

Incorporating Dissemination and Implementation Science in Health Extension: A Call to Action

Kathryn A. Stofor

Abstract

Dissemination and implementation (D&I) science describes an emerging approach to biomedical research that can complement Cooperative Extension. Both Extension and D&I researchers wish to share their work broadly, replicating successful interventions and helping others adopt best practices to improve health for communities. D&I standards, building on widely accepted translational science methods, provide scaffolding and guidelines for sharing successful efforts, ensure rigor, and create a collective vision. Cooperative Extension builds on a long history of supporting health with a renewed focus on equity. This reflective essay outlines areas for alignment throughout Extension to strengthen health equity work. D&I science can provide structure and language familiar to health care partners, and Extension can bring expertise in health education and equity. With some strategic disruption to current ways of working, Extension can build on long-standing strengths and goals to increase our impact. Collaboration ultimately can maximize reach and impacts on public health.

Keywords: health extension, health equity, interdisciplinary collaboration, health education



The term *dissemination and implementation (D&I)* science describes an emerging approach to biomedical and education research with complementary objectives to Cooperative Extension: spreading innovations from research into best practices. D&I science is a stage of translational research, a continuum describing research from foundational to applied (Sampson et al., 2016), aiming to spread evidence-based health interventions broadly and effectively into practice. Through efforts associated with publishing our evaluation results and successful programs in Extension-related journals (e.g., Kumar Chaudhary et al., 2017), as well as through strategic nationwide efforts such as those via the Extension Foundation, both Extension and D&I researchers are concerned with sharing their work, replicating successful interventions, and helping others adopt best practices—working smarter, not harder, and not reinventing the wheel. D&I offers a systematic way of doing so (Guerin et al., 2022; Leppin et al., 2020; Sampson et

al., 2016), supports wide reach (Estabrooks et al., 2018), and comes with accompanying research and evaluation into the success of efforts to spread interventions beyond their initial county, region, or state (Gaglio & Glasgow, 2017; Harden et al., 2018, 2020).

Health care researchers and providers in the United States have been using D&I more and more extensively, reflecting that the field has matured; however, it still has room to grow (Brownson et al., 2023). In particular, D&I science needs more emphasis on health equity (Brownson et al., 2021). Often, initiatives using D&I frameworks focus on a few aspects of health equity, such as addressing equitable participation of community partners or alleviating health disparities, without attending to all dimensions (Rabin et al., 2014). Indeed, some aspects of equity have not yet appeared in the D&I science literature. Extension's explicit attention to health equity could benefit D&I scientists. Broader collaboration and adoption of D&I science's rigor and frameworks by Extension and

other health educators will help align efforts across health education and health care provision, both in research and in practice. Drawing on Extension's strength with communities, particularly rural communities and 1890- and 1994-serving institutions' historically marginalized communities, D&I research projects could expand resource capacity to incorporate more dimensions of health equity in each project. Working with Extension's decentralized system may also help expand use of D&I systems change work beyond centrally controlled models for health equity work (Charbonneau et al., 2025). Such alignment will provide a continuum of care from prevention to treatment and a blending of medical care with lifestyle supports from Extension, ultimately promoting better public health and health equity.

This article will first use as an example how D&I science can support *health extension* (Dwyer et al., 2017; Kaufman et al., 2017), whereby Cooperative Extension links clientele to both patient care and health education resources (Dwyer et al., 2017). Health extension has "come of age" (Burton et al., 2021, p. 4) since the release of the first National Framework for Health and Wellness in 2014. In fact, one of the sub-themes of the second recommendation of the latest *Cooperative Extension's National Framework for Health Equity and Well-being* (hereafter, *Health Equity Framework*; Burton et al., 2021) explicitly calls for the use of implementation science to ensure effective uptake of best practices. However, I argue that the use of D&I science can permeate throughout the work of health extension and not be limited to a resource for locating best practices.

Today, the *Health Equity Framework* (Burton et al., 2021) suggests Cooperative Extension health programming should encompass two primary activities: (1) uniting an extensive array of Cooperative Extension health programming in one framework and (2) encouraging partnership between Cooperative Extension and health care research and practice organizations. For the first activity, health extension encourages more explicit attention to the social drivers or determination (formerly social determinants; Krieger, 2024; NACHC Staff, 2023) of health through recognition of how agricultural and natural resources work impacts public health, such as the sun safety needs of agricultural workers (Kearney et al., 2014), interaction

of animal and human health (Doughrte, 2021), pesticide application certification to protect applicators and residents (Perry et al., 2000), access to food as a part of agricultural economics (Norton et al., 2021), and mental health as an ecosystem service of natural spaces (Jackson et al., 2013). The goal of the two activities—programmatically alignment and health care organization partnerships—is improved public health, especially for rural populations, by going beyond traditional Extension nutrition and well-being programming to partnering to provide health services, including health education, preventive care, and treatment (Dwyer et al., 2017; Kaufman et al., 2017; Khan et al., 2020). It is these two activities that I hereafter refer to as *health extension* in the vein of Dwyer et al. (2017), and advocate for Cooperative Extension to support more explicitly with D&I science to support health equity.

Using theoretical frameworks of D&I research, I will discuss the role of D&I research in public health and how Cooperative Extension educators and researchers can facilitate the spread of health innovations, improve public health, and continue the research cycle through partnerships with health care researchers and practitioners, particularly those using D&I frameworks. As such partnerships are emerging (Buys & Koukel, 2018; Gutter et al., 2020), I will explore the potential of a health extension partnership approach grounded in D&I research to draw on the strengths of each partner to improve public health. I will review relevant D&I research frameworks from both medicine and education and introduce essential concepts and evaluation methods; note existing similarities to and differences from Extension; and, finally, outline what D&I can look like in health extension.

Literature Review

Public health is a scientific discipline focused on research and education to "protect and improve the health of people and their communities" (CDC Foundation, n.d., para. 1), that is, entire populations. The role of family and consumer sciences (FCS) Extension agents includes health education, though exact duties vary among states from specific focus on nutrition to broader programming (Gutter, 2016; Gutter & Stephenson, 2016). Yet global confusion among terms such as "health promotion," "health education," and "public health"

(van Teijlingen et al., 2021) means that FCS professionals, let alone broader Extension professionals, may not explicitly recognize their role in public health. Van Teijlingen et al. suggested that health education promotes “voluntary changes in behavior through awareness, knowledge, skills, beliefs, attitudes, and values” (p. 5) and is an integral part of health promotion. However, health promotion is a larger concept encompassing “a more enabling environment, [namely] empowerment and policy options”; that is, health promotion also uses “approaches which compel individuals to change behavior” (p. 5). Variations in preparation of FCS agents and other Extension professionals across states and land-grant institutions may contribute to confusion.

For example, anecdotal confusion among Extension professionals about their role in public health education emerged in the recent COVID-19 pandemic, when some expressed personal reluctance to promote vaccinations or other public health measures or explicitly questioned the role of Extension in such activities (Stofer et al., 2022). Grants from a joint mechanism from the CDC and USDA NIFA starting in 2021 tasked Extension professionals with teaching and engagement activities around adult vaccination (NIFA, n.d.-a). Although some Extension professionals and administrators were slow to adopt this approach, others recognized congruence with the role of animal sciences professionals who regularly talk about the importance of livestock vaccination in animal health. D&I science could be a framework to examine the barriers to uptake of vaccination or other health education and the subsequent use of programming to overcome those barriers among Extension personnel.

The term “D&I science” describes a set of research concepts and practices for systematic examination of the deliberate spread of best practices by combining organizational change and diffusion of knowledge perspectives (Dearing et al., 2018). D&I consists of two basic parts: dissemination, or the active sharing of the knowledge resulting from previous research, and implementation, or the putting into practice of those practices in the real world (Glasgow et al., 2012). In biomedical research, D&I is the continuation of a five-stage translational research cycle that “begins” with early stage research, Stage To, such as basic laboratory research

to identify fundamental biological processes (Sampson et al., 2016). Similar guidelines exist in educational research, with early stage or exploratory research considered contributors to “core knowledge” (Sampson et al., 2016, p. 156; IES & NSF, 2013).

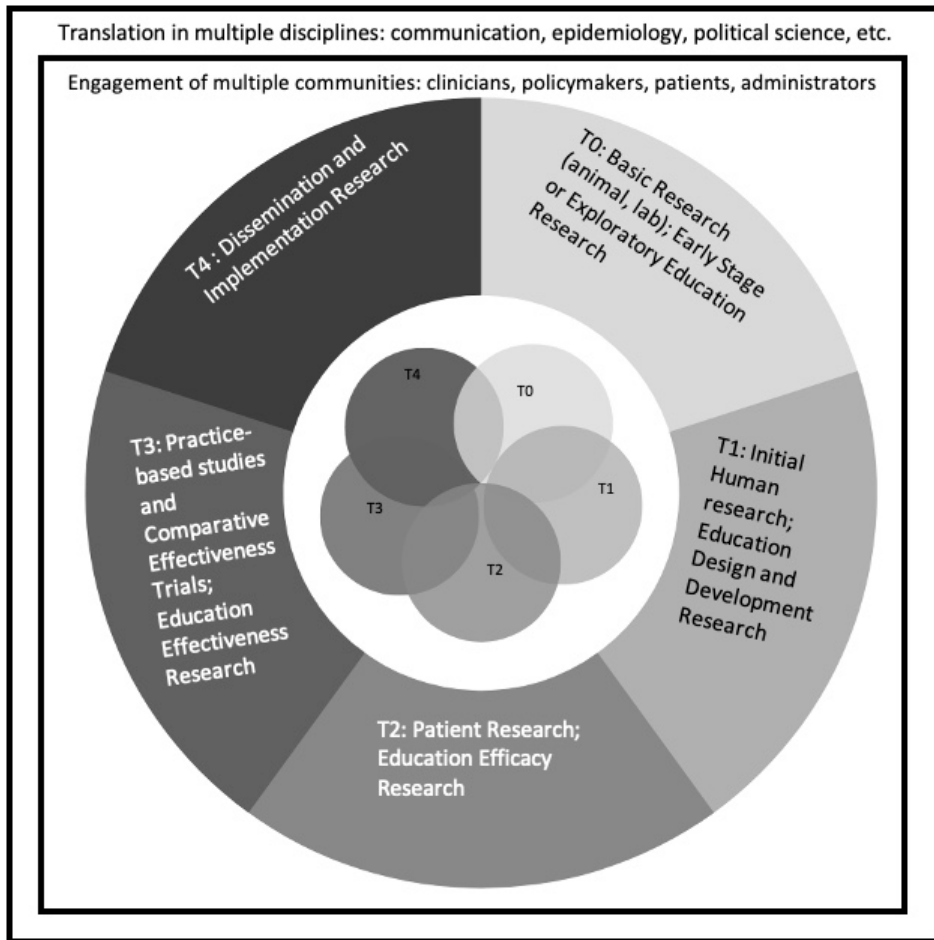
Translational stages move work from the lab or controlled environment to real-world application. For biomedical science, stages T1 and T2 establish effectiveness through trials with humans for “proof of concept” (Sampson et al., 2016, p. 154), aligning with design and development and efficacy research in education, respectively. Stage T3 is translation of the intervention to practice on a broader scale, through, for example, over 50 medical hubs funded by Clinical and Translational Science Awards from the National Institutes of Health since 2006 (National Center for Advancing Translational Sciences, 2017). In education research, the T3 parallel, effectiveness research, “[generates] reliable estimates of the ability of a fully-developed intervention or strategy to achieve its intended outcomes” (IES & NSF, 2013, p. 9). In either model, the stages do not have to be sequential; results and findings from any stage influence development of research in the others. As D&I science matures, especially in public health, researchers continue to offer frameworks that situate D&I in different places in relation to a more or less settled framework of translational research. For example, Guerin et al. (2022) cited Brownson et al. (2013) to note that all relevant parties must be engaged as early as Stage T1 and T2 to ward off development of “highly efficacious, but ill-suited” (p. 4) interventions. Truly, engaging end users in design and prioritization of even fundamental research is necessary to avoid science that sits in academic ivory towers without real-world acceptability and uptake. Leppin et al. (2020) emphasized the point of including D&I principles throughout the research cycle. However, despite these nuances, all three papers—Sampson et al. (2016), Guerin et al. (2022), and Leppin et al. (2020)—have added the fifth stage of research when discussing D&I science. Coupled with Sampson’s inclusion of additional context of translation in multiple domains and engagements of a variety of stakeholder groups (see further discussion at the end of this section), therefore, for the introduction to a broader health education audience, I maintain the Sampson et al. (2016) fundamental structure, especially

to align with education research stages. See Figure 1.

D&I standards, woven into frameworks, provided scaffolding and guidelines for sharing what has proven successful in one context and help ensure the rigor of D&I science as well as create a collective vision for the field. These frameworks often include theoretical underpinnings that describe relationships among concepts and can produce hypothesis-driven research questions (Nilsen, 2015, 2020). D&I frameworks fall into three categories, each with its own aim: process models describe or guide translation of research into practice; determinant frameworks, classic theories, and implementation theories seek to understand or

explain influences on implementation outcomes; and evaluation frameworks examine whether implementation was successful (Nilsen, 2015). Such frameworks and theories have themselves been adopted and adapted in many cases from multiple other domains of research, including from agriculture and Extension itself, particularly Rogers's (2003) diffusion of innovations, and theories of behavior change, such as Ajzen's (1991) theory of planned behavior. The same, therefore, is true of the methods associated with a number of behavior change theories in particular—that they are adapted and used in D&I research (Kok et al., 2016; Powell et al., 2017). As D&I further emerges as a framework for health extension, more extensive use of these theories and methods

Figure 1. Stages of Translational Research in Biomedicine and Education With Context Considerations



Note. Central overlapping circles indicate overlap of stages and ability to move back and forth across any stage rather than in numerical order. The two boxes surrounding the circle indicate two levels of context, engagement with multiple groups and translation into multiple disciplines. Adapted from “Implementation research: The fourth movement of the unfinished translation research symphony,” by U. K. Sampson, D. Chambers, W. Riley, R. I. Glass, M. M. Engelgau, and G. A. Mensah, 2016, *Global Heart*, 11(1) (<https://doi.org/10.1016/j.gheart.2016.01.008>).

throughout can bolster our work and alignment with our health care partners. For example, intervention mapping is a D&I approach, itself drawn from psychology, that guides facilitators in choosing appropriate methods, interventions, and theories based on desired outcomes and audience factors (Durks et al., 2017). As researchers develop more evidence-based programs and USDA's Children, Youth, and Families at Risk (CYFAR) and Substance Abuse and Mental Health Services Administration (SAMSHA) grant mechanisms further require use of existing proven models, Extension can use intervention mapping to narrow down and select appropriate programming.

One of the most widely used determinant frameworks in D&I research, the Consolidated Framework for Implementation Research (CFIR; Damschroder et al., 2009, 2022), aims to bring together aspects of many of these frameworks and theories of behavior change. CFIR includes an overarching set of 37 constructs to consider in five domains: individual participant characteristics, intervention characteristics, inner setting, outer setting, and the implementation process. Importantly for Extension, Damschroder et al. (2009) incorporated Rogers's (2003) diffusion of innovations into the individual domain of CFIR.

An additional set of frameworks addresses evaluation of D&I, with an ultimate goal to determine which program or policy interventions, which elements of those interventions, in which settings, under which conditions, and conducted by whom effectively produce which outcomes, for whom, at what cost, and how (Gaglio & Glasgow, 2017; Paul, 1969). D&I science is most concerned with spreading successes beyond single instances, making Extension an ideal setting for these types of research and evaluation efforts. Extension differs from other community programs in its extent and breadth of clientele, offering opportunities to evaluate across multiple counties or regions within a state, or across multiple states (NIFA, n.d.-b). Extension also has built-in partnerships with governments and universities that allow for asking questions of the effectiveness of programs for each of these groups. Extension also can offer chances to evaluate vertically across age groups, such as youth and adults, or younger and older adults. Finally, Extension has an array of settings in which we conduct our programs, from Extension offices to schools to other

public spaces. With all of these opportunities within a single system, using frameworks of D&I science has the potential to offer collaborators access to programs with large and diverse numbers of participants and settings, advancing research and ultimately health by examining issues extending beyond individual programs and isolated studies, the hallmark of D&I science.

In this realm of evaluation in particular, Extension researchers have already made great use of D&I science, demonstrating the potential of the collaboration. For example, studies have piloted implementation of tobacco prevention programs among 4-H youth (Bteddini et al., 2023), evaluated physical activity campaigns (Balis & Harden, 2021; Balis & Strayer, 2019), and examined the implementation of the CDC Diabetes Prevention Program (H. K. Wilson et al., 2024). The RE-AIM D&I evaluation framework (Glasgow et al., 1999) has been used most extensively as part of a national working group involving Extension since 2004 (Harden et al., 2020) and resulting in recent systematic reviews (Harden et al., 2015) and recommendations for the use of RE-AIM in communities (Harden et al., 2018), among other settings.

D&I researchers have also noted the importance of considering two other overarching contexts: First, implementation must include multiple stakeholder groups, and second, translation work must be carried out in multiple domains, including education and social marketing (Sampson et al., 2016; Woolf, 2008). The first consideration is already a hallmark of Extension as we work with policymakers, various client groups, administration, and research faculty (e.g., Jamison et al., in press; Parisi et al., 2018). The second consideration, translation into multiple disciplines, is exactly where health extension becomes relevant and necessary. See Figure 1.

Similarities Between Biomedical D&I Science and Extension

As noted, Extension has from its beginnings worked to translate research conducted by faculty into real-world applications (Seevers, 1997), neatly dovetailing with the motivations of translational research in health and medicine. Cooperative Extension aims "to improve the quality of people's lives by providing research-based knowledge to strengthen the social, economic and environmental well-being of families,

communities and agriculture enterprises" (*Co-Op Research and Extension Services*, n.d., para. 4). Basic agricultural research spans plant pathology, biochemistry and genetics, and animal biology and physiology, corresponding to medicine's To stage and core knowledge in education sciences. Developing plant and animal breeds with desirable traits, and agricultural and commercial field trials parallel the T1 and T2 stages of translational research (Sampson et al., 2016). Stage T3 is often the work of county Extension agents, who share new findings and best practices and work with their local populations and stakeholders to implement the fruits of the T0, T1, and T2 research labor.

Finally, Extension's integration of research and knowledge sharing with stakeholders definitely follows Sampson et al.'s (2016) nonlinearity and feedback mechanisms. Stakeholders in Extension are frequently called upon to dictate research priorities directly at local county Extension offices, through work with academic departments, and through funding mechanisms such as from USDA National Institute of Food and Agriculture. In medicine, the emergence of the Patient-Centered Outcomes Research Institute within the Affordable Care Act provided explicit research outcomes and funding mechanisms examining stakeholder buy-in and effective knowledge sharing beyond the halls of academic and industry research. Therefore, the stated aims of health extension, the deliberate coordination of education programs across all subject areas of Extension to focus on health holistically and in partnership with health care providers (Burton et al., 2021), naturally already parallel the T4 stage of translational research, that is, D&I science. However, the stated aims as reiterated in 2021 still lag behind actual realization of D&I science and the end-goal coordination of programs, holistic health focus, and partnership with providers.

What Can Health Extension as D&I Science Look Like?

For many years, Extension and other science communication outlets focused on raising awareness of problems among their audiences and measured impact of efforts by numbers of people reached with programming (Clements, 1999; Warner et al., 2015). The movement in the last years of the 20th century to focus on behavior change

meant not only agents, but administrators, legislators, and even public community members themselves may not have been familiar with a new kind of programming that focused on encouraging action rather than a passive receipt of information. Therefore, it is not surprising that there is still work to be done to focus on behavioral rather than strictly knowledge outcome measures and thus, different practices for sharing and implementing research findings as part of the later stages of translational research. Indeed, even within D&I work, dissemination to promote behavior change for adopting evidence-based practices still warrants deliberate and focused attention, especially for systems-level dissemination (Kerner et al., 2005).

When it comes to acceptability of overall introduction of the practices of the final T4 stage of modern D&I science, Extension has a long-standing tradition of research into economics as well as other human and consumer sciences within colleges of agriculture. The intrinsic recognition of the value of these social sciences, often given less status than natural sciences (Fanelli, 2010), means that Extension personnel may themselves require less convincing to integrate the work of these disciplines with the biological sciences than personnel less connected to Extension.

In addition, Extension has always focused on health, from its earliest days focusing on food preservation and sanitation, to today's role as the largest provider of nutrition education for people qualifying for federal supplemental nutrition assistance, though never in a coordinated fashion (Burton et al., 2021). A recent update of the health extension framework outlines five key recommendations:

1. Advance health equity as a core system value.
2. Utilize community assessment processes.
3. Invest in the success and visibility of Extension's health-related professionals, programs, and initiatives.
4. Establish partnerships.
5. Utilize a community development approach. (Burton et al., 2021, p. 14)

The first recommendation of the future of health extension is to focus on addressing systemic inequities and social drivers of

health (Burton et al., 2021). As yet, science- and justice-based health equity (Peterson et al., 2021) is not a widely explicitly acknowledged outcome of D&I science (Schlechter et al., 2021; Woodward et al., 2019; Yousefi Nooraie et al., 2020). This omission may reflect the inability of medical care and treatment to truly promote equity without supporting activities for prevention and lifestyle changes that medical providers cannot support but that Extension has long facilitated. Whatever the cause, this is an opportunity for health extension to take the lead in collaborations, given our long-standing attention to social drivers of health that health care providers struggle to support directly.

The recent emergence of integrated frameworks that bring together health equity and D&I science, especially through focus on community-based participatory research (Johnson et al., 2009), makes the timing opportune for Extension to become integral partners in the future of D&I science to help make that outcome explicit while expanding the aspects of health equity that D&I science addresses. A recent example of this type of collaboration considered different education strategies for human papilloma virus at the county level as well as county-level barriers to implementation of evidence-based strategies (Staras et al., 2022).

One of the strengths of medical research is the amount of national resources mobilized through the National Institutes of Health as well as industry. With such a large resource base, the field of D&I can pull from a large body of research to build repositories and reviews of a wide variety of research tools on which health extension can also draw, particularly to build interventions prospectively. First, health extension specialists can use widely accepted and widely applicable frameworks such as CFIR (Kirk et al., 2015) to design implementation research with Extension as an integral part of the stakeholders outlined by Sampson et al. (2016). A number of planning tools for publication of implementation research exist as well (Pinnock et al., 2017; Proctor et al., 2013; P. M. Wilson et al., 2017). Also available are behavior change taxonomies, which can be used to design implementations based on theory and evidence bases (Francis et al., 2012; Kok et al., 2016), measurement tools (Lewis et al., 2017), and evaluation frameworks to study the effectiveness of implementation of best practices (Gaglio & Glasgow, 2017).

Extension often works on individual prevention-oriented health education upstream from preventive care and disease treatment (Andress & Fitch, 2016). By partnering with health care providers and researchers, we can use our relationships with communities to help our communities access preventive and specialty care, addressing Recommendation 4. In turn, understanding the needs of our communities in terms of access to health care can also help inform our education programming. Together, our partnership can even more meaningfully impact community development and policy further upstream as well, addressing Recommendation 5.

Per Recommendation 3, health extension will require considerable professional development both for Extension agents, including those not normally foregrounding health education as part of their regular programming, and for non-Extension health researcher partners (Dwyer et al., 2017); particularly, some of that professional development should focus on research and creating partnerships (Eschbach et al., 2019). However, one-off or shorter duration workshops may not be as effective as sustained, long-term efforts to develop such new capabilities (Sweeny, 2008). As yet, research is not a recognized need for new agent professional development, though community development is, nor is Extension education a widely available formal education path (Benge et al., 2021).

Using D&I Science to Support Health Extension Throughout Extension

Almost every part of public-facing Extension already considers some aspects of human health; therefore, D&I science can support almost all aspects of Extension. Returning to the idea of social drivers of health, adequate housing and physical environment are two social issues that Extension covers through programs not explicitly under a health umbrella. For example, integrated pest management (IPM) considers not only the removal and prevention of pests from the home, but also the health considerations of each strategy, from standard cleaning to chemical-based treatments. Recent efforts to include IPM into new homeowner classes (University of Florida, n.d.) can serve as a model for integrating other health programming into such seemingly separate topics; studies of financial counseling to support cancer patients also provide interdisciplinary models. D&I science can also support such

integration by examining both organizational and individual readiness to implement a program and adding to the evidence base via an effectiveness study of the innovation (IPM in homeowner classes or financial counseling for cancer patients) itself.

State specialists and faculty need to be aware of what county, region, and state agents tasked with working directly with public audiences are doing in order to help make their research work relevant to those audiences and to understand where their fundamental research may be falling short in addressing needs of those stakeholders. For example, if a new pesticide efficiently kills insects but requires additional equipment to protect applicators from loss of work due to inhalation, that safety need must factor into the Extension translational work if not also translational research on comparative effectiveness (Sampson et al., 2016). As work becomes increasingly interdisciplinary, it is more likely researchers and research groups will take such health perspectives into account, through efforts such as the CDC/NIOSH (National Institute for Occupational Safety and Health, 2025) agricultural safety and health centers. More deliberate explication of the role of human health in all of Extension will reinforce these interdisciplinary efforts, which often take more time to accomplish, especially as seasoned researchers adapt long-standing workflows.

To be sure, those of us involved in efforts to implement health extension itself would benefit by taking lessons from D&I science. In some cases, we can use D&I science to help make sure our Extension personnel are well-prepared to implement health extension programs as vital stakeholders in the work (e.g., Jamison et al., in press). For example, a recent study of the acceptability of financial counseling for cancer patients involved a much more rigorously designed and expansive study than a typical Extension evaluation of program participants. The researchers investigated the experiences of not only the Extension personnel before and after the program implementation, but also of the medical providers, medical staff who referred patients to Extension services, and the patients themselves. The study involved mixed methods in the patients' case to determine quantitative changes in their social situation as well as acceptability of the format, asking questions related to the virtual facilitation mode and group versus individual administration of the Extension

service. The study incorporated a control group who got the typical standard of care, a pamphlet describing some tips that were the focus of the program content facilitated by Extension personnel, who instead were able to tailor their guidance to the needs of the particular patients. The study also explored multiple Extension and medical providers' experiences before implementation of the pilot, and Extension providers' thoughts after the pilot implementation. The study investigated more than just the typical individuals or innovation recipients involved based on the D&I CFIR constructs. The expansive study of several facets of the implementation process, including the inner setting, implementation process, and outer setting, surfaced more areas for improvement, including preparation for the Extension personnel, better communication support needed for Extension and the medical personnel, and infrastructure needs that actually worked against equity for participants, than might have been surfaced in a study of only the quantitative impact on participants' social situation (Stofer et al., 2026). Despite the challenges they and their participants faced, including the complexity of implementing the program, and despite modest changes in the participants' social condition, the Extension personnel still found value in the program for themselves and the participants. Focusing on only one element of the implementation might have otherwise argued for discontinuing the program entirely. In contrast, a typical current Extension approach, ending with T2 or T3 or not incorporating research on the program implementation at all, might have rolled out the program in one format (i.e., group or individual), in one county or with one health care provider, with a simple program evaluation for participant (patient) satisfaction rather than the comparison to a control group and investigation of the program presenters' experiences as well as patient satisfaction. For other examples, see Balis et al. (2019), Eschbach et al. (2024), and Weybright et al. (2025).

We need to examine the reluctance of our own Extension personnel to more explicitly advance health care programming and partnerships and work with those reluctant personnel to gain buy-in for their involvement to serve our stakeholders (Ramanadhan et al., 2018). Indeed, efforts in several states are under way to determine stakeholder needs and barriers around both implementation of programs on specific topics such

as adult immunization as well as broader ideas of health education. Coupled with the emerging examples of such work, especially around implementation evaluation provided in this article, this internal stakeholder needs assessment work supports the case for even broader use of D&I science in health extension activities.

Conclusion

Although Extension enjoys great trust among many traditional rural communities, for other marginalized communities, trust has been broken via “historic, and in some cases, ongoing experiences of exclusion and harm” (Burton et al., 2021, p. 21). Explicit attention to our community development frameworks (McDowell, 1978), coupled with D&I science’s rigorous design and evaluation via stakeholder engagement and community participatory research (Johnson et al., 2009), can pave the way for rebuilding those relationships, specifically to advance the goal of reaching health equity. After all, our mandate from USDA via the Smith–Lever Act requires us to serve the public, full stop, broad as that population may be. All of us Extension personnel, therefore, from pesticide certifiers to cattlemen to geneticists, have a role to play in health extension, even as fundamental as directing our clients to other health-related Extension programs.

Cooperative Extension and public health researchers share common goals of providing up-to-date education and programming to improve community members’ health. D&I science, an outgrowth of translational research, formalizes the process of rigorously preparing, implementing, and evaluating rollout of evidence-based programs. The health extension framework compels Cooperative Extension to center equity and communities as a charge while continuing support for such health education work. Yet, neither alone has made significant progress toward health equity, nor is it likely that they can alone, given their respective areas of patient care and patient education. Both of these foci are necessary but not sufficient

on their own to truly advance health equity, especially within the current systems of health care and health education in the United States.

By considering areas of overlap between D&I science and Cooperative Extension’s principles and goals, researchers and Cooperative Extension facilitators can maximize uptake and reach of health education and impact on public health. Coreferring could be one strategy. That is, collaborations between the two groups should work on creating and studying interventions wherein either (1) health care providers prescribe lifestyle courses that might be offered by Cooperative Extension, such as nutrition or exercise workshops, or conversely, (2) Cooperative Extension provides up-to-date guidelines and recommendations during any number of their courses that encourage participants to seek out and discuss their preventive care needs with health care providers. Indeed, in recent years even some federal government agencies began to financially support addressing social drivers of health, not just health care interventions (Whitman et al., 2022). Such iterative research and improved applied programming will bolster the work of both D&I scientists and health care practitioners and also health educators and behavioral researchers in Cooperative Extension.

Health extension necessitates that we recognize the connections of our work to health of our communities and country. Ultimately, through systematic integration and spread of health extension with the support of D&I scientific methods, such as through USDA NIFA funding support; statewide, regional, and national efforts to collaborate, such as through the Extension Foundation’s Collective for Health and Well-Being; and Extension leadership support from organizations such as the Extension Committee on Organization and Policy, we can collectively speed the spread of innovations, maximize uptake and success of implementation, learn from that, rinse, and repeat. Such efforts will build infrastructure for the long term to address systemic inequities and build a culture that values health for all.



About the Authors

Kathryn A. Stofer, PhD, is research associate professor of STEM education and outreach at the University of Florida. Her research and Extension work focus on public and community engagement to help academic research get used by community members, and bringing together communities and researchers to codesign solutions for sticky social problems. She earned her PhD in science education with an emphasis on free-choice learning from Oregon State University.

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