Implementation Science Research at NIOSH

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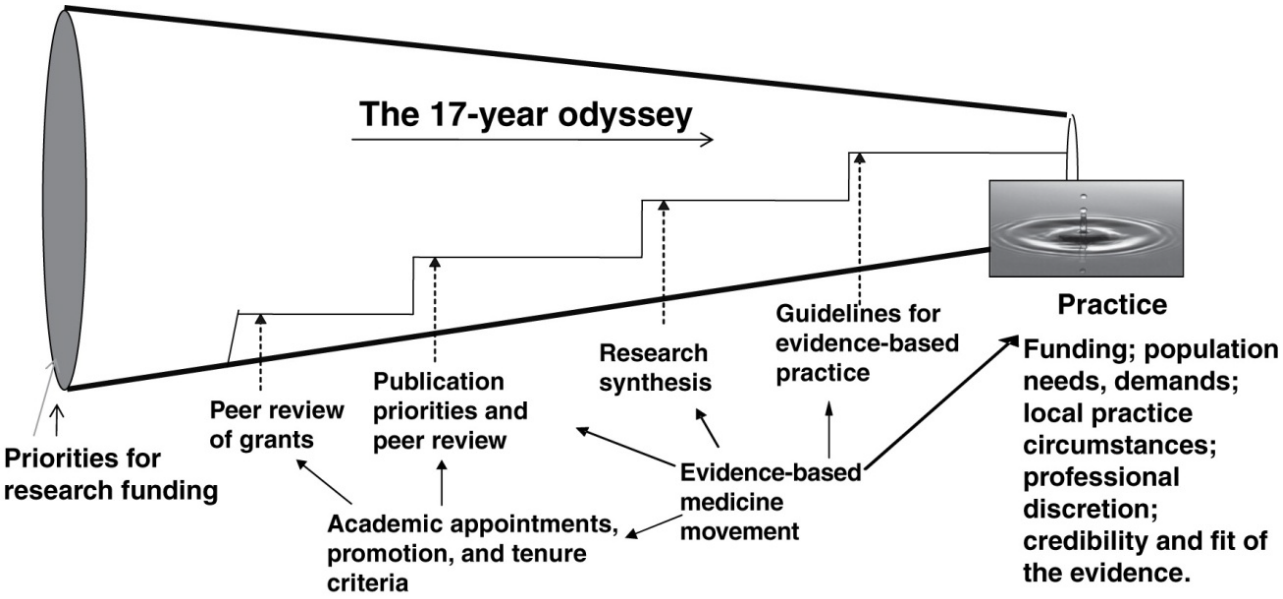
Presentation overview

- The research-to-practice gap in public health
- Implementation science : what is it and why does it matter?
- Implementation (translation) research at NIOSH: Research for impact
- Future directions and opportunities

What is implementation science? Why does it matter?

The “leaky” research-to-practice pipeline



Green LW, Ottoson JM, Garcia C, Hiatt RA [2009]. Diffusion theory and knowledge dissemination, utilization, and integration in public health. *Ann Rev Public Health* 30:151–174, https://doi.org/10.1146/annurev.publhealth.031308.100049.

Balas EA, Boren SA [2000]. Managing clinical knowledge for health care improvement. *Yearb Med Inform* 9(1):65–70.

Implementation science (IS): A cross-cutting translational science

"Study of methods to promote the adoption and integration of evidence-based practices, interventions, and policies into routine health care and public health settings to improve our impact on population health."

—National Cancer Institute

Efficacy, effectiveness, and implementation research questions

- Does this intervention work under optimal conditions?
- Does this intervention work under real world conditions?
- When, where, how, with whom, under what circumstances, and why does this intervention work?

Nilsen P, Bernhardsson S [2019]. Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC Health Serv Res* 19:1–21, https://doi.org/10.1186/s12913-019-4015-3.
Stange, Breslau, Dietrich, Glasgow [2012]. State-of-the-art and future directions in multilevel interventions across the cancer control continuum. *J Natl Cancer Inst Monogr* 2012(44):20–31, doi: 10.1093/jncimonographs/lgs006.

Important considerations for IS

Context 

- Multilevel complexity
- Adaptability
- Representativeness and reach
- Equity
- Relevance
- Generalizability
- Scalability and sustainability

Glasgow, Chambers [2012]. Developing robust, sustainable, implementation systems using rigorous, rapid and relevant science. *Clin Transl Sci* 5(1):48–55, https://doi.org/10.1111/j.1752-8062.2011.00383.x.

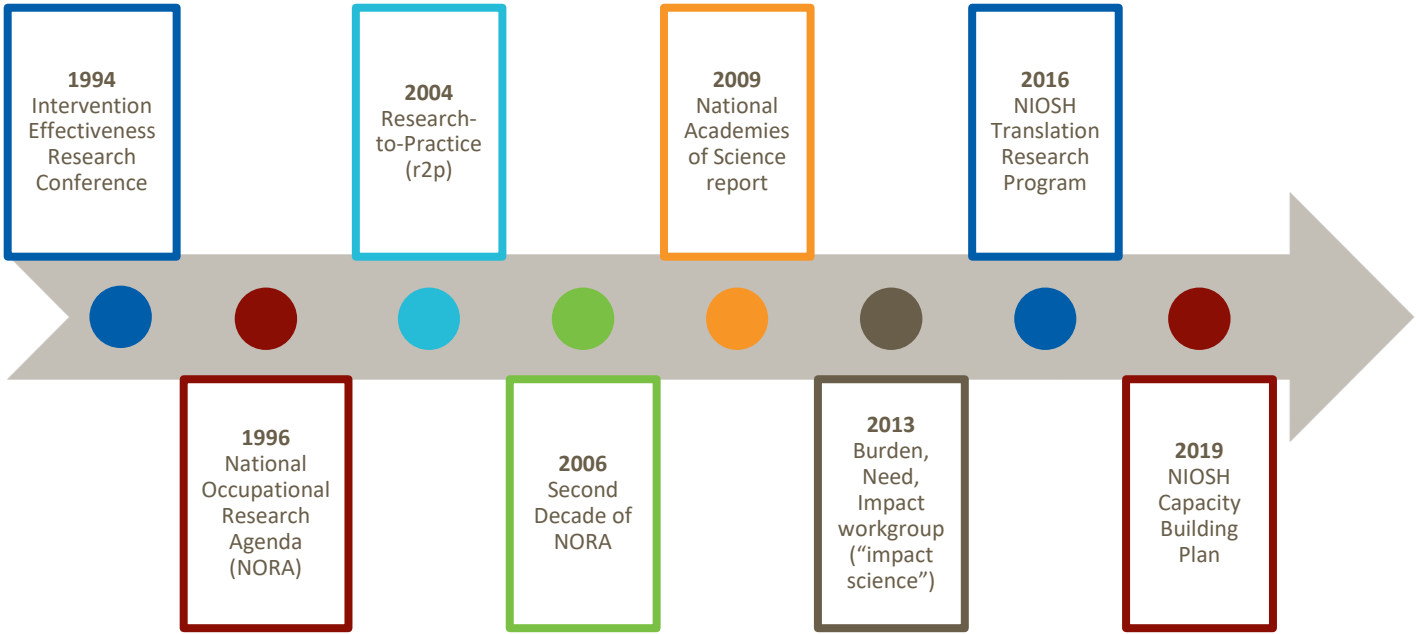
Implementation Science Research at NIOSH

Pipeline issues in occupational safety and health (OSH)

- Effective OSH research programs are not broadly adopted and implemented; Research "sits on the shelf."
  - For instance, only 17% of U.S. fishing safety research has been adopted in workplaces to benefit workers*
- Many challenges; gaps persist
- These gaps have serious implications for the safety and health of the global workforce

*Lucas DL, Kincl LD, Bovbjerg VE, Lincoln JM. Application of a translational research model to assess the progress of occupational safety research in the international commercial fishing industry. *Saf Sci* 64:71–81, https://doi.org/10.1016/j.ssci.2013.11.023.

Implementation (translation) research at NIOSH: A brief history and timeline



We have heard this before …

- "NIOSH is encouraged to fund translation/implementation research in the future."
- "Underrepresented is evidence that the knowledge has had widespread uptake by relevant user groups, and most importantly, resulted in adherence to best practice recommendations."

https://www.cdc.gov/niosh/programs/review/pdfs/NIOSH_HCSA_Program_Review_Panel_Report_Oct_2017-508.pdf

NIOSH Evaluation Capacity Building Plan, 2021–2025

Implementation (Translation) Research Workgroup

Key Learning Question:

How can NIOSH use implementation (translation) research to successfully adopt, implement, and sustain NIOSH solutions?

Key Learning Activity 1: Refine definition and develop supporting materials for implementation research (*Complete by end of FY23*)

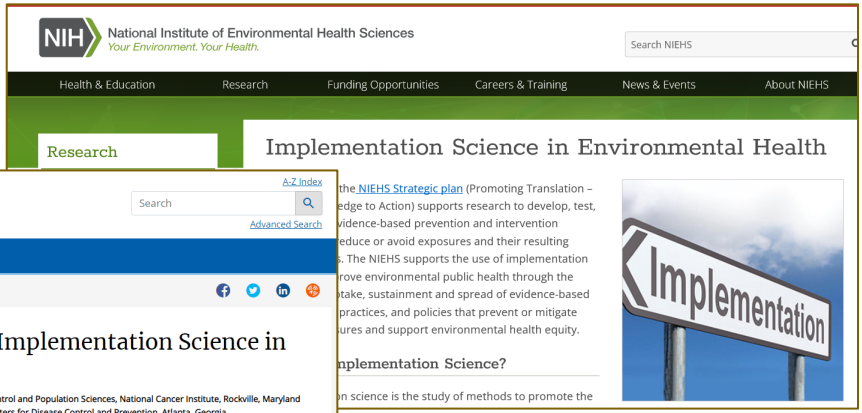
Key Learning Activity 2: Develop implementation research materials to build capacity within NIOSH (*Complete by end of FY25*)

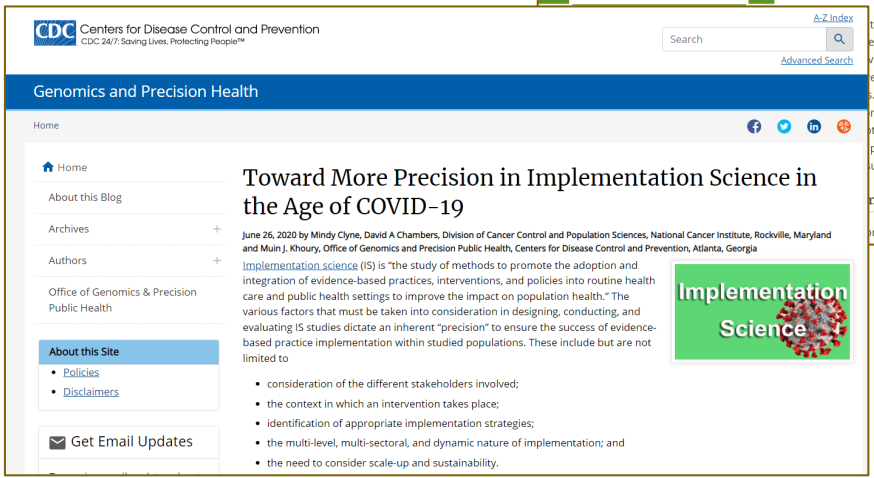
What's in a name?

QUERI
VA Quality Enhancement Research Initiative
EVIDENCE INTO PRACTICE

SAMHSA
Substance Abuse and Mental Health Services Administration

AHRQ
Agency for Healthcare Research and Quality



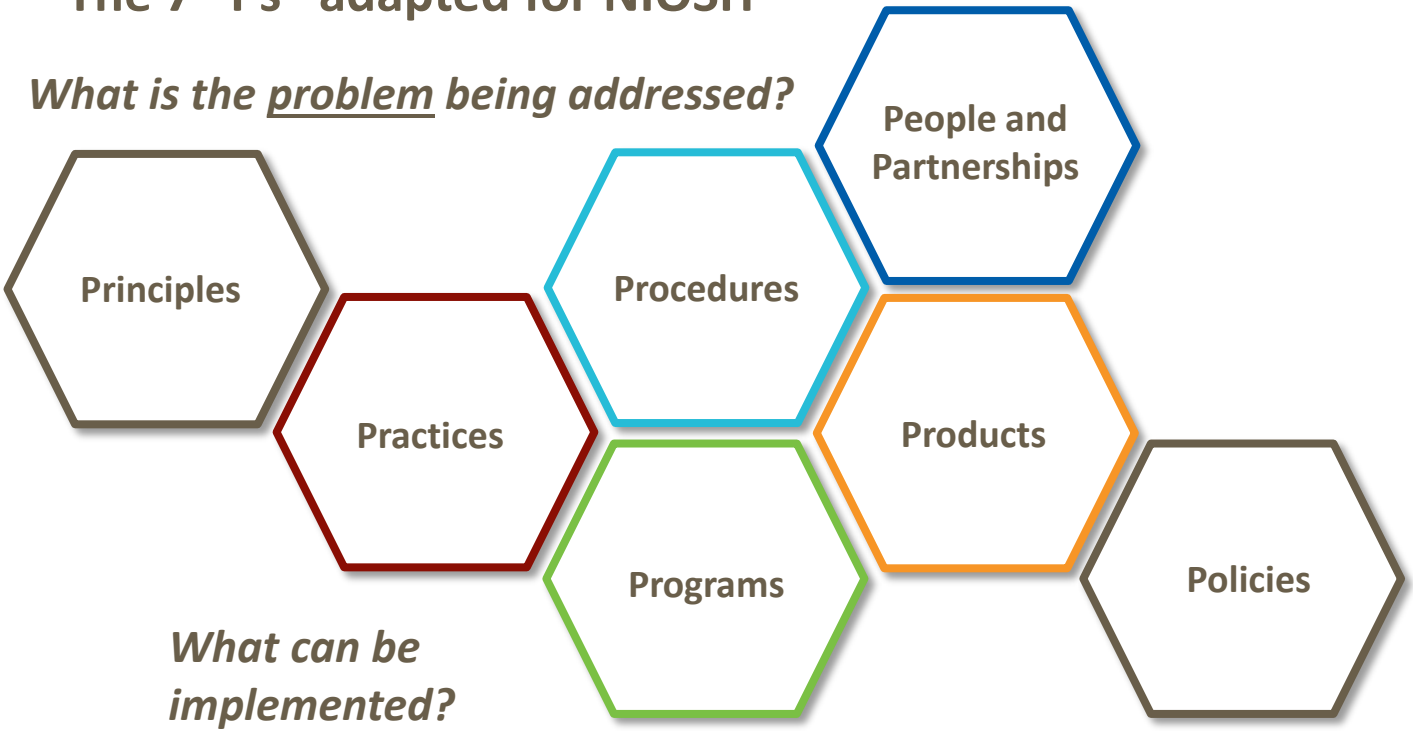


Implementation research for NIOSH

Implementation research (previously Translation research):

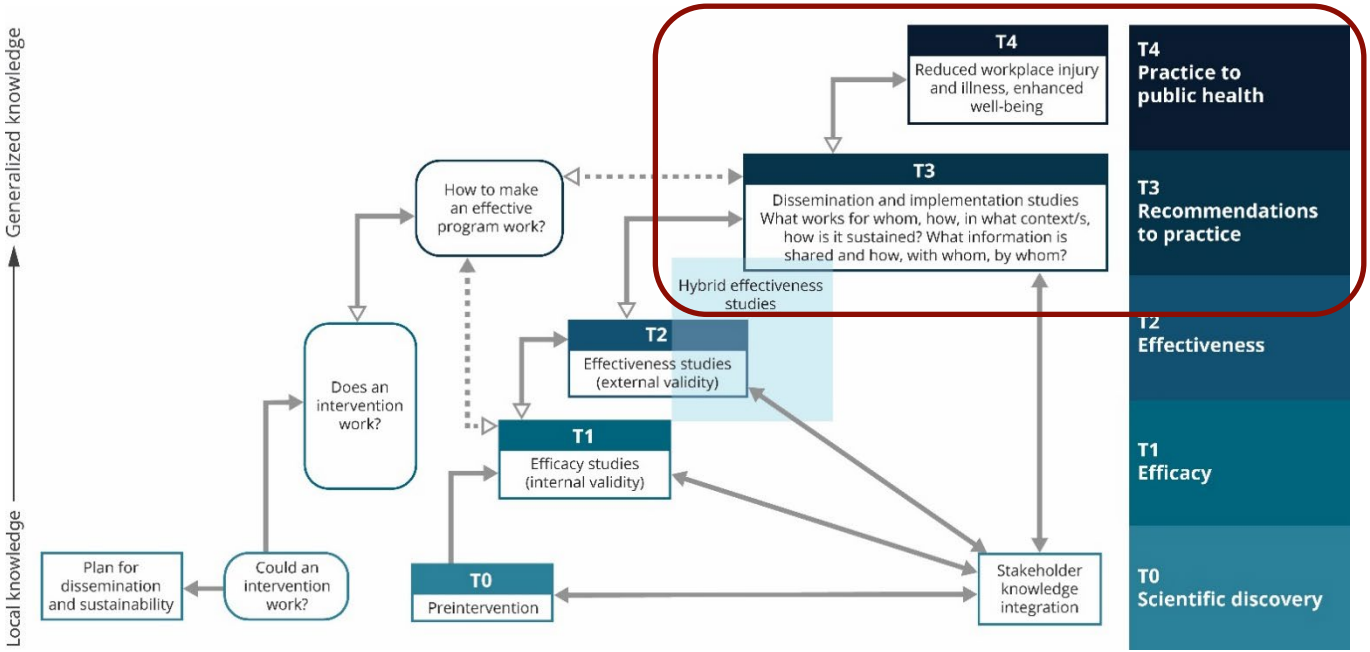
- Studies the processes by which **promising interventions** are disseminated, adopted, implemented, sustained, and scaled equitably in real-world settings.
  - Uses models, methods, and measures to **systematically identify, develop, evaluate, and refine strategies** (to support these processes).
  - Applies to all workplaces and workers, especially those who are disproportionately affected by OSH hazards and risks.

The 7 "Ps" adapted for NIOSH



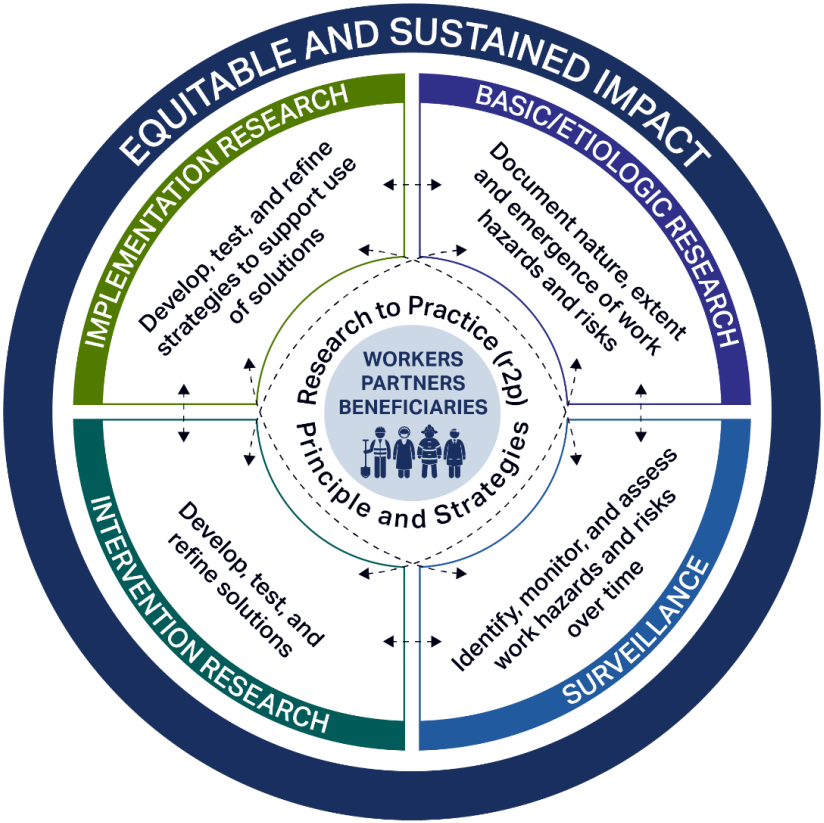
Adapted from Brown CH et al. [2017]. An overview of research and evaluation designs for dissemination and implementation. *Annu Rev Public Health* 38:1–22, https://doi.org/10.1146/annurev-publhealth-031816-044215.

The research continuum in OSH [Guerin et al. 2022]



Guerin RJ, Glasgow RE, Tyler A, Rabin BA, Huebschmann AG [2022]. Methods to improve the translation of evidence-based interventions: A primer on dissemination and implementation science for occupational safety and health researchers and practitioners. *Saf Sci* 152:1–18, https://doi.org/10.1016/j.ssci.2022.105763.

NIOSH Research for Impact Framework

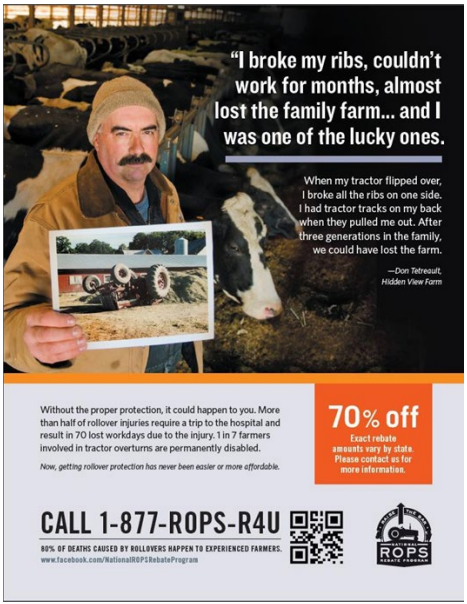


Draft

Credit: NIOSH Visual Communications Team and the NIOSH Implementation Research Workgroup

Where does implementation research fit in at NIOSH?

- Conduct “T3” implementation studies
  - — **Systematically identify, develop, evaluate, and refine strategies** that support disseminating, adopting, implementing, sustaining use, and scaling of proven interventions into workplace settings
  - — Example: Tinc et al. (2020)
- Integrate implementation science concepts throughout all stages of NIOSH research; Plan from inception for implementation, dissemination and impact



Tinc PJ, Jenkins P, Sorensen JA, Weinehall L, Gadomski A, Lindvall K [2020]. Key factors for successful implementation of the national rollover protection structure rebate program: A correlation analysis using the consolidated framework for implementation research. *Scand J Work Environ Health* 46(1)85–95, doi:10.5271/sjweh.3844.

Examples of integrating implementation research into NIOSH research

- **Basic/etiologic**
  - Research how to design personal protective equipment (PPE) that accounts for a wider range of body shapes and sizes, ensuring that PPE are accessible and effective for all workers.
- **Intervention**
  - Develop protocols that minimize the impact of research activities on partners while generating meaningful and actionable outcomes.
- **Surveillance**
  - Align the method used for collecting surveillance data with the preferences and priorities of those providing and consuming the data.

You don’t need to be an implementation scientist!

Pragmatic, easy to use tools to integrate an implementation research (and health equity) perspective into research activities

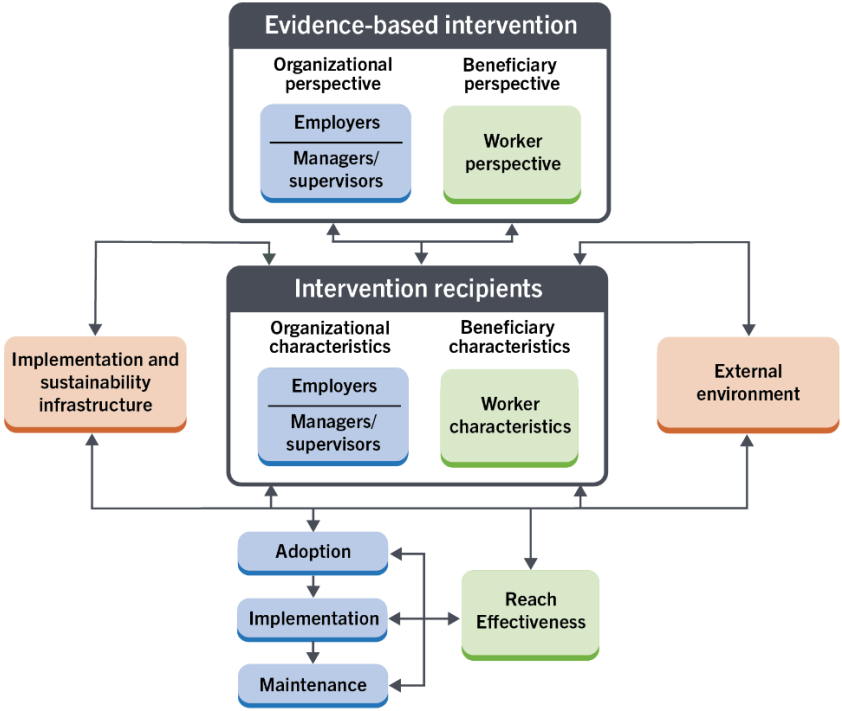
Adoption
Where will the intervention be applied and who will apply it?

Reach
Who (workers/employers) are intended to benefit, and who participate and are exposed to the intervention?

Maintenance
When will the intervention be operational? How long will it be sustained (workplace level)? How long are the results sustained (worker level)?

Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, Ory MG, Estabrooks PA [2019]. RE-AIM planning and evaluation framework: adapting to new science and practice with a 20-year review. *Front Public Health 7*(64):1–9, https://doi.org/10.3389/fpubh.2019.00064

The Practical, Robust, Implementation and Sustainability Model (PRISM) for Occupational Safety and Health



Adapted from Feldstein and Glasgow [2008]; Guerin RJ, Glasgow RE, Tyler A, Rabin BA, Huebschmann AG [2022]. Methods to improve the translation of evidence-based interventions: A primer on dissemination and implementation science for occupational safety and health researchers and practitioners. *Saf Sci* 152:1–18, https://doi.org/10.1016/j.ssci.2022.105763.

Next steps

FY23

- Identify implementation research models and tools tailored for NIOSH
- Hold listening sessions with NIOSH Divisions/Labs/Offices; capture findings
- Rename (“officially”) the Translation Research Program the Implementation Research Program
- Revise and update webpages

What do you think?

- Are the proposed activities clear and actionable?
- Are there other efforts/activities to consider to advance implementation research at NIOSH? What are we missing?
- How do we define success?

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For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Additional resources

Artwork for the NIOSH *Youth@Work-Talking Safety* curriculum by Chi-Yun Lau

Safety Science 152 (2022) 105763

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Safety Science

journal homepage: www.elsevier.com/locate/safety

Review

Methods to improve the translation of evidence-based interventions: A primer on dissemination and implementation science for occupational safety and health researchers and practitioners

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Commentary

Dissemination and Implementation Science Approaches for Occupational Safety and Health Research: Implications for Advancing Total Worker Health

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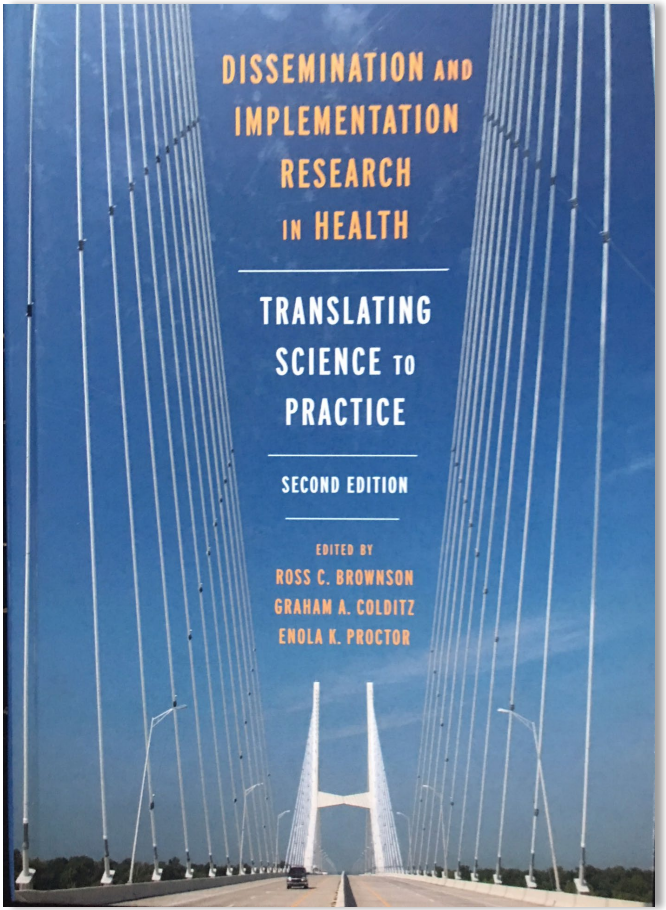
Abstract: Total Worker Health® (TWH), an initiative of the U.S. National Institute for Occupational Safety and Health, is defined as policies, programs, and practices that integrate protection from work-related health and safety hazards by promoting efforts that advance worker well-being. Interventions that apply the TWH paradigm improve workplace health more rapidly than wellness programs alone. Evidence of the barriers and facilitators to the adoption, implementation, and long-term maintenance of TWH programs is limited. Dissemination and implementation (D&I) science, the study of methods and strategies for bridging the gap between public health research and practice, can help address these system-, setting-, and worker-level factors to increase the uptake, impact, and sustainment of TWH activities. The purpose of this paper is to draw upon a synthesis of existing D&I science literature to provide TWH researchers and practitioners with: (1) an overview of D&I science; (2) a plain language explanation of key concepts in D&I science; (3) a case study example of moving a TWH intervention down the research-to-practice pipeline; and (4) a discussion of future opportunities for conducting D&I science in complex and dynamic workplace settings to increase worker safety, health, and well-being.

Keywords: dissemination and implementation science; Total Worker Health; translational science; occupational safety and health; evidence-based interventions; health equity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