# Evaluation Metrics and Impact of the CCTSI

***Continuous Quality Improvement & Evaluation***

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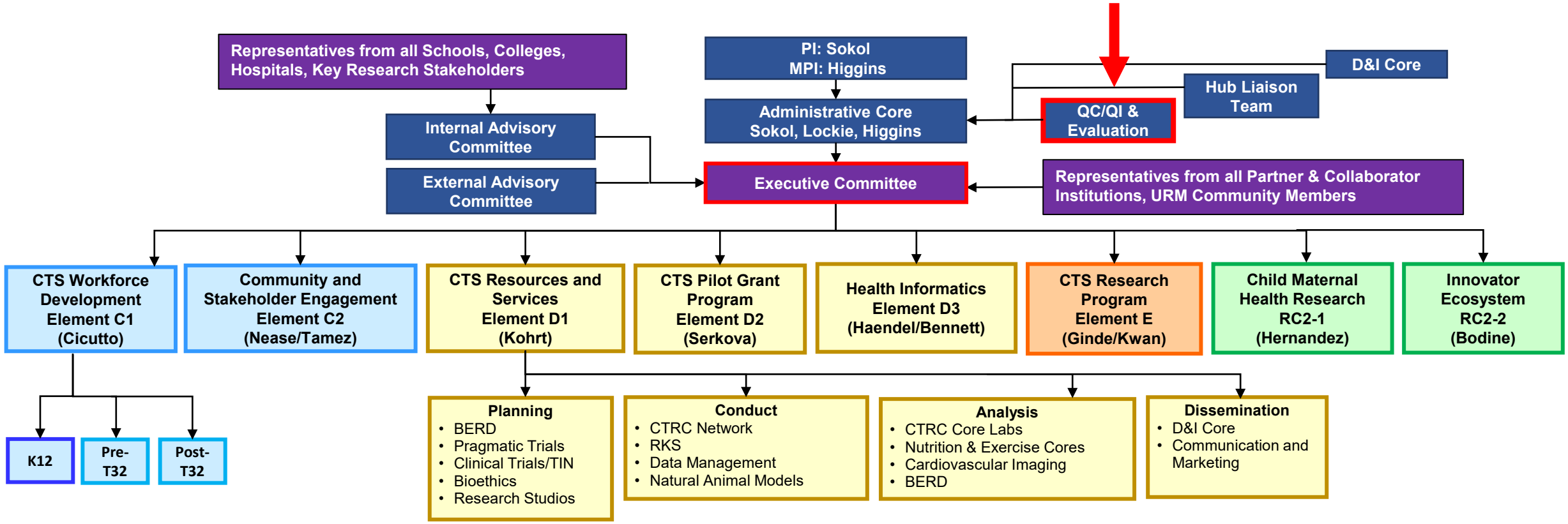

Representatives from all Schools, Colleges, Hospitals, Key Research Stakeholders
PI: Sokol
MPI: Higgins
D&I Core
Hub Liaison Team
Internal Advisory Committee
Administrative Core
Sokol, Lockie, Higgins
QC/QI & Evaluation
External Advisory Committee
Executive Committee
Representatives from all Partner & Collaborator Institutions, URM Community Members
CTS Workforce Development Element C1 (Cicutto)
Community and Stakeholder Engagement Element C2 (Nease/Tamez)
CTS Resources and Services Element D1 (Kohrt)
CTS Pilot Grant Program Element D2 (Serkova)
Health Informatics Element D3 (Haendel/Bennett)
CTS Research Program Element E (Ginde/Kwan)
Child Maternal Health Research RC2-1 (Hernandez)
Innovator Ecosystem RC2-2 (Bodine)
K12
Pre-T32
Post-T32
Planning
BERD
Pragmatic Trials
Clinical Trials/TIN
Bioethics
Research Studios
Conduct
CTRC Network
RKS
Data Management
Natural Animal Models
Analysis
CTRC Core Labs
Nutrition & Exercise Cores
Cardiovascular Imaging
BERD
Dissemination
D&I Core
Communication and Marketing

# Strategic Goals

- Goal 1: Establish metrics to demonstrate local CTSA impact through rigorous program evaluation
- Goal 2: Disseminate research results and best practices broadly
- Goal 3: Continue the Quality and Process Improvement Program (QPIP) activities to continuously improve programs and impact
- Goal 4: Participate in national-level efforts to develop and collect CTSA-wide metrics to measure the impact of the CTSA program

# Evaluation Metrics

## Community Engagement

- State-wide reach of community engagement (e.g. # of counties, # of community organizations, # of research projects)
- Surveys with community partners (e.g. satisfaction with CIT program; # engaged in CBPR; # of collaborations; benefits and challenges of participation)
- Interviews with CIT researchers and community members (conducted in English and Spanish) to assess community and research impact

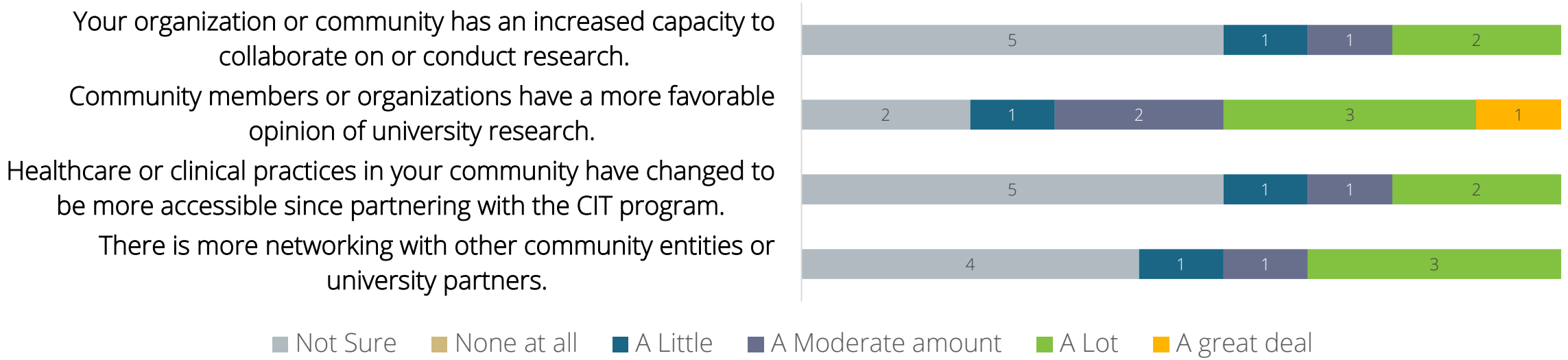
# Community Engagement (CIT) Program Outcomes

- Interviews with CIT participants (CU researchers; n=30), Community Research Liaisons (n=4), and community members from partner organizations (n=12)

- In 2021, survey sent to 39 selected community partners, 13 responses received (33% response rate)

# Community Engagement (CIT) Program Outcomes

*To what extent you have noticed the following since the CIT program partnered with your community? (n=9)*



# Community Engagement (CIT) Program Outcomes

**What have been some of the benefits or successes from working with the CIT program?**

- "Good relationships with Community Research Liaison and an exceptional opportunity to bring queer history to queer healthcare." – community member/guest presenter

- "The CIT program was very helpful in getting the youth to a place where they felt confident to do the trainings." – community organization partner

- "Not only can CIT programs bring community leaders and researchers/students together, they can also help keep communities together moving towards more positive and healthy outcome. That's because programs like CIT increase collaboration, problem solving, and validate community concerns. The collaboration is that people bring their own knowledge and experience into the process. Training is typically undertaken in small groups with lively interaction and can embrace not only the written word but art, music and other forms of expression in realizing solutions to critical issues" – CEO of community partner organization

# Community Engagement (CIT) Program Outcomes

**What have been some of the challenges with working with the CIT program?**

- “The time requirements that come with the research.” – community organization partner
- “Relationship building takes a lot of time - so a 1-week immersion is wonderful, but continued support for fostering these relationships would be helpful.” – community research advisor
- “The biggest challenge is including the voices of more diverse elders and discussing the intersectionality of their lived experience as LGBT elders.” – community organization partner

# Metrics of Success – Workforce Development

## KL2 Program

- % with independent funding (own K or R level award)
- Return on Investment calculations of new grant funding dollars obtained
- Continuous funding since program completion
- Publications and bibliometrics
- Career advancement, new leadership positions & awards
- Retention/persistence in CTR

## TL1 Pre- and Post-doctoral Program

- Retention in CTR academic pipeline (by gender, race, ethnicity, discipline)
- Demographics, diversity
- Research productivity (grants, publications, and bibliometrics)
- Career advancement

## PreK/K2R Grant Review Programs

- # of grant applications that are reviewed, awarded, resubmitted, grant amount
- Grants tracked by NIH grant mechanism (NIH reporter), Foundation, non-NIH government via longitudinal tracking
- NIH success rates compared to national and institutional benchmarks
- Success rates by # of times participated

## Other Workforce Development Programs

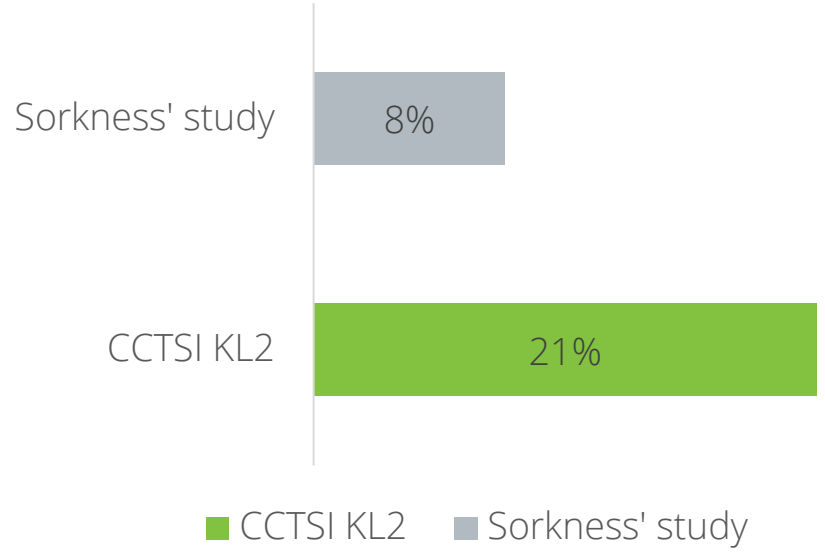
- Participant satisfaction and feedback
- Increases in knowledge, skills
- Leadership Skill development
- Increased cross-disciplinary collaboration
- Mentor/mentee self-assessments

# KL2 Program Outcomes

## Research Productivity Metrics

| COHORT | # KL2 SCHOLARS COMPLETED THE PROGRAM | % (N) OF SCHOLAR RECEIVING AN R01 WITHIN 5 YEARS | TOTAL NUMBER OF R01 GRANTS |
|---|---|---|---|
| 2008 | 4 | 50% (2) | 4 |
| 2009 | 3 | 33% (1) | 2 |
| 2010 | 3 | 66% (2) | 2 |
| 2011 | 4 | 50% (2) | 3 |
| 2013 | 3 | 33% (1**) | 1 |
| 2014 | 4 | 25% (1) | 2 |
| 2016 | 3 | 0 | 0 |
| 2017 | 3 | 33% (1) | 1 |
| 2018 | 2 | 50% (1) | 1 |
| 2019 | 4 | 0 | 0 |
| Total | 33 | 11 | 16 |

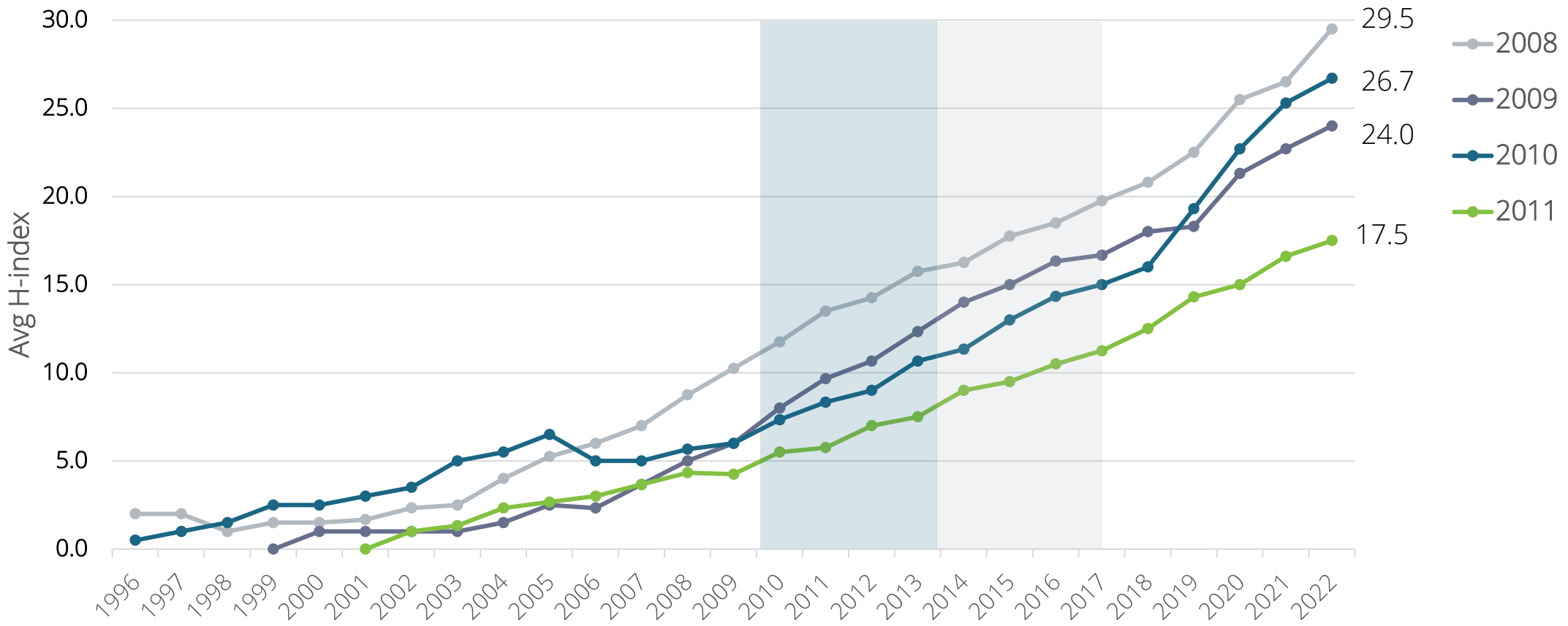
One year transition rate for receiving 1st R01/R01 equivalent grants



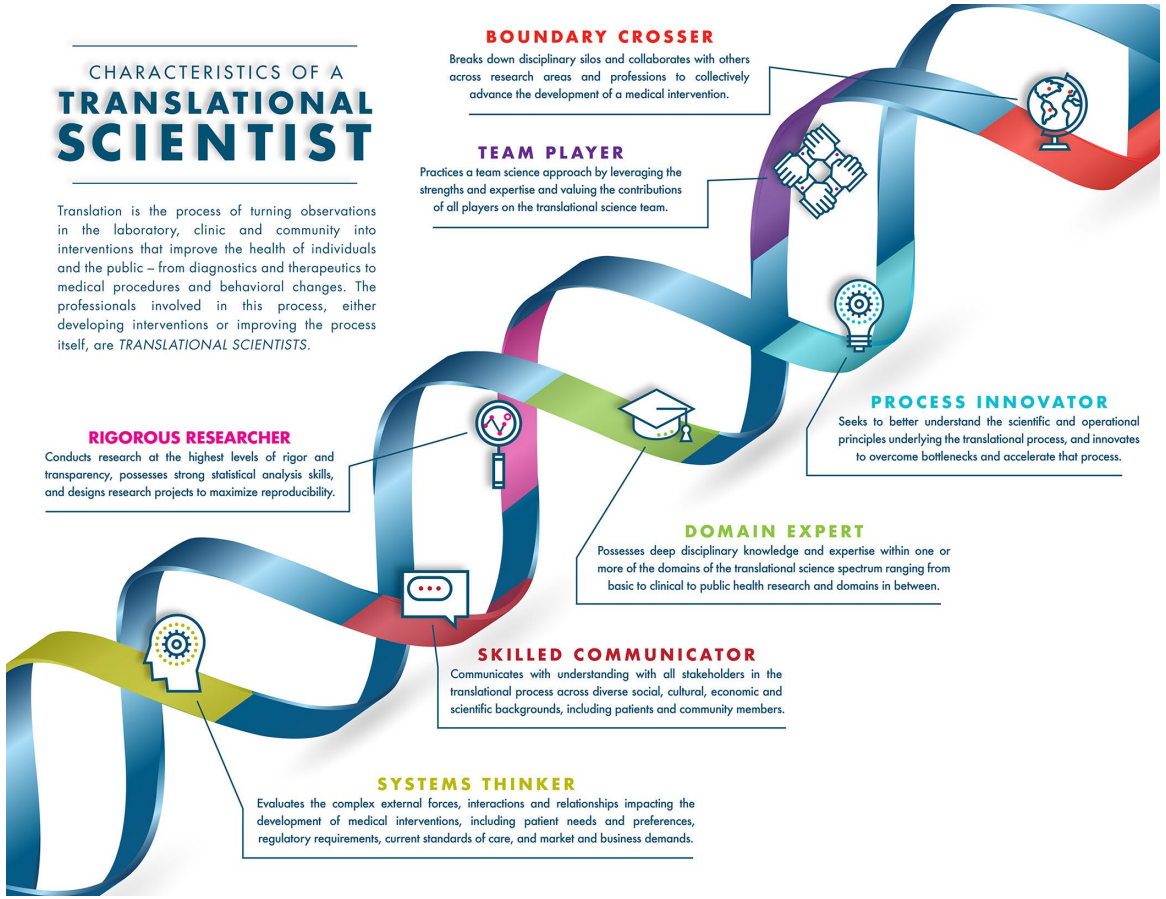

Sorkness, C. A., Scholl, L., Fair, A.M., & Umans J.G. (2020) KL2 mentored career development programs at clinical and translational science award hubs: Practices and outcomes. *Journal of Clinical and Translational Science, 4,* 43–52. doi: 10.1017/cts.2019.424.

# KL2 Program Outcomes

## H-index

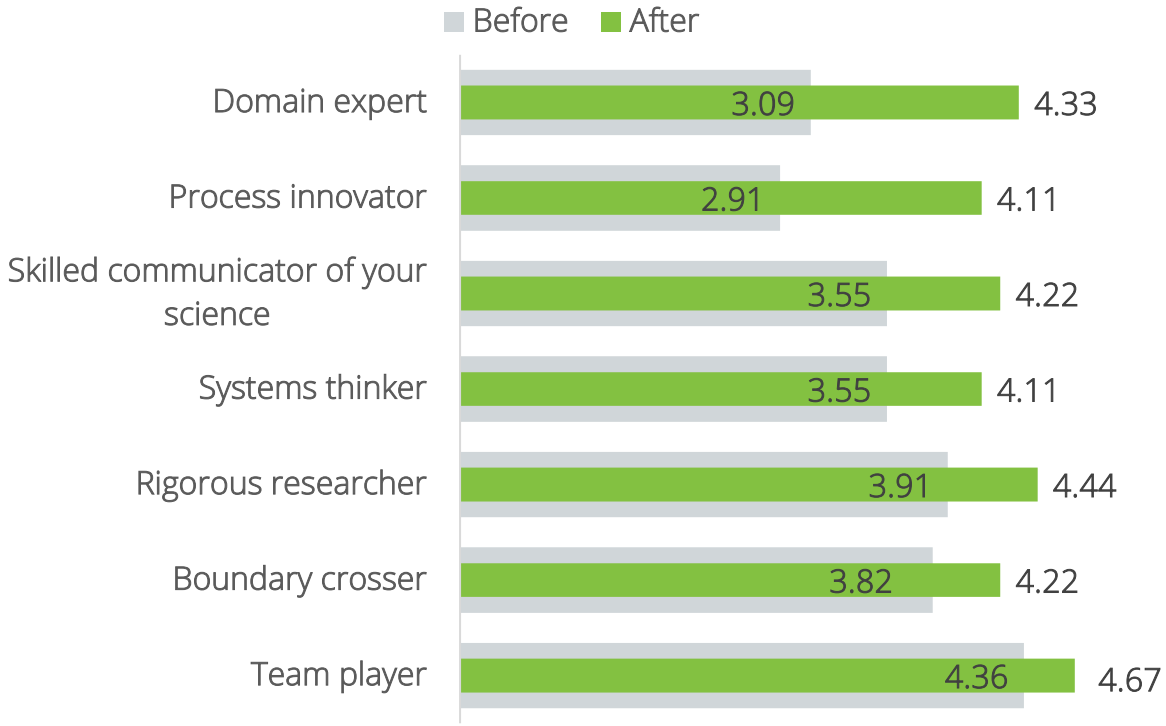


# TL1 Program




Seven fundamental character traits of a translational scientist.
DOI: (10.1021/acsptsci.9b00022)

## Pre-post survey with 2021 cohort of TL1 scholars (n=11)



# Evaluation Metrics

**Translational Pilots**

- # of Pilot applications/ # of funded Pilots
- # with Follow-on funding / $ total Follow-on funding
- # of Publications
- # Patents
- $ Financial return on investment (ROI)
- Demographics: % URM / % Female
- Translational Sciences Benefits Model (TSBM) indicators of impact

# Translational Pilot Grant Program Outcomes

**16.34**

Return on Investment across the entire program

CCTSI has funded over **$13 Million** in translational science research.

Grantees of these programs received over **$253 million** in follow on research to continue their work.

**198**

Grantees had publications based on CCTSI funded project

**192**

Grantees received follow-on funding to support CCTSI project

## Return on Investment (2009 – 2021)

| Pilot Program* | Awards | % of Projects with Follow-on Funding | ROI |
|---|---|---|---|
| CO-Pilot | 184 | 50% | **15.53** |
| CMH-Pilot | 87 | 44% | **11.13** |
| CE-Pilot | 133 | 40% | **24.67** |
| TM-Pilot | 60 | 58% | **14.73** |
| C2R2 | 4 | 25% | **3.80** |
| **Total*** | **468** | **47%** | **16.34** |

# Translational Pilot Grant Program Outcomes

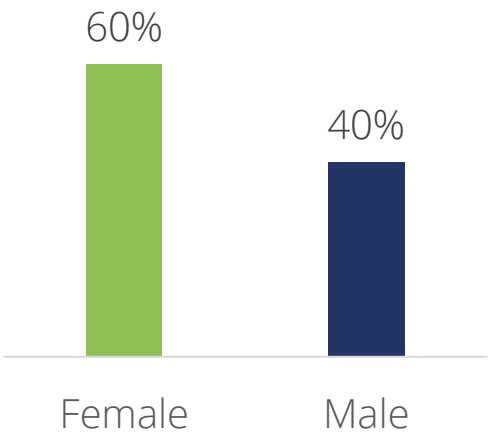
## Institutional Affiliation

| CU-Anschutz Medical Campus (*n*=303) | Colorado State (*n*=43) | CU-Boulder (*n*=19) | CU-Denver (*n*=28) | All other (*n*=17) |
|---|---|---|---|---|
| 73% | 10% | 6% | 7% | 4% |

**28%** Of grantees had an MD

**10%** Of grantees who received Translational Pilot Awards were **underrepresented minorities** (URMs)

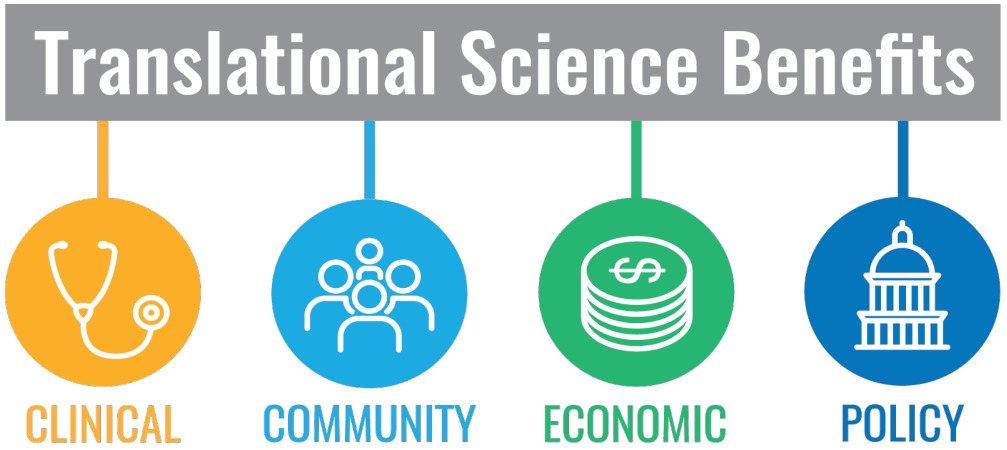
## Demographics (2009 – 2021)




60% of awardees were **female**.

# Translational Science Benefits Model

The Translational Science Benefits Model (TSBM) is intended to provide benchmarks to assess the impact of research that applies scientific findings to enhance public health and well-being.




**Clinical and Medical Benefits** (Procedures, guidelines, tools, and products)
**Community and Public Health Benefits** (Health activities, care, and promotion)
**Economic Benefits** (Commercial products, financial savings and benefits)
**Policy and Legislative Benefits** (Advisory activities, policies and legislation)

*Source: Institute of Clinical & Translational Sciences at Washington University in St. Louis. Translational Science Benefits Model website. https://translationalsciencebenefits.wustl.edu Published February 1, 2019. Accessed Dec. 16, 2021.*

# TBSM Metrics of Success / Impact

## Clinical & Medical Benefits

### Procedures & Guidelines

- Diagnostic procedures
- Investigative procedures
- Guidelines
- Therapeutic procedures

### Tools & Products

- Biological factors & products
- Biomedical technology
- Drugs
- Equipment & supplies

## Community & Public Health Benefits

### Community Activities & Guidelines

- Community health services
- Consumer software
- Health education resources

### Health Care Characteristics

- Health care accessibility
- Health care delivery
- Health care quality

### Health Promotion

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

## Economic Benefits

### Commercial Products

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

### Financial Savings & Benefit

- Cost effectiveness
- Cost savings
- Societal & financial cost of illness

## Policy & Legislative Benefits

### Advisory Activities

- Committee participation
- Expert testimony
- Scientific research reports

### Policies & Legislation

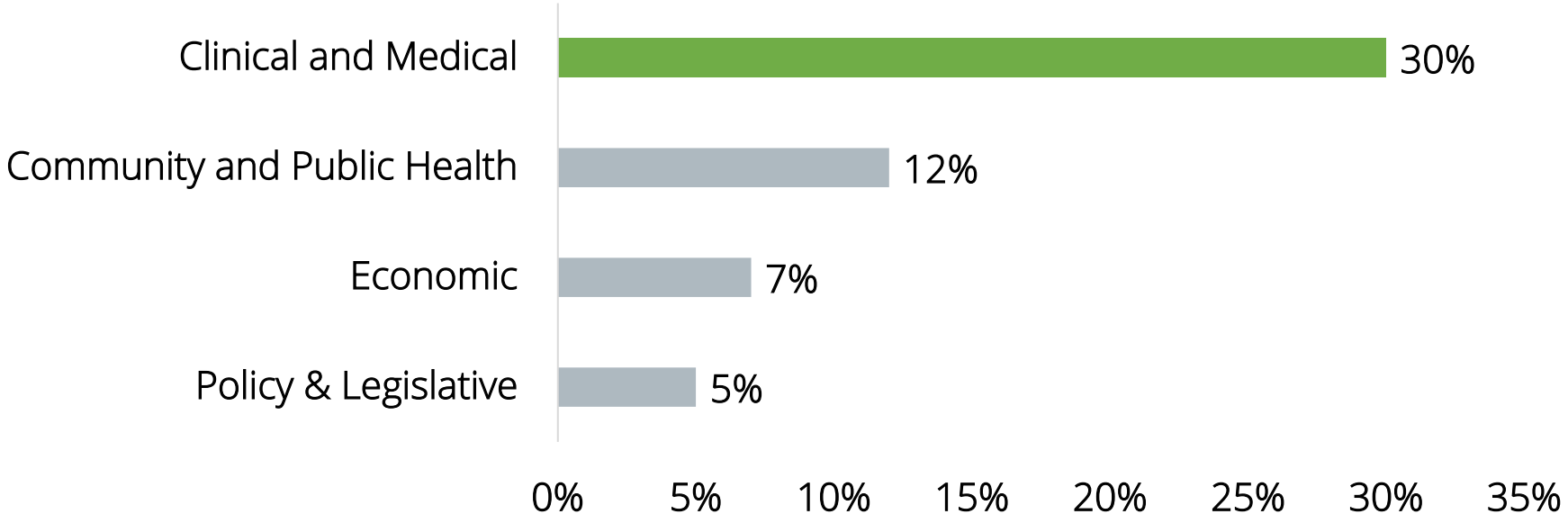
- Legislation
- Policies
- Standards

# Impact of CCTSI Pilot Grant Award Program

- Collaboration with UC Irvine on adding TSBM survey items to annual survey with CCTSI pilot grant awardees
- Survey sent to 154 awardees (cohorts 2018-2021)
  - 101 awardees responded to survey (66% response rate)
- Asked to rate impact of their research for each TSBM indicator (30 indicators)
  - "**Yes**, this project has generated a benefit in this category"
  - "**Not Yet**, but we intend that this project will generate a benefit in this category
  - "**Probably Not**, we do not intend that this project will generate a benefit in this category"
  - "**Absolutely Not**, this project will not generate a benefit in this category"
  - "**Not sure** at this time"

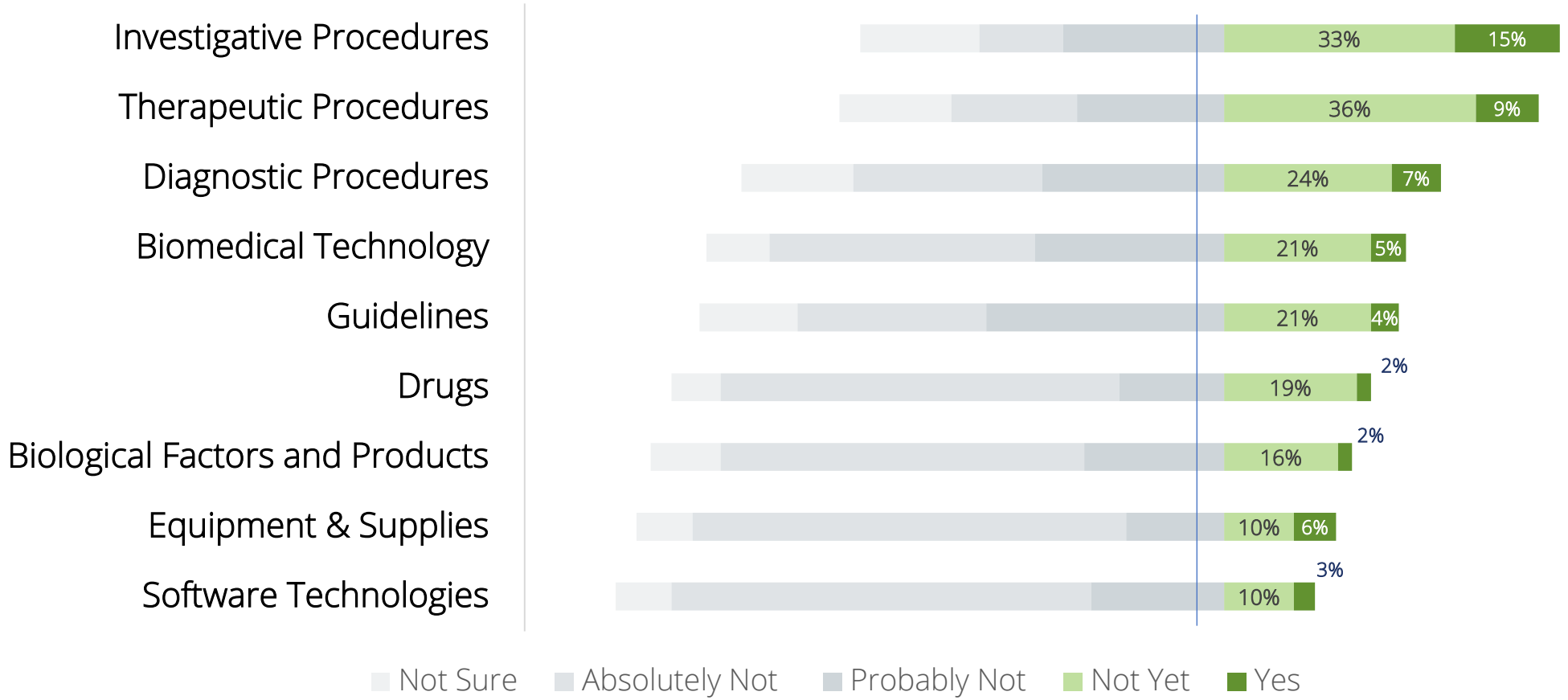
# Impact of CCTSI Pilot Grant Award Program

Nearly one-third (30%) of pilot award respondents reported their project has generated a clinical or medical benefit.



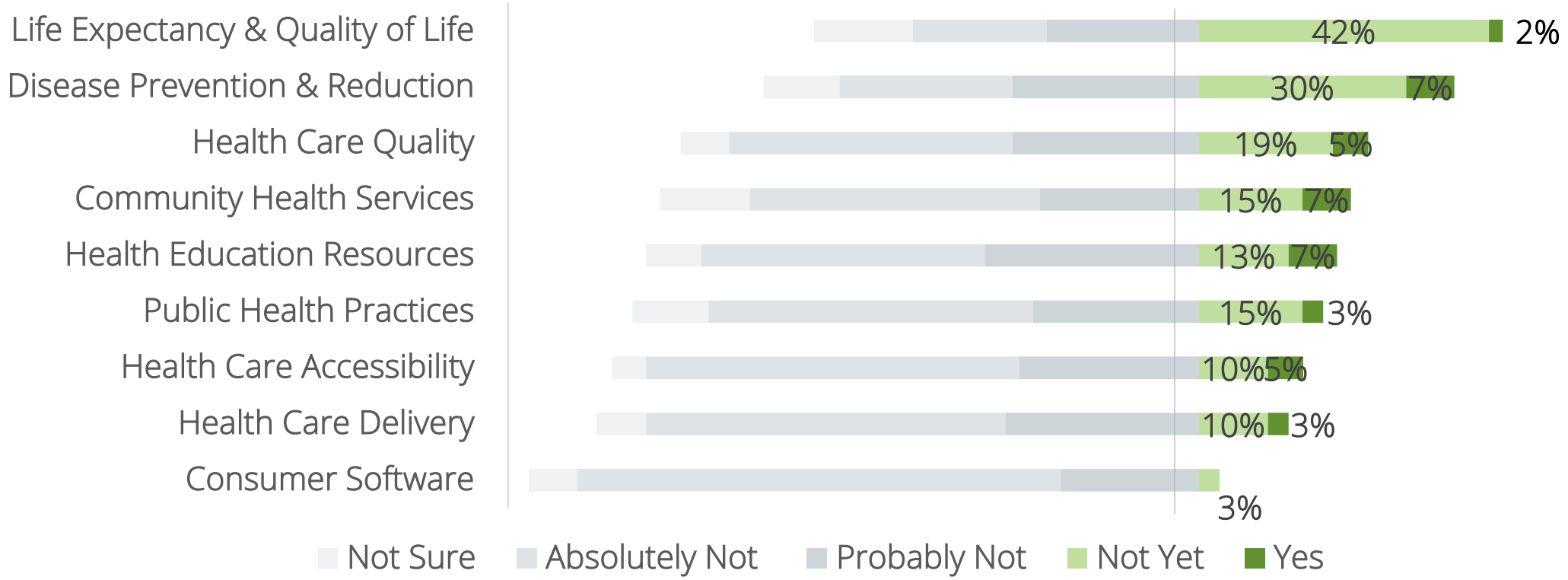
# Clinical Impact

## *TSBM Clinical and Medical Benefits (n=99-101)*



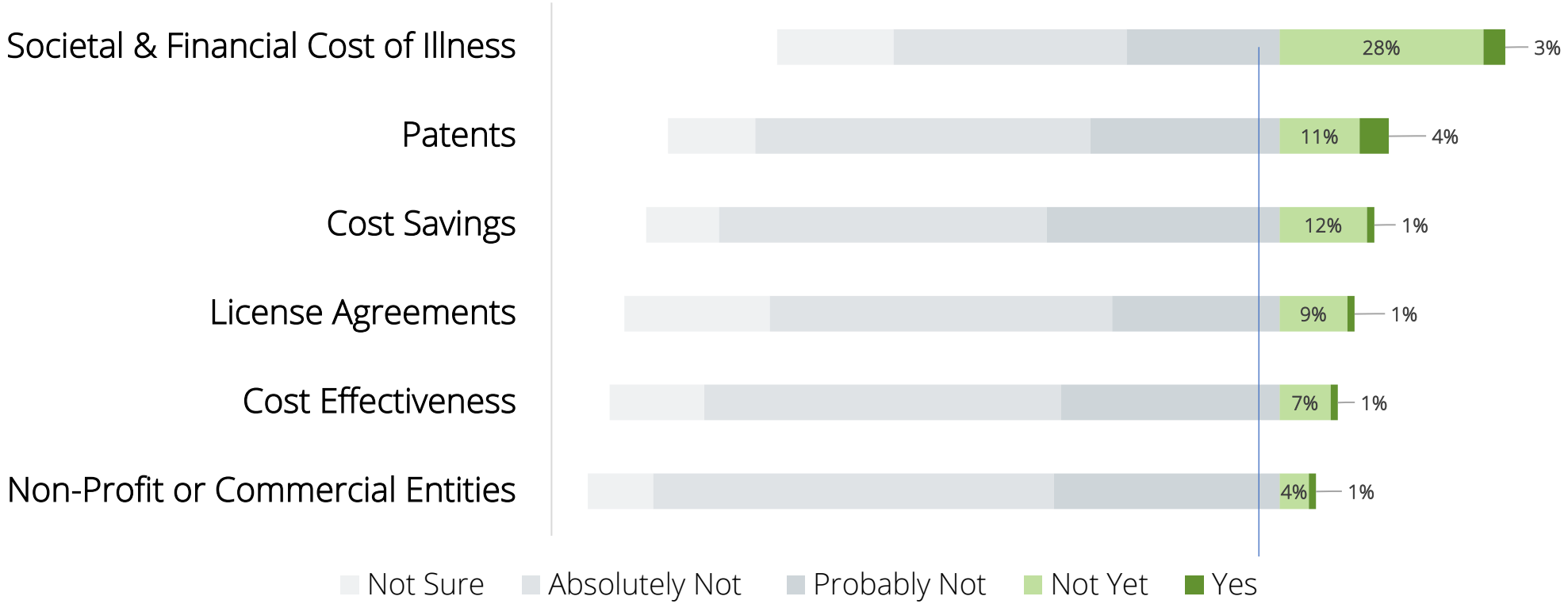
# Public Health Impact

*TSBM Community and Public Health Benefits (n=99-101)*



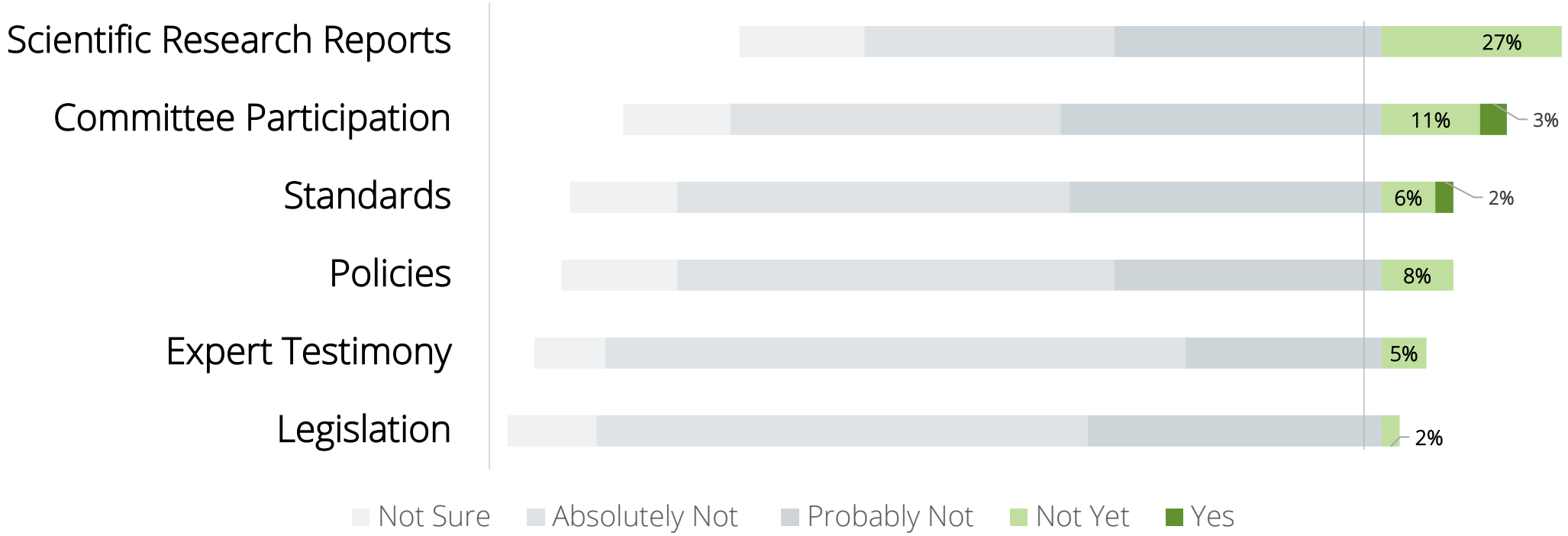
# Economic Impact

*TSBM Economic Benefits (n=96-101)*



# Policy Impact

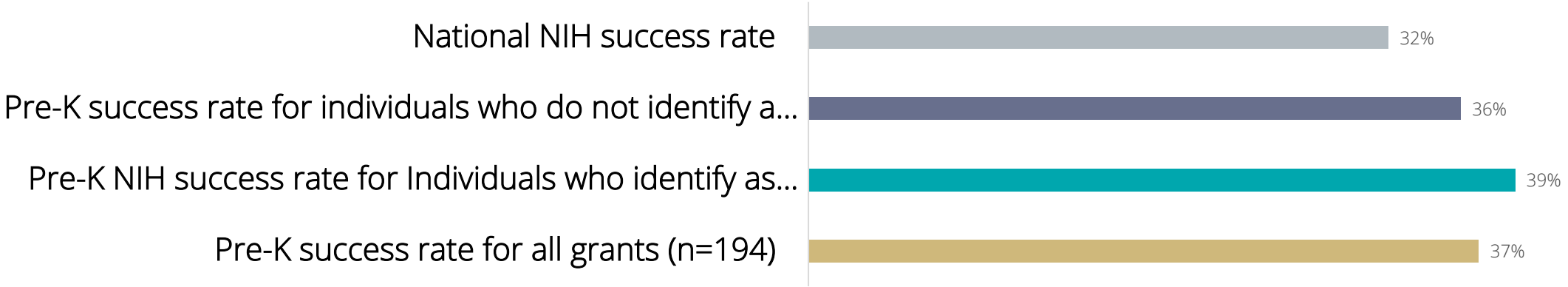
*TSBM Policy and Legislative Benefits (n=99-101)*



# DEIA and Health Equity

- Collect URM demographics for CCTSI programs
- Beginning to look at differences across groups
  - For example, funding success rate for all Pre-K grant submissions

NIH success rates for all Pre-K grants, Pre-K participants who represent URMs, Pre-K participants who do not represent URMs, and the National NIH success rate.



# Dissemination and National CTSA Involvement

- CTSA Evaluators Group
- Evaluator for the Center for Data to Health (CD2H)
  - CD2H Steering Committee;
  - National COVID Collaborative (N3C)
- Evaluator for Bridge2AI
- Manuscript “Outcomes of a Career Development Award (Pre-K) Mock Review Program for Postdoctoral Fellows and Early Career Faculty” under review at *Academic Medicine*

# Response to EAC Critiques

- A *major strength of the CCTSI is its connection to and potential for benefitting diverse populations. Consider expanding metrics to more directly assess the impact of CTS efforts on medically underserved and historically marginalized populations.*
  - We currently collect survey data and interviews with community members from community partner organizations who participate in the Colorado Immersion Training program. Have also gathered community case studies from Community Research Liaisons to demonstrate successful outcomes they've seen in communities as a direct result of the CIT program (e.g., Escuela Tlatelolco, CBPR in The San Luis Valley). In 2023, we will expand surveys to community members/organizations of CE-Pilot funded research to further measure impact of CTSA resources on medically underserved populations.
- *The needs assessment does an excellent job of assessing needs and tracking systems assess use of various CCTSI resources. These are important. Consider adding metrics and approaches to assess how well the CCTSI resources are meeting the needs of CTS researchers and community members. This could include both quantitative and qualitative assessments.*
  - Plans to incorporate how well CCTSI resources are meeting the needs of researchers in next iteration of needs assessment (2024)