020 5:58 pm ET

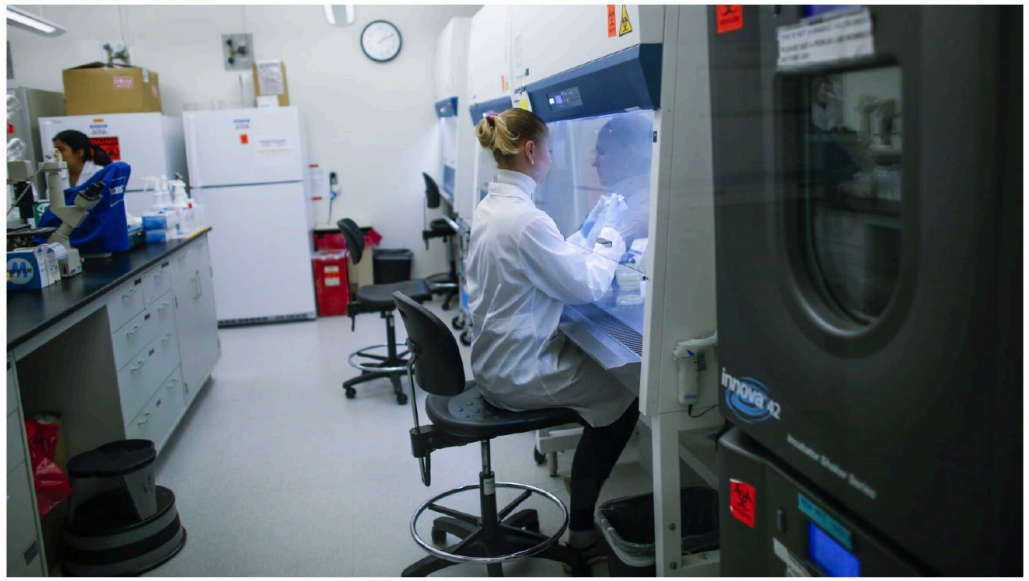
I lead clinical trials for medications to treat crippling disorders such as stroke and brain hemorrhages. During the past few months, every one of these studies has come to a grin halt. The pandemic has thrown clinical trials, the lifeblood of new treatments, into disar

STAT

Covid-19 has shuttered scientific labs. It could put a generation of researchers at risk

By Justin Chen

May 4, 2020



Kena Betancur/Getty Images

Congressional Research Service

Informing the legislative debate since 1914

Effects of COVID-19 on the Federal Research and Development Enterprise

April 10, 2020

Extensive Disruption

- Laboratories closed or nearly so
- Communications suboptimal
- Conferences and meetings cancelled or disrupted
- Supply chains interrupted; resources lost
- Widespread financial losses
- Required telework has disparate effects (e.g. childcare)
- Anxiety high, especially for early career investigators

https://crsreports.congress.gov/product/pdf/R/R46309

Real Losses

BROWSE Bloomberg Law

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Pharmaceutical & Life Sciences News

Francis Collins, director of the National Institutes of Health, testifies during a Senate panel hearing on May 7, 2020.
Photographer: Andrew Harnik/AP Photo/Bloomberg

Virus Will Cost NIH $10 Billion in Lost Research, Director Warns (1)

May 7, 2020, 1:35 PM; Updated: May 7, 2020, 3:22 PM

Listen

- NIH's Collins testifies before Senate health panel on testing
- $10 billion in lost research due to lost productivity, employment costs

Jeannie Baumann
Reporter

https://news.bloomberglaw.com/pharma-and-life-sciences/virus-will-cost-nih-10-billion-in-lost-research-director-warns

comment

Check for updates

Unequal effects of the COVID-19 pandemic on scientists

COVID-19 has not affected all scientists equally. A survey of principal investigators indicates that female scientists, those in the 'bench sciences' and, especially, scientists with young children experienced a substantial decline in time devoted to research. This could have important short- and longer-term effects on their careers, which institution leaders and funders need to address carefully.

Kyle R. Myers, Wei Yang Tham, Yian Yin, Nina Cohodes, Jerry G. Thursby, Marie C. Thursby, Peter Schiffer, Joseph T. Walsh, Karim R. Lakhani and Dashun Wang

Nature Human Behavior, July 15, 2020
https://www.nature.com/articles/s41562-020-0921-y

Impact on Productivity

ARE WOMEN PUBLISHING LESS DURING THE PANDEMIC? HERE'S WHAT THE DATA SAY

Early analyses suggest female academics are posting fewer preprints than men, and starting fewer projects.

By Giuliana Viglione

Quarantined with a six-year-old child underfoot, Megan Frederickson wondered how academics were managing to write papers during the COVID-19 pandemic. Lockdowns implemented to stem coronavirus spread meant that, overnight, many households worldwide had become an intersection of work, school and home life. Conversations on Twitter seemed

PREPRINT DROP-OFF

Two separate analyses show that women's posting rate on preprint servers has slowed during the coronavirus pandemic.

All-author analysis

When compared with March and April 2019, the number of male authors on preprints posted to bioRxiv and arXiv has grown faster than the number of female authors in that period this year.

Mar–Apr 2019 Mar–Apr 2020

arXiv: 2019 vs 2020 **bioRxiv: 2019 vs 2020**

Nature, May 28, 2020

https://media.nature.com/original/magazine-assets/d41586-020-01294-9/d41586-020-01294-9.pdf

The Virus Moved Female Faculty to the Brink. Will Universities Help?

The pandemic is a new setback for women in academia who already faced obstacles on the path to advancing their research and careers.

Lisa Warner in her lab at Boise State University. Alex Hecht for The New York Times

https://www.nytimes.com/2020/10/06/science/covid-universities-women.html

Accommodations and Flexibilities

- Application deadlines, post-submission data
- All peer review remote – through Spring 2021
- Salaries and stipends – until September 30, 2020
- Human subject research, clinical trials
- Animal research, guidance to IACUCs
- Extensions on reporting; flexibility on expenditures
- Accommodations for loss of time, ESI extension

https://grants.nih.gov/policy/natural-disasters/corona-virus.htm

Monitoring Trends

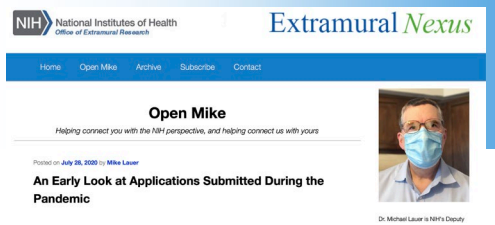

Table 1*: Number of R01-equivalent applications received between May 1 and June 5 in 4 consecutive years.

	Number	All Women (%)	All Men (%)	Other (%)
2017	6398	24.6%	61.7%	11.5%
2018	6481	26.4%	59.8%	11.2%
2019	6171	25.8%	60.9%	10.7%
2020	6799	25.7%	56.8%	14.8%

https://nexus.od.nih.gov/all/2020/07/28/an-early-look-at-applications-submitted-during-the-pandemic/

Learning From You!

NIH National Institutes of Health
Office of Extramural Research

Extramural Nexus

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Open Mike

Helping connect you with the NIH perspective, and helping connect us with yours

Posted on **October 5, 2020** by **Mike Lauer**

Encouraging Participation in Upcoming NIH Surveys to Identify Impacts of COVID-19 on Extramural Research

NIH has been working diligently to support the extramural research community since the pandemic began in March. We are now preparing to reach out with surveys to gather data on how COVID-19 is impacting our extramural researchers and their institutions. If you receive

Dr. Michael Lauer is NIH's Deputy Director for Extramural Research, serving as the principal scientific leader and advisor to the NIH Director on the NIH extramural research program.

https://nexus.od.nih.gov/all/2020/10/05/encouraging-participation-in-upcoming-nih-surveys-to-identify-impacts-of-covid-19-on-extramural-research/

Perspectives For the Future

Cell

Leading Edge

CellPress

Commentary

How Support of Early Career Researchers Can Reset Science in the Post-COVID19 World

Erin M. Gibson,[1,12,*] F. Chris Bennett,[2] Shawn M. Gillespie,[3] Ali Deniz Güler,[4] David H. Gutmann,[5] Casey H. Halpern,[6] Sarah C. Kucenas,[4] Clete A. Kushida,[1] Mackenzie Lemieux,[7] Shane Liddelow,[8] Shannon L. Macauley,[9] Qingyun Li,[10] Matthew A. Quinn,[11] Laura Weiss Roberts,[1] Naresha Saligrama,[5] Kathryn R. Taylor,[3] Humsa S. Venkatesh,[3] Belgin Yalçın,[3] and J. Bradley Zuchero[6]

"The COVID19 crisis has magnified the systemic issues plaguing academic research … often-stifling excess requirements in publication, tenure, and grant processes; the reliance on funding from national agencies that is catered towards senior level researchers; and the lack of diversity in academic research due to the attrition of women and racial or ethnic minorities during early career stages … An unprecedented opportunity to reset … will require a concerted effort between funding agencies, universities, and the public to rethink how we support scientists, with a special emphasis on early career researchers."

https://doi.org/10.1016/j.cell.2020.05.045

Closing Thoughts

- Impact on research “bipolar”
- Real losses of productivity, lost time and opportunities
- Extensive, and disproportionate, disruption
- NIH monitoring: please answer survey if asked!
- Long-term effects unclear
- Opportunity for a future reset?

NIH Impact of COVID-19 on Extramural Research Surveys

The NIH wants to understand how COVID-19 is impacting extramural researchers and their institutions to inform policy and program decisions. To achieve this, they are launching two surveys.

NIH Impact of COVID-19 on the Extramural Institutions Survey

- **Objective:** Understand institutional support for research activities, productivity expectations, and safety measures during COVID-19
- **Sample:** VPs of Research and equivalent at institutions receiving NIH funding
- **Invite:** An email from Mike Lauer, NIH's Deputy Director for Extramural Research, with a link to the survey
- **Timing:** This survey will be open until late October

NIH Impact of COVID-19 on the Extramural Researchers Survey

- **Objective:** Understand how COVID-19 has impacted researchers at institutions that receive NIH funding
- **Sample:** Individuals who have logged into eRA Commons in the past 2 years and are identified in the system as having a Scientific Role
- **Invite:** An email from Qualtrics (noreply@qemailserver.com) with a link to the survey
- **Timing:** This survey launches October 14 and is open until the end of the month

Both surveys are confidential and run by a third party, who will share only de-identified survey data with NIH. Survey results will be analyzed and reported to leadership in aggregate.

U.S. DEPARTMENT OF ENERGY | Office of Science

COVID-19: DOE Issues and Response

presented to

Council on Governmental Relations

Steve Binkley
Principal Deputy Director

October 21, 2020

Outline

- DOE S&T response to COVID-19
- Impacts on DOE National Laboratories
- Assessing impacts on universities

DOE broad capabilities for addressing COVID-19 crisis

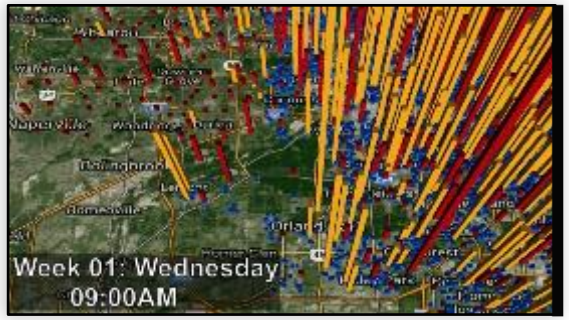
- **Light and neutron sources**
- **Nanoscience centers**
- **Computational resources**
- **Scientists with deep expertise relevant to:**
  - Testing
  - Antiviral drug discovery
  - Vaccine discovery
  - Supply chain bottlenecks
  - Modeling and understanding disease spread
  - Molecular and structural biology

- **Consortium of 17 DOE National laboratories**
- **Takes advantage of DOE user facilities**
- **Initial activities include:**
  - Epidemiological and logistical support
  - Addressing supply chain bottlenecks by harnessing advanced manufacturing
  - Medical therapeutics: computational drug discovery and structural biology
  - Innovations in testing capabilities
  - New project in understanding fate and transport of virus in the environment

Epidemiology: Modeling COVID-19 Spread

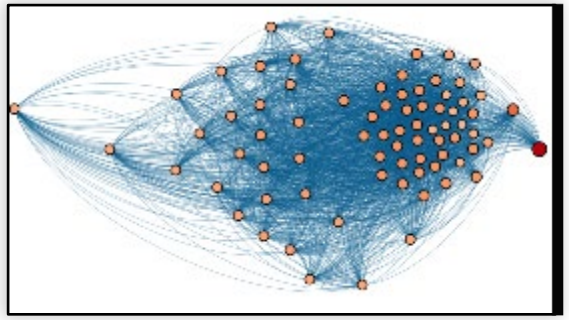
Lead: Budhu Bhaduri
Laboratories: ANL, LANL, ORNL, SNL

- Developing an integrated COVID-19 pandemic monitoring modeling and analysis capability
- Taking advantage of DOE's leadership computing capabilities
- Builds on scalable data and computing, spatial demography/ human dynamics research, and economic and risk modeling



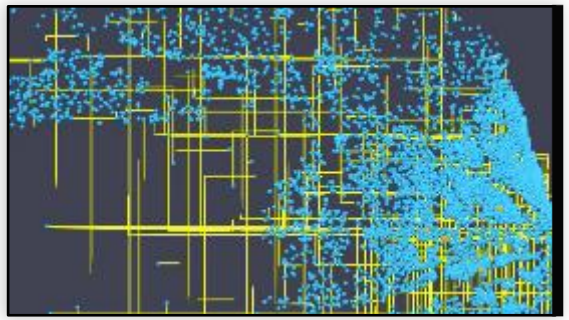
Where are people located?

With whom?



Who is infecting whom?

Who may be infected?



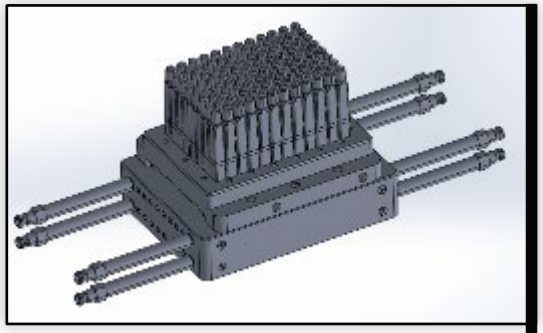
Where are people going, coming from?

Advanced Manufacturing for Medical Supplies

Lead: Lonnie Love
Laboratories: All 17

- **The rapid spread of COVID-19 has resulted in significant supply chain issues**
- **DOE leadership in materials, manufacturing, modeling, and characterization is being leveraged to design and prototype products**
  - Addressing alternative materials and approaches for rapid mass production, including new processing and tooling approaches
- **NVBL focus areas:**
  - Masks/respirators (ORNL lead)
  - Ventilators (INL lead)
  - Consumables (LLNL lead)

Tubes and swabs



Testing plates: ~500,000 needed per week

Viral Fate and Transport

Lead: Katrina Waters

Laboratories: Ames, ANL, BNL, LANL, LBNL, LLNL, ORNL, PNNL, SNL, SLAC, SRNL

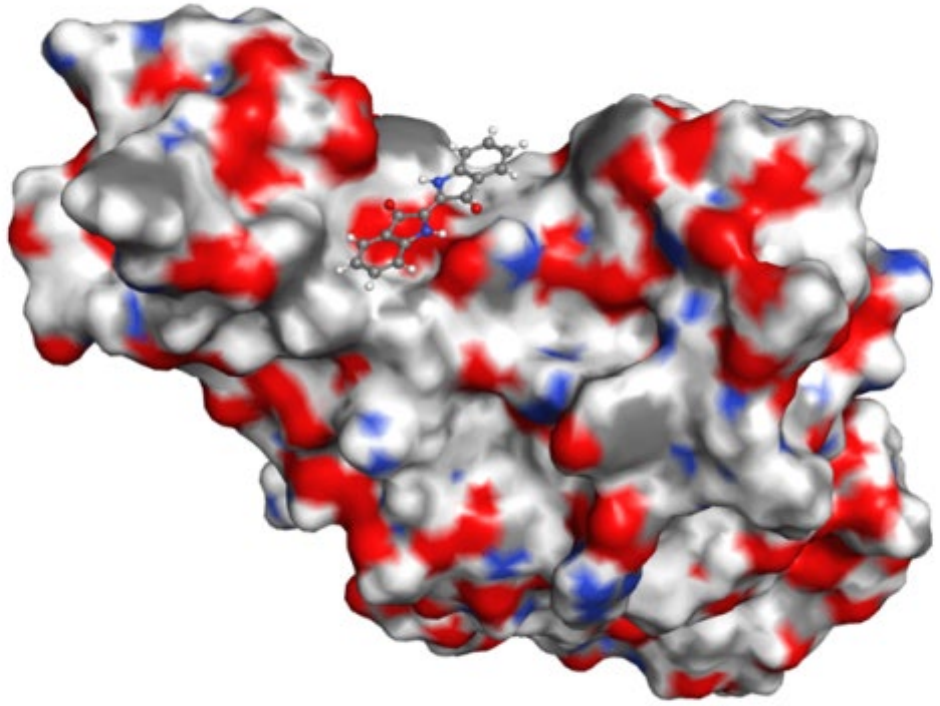
- **Major public health questions remain about what dictates the prevalence and mobility of viable SARS-CoV-2 virus indoors and outdoors under a variety of environmental conditions**
- **Enhancing the potential to predict SARS-CoV-2 viability in varied environments will inform continued quarantine measures and/or abatements of infections, as well as inform strategies that guide society's resumption of normal activities**
- **Controlling spread within our community and workplaces requires an understanding of factors regulating COVID-19 viability, transmission, and transport as well as the prevalence of infectious virus in the environment**
- **NVBL focus areas:**
  - Prioritized administrative and engineering controls that reduce the risk of SARS-CoV-2 transmission within the built environment
  - Chemical and physical properties of materials that influence binding of SARS-CoV-2 to abiotic surfaces, which can be used to design new materials for desired applications
  - Contribution of environmental reservoirs and conditions on transmission and resurgence of SARS-CoV-2

Molecular Design to Inform Medical Therapeutics

Lead: Marti Head

Laboratories: ANL, BNL, LANL, LBNL, LLNL, ORNL, PNNL, SLAC, SNL

- **COVID-19 has no approved medical therapeutic interventions beyond palliative care**
- **DOE capabilities are being applied to accelerate scientific discovery for therapeutics targeting SARS-CoV-2**
  - Supercomputing and AI
  - Materials characterization at light and neutron sources
  - Nanoscience research

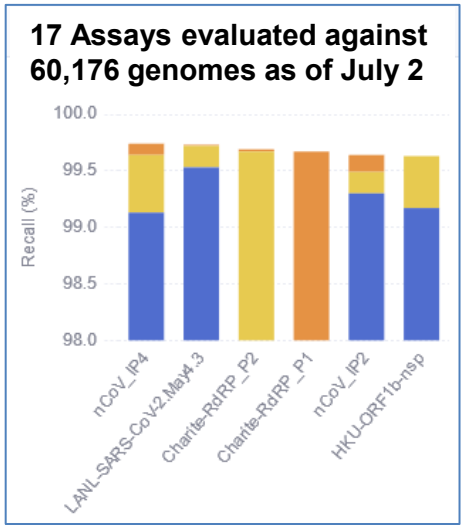


COVID-19 Testing R&D

Lead: Pat Fitch

Laboratories: Ames, ANL, LBNL, LLNL, LANL, NREL, ORNL, PNNL, SNL, SLAC

- No effective COVID-19 vaccine drives needs for improved testing accessibility and for new tests of infection and host response/immune status
- DOE capabilities in biology, bioinformatics, structural biology, bioengineering, computing, and light source and genome user facilities are being applied to accelerate COVID-19 Testing R&D
- NVBL focus areas:
  - Establishing alternative instruments and reagents
  - Developing affinity reagents for diagnostics
  - Providing structure-based protein designs for diagnostics
  - Accelerating R&D through novel data science



https://covid19.edgebioinformatics.org/#/home

High Performance Computing Consortium

Website: https://covid19-hpc-consortium.org/

Laboratories: ANL, INL, LANL, LBNL, LLNL, ORNL, SNL

- Mission: Provide COVID-19 researchers worldwide with access to the world's most powerful high-performance computing resources that can significantly advance the pace of scientific discovery in the fight to stop the virus.
- A unique public-private consortium between government, industry, and academic leaders to aggregate free compute time and resources on their machines initiated in 10 days (March 11-March 22, 2020). First project started March 26.
- Over 40 members including resources from the United Kingdom, Switzerland, Sweden and Japan
- To date: the Consortium has received 148 proposals and approved 78, declined 51 and were awaiting further information on 19 and 2 projects have completed. Out of the 78 approved projects, 68 were enabled.

HPC Consortium Members

Industry

- IBM
- Amazon Web Services
- AMD
- BP
- D. E. Shaw Research
- Dell Technologies
- Google Cloud
- Hewlett Packard Enterprise
- Microsoft
- NVIDIA
- Intel

Academia

- Massachusetts Institute of Technology
- Rensselaer Polytechnic Institute
- University of Illinois
- University of Texas at Austin
- University of California - San Diego
- Carnegie Mellon University
- University of Pittsburgh
- Indiana University
- Massachusetts Green High Performance Computing Center (MGHPCC)
- University of Wisconsin-Madison
- Ohio Supercomputer Center
- UK Digital Research Infrastructure
- CSCS – Swiss National Supercomputing Centre
- SNIC PDC – Swedish National Infrastructure for Computing, Center for High Performance Computing

HPC Consortium Members, continued

Department of Energy National Laboratories

- Argonne National Laboratory
- Lawrence Livermore National Laboratory
- Los Alamos National Laboratory
- Oak Ridge National Laboratory
- Lawrence Berkeley National Laboratory
- Sandia National Laboratories
- Idaho National Laboratory

International Government Agencies and National Laboratories

- Korea Institute of Science and Technology Information (KISTI)
- Ministry of Education, Culture, Sports, Science and Technology (MEXT)-JAPAN
  - RIKEN Center for Computational Science (R-CCS)

- **Federal Agencies**
- National Science Foundation
  - XSEDE
  - Pittsburgh Supercomputing Center (PSC)
  - Texas Advanced Computing Center (TACC)
  - San Diego Supercomputer Center (SDSC)
  - National Center for Supercomputing Applications (NCSA)
  - Indiana University Pervasive Technology Institute (IUPTI)
  - Open Science Grid (OSG)
  - National Center for Atmospheric Research (NCAR)
- NASA

Impacts to DOE and the National Laboratories

- DOE federal employees are mostly teleworking
- Within the Office of Science, we are meeting all program objectives
- All DOE Labs are mostly teleworking
- Several Labs are at Phase 2 (LBNL, SLAC, LLNL, INL, LANL, SNL, BNL, PNNL), with others (NREL, ANL, FNAL, Ames, PPPL, NETL, SRNL, ORNL, TJNAF) at Phase 1
- DOE Science User Facilities are operating at reduced levels but are supporting Pandemic response
- Travel restrictions have drastically reduced the number of users at our User Facilities, with the exception of high-performance computing centers

AAU University Senior Research Office Roundtable with the DOE Office of Science – October 16, 2020

Purpose: The purpose of the roundtable discussion with university Senior Research Officers (SRO), or equivalent, from Association of American Universities (AAU) member institutions is to provide perspectives and insights on the impacts the COVID-19 pandemic has had (and continues to have) on academic institutions, particularly on the progress of research and on personnel working on DOE Office of Science research grants (students, postdocs, faculty, staff).

In particular, the intent is to capture new information that complements what is known from public reports by scientific professional societies and other professional associations and gain insights directly relevant to potential Office of Science response actions.

The input from the roundtable discussion, along with additional data from a planned Office of Science Principal Investigator (PI) Survey, will be used to inform a charge to the Office of Science's federal advisory committees to provide advice to the Office on appropriate actions to address the impacts of the COVID-19 pandemic on academic research in the short-, medium-, and long-term.

AAU SRO SC Roundtable - Attendees

- Steven Ackerman, Univ. of Wisconsin, Madison
- Mark Barteau, Texas A&M University
- Kaushik Bhattacharya, Caltech Univ.
- Dawn Bonnell, Univ. of Pennsylvania
- Sandra Brown, Univ. of California-San Diego
- Larry Carin, Duke University
- Pablo Debenedetti, Princeton University
- Terri Fiez, Univ. of Colorado Boulder
- Douglas Gage, Michigan State University
- Randy Katz, Univ. of California-Berkeley
- Mary Lindstrom, University of Washington
- Laurie Locascio, Univ. of Maryland, College Park
- Susan Martinis, Univ. of Illinois at Urbana-Champaign
- Theresa Mayer, Purdue University
- Prasant Mohapatra, Univ. of California-Davis
- Kathryn (Kam) Moler, Stanford University
- Morley Stone, The Ohio State University
- Roger Wakimoto, University of California-Los Angeles
- Andrew Weyrich, The University of Utah
- Plus Office of Science Leadership

A Panel Discussion

Moderated by Jim Luther

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