



Master of Implementation Science

Fundamentals January 9, 2024



Dartmouth
GEISEL SCHOOL OF
MEDICINE

Dartmouth Center for
**IMPLEMENTATION
SCIENCE**

Dartmouth Center for Implementation Science

Presented by Duane Compton, Dean Geisel School of Medicine and Jeremiah Brown, Professor of Epidemiology



Approved

Dartmouth Academic Planning Council

August 15, 2022



July 27, 2022

Academic Priorities Council
David Kotz, Provost
c/o Daniel Veres
Office of the Provost
Dartmouth College

Dear Council Member

Thayer School of Engineering
Science proposed by
Medicine. The mission
from all schools and
development, and gra
collaboration in resear

We have already colla
Advisory Board for a g
awarded, Dr. Brown w
Thayer.

Sincerely,

Alexis Abramson, De

Douglas W. Van Citter

Vicki V. May, Profess



Susan Reeves, EdD, RN, CENP

Executive Vice President
Dartmouth Hitchcock Medical Center
Clinical Professor, Department of
Chief Nurse Executive, Dartmouth

July 29, 2022

Academic Priorities Council
David Kotz, Provost
c/o Daniel Veres
Office of the Provost
Dartmouth College
6004 Parkhurst Hall
Hanover, NH 03755

Dear Council Members,

As Executive Vice President of
Dartmouth Health, I am writi
proposed by Dr. Jeremiah Br
across the Dartmouth and De
engage faculty from all schoo
funding development, and th

Dr. Brown and I have met an
Dartmouth Health's strategic
chairs and clinical faculty. Th
proposed center activities inc
funding, education, and facul
activities of the Center to be

Sincerely,

Susan A. Reeves, EdD, RN, CE



July 25, 2022

Academic Priorities Council
David Kotz PhD, Provost
c/o Daniel Veres
Office of the Provost, Dartmo

Dear Council Members,

The Office of Research Opera
Center for Implementation Sci
Geisel School of Medicine. I v
programs, as I did at Yale. Thi
programs supported by the Na
the mission and vision of the c
and divisions in implementati
opportunity to explore new gr

Dr. Brown and I have spoken
members of the Dartmouth He
benefiting from the proposed c

I foresee numerous avenues of
planned CTSAs (to be submitte
education, and faculty develop
am pleased to participate in th

Sincerely,

Steven L. Bernstein, MD



July 25, 2022

Academic Priorities Council
David Kotz, Provost
c/o Daniel Veres
Office of the Provost, Dartmouth College

Dear Council Members,

The Department of Psychiatry is strongly sup
by Jeremiah Brown and Dean Compton, Geis
of the center to reaches across Dartmouth to
science training, extramural funding develop
Jeremiah has met with us and other faculty v
proposed center activities. We see many ave
science extramural funding, education, facul
Aschbrenner, Associate Professor of Psychiat
letter, will be joining the new center leaders
serving as an internal senior advisor.

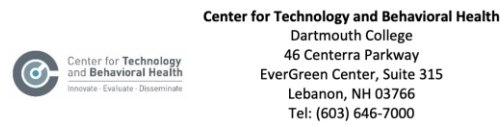
We are enthusiastic that the mission of the Center reaches across the Dartmouth community to engage faculty from all schools and divisions in implementation science training, extramural funding development, and the opportunity to explore new graduate programs. Implementation science is a growing and significant area of research that promises to have considerable impact in translational science, and Dartmouth is well-poised to accelerate its distinction and leadership in this field.

Sincerely,

Martha L. Bruce, PhD, MPH
Professor and Vice Chair for Research, Department of
Geisel School of Medicine at Dartmouth and Dartmou

Kelly Aschbrenner, PhD, MA
Associate Professor, Department of Psychiatry
Geisel School of Medicine and Dartmouth Health

Sarah Lord, Ph.D.
Assistant Professor, Departments of Psychiatry, Pediat



July 28, 2022

Academic Priorities Council
Dr. David Kotz, Provost
c/o Daniel Veres
Office of the Provost
Dartmouth College

Dear Council Members,

The **Center for Technology and Behavioral Health** (CTBH) at Dartmouth College is strongly supportive of the Dartmouth Center for Implementation Science proposed by Dr. Jeremiah Brown and Dean Compton at the Geisel School of Medicine.

We are enthusiastic that the mission of the Center reaches across the Dartmouth community to engage faculty from all schools and divisions in implementation science training, extramural funding development, and the opportunity to explore new graduate programs. Implementation science is a growing and significant area of research that promises to have considerable impact in translational science, and Dartmouth is well-poised to accelerate its distinction and leadership in this field.

Dr. Jeremiah Brown has met with me and other members of CTBH who have expressed interest in participating in, benefiting from, and contributing to the proposed Center activities.

At CTBH, our faculty and staff see many avenues of collaboration with this new Center in building on our implementation science extramural funding, education, and faculty development. Specifically, Dr. Sarah Lord, Director of the Dissemination and Implementation Science Core of CTBH will be joining the new Center leadership team. In addition, I am pleased to participate in the Center by serving as an internal senior advisor, and I am delighted to participate in this role.

Please feel free to contact me if you should need additional information (lisa.a.marsch@dartmouth.edu; 603-646-7092)

Sincerely,

Lisa A. Marsch, Ph.D.
Director, Center for Technology and Behavioral Health
Director, Northeast Node National Drug Abuse Treatment Clinical Trials Network
Andrew G. Wallace Professor



Martha L. Bruce, PhD, MPH
PROFESSOR AND VICE CHAIR FOR RESEARCH
DEPARTMENT OF PSYCHIATRY
46 CENTERRA PARKWAY
LEBANON, NH 03766
m. Bruce@dartmouth.edu



July 28, 2022

To:
Academic Priorities Council
David Kotz, Provost
c/o Daniel Veres
Office of the Provost, Dartmouth College

Dear Council Members:

As a research associate professor of Anthropology at Dartmouth, I am in support of the Dartmouth Center for Implementation Science proposed by Jeremiah Brown and Dean Compton, Geisel School of Medicine.

I have been collaborating on implementation science grants with Jeremiah and other Dartmouth faculty for more than five years. This work aims to enhance the translation of effective interventions and clinical approaches into routine practice. I met with Jeremiah to learn more about the mission and vision of the proposed center. I believe the proposed research, training, and future educational programs will provide necessary faculty development and collaboration opportunities that would engage faculty from diverse disciplines in departments across Dartmouth.

Sincerely,

Elizabeth Carpenter-Song, Ph.D.
Research Associate Professor
Department of Anthropology
Dartmouth College



Michele Tine, Ph.D.
Associate Professor, Sociology Department
Chair, Education Steering Committee
10 North Main Street, Suite 308C
Hanover, NH 03755



Robert Shumsky
Professor of Operations Management

Tuck School of Business at Dartmouth
100 Tuck Hall
Hanover, NH 03755-9000
Tel: 603-646-8137
Fax: 603-646-1308
robert.a.shumsky@dartmouth.edu
www.tuck.dartmouth.edu



Dartmouth
GEISEL SCHOOL OF
MEDICINE



Dartmouth Health
Department of Community & Family Medicine

Implementation Science,
medicine. I believe that
to engage faculty from
extramural funding, and

Health care delivery using
econometrics. Our
I, and the drivers of
ation science in general,
ombining our efforts.

ional faculty members.
d center activities. At
g implementation

Dartmouth Center for Implementation Science

Community Medicine, it is with great enthusiasm that I write
Science proposed by Drs. Jeremiah Brown and
Tine at Dartmouth.

My proposal, but with leaders from our Academic
research Center. Our departmental leadership teams
activities and believe we could benefit from future
the mission and vision of the Center for
and Dartmouth Health to engage faculty from all
nt, and the opportunity to explore new graduate and

can be of further assistance.

Dartmouth Health

the Dartmouth Center for Implementation Science
School of Medicine. We enthusiastically support the
Dartmouth and engage faculty from all schools and
nding development, and the opportunity to explore

including Anna Tosteson, Brock Christianson, Lisa
David Chambers at the National Cancer Institute
center. The NCI previously has sponsored national
which our faculty have participated. Our leadership
lation Sciences Program, have expressed interest in
activities, including collaboration in exploring
d faculty development. We previously have secure
Outcomes Research Institute (PCORI), a leading funder
ur Training Program for Quantitative Population
ly received a fundable score on its pending renewal.

and capitalize upon, the proposed creation of a
DCC Letter of Support conveys our advocacy for your

ow my
Brown and

a (Biology) to
with our current
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the planned
on science

Center Aims

- Provide an **academic home** for implementation research
- Provide **trainings** in implementation science
- Create **awareness** of the field and its multifaceted applications
- **Expand strategies** used in implementation science beyond medicine

Our Team



Jeremiah Brown, PhD
Director

Professor with Tenure of
Epidemiology
Professor of The Dartmouth Institute
Professor of Biomedical Data Science
Chair, Science of Implementation in
Health and Healthcare NIH Study
Section



Kelly Aschbrenner, PhD
Co-Director

Associate Professor of Psychiatry
Associate Professor of The Dartmouth
Institute
Senior Scientist at Dartmouth Health
Director, Center of Excellence at
Dartmouth Health
Director, Research Methods Unit,
ISCCCE, Harvard University



Sarah Lord, PhD
Co-Director

Associate Professor of Psychiatry
Associate Professor of
Biomedical Data Science
Associate Professor of Pediatrics
Director, Dissemination and
Implementation Science Core,
Center for Technology and
Behavioral Health



Julia Shaw, MPH
Program Manager



Kelly Zreloff '26
Implementation
Fellow



Vismaya Gopalan '27
Women In Science
Project

Internal Advisory Board



Duane Compton



Sue Roberts



Margaret Karagas



Steve Bernstein



Marty Bruce



Josh Kim

Provides feedback and input on Center strategies and activities

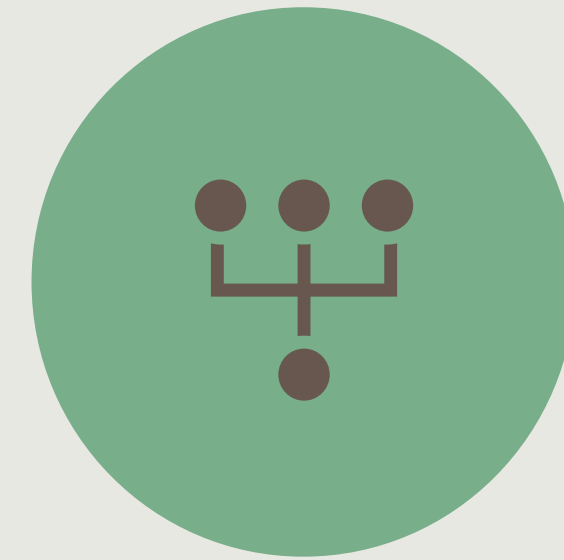
Implementation Science



EVALUATES
**MULTILEVEL FACTORS
AND PROCESSES** THAT
INFLUENCE
IMPLEMENTATION



DEVELOPS AND TESTS
**STRATEGIES TO
OVERCOME BARRIERS**
TO ADOPTION,
INTEGRATION, AND
SUSTAINABILITY



**BRINGS EVIDENCE-
BASED PRACTICE TO
SCALE** AND
ADDRESSES THEIR
UNDERUSE

Implementation Science

Multidisciplinary Influences





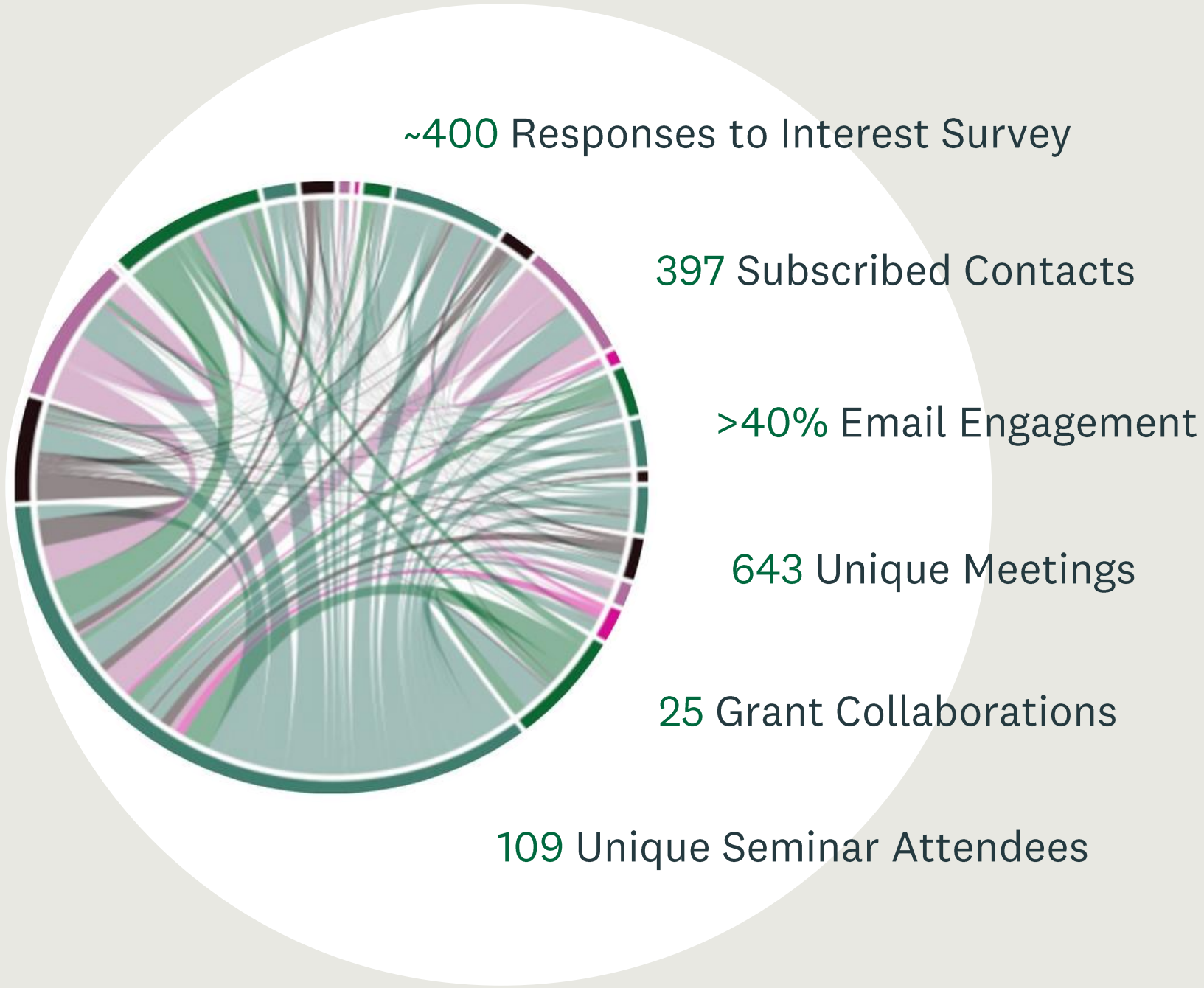
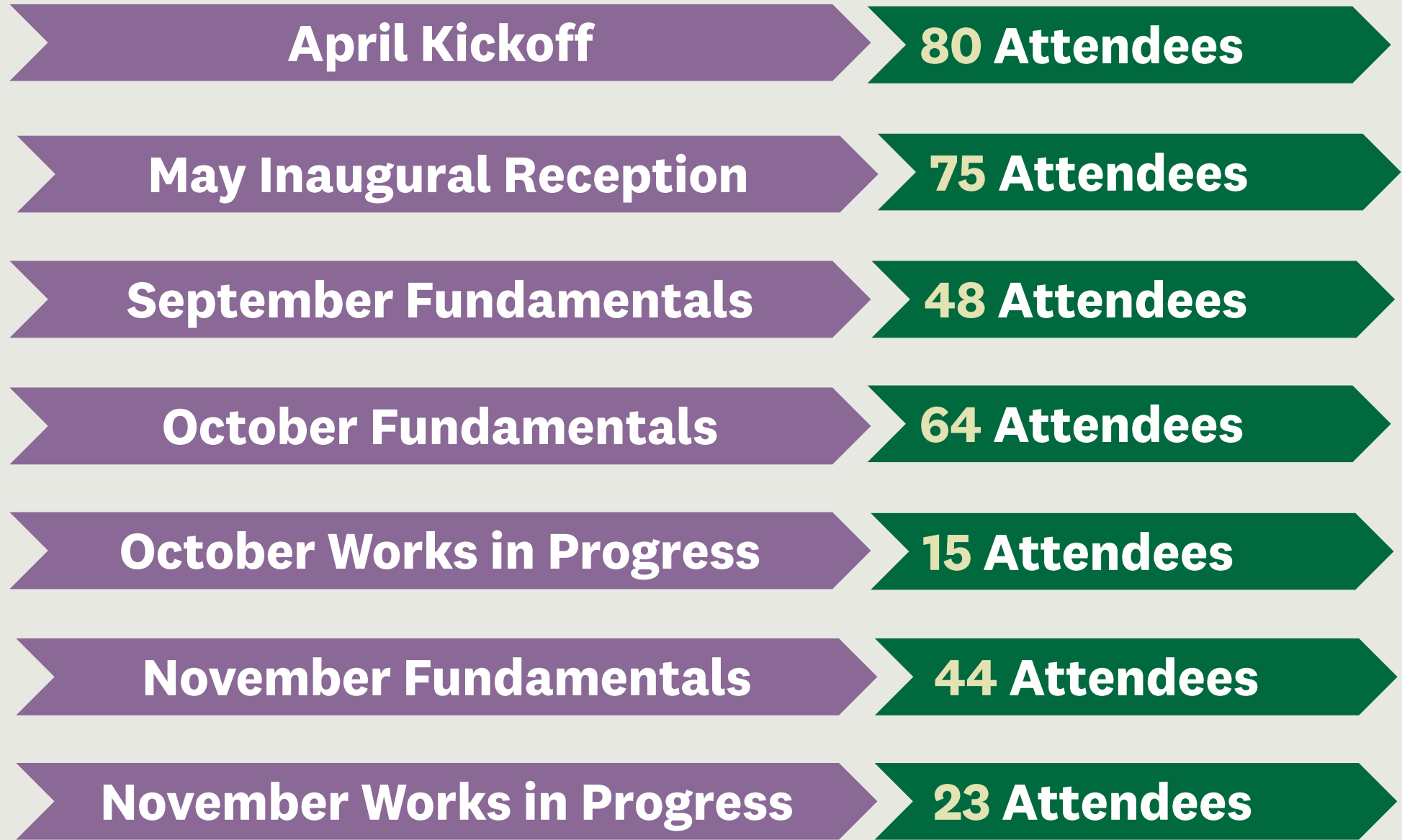
Center Activities



Dartmouth
GEISEL SCHOOL OF
MEDICINE

**Dartmouth Center for
IMPLEMENTATION
SCIENCE**

Engagement



Learning Opportunities

Fundamentals Series

Monthly on the 2nd Tuesday

12:00-1:00 PM

Virtual

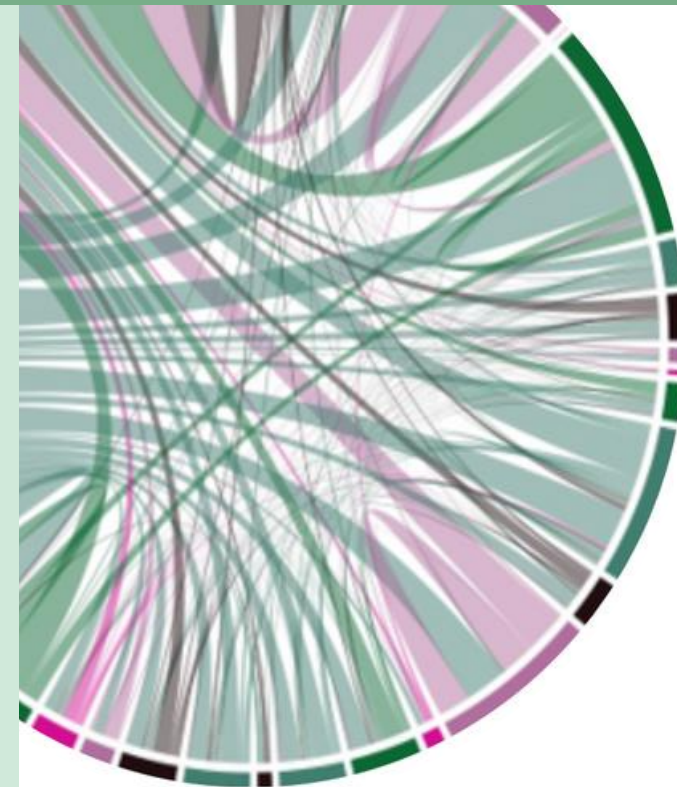


Works in Progress Series

Monthly on the 4th Tuesday

12:00-1:00 PM

In Person & Virtual



Join Our Network



geiselmed.dartmouth.edu/dcis

implementation.science@dartmouth.edu

linkedin.com/company/implementation-science

Implementation Science & Med-ED



Patients and Populations

MDED 118

Many enter medicine in order to make a difference—and as physicians we're fortunate to be able to do that somewhat regularly, for the individuals we care for. But, positioned on the 'front lines', we as physicians are also uniquely able to experience firsthand when something is simply not working. That perspective, along with our training and a sense of responsibility for the health and well-being of others, means that we also can—and ultimately are compelled to—make a difference on a larger scale. Patients & Populations is about preparing future Geisel graduates to make a difference in the health of communities and populations and advance the effectiveness and value of healthcare.

The course aims, specifically, to develop capabilities ranging from the ability to make statistical sense of local data and published research to an understanding of the cultural, regulatory, and financial context in which medicine is practiced; from the people skills critical to working within or leading teams to the tools to address errors and failures in delivering care within local systems. In small group sessions, large group discussions, and self-directed learning, Patients & Populations joins concepts to applications in

Possible ImpSci for MaD curriculum and projects, course in fall 2024, and dual degree options

MDED 218

This year's course is intended to build on the concepts mastered and skills acquired during year 1 of the course, with a focus on reinforcing the overarching course perspectives addressed last year. This year's course will have a smaller footprint than last year's; class sessions will provide the opportunity for students to actively engage and wrestle with current challenges in healthcare delivery and population health, applying the capabilities integral to successfully leading change.

The goal of the course is to empower students with the knowledge, capabilities, and commitment to be effective, collaborative problem solvers and change agents, who go on to make a difference in the health of communities and populations and advance the effectiveness and value of healthcare.

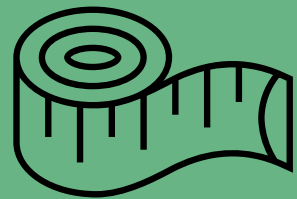
Master of Implementation Science Program Proposal



Dartmouth
GEISEL SCHOOL OF
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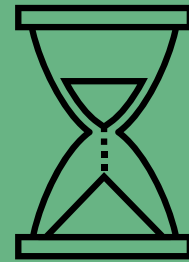
Dartmouth Center for
**IMPLEMENTATION
SCIENCE**

Master of Implementation Science



WHY IMPLEMENTATION SCIENCE?

- Bridges gaps between evidence-base and Practice Innovations & Interventions (I&I)
- Fundamentally new discipline
- Multidisciplinary methods



WHY NOW?

- Rapid growth
- Funding opportunities
- Limited program development
- Lag behind peer institution investment
- Training in high demand



WHY DARTMOUTH?

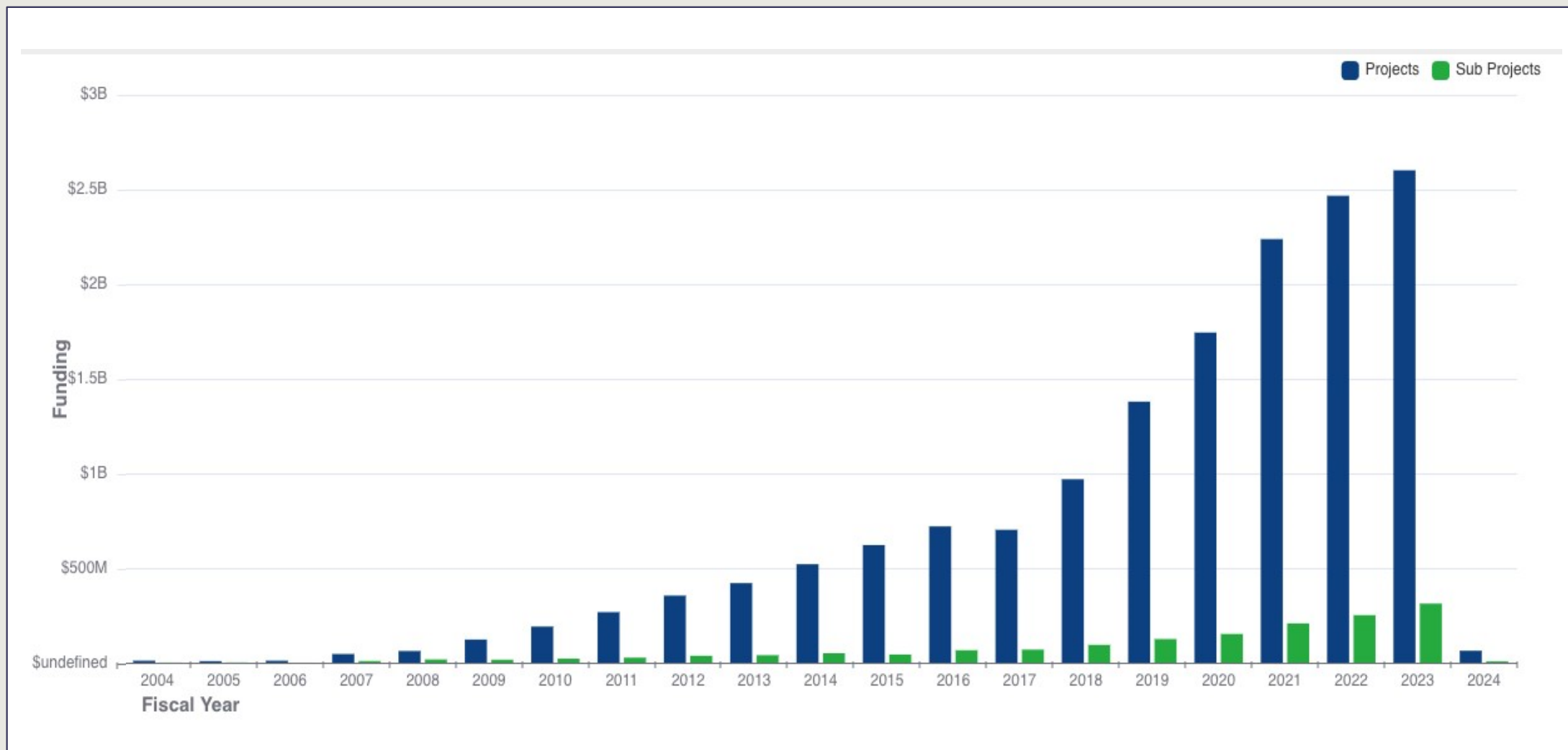
- Unique academic environment
- Undergraduate divisions
- Guarini Arts & Sciences
- Thayer Human Centered-Design
- Tuck Organizational Behavior & Operations Management



Market Demand: NIH Funding

Research conducted by both Hanover Research and DCIS indicates **robust labor projections** and a **strong market for implementation science researchers**.

NIH Implementation Research Funding by Fiscal Year



Fiscal Year	Total Funding
2019	\$1,379,403,150
2020	\$1,744,512,373
2022	\$2,467,074,843
2023	\$2,601,753,909

★ **\$2.6 Billion**
 in current-year NIH-funded
 implementation research
 (partial year, 2023)

Source: reporter.nih.gov
 Search: "implementation research"
 Accessed: December 4, 2023



ACADEMIC PROGRAM ASSESSMENT

Master's in Implementation
Science

Prepared for Dartmouth College
Geisel School of Medicine

April 2023

In the following report, Hanover assesses demand for master's degree programs in implementation science, specifically highlighting demand trends within the New England region and the nation. This report includes an examination of student and labor market demand, and an analysis of ten existing implementation science-related programs.



Market Research for Implementation Science

- Market research indicates that student demand in the nation for the proposed program is outperforming that for all fields.
- Master's programs report an average annualized growth rate of ~13% (2018 – 2022).
- Nationally, there were nearly 83,000 implementation science-related job postings in the past year.
- Employment for related occupations is projected to grow annually by 9% by 2031.
- Graduates from master's programs in implementation science-related fields can likely expect positive job prospects at all geographic levels.

Market Research: Market Comparison



New program
 Healthcare Administration
 Department
**MS, Implementation
 Science**
 1-year program
 \$37,000



School of Public Health
MS, Biostatistics
**Pathway in Implementation
 and Prevention Science**
 11,000 applicants (SPH)
 97 students per class
 2-year program
 \$95,000



School of Public Health
**MS, Translation and
 Implementation Science**
 3,200 applicants
 40 students per class
 16-24 month program
 \$65,000



Department of Global Health
MPH, Global Health
**Emphasis in
 Implementation Science**
 2-year program
 R-\$47,226
 NR-\$80,508

External Validation



Ross Brownson, PhD

Washington University

Director, Prevention Research Center

PI, Co-Director Implementation Science

Center for Cancer Control



Heather Brandt, PhD

St. Jude's Children's Research Hospital

Director HPV Cancer Prevention
Program

NIH-SIHH Study Section Chair



David Chambers, DPhil

Deputy Director for Implementation Science

Office of the Director in the Division of Cancer
Control and Population Sciences (DCCPS)

NIH/NCI

Student Engagement



Genevieve Schaefer '26



Pacifique Muciyo '26



Kelly Zrelhoff '26



Anthony Fosu '24



Vismaya Gopalan '27

“Implementation science is the bridge between **great ideas and great people ready to use them.** This science brings **the ‘know’ to the ‘do.’**”

– Genevieve Schaefer '26
Women in Science Project (WISP)

63% of student respondents to WISP survey reported **interest or potential interest in implementation science** training

Master of Implementation Science



Master of Implementation Science (MIS)

Professional Degree (Geisel)

NECHE Accreditation

Fully Online (Synchronous & Asynchronous Learning)

1-year 4-term program with 2-year option

\$50,000 (\$45,000 with 10% scholarship)

Employment Prospects



> 938,000

Open Implementation Jobs



\$70,000 - \$200,000

Salary Range

(2022)

Prospective Student Profiles



Tabitha Samiye, BS, MD '27

- First-year medical student
- Considering research career
- Looking for: Dual degree



Kara Rodriguez, MD

- Practicing MD
- Pursuing research career
- Looking for: Path to R01



Andrew Zeb, DO

- Associate Medical Director
- Practicing physician on leadership track
- Looking for: Institutional leadership position



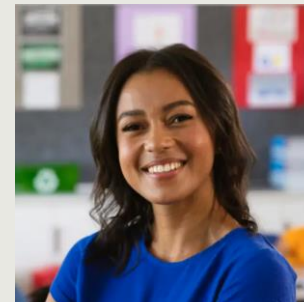
Michelle Lee, MD

- Vice President of Value-Based Care
- Looking for: Rigorous training to support leadership role



Kevin Davis, NP

- Experienced advanced practice provider
- Looking for: Career advancement



Pia McKinley, BA

- Implementation Specialist in K-12 education
- Looking for: Applied skills, career advancement



Sam Gallagher, BS

- Research Program Coordinator
- Looking for: Applied skills, career advancement



Emil Sridharan, BS

- Considering applying to MD, DO, or PhD program
- Looking for: Prestigious master's degree, applied skills

Courses & Faculty

Course	Credits	Target Faculty
Foundations of Implementation Science and Practice	4	Jeremiah Brown (Geisel, Epidemiology), David Chambers (NCI)
Implementation and De-implementation Strategies	2	Andrew Quanbeck (University of Wisconsin)
Introduction to Study Designs and Data Analysis	4	Joelle Ferron (Geisel, Psychiatry)
Experimental Designs	2	Robert Brady (Geisel, Psychiatry), Geoffrey Curran, (University of AR)
Application of Theories, Models, and Frameworks	4	Kelly Aschbrenner (Geisel, Psychiatry), Robert Brady (Geisel, Psychiatry)
Health Equity-Focused Implementation Science	2	Kelly Aschbrenner (Geisel, Psychiatry)
Qualitative and Mixed methods in Implementation Research	4	<i>TBD: Julia Moore (Center for Implementation), Shani Bardach (Geisel, TDI)</i>
Measuring Implementation Science Context, Process and Outcomes	2	<i>TBD: Rachel Tabak (Washington University)</i>
Evidence-Based Interventions: Scaling Up and Scaling Out	4	Sarah Lord (Geisel, Biomedical Data Science)

Courses & Faculty

Course	Credits	Target Faculty
User-Centered Design Applied to Interventions and Implementation Strategies	2	Elizabeth Murnane (Thayer)
Evaluation of Experimental Trials	4	Sherry Owens (TYRA)
Industry implementation	2	Stanley Shaw (Harvard)
Fidelity, Adaptation and Sustainment of Evidence-based Interventions	4	Kelly Aschbrenner (Geisel, Psychiatry)
Health Promotion and Policy Programs	2	Sarah Pratt (Geisel, Biomedical Data Science)
Education, Community-Based Participatory Research, and State Services	2	Yolanda Perkins (NIRN, USC)
Economic Evaluation of Hybrid Implementation Trials	4	Omar Galarraga (Brown University)
Global and Cancer Implementation	2	<i>TBD: Rachel Sturke (Fogarty) Lydia Pace (MGH, Harvard), Gina Kruse (UC)</i>
Behavioral Implementation	2	Sarah Lord (Geisel, Biomedical Data Science)

Academic Calendar

Option for 1- or 2-Year Track

Term	Week	Course 1	Course 2
Summer 1	Week 1	Implementation Science	Introduction to Study Designs and Data Analysis
	Week 2		
	Week 3		
	Week 4		
	Week 5		
	Week 6		
	Week 7		
Summer 2	Week 8	Implementation and De-implementation Strategies	Experimental Designs
	Week 9		
	Week 10		
Fall 1	Week 1	Application of Theories, Models, and Frameworks	Qualitative and Mixed-Methods in Implementation Research
	Week 2		
	Week 3		
	Week 4		
	Week 5		
	Week 6		
	Week 7		
Fall 2	Week 8	Health Equity Focused Implementation Science	Measuring Implementation Science Context, Process, Outcomes
	Week 9		
	Week 10		

Term	Week	Course 1	Course 2
Winter 1	Week 1	Evidence-Based Interventions: Scaling up and Scaling out	Evaluation of Experimental Trials
	Week 2		
	Week 3		
	Week 4		
	Week 5		
	Week 6		
	Week 7		
Winter 2	Week 8	User-Centered Design Applied to Interventions and Implementation Strategies	Industry Implementation
	Week 9		
	Week 10		
Spring 1	Week 1	Fidelity, Adaptation, and Sustainment of Evidence-Based Interventions	Economic Evaluation
	Week 2		
	Week 3		
	Week 4		
	Week 5		
	Week 6		
	Week 7		
Spring 2	Week 8	Health Promotion Programs OR Education, Community-based participatory research, State services	Cancer Implementation OR Behavioral implementation
	Week 9		
	Week 10		



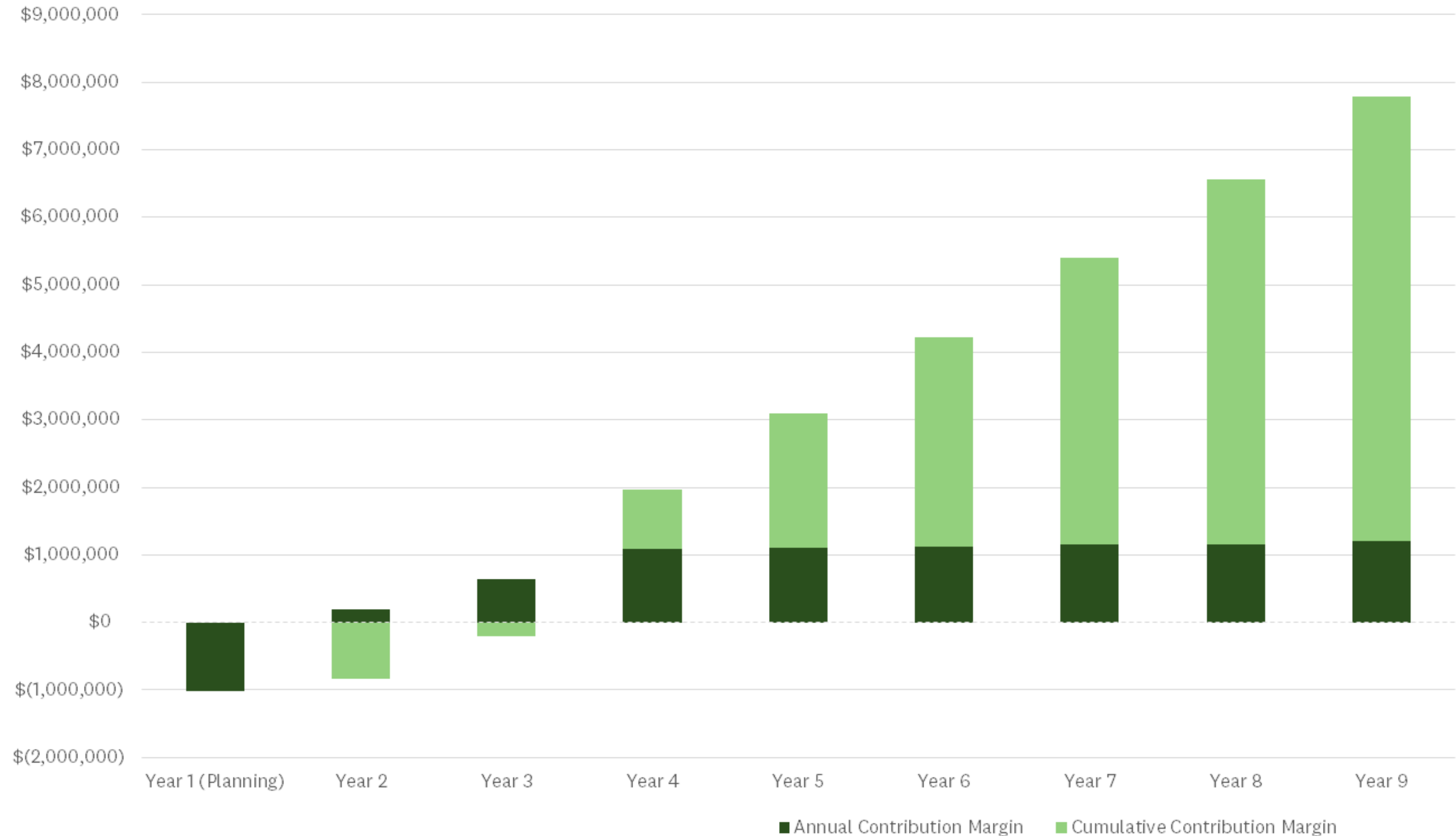
Program Sustainability

• Assumptions:

- Year 1: Recruitment
- Year 2: 30 students
- Year 3: 40 students
- Year 4: 50 students

• Projections:

- \$3M in new revenue
- Positive annual contribution margin beginning in Year 2
- Sustained contribution margin of >\$1M annually beginning in Year 4



Vision

- **Net new revenue**
- **Novel educational program**
- **Faculty, staff, and student development**
- **Improved extramural funding**
- **External, Academic, and Community-based collaboration**
- **Establish strategic cores and resources**

Stakeholder Engagement

APC

Stakeholder Engagement

APC

2022
Stakeholder engagement
Survey
Website
Networking

Market Research

2023
Monthly Training
Imp Sci Consulting
R01s, P01s, COBRE
T32 Grants
R21/R33 Grant
Faculty Recruitment

2024
Monthly Training
Imp Sci Consulting
Program Project Grants
Faculty Recruitment
Education Ramp-up
Education Program
Hires
Marketing
Recruitment

2025
Monthly Training
Imp Sci Consulting
Program Project Grants
Faculty Recruitment
Education Ramp-up
Education Program Hires
Marketing
Recruitment
Launch Masters

30 students



50 students

2026
Monthly Training
Imp Sci Consulting
Program Project Grants
Faculty Recruitment
Education Ramp-up
Education Program
Hires
Marketing
Recruitment

Discussion



Dartmouth
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Dartmouth Center for
**IMPLEMENTATION
SCIENCE**