CLIMATE AND ENVIRONMENT RESPONSE FOR HEALTH IN THE AMERICAS

Introduction to transdisciplinary research approaches
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Learning Objectives

- Define transdisciplinary research (TD) approaches and distinguish them from other forms of collaborative work
- Make connections between translational science of the medical/healthcare context and transdisciplinary science (TD) for action-oriented research and policy interventions
- Describe the relevance of transdisciplinary science (TD) in public health practice and solution-oriented research in the CEH nexus

Session 1 Focal Areas

- Introduction to Transdiscipline (TD) in Public Health
- Interconnections between translational science in the field of public health and approaches in transdisciplinary research
- Transdisciplinary work as a way of life
- Transdisciplinary approaches to solutions in science and policy in the context of Climate, Health and Environment

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Defining Transdiscipline (TD)

Transdiscipline is more than a new discipline or a super discipline; it is "a different way of looking at the world [that is] more systemic and holistic“ (Max-Neef, 2005)

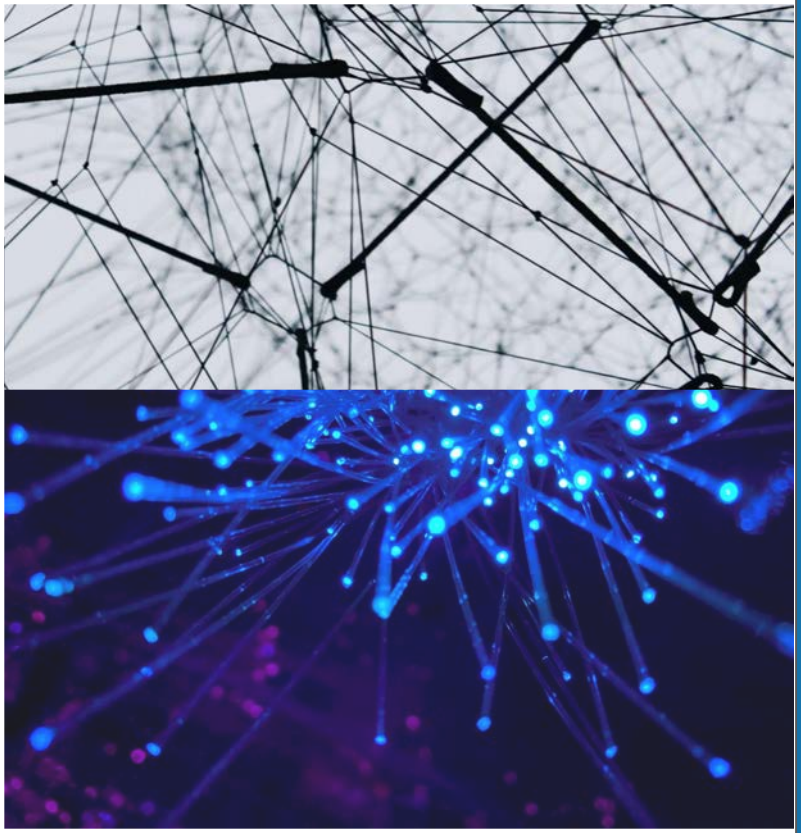
- Transdiscipline (TD) is a research approach that emphasizes integration across disciplinary fields, inclusion of non-academic actors, and solution-oriented, context-based knowledge production:
- TD attempts to break down the methodological, epistemological and ontological boundaries that prevent the shared understanding of complex questions (Stock and Burton, 2011)
- TD emphasizes the inclusion of non-academic actors in the knowledge production process (Scholz and Steiner, 2015; Rigolot, 2020)
- TD promotes participatory problem-solving approaches that apply to tangible real-world problems (Scholz and Steiner, 2015)

Distinguishing TD from other forms of collaboration

Interdiscipline (ID): refers to a form of coordinated and integration-oriented collaboration between researchers from different disciplines (Pohl and Hirsch Hadorn, 2007; Fiore, 2008; Dieleman 2017)

Multidiscipline (MD): addresses a problem from the perceptions of a variety of disciplines (scientific disciplines); but each discipline works autonomously with little fertilization of ideas or new concepts between disciplines or synergy in results (Bammer 2017)

Convergence: involves integrating knowledge, methods and experience from different disciplines and forming new frameworks to catalyze scientific discovery and innovation. Refers to the inclusion of technologies in disciplinary fields (NSF, 2016)



Key Objectives and Features of TD Investigation

- Transcend discipline-specific perspectives and approaches to address a common problem
- Researchers from different disciplines work together to create new conceptual, theoretical, methodological and translational innovations

- Openness to the perspectives on other disciplines, where no individual discipline has intellectual precedence
- Generate new integrative knowledge

- Collaborative approach to problem formulation and methodological development
- Involve non-scientists in the research process and various forms of knowledge
- Strong focus on building personal relationships and joint understandings

- Aim to produce accessible and usable outcomes for local policymakers and decision-makers
- Problem-oriented science
- Create practical outcomes to facilitate change

Relevance of the TD work

Transdisciplinary research (TD) is necessary when knowledge about a problematic field relevant to society is uncertain, when the concrete character of problems is questioned, and when the stakes are high for those who care about the problems and are involved in dealing with them.

Transdisciplinary research deals with problem fields in such a way that it can:

a) capture the complexity of problems,

b) consider the diversity of the world of life and scientific perceptions of problems,

c) link abstract knowledge and the experiential aspect of specific cases,

d) and develop knowledge and practices that promote what is perceived as the common good (Pohl and Hirsch Hadorn, 2007; Dieleman 2017)

TD as a way of life

TD as a discipline (Bammer, 2015)

- Sociology of Science (Fujimura, 1999)
- Theory of Social Ecology (Stokols, 1997)
- Environmental Psychology (Andreas, 2014)
- Team Science (Fiore, 2015; Bammer, 2010)

TD *as a way of life* (Rigolot, 2020)

When transdisciplinarity is considered as a way of being, it is inseparable from personal life and extends far beyond the professional activities of a researcher.

- Loom/Tapestry of Life (Diaz et al., 2022)
- Nature's contribution to people (Diaz et al., 2019)
- Epistemologies of the South (Rivera Cusicanqui, 2019)
- Cognitive Justice (Odora Hoppers, 2020)

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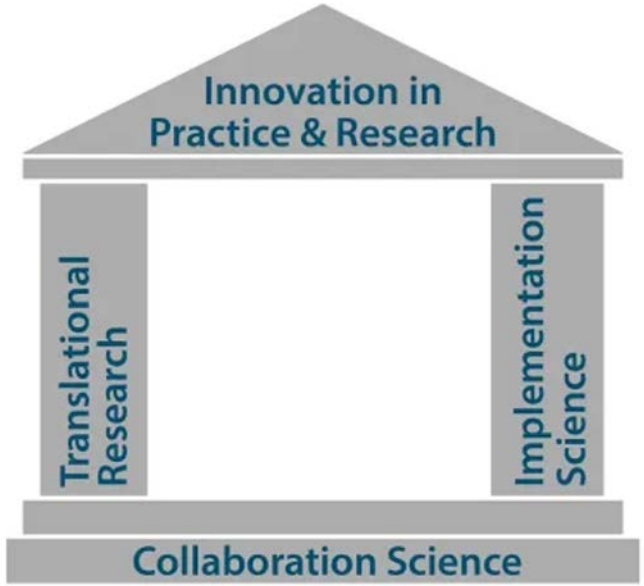
Translational Science and Public Health

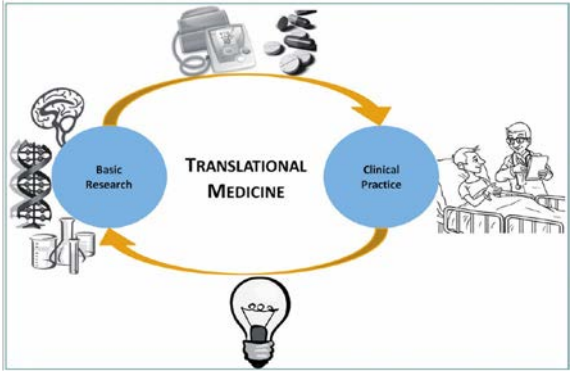
- Translational science focuses on the implementation of ideas, knowledge and discoveries generated from research on diagnosis, treatment and prevention of diseases (Betancourt et al. 2014)
- It is considered a transformative process of turning observations into interventions to improve health outcomes
- Promotes interaction between producers and users of health research
- Strong representation of stakeholders investing in health outcomes (Lotrecchiano and McDonald 2018)

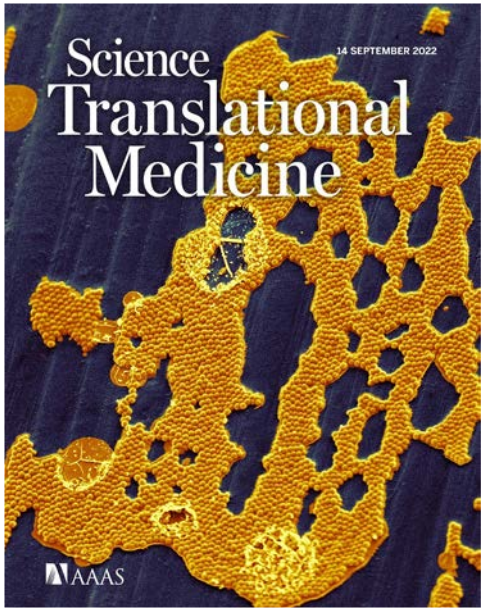


(Source: Lotrecchiano *et al.*, 2016)

“From the laboratory to the patient”

- Translational science progresses from lab to patient (McGaghie 2010)
- Helps move laboratory discoveries in biomedical sciences into clinical research
- Produces evidence of clinical effectiveness at the patient level
- Serves as a mechanism for translating results into practice guidelines for patients, physicians, and policymakers
- Enables more comprehensive approaches to health care delivery, community engagement, and preventive services
- It allows to demonstrate the usefulness of medical interventions to the public.
- It is a mechanism for disseminating data, analysis and methodologies to communities.





Transdisciplinary Public Health

It is a transdisciplinary approach to translational science (Stokols et al. 2013; Scudder et al. 2021):

- It is an integrative process that includes academic, scientific and professional actors who establish collaborations.
- It allows to develop and use new conceptual and methodological approaches, synthesize and expand theories, methods and translation strategies specific to the discipline as well as create innovative solutions to key public health problems in the scientific and social domains.

Benefits of the TD approach in Public Health:

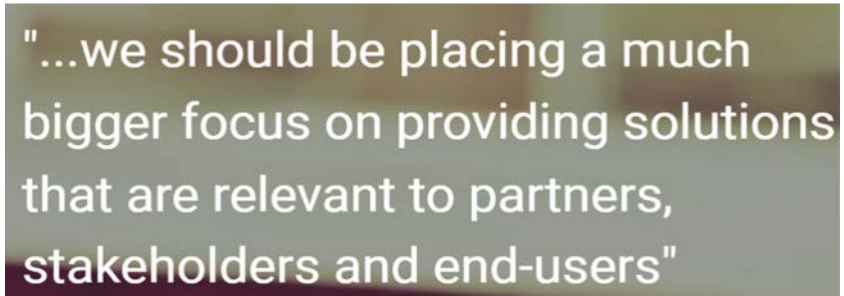
- Increase productivity, i.e. the impact of translational research
- Achieve faster and wider dissemination of research results across disciplines and fields.
- Produce practical applications and high-impact scientific results.

Challenges of the TD approach in Public Health:

- Increased time and effort required to communicate with more diverse collaborators
- Competing demands from researchers' organizational departments
- Tensions between scientists and professionals
- Potential productivity delays or longer start-up time needed for teams to plan and collaborate

Solution-oriented research

- Solution-oriented research strengthens the contribution of science to addressing emerging challenges from the HSC nexus (Lang and Wiek, 2022)
- Today's great challenges demand collective and urgent action
- TD approaches and solution-oriented research focus attention on questions about who is included in knowledge creation, what knowledge matters, and how solutions are implemented.
- Adopt greater pluralism of knowledge systems and knowledge holders and include "lived realities" (Mormina and Schoneberg, 2021)
- Address structural inequalities in knowledge production systems to diversify the social and epistemological foundations of science
- Projects with non-academic actors have led to significant improvements in addressing important issues



Interface between TD and science-policy

> *"Public policy can be one of the most effective approaches to protecting and improving the health of the population."*
> *(U.S. Institute of Medicine, 2011)*

- TD science provides a framework for researchers to collaborate directly with potential implementers (e.g., policymakers or NGOs) as well as affected stakeholders in the development, implementation, and evaluation of public policy options (Lang & Wiek, 2022).
- TD science as a science-policy bridge centers community and is intervention-oriented (Watson, 2013)
- The composition of work teams is unique and has a greater possibility of achieving creative results.
- Translating research results into practical solutions to social problems (Stokols et al., 2013)
- Among the main tools to implement transdisciplinary research are law and public policy (Watson, 2013)
- Law and policy give governments the power to manage public health by authorizing, organizing, and empowering government public health agencies (Watson 2013)

From distant research approaches to inclusive approaches

Distant

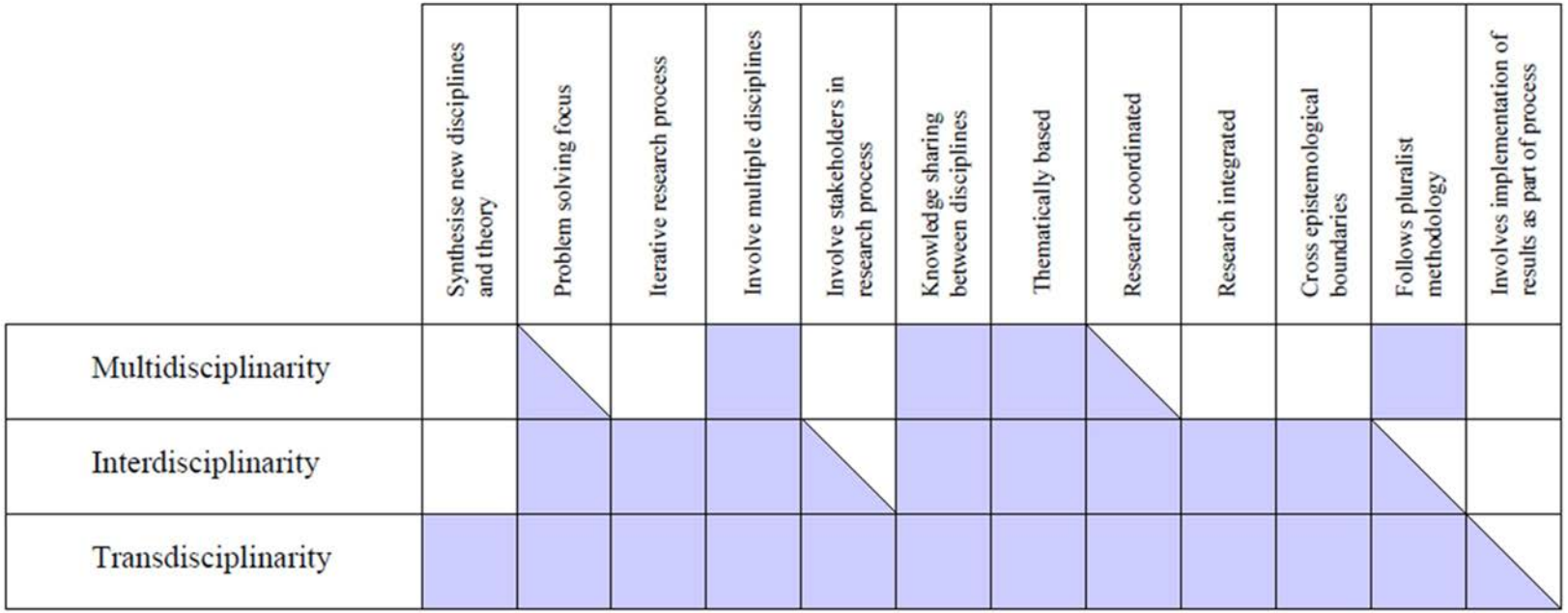
- Scientists develop new solution options through one-way interactions (e.g., consultations) with future implementers and potentially affected actors.
- Scientists test solution options in controlled environments

Inclusive

- Scientists and potential implementers actively collaborate on experiments to test solution options.
- Solution options and experimental designs are created collaboratively.
- Implementers and affected stakeholders collaborate in the implementation, adaptation and evaluation of solution options to improve their results
- It connects solution-oriented research with local or indigenous knowledge to broaden the spectrum of solution options.

Review: Distinguishing TD from Interdiscipline and Multidiscipline

Figure 1. Defining characteristics of integrated research approaches.



Source: Stock & Burton (2011) Defining Terms for Integrated (Multi-Inter-Trans-Disciplinary) Sustainability Research. *Sustainability Science.*

Conclusion: When is TD a suitable approach?

- What kind of problems need a TD approach?
- Complex problems that integrate dimensions across social and ecological systems, such as climate, environment, and health.
- Multi-scalar problems that transcend global-regional-local scales
- Issues that have impacts on the community and require investment from community members for effective implementation
- Problems where local context and local knowledge are important (e.g., "lived realities")

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