Presenters and Panelists

• Anthony P. Monaco, President, Tufts University
• Prof. Moon Duchin, Tufts University
• Dr. Michael Apkon, President and CEO, Tufts Medical Center
• CAPT Wesley H. Hester, USCG and The Fletcher School, Tufts University
• Dr. Assaad Sayah, CEO, Cambridge Health Alliance
• Martin F. Spellacy, Emergency Management, Tufts University
• Barbara M. Stein, VP for Operations, Tufts University
**COVID-19 Student and Community Support Plan**

- **Goal**: Leverage college and university resources to lower the infection and mortality rate of COVID-19
- **Context**: Potential for overwhelming demand on hospitals and healthcare system
  - Example of Italy: Makeshift tents, hallways, parking lots...
  - Need to dedicate hospital beds to critical care
  - Meet needs of first responders and health care workers
How Can Colleges and Universities Help?

• Universities and colleges: Surplus residential capacity, campus facilities following de-densification in March
  • How to take advantage of this capacity to reduce strain on hospitals?
• This webinar
  • Focus on critical work at two levels
    • Individual institutions of higher education
    • Tufts as case study
  • Data-based assessment of needs and opportunities
    • Connecting hospitals with nearby college campuses
    • Mathematical model developed by Prof. Moon Duchin for optimizing location of alternative hospital sites or housing medical personnel
Potential Uses for Campus Resources

• Outdoor testing sites
• Housing for high-risk or exposed workers away from families
  • First responders
  • Healthcare personnel
  • University staff including police officers
• COVID+ recovering patients skilled nursing unit (SNU)
• Non-COVID+ ambulatory patients
Partners and Requirements

- Partners in community support
  - Colleges and universities
  - Municipal governments
  - Local/regional healthcare providers
- Requirements
  - Leadership commitment
  - Cross-functional support
  - Inventory of available campus resources
  - Clear operating agreements
  - Plan for returning facilities to university use
Tufts Partnerships

• Medford, Somerville municipal governments
• Tufts Medical Center, Cambridge Health Alliance
• Expertise provided by military logistics and planning experts in Fletcher Fellows Program
Principles for Use of Campus Resources

• Requests for use vetted and triaged by your community liaison and your city and clinical partners
• Specific uses assigned to appropriately designated zones of campus
• Separate residential zones for different populations
Principles for Use of Campus Resources

• Services in non-student zones to be provided by partner organizations to greatest extent possible
• Transparent communication with Tufts community
• Share experience to support peers’ efforts
Outdoor Testing Locations

- Medford/Somerville
- 5 sites identified
- How it works
  - We provide space for drive-thru
  - Need power, WIFI, bathroom access, tents, heaters, coolers, traffic flow management
- Questions/Concerns
  - Liability/License to use
  - Neighbor concerns
  - Staffing
**Housing Requests**

- Expected populations
  - University students, faculty, and staff – your police force
  - High-risk exposed workers who want/need to remain separated from their families
    - First responders – cities, towns, communities
    - Health care personnel – hospital, health care provider
  - COVID+ recovering patients (communal housing - SNU)
  - Non-COVID ambulatory care patients
Aligning Facilities with Needs

- Assess logistics
  - Isolatable vs. communal rooms, community vs. private bathrooms, stairs vs. elevators
- First responders, health care personnel, university staff
  - Smaller groups, suites, separate entryways
  - Separate healthy, exposed/quarantining and COVID+/isolating
- COVID+ recovering patients and non-COVID ambulatory care patients
  - Multi-bed units, standard dorm corridor used as SNU
Medford Campus: Support Housing
Support Considerations

• Housekeeping and sanitation services for lodging and spaces (laundry, daily trash, deep cleaning)
• Dining services; delivery for isolated and quarantine residents
• IT network availability
• Storage space for large volume of supplies
• Large indoor “ward” spaces like a gym or field house
Support Considerations

• 1st floor or elevator accessibility – needed for recovery SNU
• Clinical suitability
• Public safety support
• Licensing – medical and legal
• Liability
Other Roles for Colleges and Universities

• Medical supplies, community service
  • Tufts: Mask repair
• Leverage networks to support healthcare partners
  • Tufts: Alumni, parent donations of PPE
• Research and innovation
  • Science and public health
  • But also social science and mathematics
  • Introduce Prof. Moon Duchin
HOSPITAL-TO-UNIVERSITY MATCHINGS

Moon Duchin, MGCGG Redistricting Lab
MODELING THE MATCHING

- Classic math modeling problem: *network flow / optimal transport*. Send material from source nodes to sink nodes in a network in a way that minimizes travel time.

- **Sources**: hospitals

- **Sinks**: college and university campuses

- Massachusetts has 20,882 hospital beds and 162,215 dorm beds, so the matching problem is solvable even with many constraints.

Mggg.org/covid-flows
Campus Coronavirus Response

Colleges can provide much-needed support for strained hospitals

As the growing number of coronavirus cases continues to strain limited hospital resources, college campuses with largely vacated dormitories are in a unique position to provide additional beds and facilities to hospitals. Dorms can be repurposed as alternative sites to house recovering patients and offer temporary lodging to medical personnel, coordinated through hospital systems.

At the MGGG Redistricting Lab, we usually study gerrymandering. But with the same geodata and math modeling skills, we can build a simple model that connects hospitals to nearby college campuses.

Let’s take a look at Massachusetts.
Mapping hospital-university flows in MA

Size is proportional to number of beds

- Hospitals
- Colleges

Think we should adjust which colleges and hospitals are included? Provide feedback here.
Mapping hospital–university flows in MA

size is proportional to number of beds

- Hospitals
- Colleges

Think we should adjust which colleges and hospitals are included? Provide feedback here.
Mapping hospital–university flows in MA

Size is proportional to number of beds  🟥 Hospitals  🌐 Colleges

Think we should adjust which colleges and hospitals are included? Provide feedback [here](#).
Mapping hospital–university flows in MA

*size is proportional to number of beds*  
- **Hospitals**  
- **Colleges**

Think we should adjust which colleges and hospitals are included? Provide feedback [here](#).
<table>
<thead>
<tr>
<th>College</th>
<th>City</th>
<th>Number of dorm beds</th>
<th>Hospital staff assigned by the model</th>
<th>Patients assigned by the model</th>
<th>Utilization (%)</th>
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<td>Boston</td>
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<td>Massachusetts Maritime Academy</td>
<td>Buzzards Bay</td>
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<td>Haverhill</td>
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<td>74</td>
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</tbody>
</table>

Showing 66 colleges
HOW TO USE THE CAMPUS FLOW MODEL

➢ Priority campuses. You can sort the campuses in order of utilization to get a priority order for mobilizing the campus response.

➢ Underserved areas. Planners can look at regions of the state with long travel times to decide where other building types or new emergency facilities will best complement the campus response.

➢ Well-matched hospitals. Universities can set the mapping tool to reflect their own available dorm capacity, then receive an indication of which hospitals they are best suited to support.
Questions and Discussion