Translational Science Benefits Model

Moving beyond traditional measures of research impact

Douglas Luke, Julie Heidbreder & Mia LaBrier

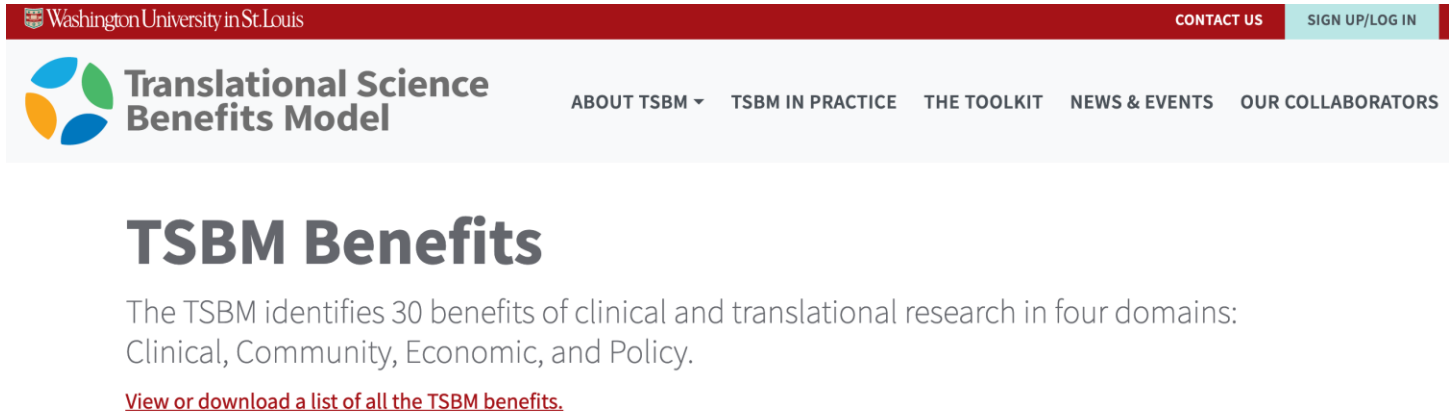
ACTRI, UCSD, December 14, 2023

Disclosure

- I have no actual or potential financial conflicts of interest in relation to this presentation

Goals

- Importance of impact evaluation
- Translational Science Benefits Model
  - History & overview
  - Tools & resources
  - Partners
  - Community engagement
  - Integrating TSBM into CTSA evaluation and activities
- Discussion



The Importance and Challenge of Impact Evaluation

History

from counting widgets

- Publications (# accepted, impact factor)
- Grants (# submitted, $$ amounts)

to identifying what communities, policy makers and funders care about

- Saving lives
- Improving health
- Saving money

to assessing impact

- Identifying the ways that science benefits society beyond science itself
- Talking about the tangible benefits

What is impact?

Impact is...

the effect research has on the wider world

- Influencing policy
- Changing public opinion or informing debate
- Improving systems, designs, or processes
- Scientific advances, across and within disciplines

Impact is not...

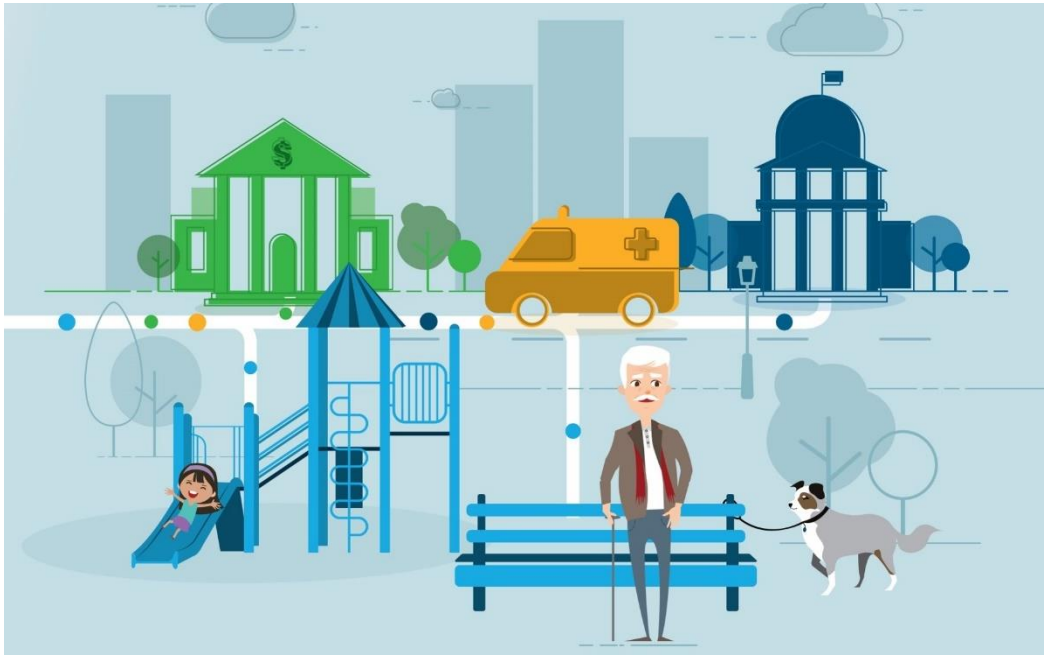
the activities taken to increase these effects

- Publishing academic papers or newspaper articles
- Presenting at conferences
- Discussing your research in the media
- Writing a blog or social media post

https://www.ucd.ie/research/portal/outcomesandimpacts/impactplancapturecommunicate/

Why is impact important?

- Avoids “research for the sake of research”
- Enhances public accountability for research funding
- Can and should inform allocation of future research funding
- **Increases the likelihood that future research will improve health**



Measuring impact is hard

- Time lags
- Contribution and attribution
- Quantifying impact
- Cost
- Training
- Lack of data infrastructure

Jones MM, Castle-Clarke S, Manville C, Gunashekar S, Grant J. *Assessing Research Impact: An International Review of the Excellence in Innovation for Australia Trial*. Santa Monica, CA: RAND Corporation, 2013. https://www.rand.org/pubs/research_reports/RR278.html. Accessed November 3, 2020.

The Translational Science Benefits Model

The Translational Science Benefits Model

- A new approach for demonstrating the impact of science in the broader community
- Focused on research outcomes that are relevant for:
  - The public
  - Policymakers
  - Organizational leadership

ARTICLE | Open Access

The Translational Science Benefits Model: A New Framework for Assessing the Health and Societal Benefits of Clinical and Translational Sciences

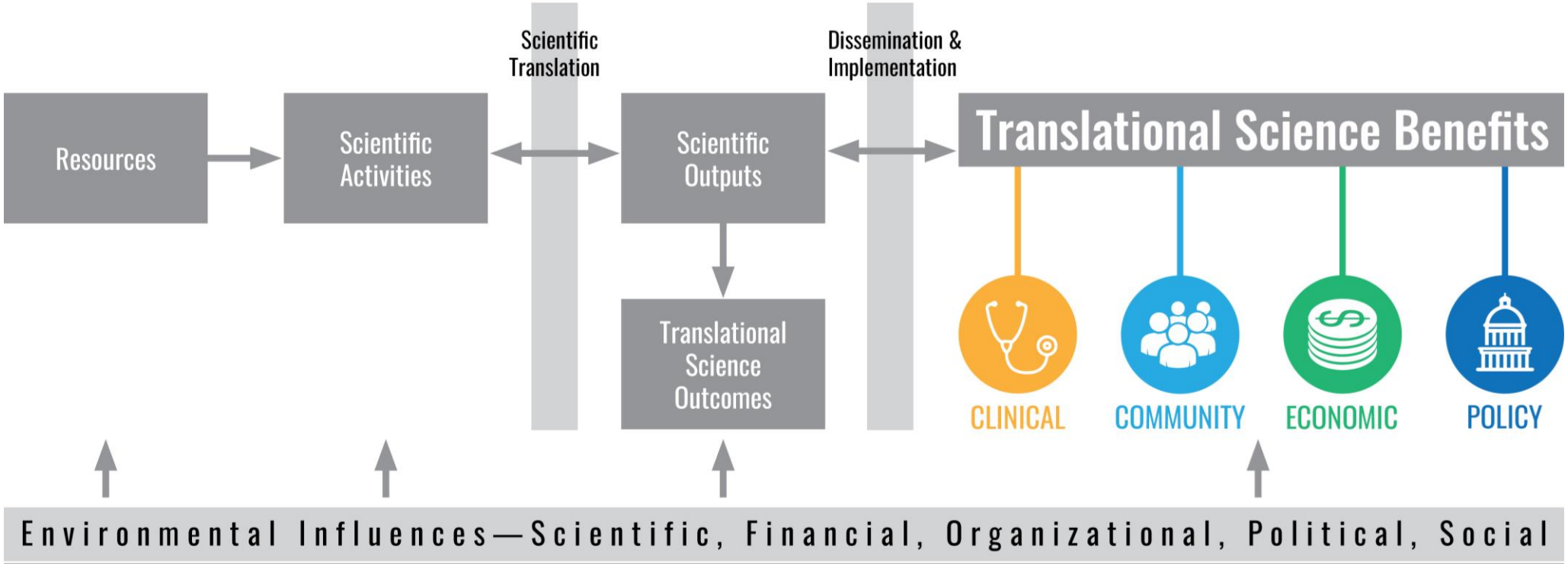
Douglas A. Luke, Cathy C. Sarli, Amy M. Suiter, Bobbi J. Carothers, Todd B. Combs, Jae L. Allen, Courtney E. Beers, Bradley A. Evanoff

First published:08 September 2017 | https://doi.org/10.1111/cts.12495 | Citations: 6

From research to impact

https://cphss.wustl.edu/tsbm-video/

Translational pipeline – from science to benefits



5. Luke DA, Sarli CC, Suiter AM, Carothers BJ, Combs TB, Allen JL, Beers CE, Evanoff BA. The Translational Science Benefits Model: A new framework for assessing the health and societal benefits of clinical and translational sciences. *Clin Transl Sci 11* 77-84 (2018). (modified version)

Benefits in each domain

Clinical

Procedures & Guidelines
- Diagnostic procedures
- Investigative procedures
- Guidelines
- Therapeutic procedures

Tools & Products
- Biological factors & products
- Biomedical technology
- Drugs
- Equipment & supplies
- Software technologies

Community

Health Activities & Products
- Community health services
- Consumer software
- Health education resources

Health Care Characteristics
- Health care accessibility
- Health care delivery
- Health care quality

Health Promotion
- Disease prevention & reduction
- Life expectancy & quality of life
- Public health practices

Economic

Commercial Products
- License agreements
- Non-profit or commercial entities
- Patents

Financial Savings & Benefits
- Cost effectiveness
- Cost savings
- Societal & financial cost of illness

Policy

Advisory Activities
- Committee participation
- Expert testimony
- Scientific research reports

Policies & Legislation
- Legislation
- Policies
- Standards

Examples of impact:

Clinical

Software technologies

The research team developed wearable device technology that provides feedback to patients and families on patient physiological stress. ***Demonstrated***

Examples of impact:

Community

Healthcare Delivery

The EMPOWER 2.0 team is testing different training and support strategies to ensure VA women's telehealth rollouts are successful. ***Potential***

Examples of impact:

Economic

Societal &

Financial

Cost of Illness

A project to increase uptake of long-acting reversible contraception and decrease unintended pregnancy in the St. Louis area saved the state of Missouri an estimated $5 million in Medicaid costs.

Demonstrated.

Examples of impact:

Policy

Policies

The lead researcher on a dissemination project to create messages the reduce stigma around addiction served as a member of the Joe Biden campaign/transition team behavioral health committee and led the development of a draft executive order detailing actions the federal government could take to reduce addiction stigma.

Potential

How to use TSBM

- Monitor and evaluate research impact
  - Individual scientist
  - Research program (over time)
  - Impact profiles for research groups (centers, institutes)
  - Guide funding and strategic planning
- Training and workforce development
- Culture change and agenda setting
- Communicate research impact to policy and practice audiences

Translating for Impact Toolkit

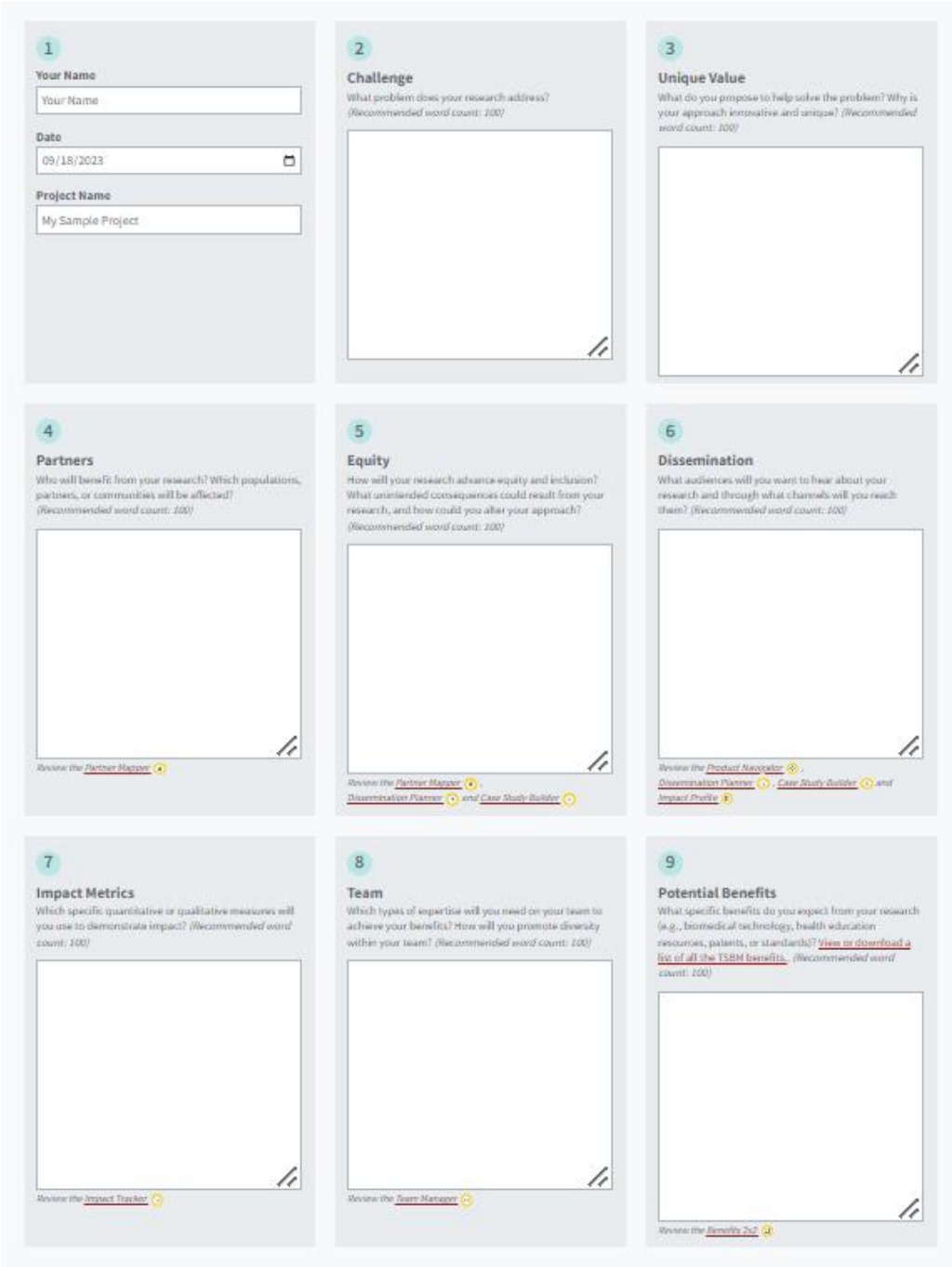
Plan, track, and demonstrate impact

New tools for assessing impact

translationalsciencebenefits.wustl.edu/toolkit/

Get started with the

Roadmap to Impact



Impact Case Studies

Case Studies

Welcome to the TSBM in Practice page. This page currently houses our TSBM case studies.

If you would like to submit your own case study for inclusion on our website, complete the Case Study Builder tool in the Translating for Impact Toolkit and submit to our team.

VIEW ALL FILTER +

Results: 25

Supporting Maternal Mental Health in Early Childhood Settings

By Implementation Research Institute (IRI)
June 6, 2023

Implementing the Mothers and Babies program in Baltimore City

Optimizing Provider Training in Eating Disorders (OPTED)

By Implementation Research Institute (IRI)
May 16, 2023

Increasing accessibility of eating disorder services for diverse youth

Supporting Teacher Use of Positive Behavior Management Interventions in the Classroom

By Implementation Research Institute (IRI)
April 12, 2023

Developing implementation resources that support teachers and improve student well being

Safely Reopening Schools during COVID-19

By ICTS and UCI Institute for Clinical & Translational Science
March 8, 2023

Leveraging multidisciplinary collaboration and partnerships to create guidance for schools navigating the pandemic

Expanding SARS-CoV-2 Testing with a Saliva-Based Test

By ICTS
September 15, 2022

A rapid, simple, and economical diagnostic test for COVID-19

Biopsychosocial Determinants of Pain in Sickle Cell Disease

By Duke University Clinical & Translational Science
May 24, 2022

A study of the contributors to severe pain, toward better management

Expanding SARS-CoV-2 Testing with a Saliva-Based Test

By ICTS | September 15, 2022

Researchers at Washington University School of Medicine in St. Louis developed a saliva-based test for COVID-19. Collecting samples is fast, easy, and less invasive than other COVID-19 diagnostic tests. Photo Credit: Matt Miller

Translational Science Benefits

Clinical Community Economic

Summary

Developing a COVID-19 diagnostic test that was simple, rapid, accurate, and economical was critically important in controlling the spread of COVID-19.[1] Many COVID-19 diagnostic tests require materials such as swabs and personal protective equipment that were in short supply at the start of the pandemic.[2,3] Some needed to be collected by a trained professional, which exposed workers to the virus.[3]

Early in the pandemic, an interdisciplinary team at Washington University in St. Louis and Fluidigm Corporation (now Standard BioTools Inc.) came together to develop and deploy the Advanta Dx SARS-CoV-2 RT-PCR Assay, a saliva-based test for SARS-CoV-2.[1] The development was the result of a collaborative initiative between the Department of Genetics, the McDonnell Genome Institute, and Fluidigm that resulted in a highly-sensitive pairing of a saliva sample processing protocol with a particular RT-PCR assay. In the test, the user can collect the sample themselves by spitting into a collection tube.[1] Saliva tests are more scalable and less invasive than other COVID-19 diagnostic tests, and the sample is easy to collect. Self-collected saliva tests have also been shown to perform as well as or better than health care worker-collected nasopharyngeal swabs and self-collected anterior nasal swabs.[4]

Research Team

Executive Director Dr. Jeffrey Milbrandt, MD, PhD

Department of Genetics; McDonnell Genome Institute Director Rich Head, MS *(primary contact)*
McDonnell Genome Institute

Lauren Burcea; Shelly O'Laughlin; Chris Sawyer; Robert Fulton; Catrina Fronick; Michael Heinz; Lisa Cook
McDonnell Genome Institute

Robi Mitra, PhD; William Buchser, PhD; Matthew Lalli, PhD; Josh Langmade
Department of Genetics

Bill Powderly, MD; Jane O'Halloran, MD, PhD; Clay Dunagan, MD; Charles Goss, PhD; Michael Klebert, PhD; Lisa Kessels; AJ Winningham

Benefits

Demonstrated benefits are those that have been observed and are verifiable.
Potential benefits are those logically expected with moderate to high confidence.

Developed a saliva test to detect SARS-CoV-2, the virus that causes COVID-19. ***Demonstrated.***	Clinical	Diagnostic procedures
Created a software infrastructure to deliver test results and that can be integrated into other IT systems.[6] ***Demonstrated.***	Clinical	Software technologies
The saliva test enables rapid, easy testing on a large-scale, which could reduce disease spread and prevent new cases. ***Potential.***	Community	Disease prevention & reduction
Distributed saliva tests to students, teachers, and staff at multiple school districts, as well as at various universities.[6,8–12] ***Demonstrated.***	Community	Health care accessibility
Increased diagnostic COVID-19 testing for students, teachers, and staff at the Special School District in St. Louis city.[10,11] ***Demonstrated.***	Community	Community health services
Rapid, widespread testing of large populations allows people to return to work, school, and their daily activities safely, which could improve quality of life. ***Potential.***	Community	Life expectancy & quality of life
The saliva test increased testing capacity, which enhanced contact tracing and surveillance of COVID-19. ***Demonstrated.***	Community	Public health practices
Collaboration with the school stakeholders will lead to tailored messaging strategies to maximize testing of children and staff.[11] ***Potential.***	Community	Health education resources
Reduced testing costs by decreasing reliance on more expensive testing methods and scarce testing supplies.[13] ***Demonstrated.***	Economic	Cost savings
The FDA approved emergency use of the Advanta Dx SARS-CoV-2 RT-PCR Assay test on August 25, 2020.[5] ***Demonstrated.***	Economic	License agreements

https://translationalsciencebenefits.wustl.edu/case-study/expanding-sars-cov-2-testing-with-a-saliva-based-test

Impact Profiles

The Stigma Lab: Developing Communication Strategies to Reduce Addiction Stigma

Translational Science Benefits Model

IMPACT PROFILE

The **Stigma Lab** tests the effects of different communication strategies to address addiction stigma and increase support for expanding evidence-based addiction prevention and treatment interventions.

The Impact

The Stigma Lab's research has resulted in *clinical, community,* and *policy* benefits.

Stigma Lab developed effective addiction-stigma reduction messages that have been used by the Johns Hopkins Health System and National Institute on Drug Abuse to communicate with healthcare providers, the public, and policymakers about addiction stigma. Support from these groups also increases the likelihood that policies and practices will be adopted and implemented as intended.

Stigma Lab research has also been used by the state of West Virginia, the Joe Biden Presidential Campaign, and the United Nations to plan future addiction stigma reduction policies and practices. Reducing stigma can enhance engagement in services by people with addiction and ultimately increase recovery.

The Challenge

Drug use is highly stigmatized. Evidence-based interventions to combat addiction are severely under-implemented, in large part due to stereotypes and negative attributes applied to people experiencing addiction. Effective communication strategies are needed to reduce addiction stigma and increase support for expanding evidence-based interventions among the public, some treatment providers, and policymakers.

The Approach

The Stigma Lab has used a large national sample of health professionals to test the effects of different addiction stigma messaging strategies on:

- Addiction stigma
- Perceived effectiveness of evidence-based interventions
- Support for policies to scale-up those interventions

RESEARCH HIGHLIGHTS

The Stigma Lab found that:

- Including messages about the importance of using non-stigmatizing language and delivering messages from the perspective of a patient with addiction **reduced addiction stigma** among health professionals.
- Using the term "overdose prevention site" instead of "safe consumption site" increased public support for this intervention by more than **15 percentage points.**

Key TSBM Impacts

CLINICAL — Informed guidelines for doctors on reducing stigma created by the National Institute on Drug Abuse

COMMUNITY — Developed effective addiction-stigma reduction messages for Johns Hopkins Health System that will also be shared with other health systems

COMMUNITY — Helped West Virginia develop the state's strategic plan around addiction stigma reduction

POLICY — Contributed to a report on stigma reduction policies and practices developed by the United Nations Technical Consultation Panel on Stigma Reduction and Drug Use

POLICY — Informed terminology used in city legislation to legalize facilities in which people can safely use pre-obtained drugs under medical supervision.

The team:
Beth McGinty, PhD & Alene Kennedy-Hendricks, PhD, *Johns Hopkins Bloomberg School of Public Health*; Colleen Barry, PhD, *Jeb E. Brooks School of Public Policy at Cornell University*; Johns Hopkins Hospital; National Association of Attorneys General; National Business Group on Health

Find out more:
Visit full case study
Visit Stigma Lab website

Contact:
Emma Beth McGinty, PhD, bmcginty@jhu.edu
Johns Hopkins Bloomberg School of Public Health
Department of Health Policy and Management

How Collaborators are using the TSBM

How other CTSAs are using the TSBM

- Pilot program evaluation
- Hub-level evaluation planning
- Prospective surveys across portfolio of funded projects
- Retrospective impact analysis
- Impact case studies

Duke Clinical & Translational Science Institute

CTSI MIAMI CLINICAL & TRANSLATIONAL SCIENCE INSTITUTE

OHSU Oregon Clinical & Translational Research Institute

Clinical & Translational Science Center
Accelerating Discoveries Toward Better Health

Duke Clinical & Translational Science Institute

OHSU Oregon Clinical & Translational Research Institute

Duke University CTSI

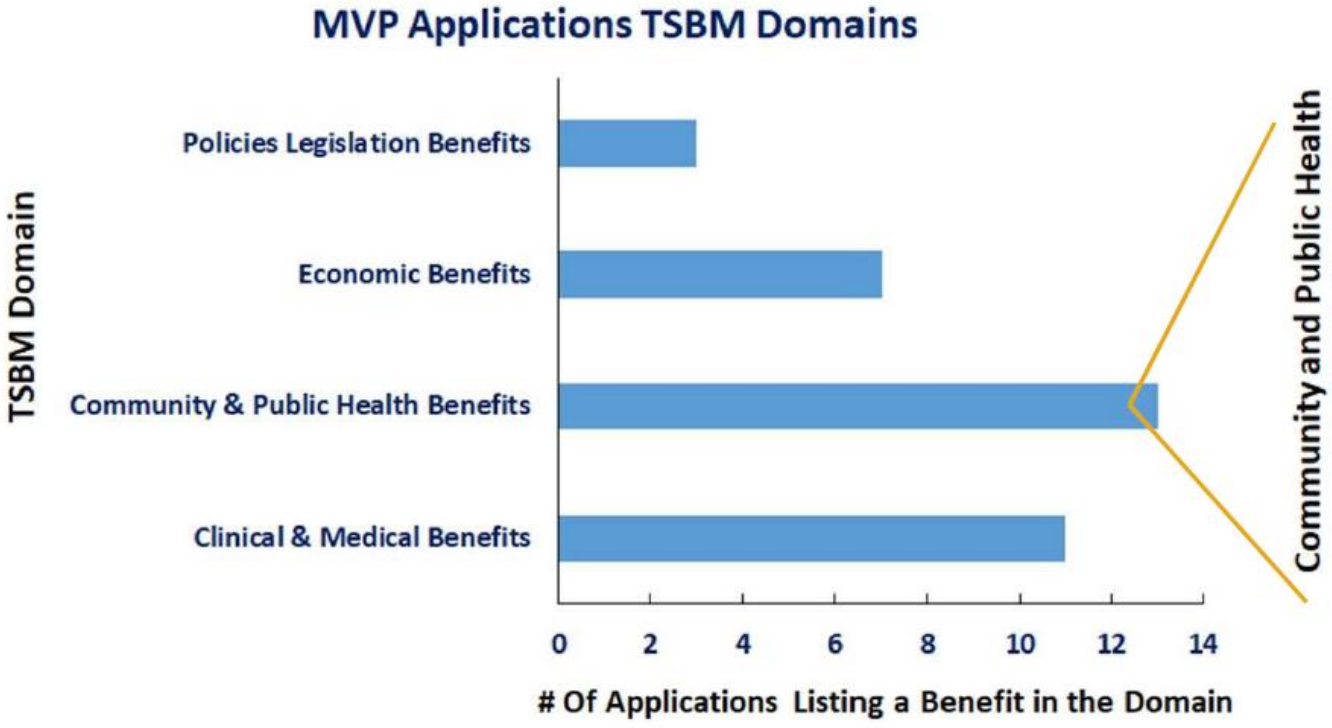
The Duke University Clinical & Translational Science Institute is using the TSBM to:

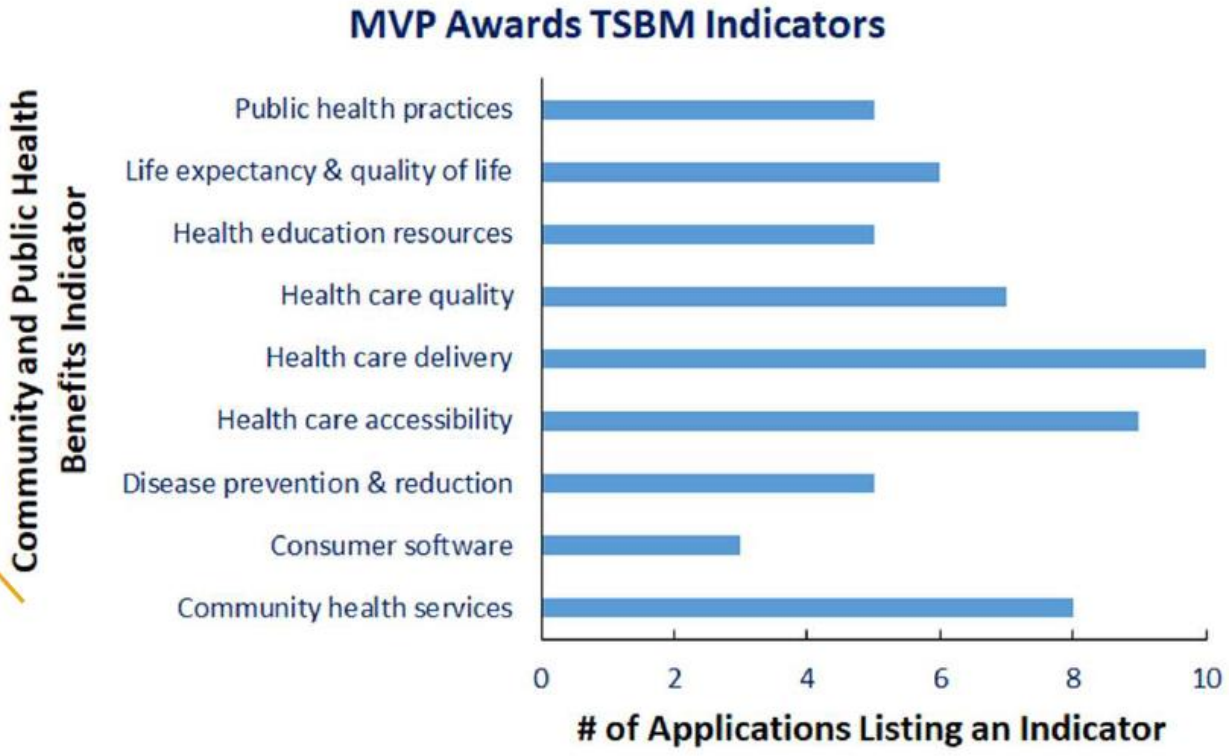
- ***Evaluate*** the impact of pilot projects funded by the CTSI by incorporating the TSBM into Accelerator funding applications
- ***Create*** an online platform to track important milestones and translational real-world benefits of CTSI programs and projects
- ***Disseminate*** impact case studies of their work using the TSBM model

Duke Clinical & Translational Science Institute

MVP Pilot Applications: TSBM Metrics

- 13 applications received
- Choose 5 total indicators for proposed impact





Implementation Research Institute

The Implementation Research Institute, a mentored training network for implementation scientists, is using the TSBM to:

- ***Train*** junior investigators to identify the broader health impacts of their work, map pathways of impact for their research, and communicate about how implementation science can improve health services and change communities
- ***Disseminate*** impact case studies and impact profiles to showcase the impact of IRI fellows' and alums' work and the impact of the IRI itself as a mentored network

TSBM is having an impact

EVALUATION

CTSAs around the country using as evaluation framework

Duke Clinical & Translational Science Institute

Wake Forest School of Medicine

OHSU Oregon Clinical & Translational Research Institute

University of Nebraska Medical Center

UNC The North Carolina Translational & Clinical Sciences Institute

Center for Clinical and Translational Science — Accelerating discoveries to improve health

UAMS Translational Research Institute

Northwestern University NUCATS Clinical and Translational Sciences Institute

UNM Health Sciences Clinical & Translational Science Center

CTSI Miami Clinical & Translational Science Institute

STRATEGIC PLANNING

Growing and strengthening public health at WashU

Washington University in St. Louis

TRAINING

Training young scientists to design for impact

IRI Implementation Research Institute

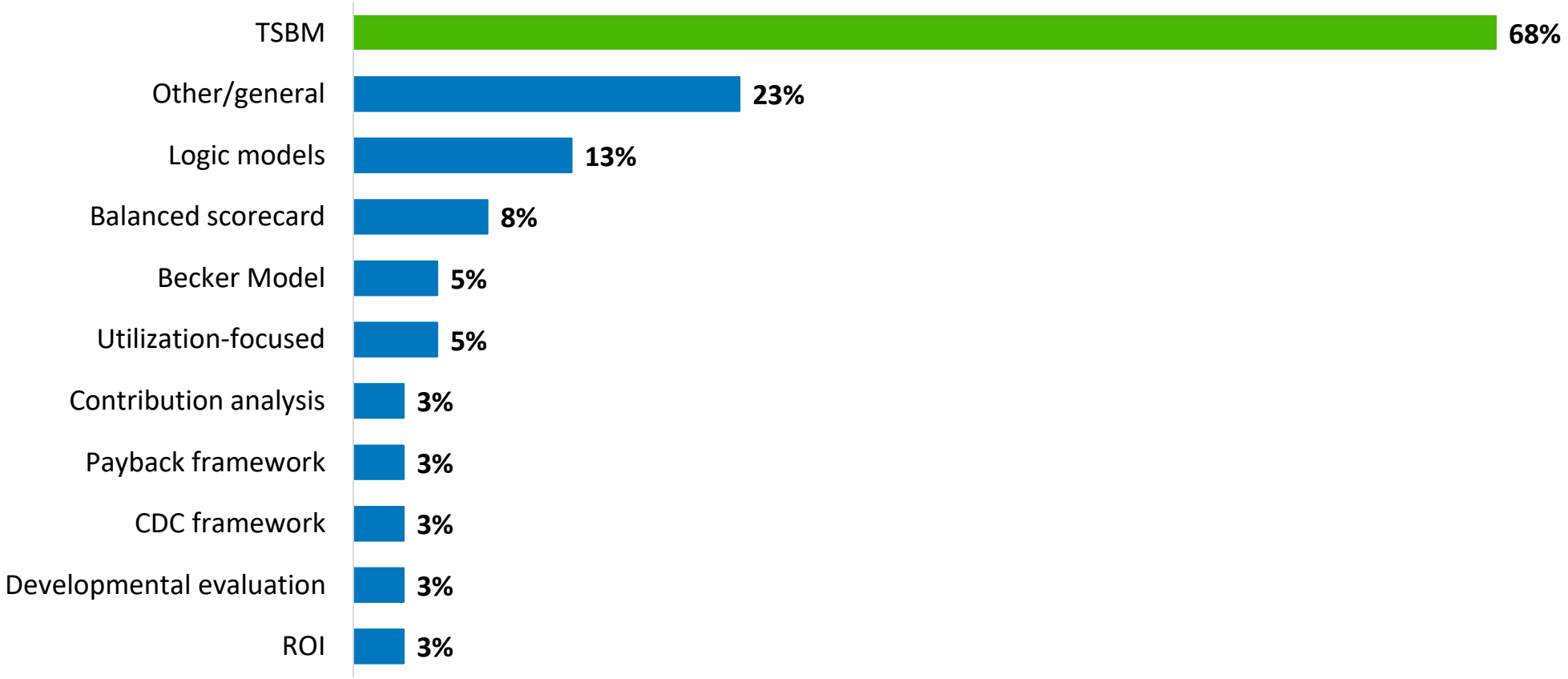
DISSEMINATION

Federal funding agencies communicating the importance of impact

NIH National Institute of Diabetes and Digestive and Kidney Diseases

NIH National Center for Advancing Translational Sciences

TSBM use across the CTSA consortium



Impact Evaluation Methods

2021 CTSA Evaluators Survey Report (n=59/61 hubs, 96.7% response rate)

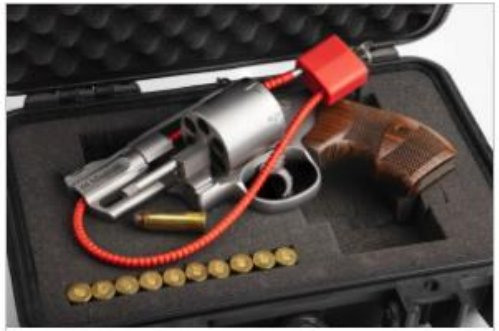
The TSBM and Community Engagement

Demonstrating the impact of community-engaged research with the TSBM

Providing Integrated Support to Prevent and Treat Parental Substance Use

By Implementation Research Institute (IRI) and TSBM
March 1, 2022

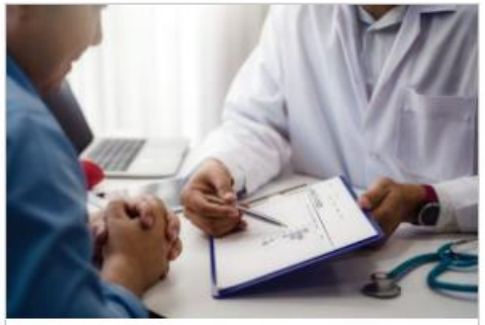
Implementing FAIR, an intensive treatment program for parents of children in the child welfare system



Preventing Youth Suicide and Injury by Implementing a Secure Firearm Storage Program in Pediatric Primary Care

By Implementation Research Institute (IRI) and TSBM
March 1, 2022

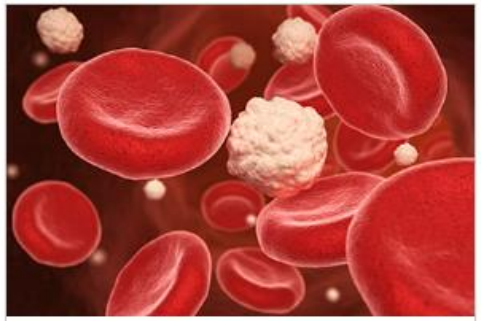
Counseling parents on secure firearm storage during pediatric visits



Improving the Physical Health of Adults with Serious Mental Illness (SMI)

By Implementation Research Institute (IRI) and TSBM
March 1, 2022

Implementing interventions to improve the physical health of racial and ethnic minority adults struggling with mental illness



Reducing Diabetes Risk Factors

By Oregon Clinical & Translational Research Institute (Oregon CTSA)
March 30, 2020

Reducing risk factors for Type 2 diabetes through a collective impact approach.

Involving the community in TSBM development

- A community-engaged approach to incorporating health equity into the TSBM
- Increase opportunities for community members to define impact in their own terms

Institute for Clinical and Translational Research
UNIVERSITY OF WISCONSIN–MADISON

CARDS
COMMUNITY ADVISORS ON RESEARCH DESIGN AND STRATEGIES

Institute of Clinical and Translational Sciences

Integrating equity into the TSBM

- Partnership with UW CTSA
- Review of impact literature for equity measures
- ICTS Community Engagement Studio
- Expansion of equity guidance for existing benefits and addition of new equity benefits

Equity dimensions of existing benefits

Clinical

- Diagnostic procedures
  - Routinely screening for social determinants
  - Creating tools to reduce diagnostic inequities, such as those that address physical, hearing, visual, developmental, or psychiatric disabilities; low literacy; or limited English language proficiency

Community

- Health care accessibility
  - Reducing delays in obtaining care
  - Removal of barriers to access for marginalized populations
  - Reducing bias in evaluation criteria for receiving care

Economic

- Societal & financial cost of illness
  - Reducing healthcare spending due to disparity

Policy

- Legislation
  - Public policies with explicit provisions for marginalized populations

New benefits in each domain

Clinical

Procedures & Guidelines
- Diagnostic procedures
- Investigative procedures
- Guidelines
- Therapeutic procedures

Tools & Products
- Biological factors & products
- Biomedical technology
- Drugs
- Equipment & supplies
- Software technologies

Workforce development & training

Community

Health Activities & Products
- Community health services
- Consumer software
- Health education resources

Health Care Characteristics
- Health care accessibility
- Health care delivery
- Health care quality

Health Promotion
- Disease prevention & reduction
- Life expectancy & quality of life
- Public health practices

Social determinants of health

Community capacity

Economic

Commercial Products
- License agreements
- Non-profit or commercial entities
- Patents

Financial Savings & Benefits
- Cost effectiveness
- Cost savings
- Societal & financial cost of illness

Affordability of care

Policy

Advisory Activities
- Committee participation
- Expert testimony
- Scientific research reports

Policies & Legislation
- Legislation
- Policies
- Standards

Equitable enforcement

Training and Acculturation

Seeding the ground for impact evaluation: The role of training

- Starting to see TSBM feature in training of early career scholars
  - WashU
    - KL2, TL1
    - Implementation Research Institute
  - Emphasizing ‘designing for impact’ ideas
    - Never too early to plan for impact
    - app.d4dsplanner.com

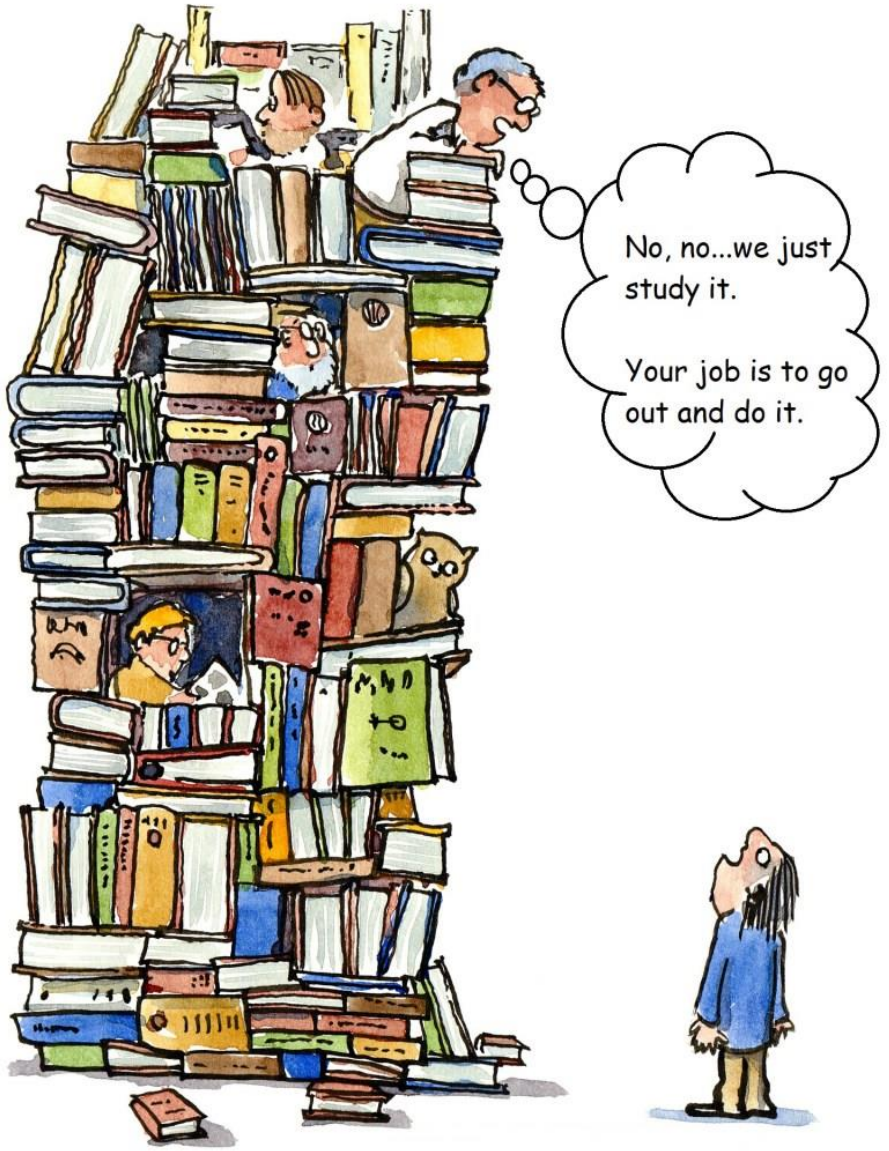
Bringing impact back into our culture

- (Think back to priming question.)
- Where is the value of impact well-aligned in our institutions?
  - (And where is it mis-aligned?)

"I'm afraid the building next door might be undermining your foundations."

Impact roadblocks

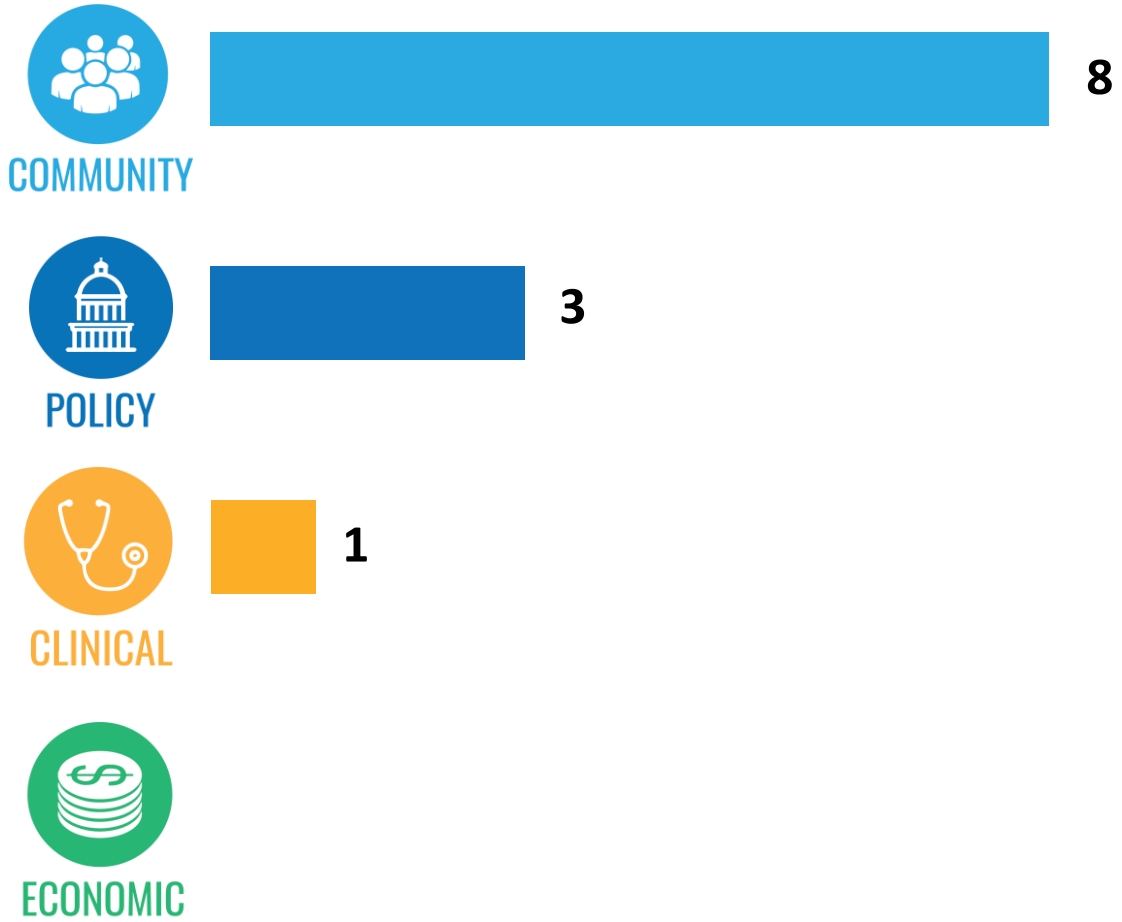
- Wrong incentives
- Private and proprietary
- Narrow audience
- Slow pace
- Archaic academic structures
- Political interference



*https://*www.brookings.edu/blog/education-plus-development

Integrating impact evaluation into CTSAs

Demonstrating impact of the Gun Violence Initiative with TSBM



https://publichealth.wustl.edu/programs/gvi

IRI uses TSBM for portfolio evaluation

Developing Communication Strategies to Reduce Addiction Stigma

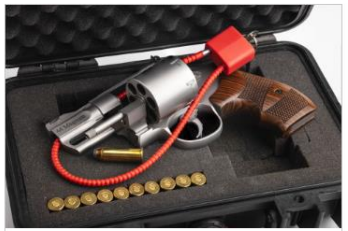
By Implementation Research Institute (IRI) and TSBM
March 1, 2022

Implementing messaging campaigns to reduce addiction stigma and increase support for evidence-based interventions

Increasing Access to Preventive Telehealth Services for Women Veterans

By Implementation Research Institute (IRI) and TSBM
March 1, 2022

Implementing EMPOWER 2.0, a gender-specific telehealth care intervention for women



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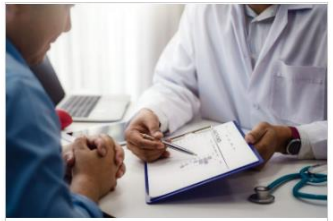

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Providing Integrated Support to Prevent and Treat Parental Substance Use

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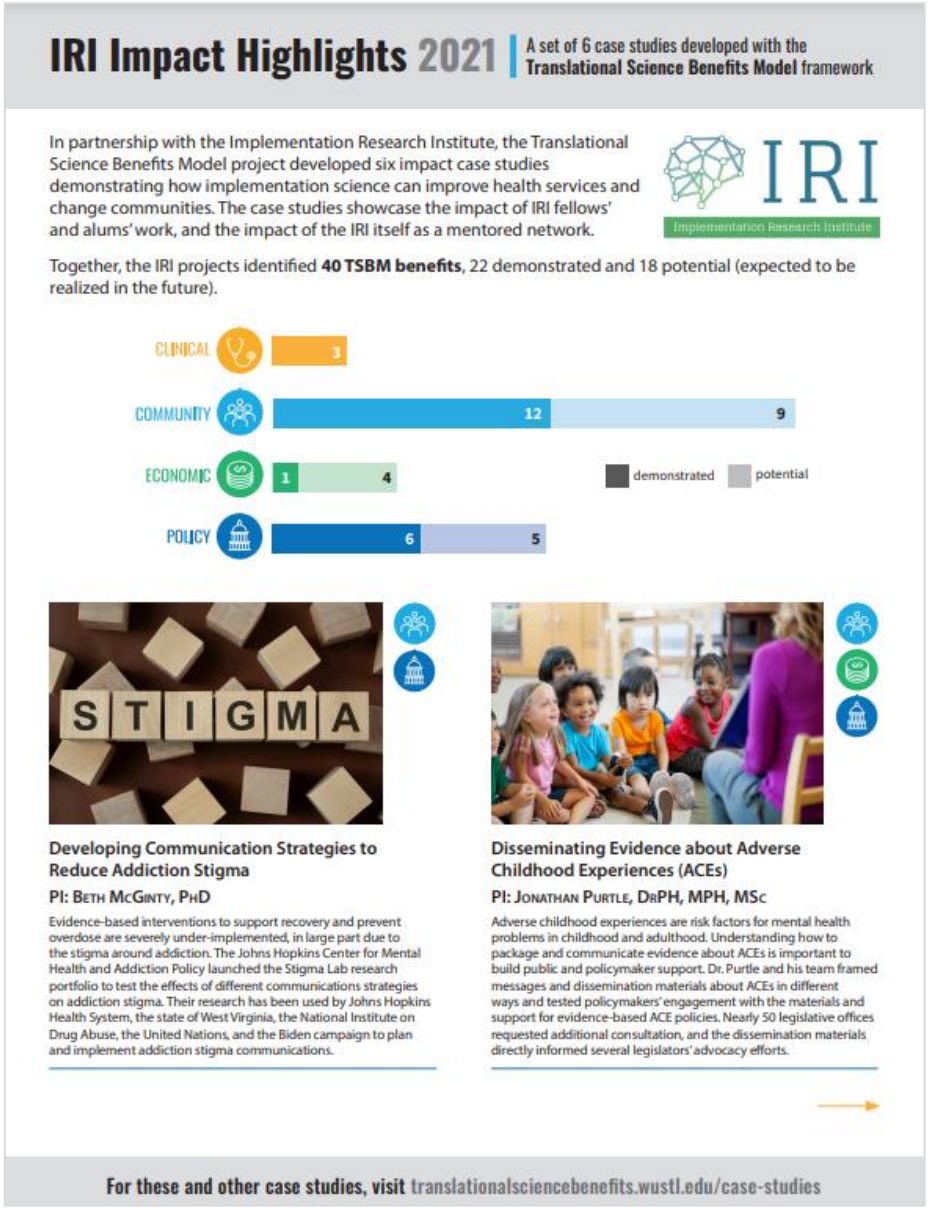
Implementing FAIR, an intensive treatment program for parents of children in the child welfare system

Disseminating Evidence about Adverse Childhood Experiences (ACEs)

By Implementation Research Institute (IRI) and TSBM
March 1, 2022

Communicating about ACEs and behavioral health to policymakers and the public

IRI uses TSBM for portfolio evaluation



IRI Impact Highlights 2021

A set of 6 case studies developed with the **Translational Science Benefits Model** framework

In partnership with the Implementation Research Institute, the Translational Science Benefits Model project developed six impact case studies demonstrating how implementation science can improve health services and change communities. The case studies showcase the impact of IRI fellows' and alums' work, and the impact of the IRI itself as a mentored network.

IRI
Implementation Research Institute

Together, the IRI projects identified **40 TSBM benefits**, 22 demonstrated and 18 potential (expected to be realized in the future).

Developing Communication Strategies to Reduce Addiction Stigma

PI: Beth McGinty, PhD

Evidence-based interventions to support recovery and prevent overdose are severely under-implemented, in large part due to the stigma around addiction. The Johns Hopkins Center for Mental Health and Addiction Policy launched the Stigma Lab research portfolio to test the effects of different communications strategies on addiction stigma. Their research has been used by Johns Hopkins Health System, the state of West Virginia, the National Institute on Drug Abuse, the United Nations, and the Biden campaign to plan and implement addiction stigma communications.

Disseminating Evidence about Adverse Childhood Experiences (ACEs)

PI: Jonathan Purtle, DrPH, MPH, MSc

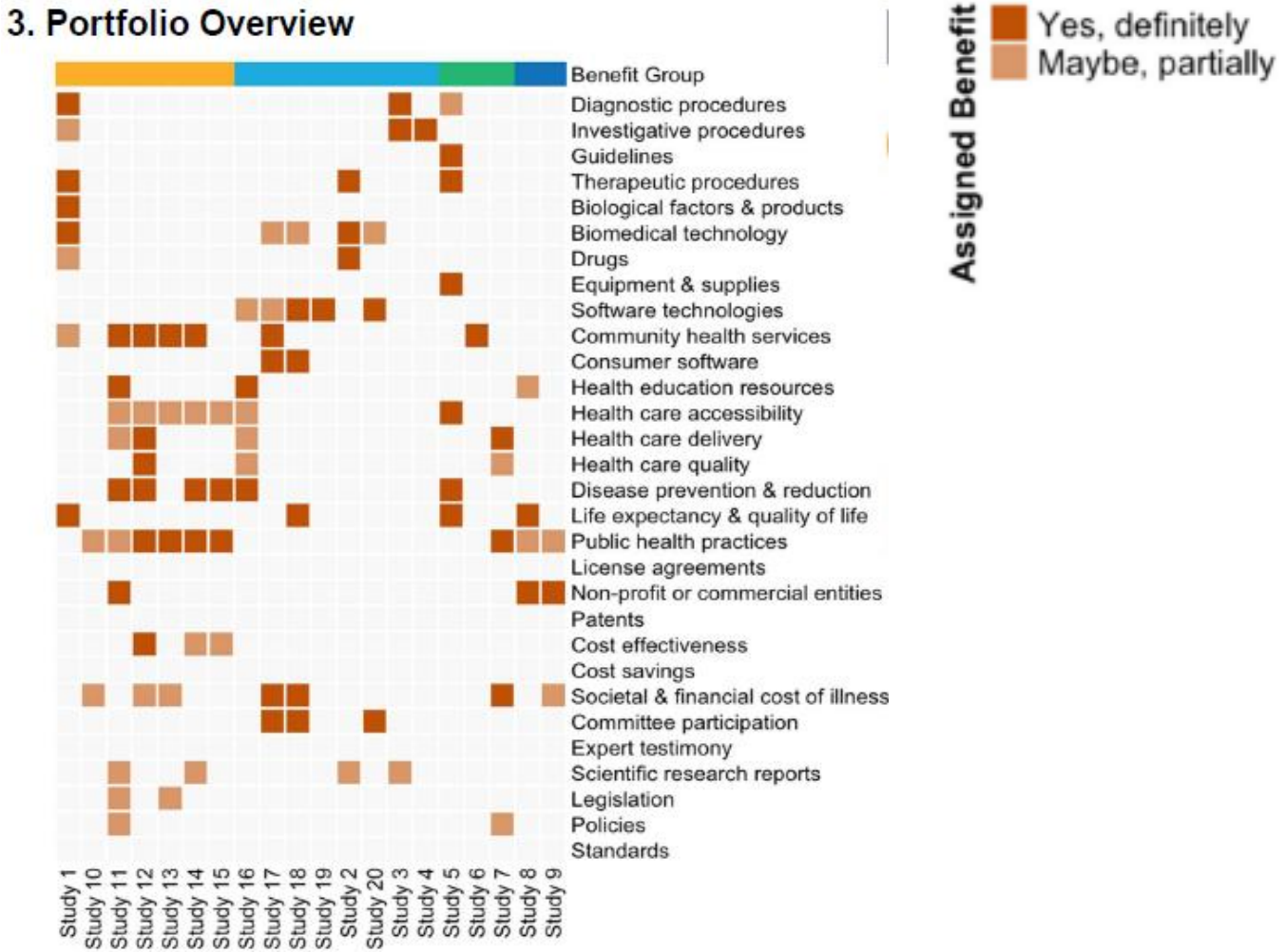
Adverse childhood experiences are risk factors for mental health problems in childhood and adulthood. Understanding how to package and communicate evidence about ACEs is important to build public and policymaker support. Dr. Purtle and his team framed messages and dissemination materials about ACEs in different ways and tested policymakers' engagement with the materials and support for evidence-based ACE policies. Nearly 50 legislative offices requested additional consultation, and the dissemination materials directly informed several legislators' advocacy efforts.

For these and other case studies, visit translationalsciencebenefits.wustl.edu/case-studies

https://translationalsciencebenefits.wustl.edu/partners/

Oregon uses TSBM for portfolio evaluation

Evaluating the impact of the Oregon Clinical and Translational Research Institute (NCATS)



How to integrate TSBM into (a) CTSA

- Evaluation
- Strategic planning
- Community engagement
- Training
- Recruitment, retention, promotion
- Agenda setting, acculturation

Renewal ruminations…

- Make sure that use of TSBM is aligned with overall ACTRI goals, aims, and vision
  - (ACTRI: "…moving knowledge and discovery…to its application in clinical and community settings. Vision … is to translate discoveries into improved health.")
- Use of TSBM should be housed somewhere specific (typically evaluation group)
- It has helped us to distinguish between impact evaluation (as a broad activity) and the use of the TSBM as a specific example of how to do impact evaluation
- Benefits/impacts are mostly *changes* of things
  - Implies qualitative metrics are as important as quantitative metrics (e.g., new businesses, new guidelines, new policies)
- Designing and planning for impacts can help impacts come about
- Impact evaluation is probably a waste of time unless leadership and champions push the value of research impact

DISCUSS

Translational Science Benefits Model

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