

## HSI Annual Report for 2021

July 1, 2020 to June 30, 2021

### Letter from the Director

This past year, we were more adept at functioning under the constraints of the pandemic. Despite the hindrances, HSI researchers produced award-winning research and collaborated with a variety of organizations and companies. Their insights were translated into business-ready impact articles for our newsletters and website thus serving a number of different audiences for our work. The quality, quantity and channels for our communications saw tremendous growth this past year.



We continued to offer zoom seminars. The on-line format allowed us to invite speakers who wouldn't normally be able to travel to speak with our students and supporters. Similarly, our audience was drawn from a much larger area. This larger catchment area was especially noticeable and gratifying during our HSI Healthcare Certificate Ceremony. Graduates could invite friends and relatives from all over the world to celebrate their achievement.

The larger graduating class is indicative of the continuing interest in healthcare at MIT Sloan. Registration from both the Certificate and for Healthcare Lab continue to grow at an accelerating rate.

In this report, we present a snapshot of our accomplishments for the past year. I hope you enjoy this look back and thank you – our researchers, advisors, donors, collaborators, students, and friends – for your support.

***Dr. Anne Quaadgras***

*Director, MIT Sloan Health Systems Initiative*

### What's New

This past year we expanded our research bench to include Dean Eckles in our Economics, Finance and Behavioral Science group. We also welcomed MLK Visiting Scholar for one year, Charles Senteio who focused on health equity and social determinants of health. Each researcher brought their expert lens to the COVID-19 pandemic. One of Eckles' [recent papers](#) focuses on how to substantially increase intentions to accept a vaccine for COVID-19. Senteio's [continued collaboration](#) with Professor David Rand and others probes the issue of race and its effects on intentions and perceptions of COVID-19.

We revamped our website to focus on how readers can make use of researchers' insights and to adapt academic work to the business environment.

Our [site](#) now highlights the impact of our most recent research on the [landing page](#). Currently, we feature several articles including:

[Prize-winning Research Reduces Transportation Inefficiencies](#)

[Agile Collaboration Improves Health Hub Design Adoption](#)

[AI-driven, personalized transparent decision-support tool enables improved treatment decisions](#)

[Healthcare Certificate Grads Make Their Mark](#)

Our landing page is also the place to find spotlights that summarize our work. Now, these include:

[HSI Spring 2021 Research Updates](#)

[MLK Scholar Charles Senteio’s Research Shines a Light on Health Inequity](#)

[HSI Funds Five Research Projects in 2020 that Address Pressing Issues](#)

We have also supplemented our website with [links to HSI work publicized in other areas of MIT](#). Our researchers’ work has been featured on pages highlighting MIT experts, including MIT Sloan’s [Ideas Made to Matter](#) series.

During the past academic year, despite the challenges posed by the pandemic, we hosted eight virtual events, which we detail in the Accomplishments section, below.

## Research Accomplishments and Impact

Over three research grant cycles, we have allocated a total of nearly \$1M across 10 projects. For several projects, HSI supplied the “seed funding” for researchers to show proof of concept, which enables them to successfully apply for much larger grants from funders such as the NIH. Professors Joseph Doyle, Erin Kelly, and Vivek Farias, have received additional funding based on research that was supported by HSI, and we expect other researchers to follow a similar path. Similarly, our industry research partner, the Staten Island Performing Provider System (PPS), was able to secure outside funding to allow them and HSI researchers to continue our collaborative project, and test the researchers’ opioid overdose predictive model.

### **HSI Funded Projects**

Project Title	Research Team (HSI Researchers in Bold)	First Funded	Status
Developing Advanced Analytics to Develop a Liquid Biopsy to Detect Early-Stage Cancer	<a href="#">Vivek Farias</a> , Jackie Baek, Tianyi Peng, Deeksha Shinha, Andrew Li	2019	Complete
Predictive-Prescriptive Analytics to Address the Substance Abuse Crisis	<a href="#">Georgia Perakis</a> , Dessi Pachamanova, Omar Lami, Amine Bennouna	2019	Complete
Analytics-based Opioid Overdose Prediction	<a href="#">Jonas Jonasson</a> , <a href="#">Nikos Trichakis</a> , Neal Kaw, Deeksha Sinha	2019	Complete
Warehouse Work and Worker Well-being	<a href="#">Erin Kelly</a> , <a href="#">Hazhir Rahmandad</a> , Alex Kowalski, Kirsten Siebach	2020	Ongoing
Geisinger's Fresh Food Farmacy: A Randomized Controlled Trial	<a href="#">Joseph Doyle</a> , Marcella Alsan, and John Cawley	2019	Ongoing
Combining machine learning and behavioral insights to provide differentiated digital adherence support	<a href="#">David Rand</a> , <a href="#">Jónas Jónasson</a> , <a href="#">Erez Yoeli</a>	2020	Ongoing

Data Challenges, IT and Healthcare Challenges in Reporting Accurate Data in the COVID-19 Pandemic	<a href="#">Catherine Tucker</a> , Yiqun Cao, Yifei Wang, Hong Yi Tu Ye, & 10 undergrads	2020	Ongoing
Causal Inference in Large-Scale Observational Omics Data	<a href="#">Vivek Farias</a>	2021	new
Improving Hospital Operations through Predictive-Prescriptive Analytics and Behavioral Models	<a href="#">Georgia Perakis</a> , Dessi Pachamanova, Maureen Canellas	2021	new
Understanding and Reducing Racial Inequity for COVID-19 Vaccination	<a href="#">David Rand</a> , Charles Senteio	2021	new

For more detail about our research, please see: [Our Work](#).

We’ve been focusing on the impact of our research beyond the scope of the specific projects, since much of our work is adaptable to other contexts. The general building blocks of a project are methods, data and interventions. For the project “Analytics-based Opioid Overdose Prediction project with The Staten Island PPS, HSI researchers developed new, best-in-class methods, and those are adaptable and transferrable. The data and interventions are, by necessity, local: what might work in an urban environment may be different from what would be effective in a less densely populated area.

Our researchers are also called upon as experts outside of MIT. Every week, some are mentioned in the popular press. Some recent examples are:

David Rand: [How ‘Prebunking’ Can Fight Fast-moving Vaccine Lies](#)

Dimitris Bertsimas: [New MIT Analytics Tools Predict COVID-19 Patient Outcomes and More](#)

Erin Kelly: [The Upside of a Flexible Work Week](#)

## Education

### Healthcare Certificate and Healthcare Lab



On June 2, 2021, 30 students from eight programs across MIT received the Healthcare Certificate in a virtual ceremony. After the formal ceremony, attendees could visit various breakout rooms to have more personal chats and learn more about others’ plans and experiences, mirroring an in-person experience—an improvement on the prior year’s virtual ceremony. We are hopeful this coming year can be in-person and perhaps a hybrid format. As of

Fall 2021, at least 30 students are on track to earn the Certificate in 2022.

Healthcare Lab enrollment continued its enormous growth. This past year 45 students, 20 more than the previous year, completed 12 projects for a variety of industry and organization partners. Some Healthcare Lab projects have been featured on the Action Learning Lab [web page](#).

Healthcare research and education continue their dramatic growth in both quality and popularity among students and researchers. Communicating this trend enhances MIT’s reputation in the marketplace as a major player and thought leader, which further benefits our programs.

### Seminars

We presented six seminars and two events in FY21, via Zoom. Since the meetings were virtual, we were able to invite speakers and audience members to attend without regard to geographic location. So, for example, we had speakers call in from all over the United States who would not have been able to travel to campus. For the virtual Healthcare Certificate graduation, many more people were able to attend and celebrate with our students.

Date	Speaker	Topic
June 2, 2021	<a href="#">Healthcare Certificate Virtual Ceremony</a>	
May 6, 2021	Professor Jónas Oddur Jónasson	Drivers of Consistency in Paramedics’ Performance
March 25, 2021	Jason Troutner, LGO 19	How the Generic Startup Truisms Fall Short in the World of Medical Devices
March 18, 2021	Professor Charles Senteio	Using Machine Learning to Improve Health Equity and Reduce Cost of Care
Feb. 26, 2021	<a href="#">Sloan Healthcare and Bioinnovations Conference</a>	
Nov. 12, 2020	Meredith Smith, Risk Management Director, Alexion Pharmaceuticals, Inc.	Uptake of Digital Risk Minimization Tools by Healthcare Professionals and Patients
Oct. 29, 2020	Sonal Singh, MBA '19, co-founder & CEO; Jim Peraino, SM '20, RA, EDAC co-founder & CTO	Rethinking Buildings’ Role in Healthcare Delivery
Sept. 24, 2020	John Glaser, Former CIO, Partners Healthcare; Former CEO, Siemens Health Services	Transformation of the Electronic Health Record

### Communications



Both communication frequency and quality have benefited from donor funding. We completed all of the proposed tasks listed in last year’s report. We are continuing to improve current channels and are in beta testing for a Twitter feed. We are also in the process of creating a taxonomy to index all of our content, making it easier for our readers to find resources by topic, trend or author. In the coming year, we are also going to add more analytic capacity to our communications channels to track which channels and types of information are of most interest to our readers.

## Newsletter

This year we grew our audience by approximately 30% to almost 600 subscribers from 459 a year ago. Our average open rate of 53.1% far exceeds our industry peers' rate of 38.7%. We published three issues in 2020 (August, October and December) and three more in 2021 (February, April and June).

We also changed the format to reflect the changes on the website. Our newsletter features two types of articles: Impact and Spotlight. We continue to publicize events of interest to our audience, which have been well attended.

## New HSI Lab

In last year's annual report, we announced our new research initiative, The HSI Lab for Employee Population Health. The pandemic has complicated some of our efforts in launching this program; we had to cancel a March 2020 in-person kick-off. However, on a positive note, after conversations with our Board, we have sharpened our focus on those issues that matter most to potential collaborators. Subsequently, we have conducted several discussions with interested companies and organizations. American Express has already committed to a membership for three years.

Our conversations have confirmed that employee health and wellbeing are still at the top of mind of industry leaders. Such efforts can have a major impact on productivity and retention and are a key part of corporate responsibility and Environmental/Social/Governance (ESG) standards. We continue to believe that MIT Sloan should be well positioned to partner with large employers to test what works and what doesn't for employee health and wellbeing. It seems that we need to co-fund initial projects to build success stories that can be relayed to new collaborators.

## Call to Action

We are always interested in introductions to others who may like to connect with us as subscribers, guest speakers, research collaborators, experts, and data providers. Please contact us at [healthsystems@mit.edu](mailto:healthsystems@mit.edu)


We welcome you to join us for zoom events in FY22. [Subscribe to our newsletter](#) or see the [Events](#) section on our website for details.

[Contact us!](#)

## Thank You

### Our Thanks To:

Our Advisory Board is comprised of MIT alumni and other leaders from the healthcare sector. We would like to thank them for their valuable time, advice, and introductions to others who may be interested in collaborating with HSI. They help us achieve both rigor and relevance in our work.

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### This year's donors to HSI

Kirill Bezzubov MBA '06	Lyndon D. Braun SM '89	Ivy Head Family Foundation
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