



Harvard FAS Science

State-of-the-Division*

April 21, 2020

*this is a snapshot as of late April, things evolve rapidly...

Agenda

- Welcome
- COVID-19 Science Division & SEAS Response & Updates
- Forward-Planning
- Clarifying Guiding Principles
- Creating "Remote Excellence"
- Q & A

Thank you

- ▶ You pivoted effectively to remote instruction.
- ▶ You prioritized public health over lab access.
- ▶ You donated personal protective gear from labs.
- ▶ You shifted to remote work and became zoom-experts.
- ▶ FAS & SEAS are continuing to contribute to COVID-19 needs

Donation of Personal Protective Equipment to Critical Care Providers



Plus, national-level crowdsourcing of local PPE donations....

Re-use of Personal Protective Equipment



N95DECON

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A scientific consortium for data-driven study of N95 filtering facepiece respirator decontamination

New Publications:

[April 1st, 2020] [N95DECON releases study of three approaches to N95 decontamination for the COVID-19 pandemic](#)

[April 5th, 2020] [N95DECON releases cautionary fact sheet for unsuitable methods of N95 decontamination](#)

Fabrication

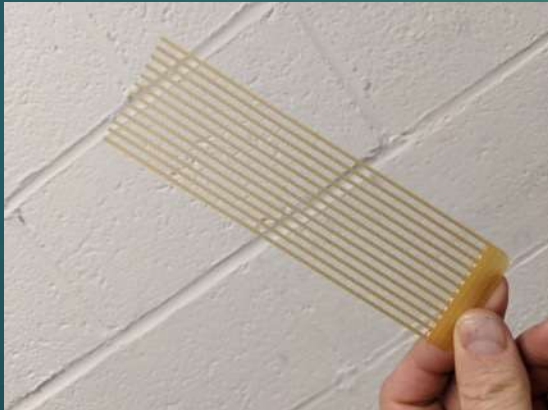
Disposable face shields

- Prototyping and clinical evaluations complete
- Qty ~1000 made on campus
- Shifted to industry-capacity (tens of thousands)
- Linked to BIDMC, MGH, Tufts, St. Vincent's hospitals.



Nasopharyngeal test swabs

- Multi-site coordination (USF, Stanford, Harvard, Army) w/ local companies, FDA
- Also shifted from prototyping to large-scale manufacturing.



Life Sciences



Local consortium addressing diagnostics (testing), therapeutics, epidemiology, and clinical care aspects.

Life scientists from FAS, SEAS, and Broad are engaged in a wide range of efforts in coordination with this regional structure.

No infectious materials are being used in Cambridge buildings.

Our engagement includes

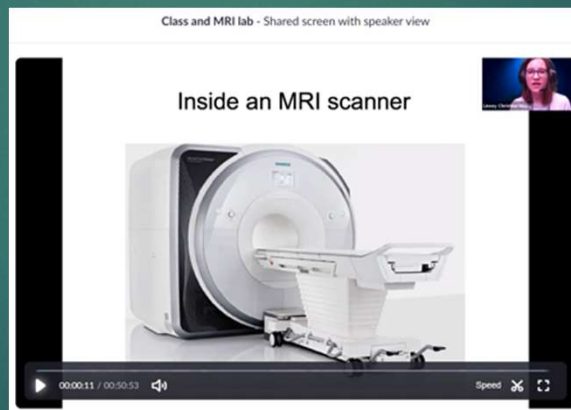
- Advancing ideas for therapeutics and drug discovery,
- Using innovative high-resolution imaging methods to map out infection pathways.

Remote teaching, thus far...

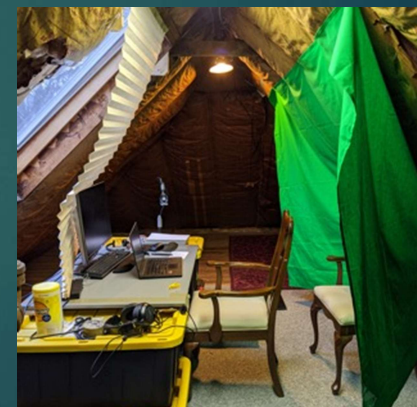
- Faculty showed great flexibility to adapt on such short notice
- So far, so good...
- Creative approaches being implemented to support lab experiences



Chem 20 Workspace



BE 128 "Virtual Lab"



BE 128 "Home Studio"

Five aspects of Forward Planning

1. Financial impact of COVID-19
2. Return to research on campus
3. Fall 2020 undergraduate program
4. Fall 2020 entering graduate students
5. Opportunities, and longer-range planning

This is a good time to pause and examine what we're doing, how we're doing it, and how that work aligns with Harvard's mission and priorities.

Guiding Principles & Values



- Our highest priority is to support community health and well-being.
- We will sustain the excellence and intellectual diversity of Harvard in both learning and research.
- We will adopt an evidence-based risk management approach to the COVID-19 challenge. Our decisions will be guided by data, public officials, and health experts.
- We are a residential research, teaching, and learning institution, and we should return to operations as soon as it is safe to do so.
- We acknowledge that we face considerable uncertainty and will communicate this transparently to our stakeholders.

Guiding Principles & Values



- We will continue to address issues of inequity and social justice.
- We are an institution that attracts people globally. We recognize that local conditions alone should not drive our decision making.
- The University and the nation are facing a once-in-a-generation challenge, and we will all be called upon to make sacrifices in order to advance Harvard's mission and serve society.
- We will continue with strategic investments in people and programs.

1. Financial Consequences

Given rapidly evolving circumstances and considerable uncertainty, FAS is taking a conservative approach.

- Searches suspended
- Construction projects suspended
- Discretionary spending curtailed

Three main areas of financial impact:

1. Direct costs associated with COVID-19:

Moving undergrads out, facilities, testing, PPE...

2. Loss of endowment value, payout is $\sim\frac{1}{2}$ of FAS revenue.

3. Increased need for financial aid.

We will be facing hard choices.

2. Return to research on campus

- Staged return, in phases.
- Pre-requisites
 - Adequate health care system surge capacity exists
 - Availability of face masks, no resource contention
 - State restrictions lifted, child-care accessible
 - Resolution of open policy questions
 - Buildings prepared- doors, HVAC, elevators...
- First phase:
 - Those who can work remotely should do so.
 - Faculty craft a low-interaction plan for their team.
 - Departmental approval process, then divisional.
 - Block-diagonal interaction matrix
 - Symptoms or positive diagnosis → isolation of group

Minimize interactions between sub-networks- diagonalize the interaction matrix



| | A | B | C | D | E |
|---|----------|----------|------------|------------|------------|
| | | people | | | |
| A | Dark Red | Orange | White | White | White |
| B | Orange | Dark Red | White | White | White |
| C | White | White | Black | Light Blue | Light Blue |
| D | White | White | Light Blue | Black | Light Blue |
| E | White | White | Light Blue | Light Blue | Black |

Minimize interactions between sub-networks- diagonalize the interaction matrix



| | A | B people | C | D | E | Elevator 1 | Restroom 4 | Shared microscope |
|---|--------|-------------|------------|------------|------------|---------------|---------------|----------------------|
| A | Black | Yellow | White | White | White | Light Green | Light Orange | White |
| B | Yellow | Black | White | White | White | Light Green | Light Orange | Light Orange |
| C | White | White | Black | Light Blue | Light Blue | Light Green | Light Orange | Light Orange |
| D | White | White | Light Blue | Black | Light Blue | White | Light Orange | Light Orange |
| E | White | White | Light Blue | Light Blue | Black | White | Light Orange | White |



shared surfaces
HVAC systems are also common

Implications for Phase 1



- Face masks (likely surgical) inside and outside buildings
- No shared meal service areas
- Balance lab safety with social distancing
- Staggered occupancy timing, also to minimize public transit density
- Attention to shared surfaces and restrooms
- Emphasis on hands-on work in labs and archives
- Much as we did for “essential” access, craft group-level plans with departmental and divisional input & approvals
- We should be prepared for short-notice ramp-downs in the future
- Evidence of symptoms or positive viral test results from one member triggers isolation of that work group. Requires disclosure. Requires backup plan.

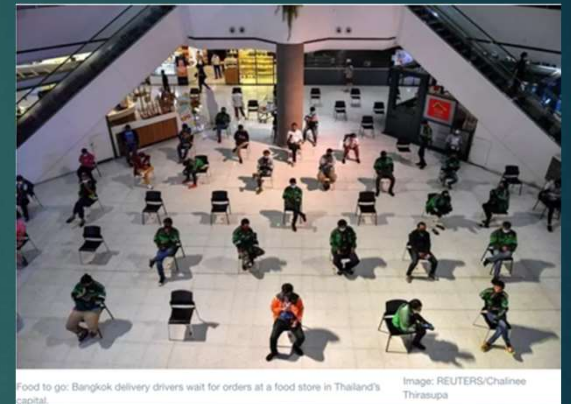
Open Issues for Phase 1



- Health information disclosure and group-dissemination mechanism
- Protocols and implementation policies for both viral and antibody testing
- Training and compliance for new social hygiene expectations
- Individual risk assessments that differ from institutional one
- Surface decontamination protocols
- ...

We need to change social norms, and lead by example

- Interactions *within* groups must change
 - Attention to personal space.
 - Make it OK to say “Please back off.”
 - Establish expectations about mask use.
 - Distancing for meals.
 - Attention to shared surfaces
 - Work surfaces
 - Telephones, keyboards, door handles...
 - Shared instruments
- Showing people how to do things is going to be awkward.
 - Think about using videos, telepresence, etc.
- Interactions *between* groups must change
 - Do seminars remotely
 - No social gatherings, for some time...
- Interactions between colleagues have already changed
 - Need to establish alternatives to “corridor conversations.”



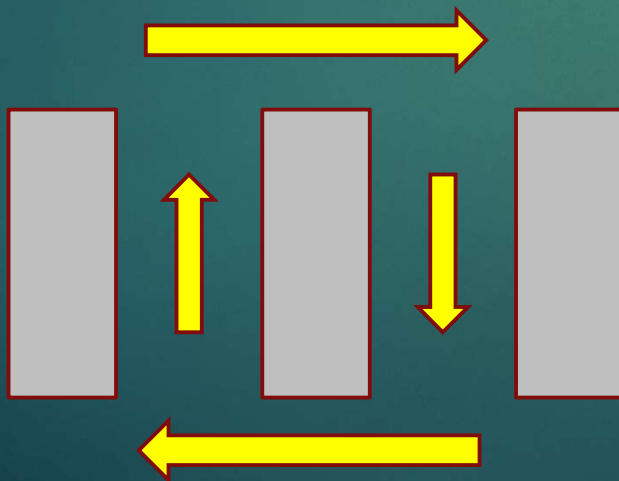
Evolution of return plan



- Our Science Division Advisory Group, comprising
 - Eisenstein (astronomy)
 - Extavour (OEB)
 - Fishman (SCRB)
 - Friend (CCB)
 - Hopkins (mathematics)
 - Johnston (EPS)
 - Murray (MCB)
 - Ruvolo (HEB)has been considering this for past 3 weeks, has delivered white paper.
- Department chairs have also been meeting to consider this, plus field work
- Vice Provost for Research has assembled a committee across schools
- These various threads needs to converge. For now, start thinking about
 - 1) how essential is on-campus access, and why?
 - 2) how your group could achieve block-diagonal-interaction-matrix
- When might we return? Unclear at present. But let's be ready!

Start your return planning now

- Consider your research priorities, student and postdoc professional and career needs, funding issues, and what work requires building access.
- Static configuration considerations- where are things located? Rearrange?
- Dynamic workflow considerations- who goes where, and why? Traffic lanes?
- Staffing overlap considerations-
 - What are the lab safety issues?
 - What's a good plan for minimizing presence in the building?
- Need a plan to handle zero-notice group isolation if someone is positive.



Don't send in a plan quite yet,
we're going to provide a
structured way to do so.

But do start thinking about it, and
consult/socialize with your team

3. Undergraduates & College

- Harvard College is a residential liberal arts institution
- Close-quarters dormitories (houses) and social engagement are in collision with social distancing.
- Various possible scenarios:
 - Students return in late 2020, to a different campus experience, or
 - Remote instruction continues in fall 2020, or
 - Some hybrid of these.
- Plan is to defer making this decision as late as possible, perhaps mid-June.
- That would leave insufficient time to prepare a quality remote undergraduate experience.
- We need to start now to prepare for “remote excellence”

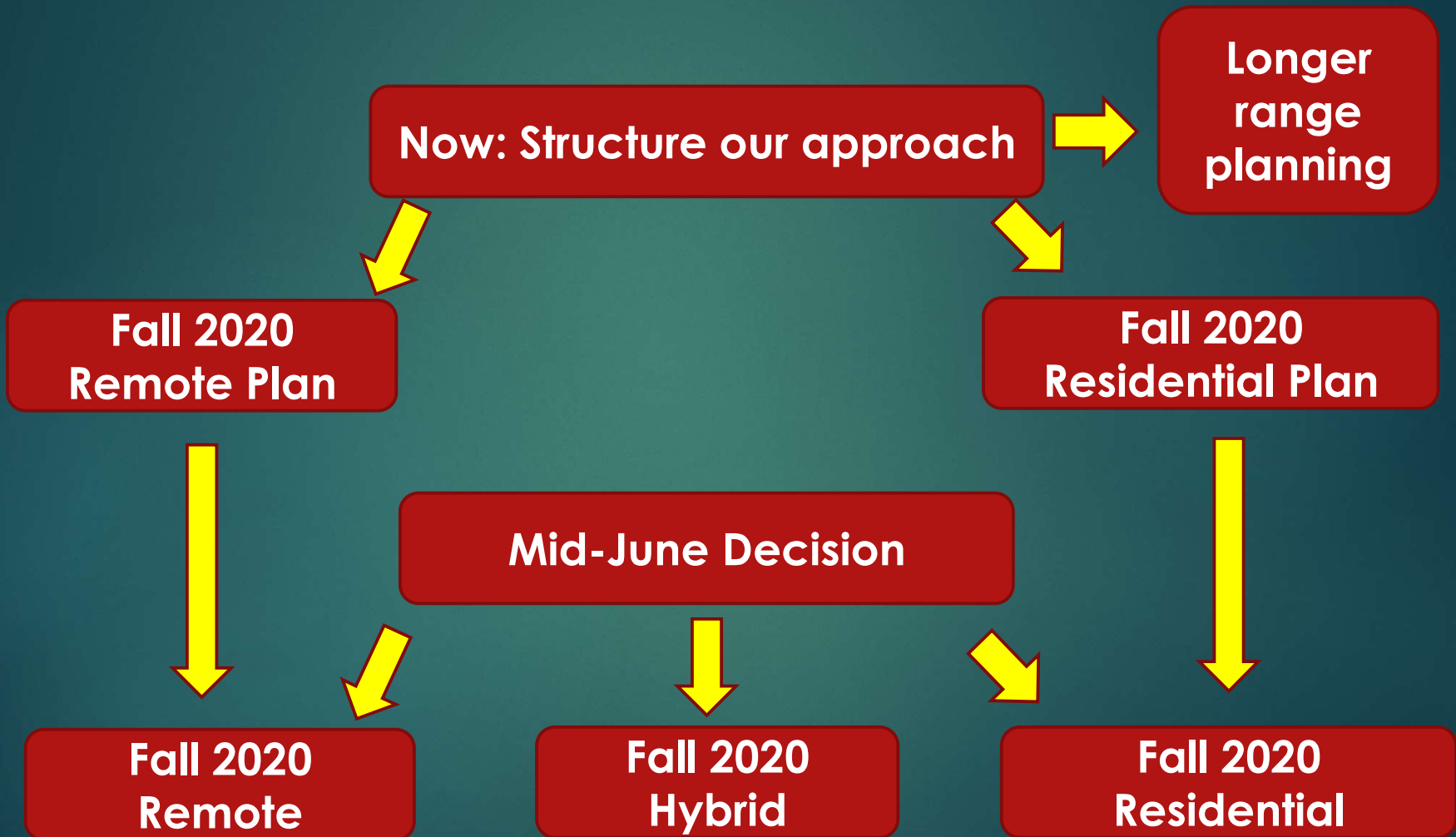
Students will not be returning to the Harvard College experience they left

Preparing for Remote Fall 2020



- Spring 2020 has been, all things considered, a successful pivot to remote instruction.
- Remote learning in Fall 2020 does not mean putting the entire course catalog on Zoom, but rather offering a select subset of existing and some new courses.
- In addition to courses, we need to provide meaningful engagement with faculty, and the Harvard community.
- Must determine what courses and experiences are critical-path for concentrators, and how to help rising seniors graduate on time. This might require re-thinking how we achieve core learning goals.
- College's OUE will take the lead on organizing this.

Defer Fall 2020 Decision, and make Parallel Contingency Plans



4. Graduate program



- Yield of acceptances in science was higher than usual, overall.
- By start of next academic year I very much hope we'll back in research labs, with some occupancy density TBD.
- That does not mean densely-packed students working in shared offices... or even courses taught in our classrooms.
- We need to address some specific challenges for entering students:
 - How do we foster a sense of community, and welcome them to Harvard?
 - We face significant administrative challenges around visas and travel, that make it hard to on-board and pay them.
- Progress to degree completion has been adversely impacted by COVID-19. What's the best way to handle this?
- Over-yield means further strain on GSAS and FAS financial resources.

5. Looking to the future



- COVID-19 has been a major shock.
- This is a good time to take stock and assess the extent to which we are configured for future success.
- We should make these assessments at the research group, department/center, divisional, and University levels.
- Subsequent decisions should be driven by our priorities and optimizing for the future, not the past.
- We should continue to make strategic investments
 - Climate change science and engineering
 - Cognition in Silicon, animals, and humans
 - Quantum science and engineering
 - ...
- Our overarching goal is to continue to attract the best and brightest minds

Action items

- Consider to what extent your group needs access to labs and/or other on-campus resources, in first phase of re-entry.
- Consider what staffing and workflow could accomplish highest priority work that requires on-campus work, with block-diagonal interaction matrix.
 - Shifts and staffing
 - Laboratory workflow –
 - Reposition apparatus?
 - Circulation patterns?
 - Robust to isolation-triggered interruptions.
- Initiate departmental and concentration-focused discussions on what fall offerings are essential to degree progress, and what interesting new classes we might offer.
- Be prepared to step up and contribute to other aspects of remote engagement with undergraduates- mentoring, small-group discussions, new classes...

Thanks again for your agility and engagement.

Questions?

Anonymous Suggestions (curricular, financial, other...)?

<https://science.fas.harvard.edu/suggestions>

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FAS Division of Science

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