27

Designing for Dissemination and Sustainability

Principles, Methods, and Frameworks for Ensuring Fit to Context

BETHANY M. KWAN, DOUGLAS A. LUKE, PRAJAKTA ADSUL, HARRIET KOORTS, ELAINE H. MORRATO, AND RUSSELL E. GLASGOW

INTRODUCTION

Over the last 20 years, the field of dissemination and implementation (D&I) science has emerged as part of a collective commitment to accelerate and improve translation of evidence into practice.[1] Barriers to dissemination, sustainability, and health impacts of translating evidence to practice in health and healthcare range from poor fit between evidence-based innovations and the context in which such innovations are meant to be used to cultures and systems that fail to incentivize and support active dissemination and translation of evidence into practice.[2–4] Within D&I science, the concepts of *designing for dissemination*—and more recently, *designing for sustainability*—refer to principles and methods for addressing the need for innovation "fit to context" as well as early and active dissemination and sustainability planning. Designing for dissemination and sustainability (D4DS) approaches may enhance the equitable and sustainable impact of evidence-based innovations on health and well-being of populations. D4DS is recognized as a key competency for D&I researchers.[5]

Traditionally, research paradigms used to develop and test innovations for translation into practice have been grounded in a sequential pipeline approach. This approach does not adequately incorporate early planning activities and stakeholder engagement necessary for innovation adoption, integration, and sustainment in real-world settings or the systems and structures that can help or hinder the process. The extent to which academics engage in research designed to translate to practice is linked to factors embedded in the academic system structure, such as current performance models and funding and publishing criteria.[6] Greater focus on advancing the science of ensuring fit to context is warranted to ensure health innovations will achieve broad and equitable adoption, sustainability, and impact on health.[7]

In this chapter, we define and describe the rationale for adopting a D4DS approach to research and describe products, principles, systems, and methods useful for D4DS. We introduce the fit-to-context framework (F2C) for designing for dissemination and sustainability, a process framework encompassing four stages for a long-term research endeavor. We provide case examples of research endeavors representative of D4DS principles and impact. In addition, we discuss approaches to D4DS with a health equity focus, both in the processes undertaken when employing such an approach and as an expected outcome of the processes undertaken. We anticipate that designing with consideration of research structures and distribution systems will enhance adoption and sustainment as well as mitigate inequities in access to health innovations.

RATIONALE FOR A D4DS APPROACH

There is a well-documented chasm between how researchers disseminate their findings and how

communities, practitioners, and policymakers learn about and use the latest evidence.[8] Passive diffusion of evidence-based interventions is ineffective, resulting in only small changes in the uptake of new practices.[9,10] According to the *push-pull* capacity model,[11] successful dissemination requires a basis in science and technology (the push), a demand from organizations or the populations being served (the pull), and the delivery ability of community, public health and healthcare systems (capacity). Dissemination strategies have often focused too much on the push side of this model, while lacking creative approaches and resources to address pull and capacity. The push-pull disconnect between researchers and practitioners was illustrated in a 2002 *Designing for Dissemination* workshop sponsored by the US National Cancer Institute.[12] A key workshop insight was the endorsement of the importance of active dissemination of the evidence—but neither researchers nor practitioners assumed the responsibility for dissemination activities. When leadership and ownership for dissemination are absent or when capacity is lacking, dissemination often sinks to a low priority in already overstressed systems.[13,14]

C27P5   A D4DS perspective situates the responsibility for active dissemination within the research enterprise (i.e., researchers and research partners, research institutions, funders, scientific publishing, and communication platforms), with appropriate supportive systems, processes, and policies. Guidance on frameworks and necessary systems and processes have previously been proposed, such as Nutbeam's 1996 ideas on how to enhance dissemination beyond traditional journal article publications, incentives to reward researchers for translational research, and expanded practitioner training.[15] In 2006, Bauman and colleagues[16] proposed a six-step dissemination framework, which highlights the need to (1) describe the innovation; (2) identify the target audience, the sequence, timing, and format for dissemination; (3) define the communication channels; (4) determine the role of key policymakers and partnerships; (5) identify the barriers and facilitators for dissemination; and (6) evaluate the dissemination process. More recently, the PRACTIS (PRACTical planning for Implementation and Scale-up) guide assists researchers, practitioners, and policymakers to characterize the intended implementation context and identify potential adopters and decision makers within

the system(s) that influence, and are influenced by, innovation and implementation processes.[17]

C27P6   While there has been progress in advancing the D4DS perspective, there remain substantial gaps in researcher self-reported adoption of foundational D4DS activities, such as stakeholder engagement and planning for active dissemination. A 2012 study of US public health researchers showed only half of respondents (53%) had personnel dedicated to dissemination to nonresearch audiences.[13] Only 17% used a model to plan their dissemination activities, and 34% always or usually involved stakeholders in the research process. A similar 2018 survey of US and Canadian researchers found some improvement in stakeholder engagement in D4DS processes relative to the 2012 report, yet also identified a continuing misalignment between which dissemination methods impact a researcher's career and the methods that impact practice and policy.[18] Note the term *stakeholder* is increasingly seen as a remnant of colonialism; henceforth, we use terms such as "partner," "adopter," "decision maker," or other precise descriptors of those with a vested interest in a research initiative unless directly referencing another source.

C27P7   While theories, methods, and outcomes of evidence-based adoption and implementation have been widely studied,[19,20] less attention has been paid to factors related to successful sustainability of programs and practices postimplementation.[21] Programs and practices need to be sustained over time to achieve their desired health impacts and associated outcomes.[22] Sustainable impact may also require that innovations become embedded in systems for population-level health improvement.[23] Many evidence-based programs and policies are not sustained after initial implementation, wasting large amounts of financial, organizational, and social capital.[24] For instance, a minority of efficacious health behavior innovations become embedded in systems at scale.[23] More recently, new work has made the case for more systematic study of sustainability, including conceptual development,[25] methods development,[26–28] and applications to a wide variety of health disciplines, including public health, mental health, and healthcare delivery systems.[29,30] Thus, planning for dissemination and sustainability needs to be more highly prioritized in the conduct of clinical and translational research and ideally earlier in the development and evidence-generation process.

C27S3

ESSENTIAL COMPONENTS OF A D4DS APPROACH

C27P8

When using D4DS in health research, there are three essential components: the research product itself, the dissemination plan needed to promote initial adoption and use, and the sustainability plan supporting sustained program delivery or innovation use over time.

C27S4

Component 1: Designing a Research Product With the End in Mind

C27P9

The **research product** is the health innovation to be disseminated. It can be an intervention, program, treatment, device, service model, policy, guideline, or implementation strategy resulting from clinical and translational research. To illustrate, Table 27.1 provides examples of research products found in a case example of designing for diabetes care.

C27P10

A central principle in D4DS is *beginning with the end in mind*, meaning to plan for active dissemination and sustainability at the outset of a research effort.[31] That is, in adopting a D4DS perspective, scientists should start by considering who will ultimately benefit from uptake and use of the research product—and who may not and if expected benefits are likely to be equitable. Consider who will need to change practice or policy, who will need to invest resources, and who will need to develop new skills or apply skills in new ways. A second D4DS principle—*ensuring product-context fit*—refers to when the products of research are developed in ways that match the needs, resources, workflows, and contextual characteristics of the target audience and setting.[1] That is, D4DS means ensuring research products fit the context of intended use, at both the outset and over time. Note, we consider similar terms—such as "problem-solution fit" and "innovation-context fit"—part of the broad product-context fit concept.

C27T1

TABLE 27.1 RESEARCH PRODUCT TYPES, DEFINITIONS, AND DESIGNING FOR DIABETES CARE CASE EXAMPLE

Research Product Type	Product Type Definition	Case Example: Designing for Diabetes Care[117–119]
Evidence	The generalizable knowledge resulting from the conduct of research and evaluation	People with diabetes benefit from diabetes self-management education and support (DSMS/E).
Programs, interventions, and services	Health promotion and/or disease prevention or educational programs, interventions, initiatives, treatments, or services	Diabetes shared medical appointments (SMAs) are an effective, efficient DSMS/E service model.
Technology and equipment	Devices, software, hardware, web-based, and other tools and equipment for disease prevention or management, research, evaluation, or educational purposes	Telehealth platforms can be used to deliver DSMS/E via diabetes SMAs virtually.
Dissemination and implementation strategies	Methods, approaches, guides, or materials for dissemination, implementation, and sustainment of effective, equitable, and efficient public health and healthcare practices in real-world settings	The Enhanced Replicating Effective Programs framework with external practice facilitation can be used to guide implementation of diabetes SMAs.
Policy, recommendations, and guidelines	Local and/or national public health and healthcare guidelines, practice or implementation standards, and policies emerging from the evidence base	Diabetes care guidelines recommend DSMS/E in primary care settings and inform practice priorities.
Methods	Research and evaluation techniques, instruments, tools, models, measures, and/or equipment	Validated measures of diabetes distress and self-care can be used to assess patient-centered outcomes for DSMS/E.

C27P11   Poor innovation-context fit can arise very early in the research process, such that the research evidence prioritized by investigators or funders may or may not align with community needs or perspectives and the evidence required by the target audience to promote adoption.[6] The innovation-context fit is relevant when considering the wider multisector systems in which organizations are situated (e.g., health, transport, and education systems). An innovation designed for fit to organizational context will align with organizational goals and capacity for change, thus enhancing receptiveness of the organization to investing in adoption of the innovation. For example, the innovation-system fit relates to system readiness for change,[32] such that a system's capacity for change is an integral component for successful scale-up of health innovations.[33] System readiness and capacity for change are concepts that could be addressed during early planning and phases for scale-up, which may be achievable by adopting a systems perspective on scaling innovations for sustainable implementation.[34] More on scale-up of effective interventions is found in chapter 29.

C27P12   Organizational support for innovations is essential for innovation uptake. Such support can be challenging to achieve even in contexts where the setting goals and innovation outcomes are highly congruent[35]; however, in contexts where goals and outcomes do not align, organizational systems and structures can have an increasingly dominant role in determining the innovation-context fit.[36]

C27S5   Component 2: A Systems Approach to Planning for Active Dissemination

C27P13   A third principle in D4DS is *planning for active dissemination*. Active dissemination refers to "an active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies."[37(p22)] A dissemination plan includes messaging about the relative advantages of the innovation for a specific target audience; how that message is packaged given communication preferences of the audience; and the communication channel by which that message is delivered to reach the intended audience. Consideration of the broader systems and structures in which a research product is meant to be used should inform product messaging, packaging, and communication

channels. Messaging the value of a product in ways that align with the needs and perspectives of decision makers within larger systems is critical to adoption.

C27P14   There are public health, delivery, education, and health policy systems and structures that are needed to support local and national policy change, workforce development, and change management. Planning for active dissemination requires understanding the characteristics of systems, organizations, and delivery settings in which research products are to be adopted and used, such as physical infrastructure or organizational culture.[13,38] Innovations intended for scale-up are often planned without an understanding of the prospective context and setting for use, the partnerships required, the role of potential adopters and decision makers in dissemination, or the scale-up resources needed.[17] Active dissemination should build and leverage existing system capacity and structures for marketing and distribution of research products (e.g., community dissemination pathways).[39] For instance, knowledge brokers acting between academic and practice settings and embedded researcher-practitioner partnerships and joint appointments between universities and government/nongovernment organizations can support an integrated process of D4DS.[40]

C27S6   Component 3: Planning for Sustainability

C27P15   A sustainability plan addresses the systems, resources, and value proposition that will support continued use of the research product in the real world. Particularly important for sustainability planning is engagement of those who make decisions at both local or organizational levels ("small p policy") and national or international levels ("big P policy") about how and by whom public health and healthcare should be delivered and financed.[41] Designing research products such that they address a policy need that can be effectively communicated to policy- and system-level decision maker audiences helps to ensure long-term and sustained impacts of innovation.[42]

CASE EXAMPLE   C27S7

C27P16   The Hunter New England Population Health (HNEPH) research-practice partnership is a government-funded population health unit in partnership with the School of Medicine and Public Health at the University of Newcastle,

Australia.[40] University researchers are embedded within the HNEPH unit, collocated to work alongside service delivery staff. A single-integrated governance structure oversees both service delivery and research initiatives, with senior researchers holding service delivery roles and health service managers leading research initiatives. This integrated research-practice partnership has optimized the coproduction of research so that it aligns with policy needs and enhanced active dissemination of research evidence as outputs are readily available for end users and decision makers, and it has streamlined the use of resources to achieve scientific and service delivery objectives.

C27S8
FRAMEWORKS AND MODELS FOR D4DS

C27P17
Process, evaluation, and determinants frameworks provide structure to the D4DS process and include a variety of approaches from D&I science. Several specific frameworks have been demonstrated as useful for D4DS. For instance, the IDEAS (Integrate, DEsign, Assess, and Share) Framework describes a step-by-step process for design of digital health interventions based in design thinking, behavioral theory, user-centered design, and dissemination approaches.[43] The research lifecycle framework from the US Department of Veterans Affairs Office of Research and Development Research-to-Real-World Workgroup explicitly incorporates scale-up, spread, and sustain phases of research, depicting the need for a research business plan, common impact metrics, and a sustainability plan as critical steps in translation of research innovations into routine practice.[44] Among other D&I frameworks with implementation or planning phases ideal for D4DS are the exploration, preparation, implementation, and sustainment (EPIS) framework,[45] the integrated Promoting Action on Research Implementation in Health Services (i-PARIHS) framework,[46] and the World Health Organization ExpandNet framework for scaling up.[47]

C27P18
The D&I context and determinants frameworks such as diffusion of innovation theory[48] and the PRISM (practical, robust implementation and sustainability model) expansion of Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM)[49] can also guide consideration of multilevel factors known to influence dissemination, impact,

and sustainability during the design process, informing product features that address barriers and facilitators.[50] To enable effective planning for D4DS, Klesges and colleagues illustrated the usefulness of the RE-AIM framework for designing studies with a higher likelihood of future dissemination.[51]

C27P19
Also, D&I science has contributed methodology and frameworks for planning for adaptation to ensure sustained fit to context.[52] For instance, the dynamic sustainability framework describes the need to expect and plan for pivots and iteration of the innovation and implementation process over time given anticipated dynamic context and changes in effectiveness on scale-up.[25] Although still an emerging area, guiding adaptations in a way that maintains the core functions or principles of a program, but adapts the form or specifics of how the program is delivered in ways that fit local context are promising directions.[53,54]

C27S9
THE FIT-TO-CONTEXT FRAMEWORK: A NEW ITERATIVE APPROACH TO DESIGNING FOR DISSEMINATION AND SUSTAINABILITY

C27P20
While the frameworks and models noted above are all relevant to D4DS, there is no single model that explicitly considers design of a research product and dissemination and sustainability plans from the perspective of ensuring fit to context. Fit to context—the fundamental concept in D4DS—serves as the basis of the process framework we present here (Figure 27.1). This F2C framework for D4DS was informed by and expands on previous work to define processes, products, and system changes needed to support D4DS efforts, push-pull-capacity concepts, and logic models in D&I.[13,55] The framework is represented as an iterative logic model depicting four phases in D4DS in ways that enhance the likelihood of research product adoption, sustainment, and ultimately more equitable impact on health. The conceptualization of D4DS as ensuring *fit to context* recognizes that the products being designed are culturally appropriate, feasible for use in resource-limited settings, align with the strengths and assets of the intended audience and setting, and impact outcomes that matter to communities and partners.[56,57]

C27F1
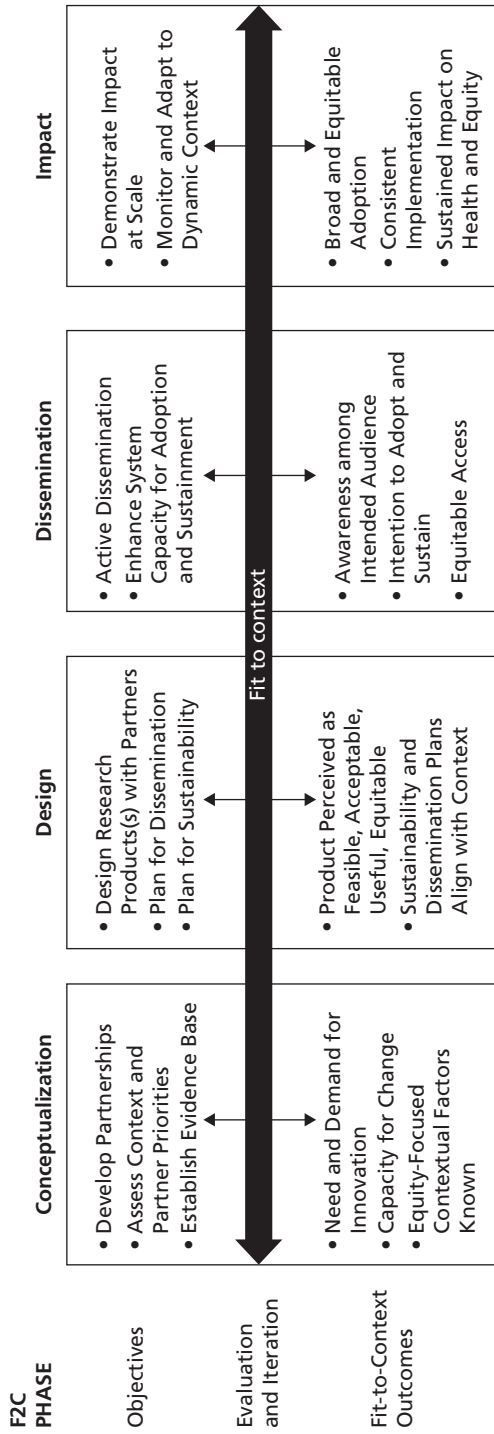
FIGURE 27.1 The fit-to-context (F2C) framework for designing for dissemination and sustainability.

3D50B.2C1 Template has been standardized as on 31-04-2015

C27P21   The research product is informed by an initial conceptualization phase and product design phase. The *conceptualization phase* determines the need and demand for a solution to a health problem (the "pull") and draws on an evidence base of effective strategies for addressing the health problem. To effectively disseminate the evidence in response to the demand, a D4DS approach then considers a *product design phase* (determining the "research product" to be disseminated, how the product will be packaged and delivered, and how it would be sustained in real-world settings). The design phase of D4DS involves an active process of developing a research product and planning for its dissemination, scale-up, and sustainment as well as evaluating and iteratively improving design phase outcomes relevant to ensuring fit to context.

C27P22   Research product design and the resulting dissemination plan is followed by an active *dissemination phase* (making use of systems and infrastructure [the "capacity"] to distribute the product package with broad reach to intended audiences [the "push"]). The final *impact phase* considers research product adoption, sustainment, and ultimate impact on health and health equity at the population level.

C27P23   Evaluation occurs at every D4DS phase and is ideally iterative and ongoing to ensure continued fit to context and equitable reach, adoption, sustainment, and health impact over time. Various research and design methods, study designs, and outcome assessments are relevant across phases. Conceptualization and design phases are generally consistent with developmental/exploratory phases of research, including pilot and feasibility testing of health innovations. Dissemination and impact phases are consistent with full-scale randomized controlled trials, pragmatic and hybrid implementation-effectiveness trials, demonstration projects, quality improvement, and health system embedded research. Other D&I frameworks—especially those for informing approaches to community and partner engagement, assessment of contextual factors, and situation-specific determinants of dissemination and sustainability and measuring design phase outcomes and impact—are seen as complementary and are integrated into the F2C framework phases.

Fit-to-Context Decision Points Across the D4DS Phases   **C27S10**

C27P24   Each F2C framework phase includes an assessment of the extent to which phase-specific questions about fit to context have been answered before moving to the next D4DS phase versus continued iteration within the current phase (Table 27.2, "key question and phase outcome").

- In the conceptualization phase, the goal   **C27P25** is to develop partnerships and assess the context in which a research product would be used and determine key partners' level of satisfaction with the current state, the demand for change, and a relevant evidence base. A context analysis can include identifying the characteristics of the recipients, the delivery setting, and implementation and sustainability infrastructure,[49] which can inform the design, dissemination, and impact phases. On demonstrating need, demand, and capacity for change (e.g., partners agree that a new approach is needed in a particular context), the next phase is to design a research product that addresses that demand and fits the expected context for use.

- During the product design phase,   **C27P26** the objective is to co-design research product(s) and dissemination and sustainability plans with partners. Assessment of F2C design phase outcomes involves evaluation of perceived acceptability, appropriateness, and feasibility[58]; implementability[59]; costs, resources, and sustainability at the setting level[60]; and usability, usefulness, and user satisfaction at the user level.[61] Other design phase outcomes may include needed adaptations to fit changes in context over time or when translating a product for use in a new setting.[25] Evaluation and research methods of design phase outcomes range from user testing (e.g., system usability, user satisfaction, and engagement)[62] to pilot/feasibility studies and other research designs appropriate for testing D&I strategies[63] and can use quantitative and/or qualitative methods. Ideally, design phase outcomes are assessed rapidly and

C27T2

TABLE 27.2 THE FIT-TO-CONTEXT (F2C) FRAMEWORK FOR DESIGNING FOR DISSEMINATION AND SUSTAINABILITY

F2C Phase Questions and Outcomes	F2C Phase Objectives	F2C Phase Exemplar Methods	F2C Phase Research Approach
Key questions to be answered and **outcomes** *to be assessed at each F2C phase*	*Actions to be taken by the research team and partners at each F2C phase*	*Research methods particularly relevant to co-design research products and evaluate and iterate "fit-to-context" outcomes at each F2C phase*	*Research approaches particularly relevant at each F2C phase*
F2C Conceptualization Phase			
Based on evidence and partner input, to what extent is there a **need, demand, and capacity** *for a new approach, product, or change in practice or policy in the context for intended use? To what extent are* **contextual factors** *relevant to* **equitable impact known?**	Develop partnerships to address a priority health problem with an established evidence base. Assess the context (the characteristics of the recipients, the delivery setting, systems of communication and influence, and implementation and sustainability infrastructure) for which an innovative and equity-focused research product will be used.	• Literature review • Community-based participatory research • Partner and community engagement • Customer discovery • Situation/SWOT analysis • Process evaluation • Context analysis • Determinants analysis • Systems mapping and modeling • Social network analysis • Market research • Logic models • Needs assessment	• Partnership development • Partner engagement in research conceptualization and planning • Formative research • Baseline evaluation • Developmental/exploratory research
F2CF Design Phase			
To what extent is the new approach, device, or change in practice or policy **perceived as feasible, acceptable, useful, effective, and equitable** *by the intended audience in the intended setting? How well do* **plans for active dissemination and sustainability align with context?**	Co-design research products(s) with partners that meet the needs, demand, and capacity for change established in the conceptualization phase. Create plans for active dissemination that align with the messaging, packaging, and distribution channels best suited for the intended audience and setting.	• Human & user-centered design/user testing • Participatory methods and co-design • Value proposition design • Market viability analysis • Business model generation • Intervention/implementation mapping • Optimization methods	• Developmental/exploratory research • Pilot/feasibility studies • "Proof-of-concept" studies • Small-scale pragmatic trials

3D50B.2C1 Template has been standardized as on 31-04-2015

F2C Dissemination Phase

Question	Activities	Methods	Methods
How well does the active, planned **dissemination strategy** *work to create* **awareness** *and* **intention to adopt and sustain** *the product? To what extent does the system capacity for adoption and sustainment create* **equitable access?**	Determine a viable strategy for sustainability of the research product(s) in real-world contexts for intended use.	• Adaptation methods • Logic models • Rapid prototyping • Graphic design and other art forms	
	Enact design phase plans for active dissemination of the research product(s) to intended audiences using appropriate distribution channels and leveraging known systems of communication and influence. Build and leverage system capacity for broad and equitable adoption and sustainment in the intended context.	• Dissemination trial designs • Hybrid implementation/ effectiveness trials • Adaptation frameworks and methods • Logic models	• Larger scale, pragmatic trials • Demonstration projects • Quality improvement • Program evaluation • Learning Health Systems research

F2C Impact Phase

Question	Activities	Methods	Methods
To what extent does the product demonstrate **equitable impact on health** *and* **continued fit to context** *over time in real-world contexts?*	Demonstrate equitable impact of research product(s) and active dissemination and sustainability plans at scale. Monitor and adapt research product(s), dissemination, and sustainment plans to ensure fit to dynamic context in real-world settings and populations.	• Pragmatic trial designs • Real-world evidence/observational methods • Economic and cost analysis • Hybrid implementation/ effectiveness trials • Policy analysis • Fidelity and adaptation methods • De-implementation methods	• Larger scale, pragmatic trials • Demonstration projects • Quality improvement • Public health surveillance • Program evaluation • Learning Health Systems research

iteratively based on successive prototypes or minimum viable products before moving on to distribution and large-scale testing.

C27P27
• In the dissemination phase, the resulting research product is packaged and made available to users through a variety of platforms with messaging tailored to audience needs and perspectives. It may also include building and leveraging system capacity for broad and equitable adoption of the product. F2C outcomes in the dissemination phase include successfully reaching the intended audience by creating product awareness, enhancing intention to adopt and sustain use of the product in the intended context, and ensuring equitable access to products and services.

C27P28
Notably, the way a research product is messaged, packaged, and distributed to intended audiences is an aspect of the D4DS approach parallel to, but distinct from, the design of the research product itself. *This step is the most overlooked component of D4DS.*[18] Messages, packaging, and distribution plans should be aligned with how that audience best receives information and should leverage existing and familiar distribution channels, platforms, and systems of communication and influence.[64] While dissemination to academic audiences, through conference presentations and journal articles, is necessary for academic researcher career advancement, dissemination to nonacademic audiences is necessary to achieve broad adoption.[65]

C27P29
• In the impact phase, research tests the extent to which a research product exerts a sustained impact on health and health equity—the ultimate goal for the effective design and dissemination of research products. The impact phase should consider dynamic context, monitoring outcomes, and the need for adaptation over time. The impact phase may also reveal the need for "de-implementation" of innovations that no longer fit the context due to new, superior innovations or changes in context.

C27P30
During any F2C phase (Table 27.2), it may become clear that the envisioned dissemination

product is not a fit to context or target audience needs—necessitating a pivot or possibly abandoning the idea altogether. This is a valuable outcome as it can prevent continuing to invest resources in a product unlikely to be broadly adopted.[66] Clinicians, healthcare organizations, public health officials, and communities can waste time and resources on adapting and adopting solutions that are ultimately not scalable or financially sustainable, thereby providing a negative-feedback loop and reducing motivation to engage in the implementation of future solutions.[67]

Methods for Designing for Fit to Context Across D4DS Phases   C27S11

C27P31
A variety of methods are particularly relevant to each F2C framework D4DS phase, including participatory and co-design methods; context and situation analysis; systems science methods; business and marketing approaches; and methods from the fields of communication and the arts. This is not an exhaustive list, and many more methods from D&I and other disciplines may be appropriate for fulfilling D4DS principles. Several of these topics are covered in detail in chapters 10, 13, and 28.

Participatory and Co-design Methods   C27S12

C27P32
Guided by participatory perspectives on D&I,[68] D4DS encourages partnerships among transdisciplinary researchers, practitioners involved in the delivery of an intervention and impacted by the research, and, critically, the individuals and communities impacted by the research. That is, design is done in partnership with the intended audience—a participatory, co-design approach. Many types of partners can be involved at appropriate stages in the design process, from multiple systems, cultures, and socioecological levels, including members of the public, practitioners, policymakers, and payers, in both the health sector and beyond.[69] Community and partner engagement is important in all D4DS phases and is especially valuable during the conceptualization phase, orienting all future research activities to the needs, priorities, assets, and strengths of communities from the outset. Resources are available for selecting engagement methods most appropriate for project, organizational, and implementation team resources and constraints.[70]

C27P33
Participatory co-design methods include techniques such as brokered or deliberative

dialogue,[71] co-design/co-production such as experience-based co-design and behavioral design teams,[72] group model building and concept mapping,[73] consensus approaches such as nominal group technique or Delphi processes,[74] and the double-diamond design approach.[75] Co-design processes benefit from leveraging multisectoral partnerships among academic, industry, health system and community groups.[76] Considering and designing for the consumer perspective—which may include direct marketing to consumers—is an important form of collaborative program development.[77]

Context and Situation Analysis

A critical aspect of D4DS is gaining an indepth understanding of the context in which a product is intended to be used and sustained. By context we include multilevel influences and factors such as culture, history, relationships, resources, and other factors as well as geographical setting. Methods for assessing context inform tailoring products that fit context[78,79] and adapting to changing context over time.[25,57] Context and situation analysis methods yield insights into the unmet needs and perspectives of the intended audience; the existing networks, systems, processes, and workflows into which the product will be integrated; and the resources available to support sustained use.[80]

Context and situation analysis methods include process mapping, network analysis, needs assessment, ethnography, and discourse analysis.[81,82] Customer discovery and value proposition design methods guide assessment of potential adopters and decision makers' context of intended use of an innovation; this process yields validated message framing about the value of a product on metrics most important for the target audience and in the context of competing alternatives.[83,84] Qualitative and mixed methods such as surveys, key informant interviews, and focus groups designed to assess audience needs, circumstances, and perspectives may be used during product design to understand contextual factors likely to influence dissemination, use, and sustainability.[85]

Systems Science Approaches

Dissemination and sustainability activities are embedded within complex social, health, cultural, organizational, and political systems.[86,87]

Systems science approaches such as systems thinking, systems mapping, computational modeling, system dynamics modeling, agent-based modeling, and human factors engineering have all been used in D4DS endeavors.[76,88] These are distinct but related approaches for addressing the interactive and complex adaptive systems issues in dissemination and sustainment. For instance, systems thinking based on complex adaptive systems with system dynamics mapping has been used to inform large-scale change related to guideline implementation in Canada[89] and health services outcomes in the US Veterans Administration system.[90] A review of system dynamics applications in injury prevention research concluded that building capacity for system dynamics can support partner engagement and policy analysis.[91] Others have demonstrated the usefulness of iterative engineering approaches to successful program D&I.[92]

Complexity and systems science approaches focus attention on three specific substantive issues: dynamics, heterogeneity, and interactivity. First, the organizations and communities who are adopting and implementing new evidence-based practices are *dynamic*, not static. Systems perspectives can help focus attention on these dynamics, including feedback loops, indirect effects, and unintended consequences, as well as the need for program adaptation over time.[25] Second and third, these complex systems are made up of *heterogeneous* actors (e.g., patients, healthcare providers, regulatory agencies, commercial businesses, etc.) who *interact* with one another. Systems tools such as social network analysis and system mapping reveal and explore these interactions and thus are useful for dissemination design.[93,94]

Business and Marketing Approaches

Best business practices embrace a multistage development process consistent with D4DS principles: (1) problem-solution fit; (2) product-market fit; and (3) business model fit.[95] In the first stage, the developer gathers evidence demonstrating that the innovation is designed to solve an important job to be done, problem, or goal from the adopter's point of view better than competing alternatives will generate sufficient value to promote adoption. In the second stage, the developer validates that the innovation does indeed provide that value and that there is a market of potential adopters. In

the last stage, the developer ensures the value proposition is embedded in a financially sustainable and scalable business model.

Communication and the Arts

C27S16

C27P39 Methods from the fields of communication, media production, advertising, journalism, and graphic design are useful for design of messaging, packaging, and distribution plans.[96,97] Packaging dissemination products can take multiple forms, such as web-based "knowledge translation platforms,"[98] evidence search and synthesis tools,[99] and professional learning and training platforms.[100] The web and social media are valuable channels for research dissemination and health communication with the public and clinical and public health professional audiences.[101,102] There are opportunities to explore "arts-based knowledge translation"[103]— the process of using "diverse art genres (visual arts, performing arts, creative writing, multimedia including video and photography) to communicate research"[104]—for dissemination to health care and public health audiences. Use of visual graphics can support communication with and translation of complex science concepts to target audiences.[105] Presenting data in engaging, easily understood ways is a hallmark of effective evidence communication to many audiences. End-user preferences for how evidence should be packaged and delivered need to be considered, as preferences can vary by audience.[106]

Packaging Dissemination Products Case Example

C27S17

C27P40 The MOVE! Weight-Management Program for Veterans in the US Veterans Health Administration (VHA) was designed to translate best practice guidance and evidence on weight loss into practice.[107] The program was packaged in the form of a toolkit consisting of patient handouts, promotional brochures, clinical references, and administrative manuals (https://www.move.va.gov/ReferenceTools.asp); marketing materials (e.g., posters, banners, pens); and online discipline-specific training modules about weight management with continuing education credit. All VHA networks and medical centers received the packaged intervention. Established VHA policy and clinical practice guidelines now require weight management programs, with MOVE! recommended.

A Focus on Health Equity Across D4DS Phases

C27S18

C27P41 We posit the F2C framework can be useful in designing for equitable reach and impact on health. To do so, the F2C conceptualization phase begins with considerations for individuals and communities with differential access to health interventions based on social, structural, and political determinants of health (i.e., education, economic stability, slavery, racism, health policies, unsafe neighborhoods, among others).[108] During the F2C design phase, researchers should ensure representation from communities for whom inequities may arise without consideration of social, structural, and political determinants. In addition, use of science communication approaches sensitized to cultures and to diversity, equity, and inclusion principles[109] enhances the likelihood that research products will reach historically and systematically marginalized communities.[110]

C27P42 Critically, we advocate for engagement of population subgroups that have and continue to experience discrimination, trauma, and injustices and settings that perpetuate racism and discrimination. Designing from a F2C perspective builds on priorities for the partners and operates with the purpose of translating research findings into policy, practice, and system changes toward improving health, with an explicit goal of enhancing progress toward health equity.[111] A newer understanding on how to promote social justice within design thinking has been gaining recent traction and includes an explicit focus on the "ways that design reproduces and/or challenges the matrix of domination (e.g., white supremacy, heteropatriarchy, capitalism, ableism, settler colonialism, and other forms of structural inequality)."[112] For example, a "design justice" perspective centers co-design within the voices of the community, incorporates what is already working in the community, and facilitates change as a collaborative process.[112]

SUMMARY

C27S19

C27P43 Most health innovations are neither translated into practice nor sustained due to poor product-context fit as well as lack of emphasis on active dissemination and insufficient systems and infrastructure to support scale-up and sustainability. An F2C perspective using a D4DS approach places the responsibility for active dissemination in the scope of work for

TABLE 27.3 SUMMARY OF RECOMMENDED PRINCIPLES, METHODS, AND SYSTEMS FOR FIT TO CONTEXT AND DESIGNING FOR DISSEMINATION AND SUSTAINABILITY

Recommendation	Explanation
Embrace the Principles of Designing for Dissemination and Sustainability (D4DS)	
Recommendation 1: Begin with dissemination, sustainment, and equitable impact in mind.	It is not enough to begin with anticipated health outcomes in mind—begin by asking, who will influence the decision to adopt and sustain an innovation? Who is expected to deliver, benefit from, and pay for services and products? How can we reach the intended audience? How can we ensure equitable impact?
Recommendation 2: Prioritize the needs and perspectives of potential adopters, recipients, and decision makers at every stage of the process.	Involve partners representing multiple perspectives and context levels, including potential adopters and decision makers, to ensure products will fit the context of intended use; keep partners involved throughout the process to improve quality of adaptations.
Recommendation 3: Appreciate the value of a rapid and iterative approach and the need for periodic adaptation.	Anticipate and plan for the need to adapt programs or strategies in response to changes in context over time.
Apply Methods for D4DS	
Recommendation 4. Incorporate team science and systems science principles and practices.	D4DS is a collaborative enterprise and produces products that will influence systems of prevention, care, and health. Team and systems science best practices can help ensure that teams work well together and that they produce better products.
Recommendation 5. Employ strategic communication techniques tailored to the intended audience(s).	Audience segmentation and tailored messaging help ensure messages and materials will align with audience members' values, priorities, and ways of receiving information.
Recommendation 6. Evaluate adoption, equity, and sustainment at scale.	Conduct rigorous evaluation of research product adoption, equity, and sustainment impacts using both randomized and nonrandomized designs.
Develop Systems and Structures to Incentivize D4DS	
Recommendation 7. Establish and promote research training programs that acculturate trainees to the D4DS perspective and teach D4DS skills.	Build capacity for use of D4DS methods through training in partnership development and community engagement, user-centered design, and dissemination and sustainability planning.
Recommendation 8. Provide resources to support programs and policies that inform D4DS and develop pragmatic evidence.	Provide support and funding for systems and infrastructure needed to embrace a D4DS approach.

ᵃAdapted with permission from Kwan et al.[113]

the research enterprise and related partners. We offer the F2C framework to D4DS as an iterative process that emphasizes the design phase of developing a research product and corresponding dissemination and sustainability plans. We list a range of methods for design, testing, and adaptation that can be used individually or in combination during each D4DS phase. To advance the science and practice of D4DS, we should reorient toward a mindset of beginning with the end in mind, requiring consideration of the needs of the intended

audience and setting for use of research products from the outset.

C27P44   To accelerate adoption of either our proposed F2C or another D4DS approach, we must have systems and organizational cultures and values that incentivize and facilitate partner engagement, active dissemination, and planning for sustainability.[13] We should equally consider and assess the systems and structures that *impact* and are *impacted by* dissemination efforts.[34] Table 27.3 summarizes key recommendations for embracing the principles of D4DS, skills needed to apply D4DS methods, and systems needed to incentivize a D4DS approach to research.[113] Ultimately, a D4DS approach advocates for transdisciplinary research paradigms (i.e., integrating various disciplines such as health communications, political science, economics, and public health, among others). Such research paradigms, in close engagement and collaborations with implementers and policymakers, have the potential to provide multisectoral solutions and products to achieving broad, sustainable health and health equity impact.[114,115]

ACKNOWLEDGMENT

C27S20   ### SUGGESTED READINGS AND RESOURCES

C27P47   Readings

C27P48   Koorts H, Eakin E, Estabrooks P, Timperio A, Salmon J, Bauman A. Implementation and scale up of population physical activity interventions for clinical and community settings: the PRACTIS guide. *Int J Behav Nutr Phys Activ.* 2018 Dec;15(1):1–1. https://doi.org/10.1186/s12966-018-0678-0

C27P49   *The PRACTIS guide addresses how to plan for implementation and scale-up during intervention development, testing, and ongoing adaptation. The guide is framed around the principle that prioritizing factors relevant to dissemination, implementation, and scale-up early within the research process will enable potential barriers to be addressed and their impact measured. The guide is aimed at researchers, practitioners, and policymakers, with varying levels of implementation experience and expertise, to navigate the complex considerations and decision-making processes involved in translating evidence-based interventions into practice.*

Kwan BM, Brownson RC, Glasgow RE, Morrato EH, Luke DA. Designing for dissemination and sustainability to promote equitable impacts on health. *Annu Rev Public Health.* 2022;43(1):331–353. https://doi.org/10.1146/annurev-publhealth-052220-112457 C27P50

C27P51   *This narrative review of the literature on designing for dissemination and sustainability served as the basis for this chapter. It provides an in-depth review of the history of designing for dissemination concepts and frameworks. An organizing schema, adapted in this chapter as the F2C framework, was used to guide presentation of designing for dissemination methods and case examples.*

Paina L, Peters DH. Understanding pathways for scaling up health services through the lens of complex adaptive systems. *Health Policy Plann.* 2012 Aug 1;27(5):365–373. https://doi.org/10.1093/heapol/czr054 C27P52

C27P53   *This resource describes how to understand and interpret changes in health systems through a complex adaptive system lens. The article provides examples of how the behaviors of complex adaptive systems influence implementation and scale-up and suggests ways we can use a systems lens in the future to improve implementation efforts.*

•Pauwels L, Mannay D. *The SAGE Handbook of Visual Research Methods.* Sage; 2019. C27P54

C27P55   *This text describes a visual research technique for public engagement and communication, ranging from visual media production, photovoice, visual ethnography, anthropological filmmaking, multimodal strategies, and making arguments with images.*[116]

C27P56   Selected Websites and Tools

C27P57   Agency for Healthcare Research and Quality. https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/patient-safety-resources/resources/advances-in-patient-safety/vol4/planningtool.pdf

C27P58   *The Agency for Healthcare Research and Quality supported development of the Dissemination Planning Tool: Exhibit A from Volume 4, as part of efforts in Advances in Patient Safety: From Research to Implementation. The tool guides users through the components of creating a dissemination plan for research findings and products.*

Henriksen K, Battles JB, Marks ES, Lewin DI, eds. Advances in patient safety: from research to implementation. Vol. 4, Programs, tools, and products. AHRQ Publication No. 05-0021-4. Rockville, MD: Agency for Healthcare Research and Quality; February 2005. C27P59

C27P60 Clinical Sustainability Assessment Tool and Program Sustainability Assessment Tool. https://sustaintool.org/

C27P61 *Washington University in St. Louis's Clinical Sustainability Assessment Tool and Program Sustainability Assessment Tool aid in assessment of the sustainability capacity of a program or clinical practice to inform sustainability planning.*

C27P62 Communication Handbooks for Clinical Trials. https://communications4clintrials.org/

C27P63 *The Microbicides Media and Communication Initiative, a multipartner collaboration then housed at the Global Campaign for Microbicides at PATH (now coordinated by AVAC), and by Family Health International (now FHI 360) produced the Communication Handbooks for Clinical Trials. The handbook provides guidance on preparing and budgeting for communications, developing a strategic communication plan, developing and using key messages, communicating science clearly, and working with the media.*

C27P64 D&I Design for Dissemination (D4D) tool. https://ictr.wisc.edu/dissemination-implementation-launchpad/di-design-for-dissemination/

C27P65 *The University of Wisconsin-Madison's Institute for Clinical and Translational Research D&I Design for Dissemination (D4D) tool incudes a D4D Introduction Flyer, a D4D Engaging Adopters Booklet, a precall planning sheet, and a letter of support template.*

C27P66 Stakeholder Engagement Navigator. DICEmethods.org

C27P67 *The University of Colorado's Data Science to Patient Value initiative and the Colorado Clinical and Translational Sciences Institute's Stakeholder Engagement Navigator is an educational and interactive web tool for clinical and translational scientists seeking education and strategies for stakeholder engagement in research planning, conduct, and dissemination.*

C27P68 Exchanging Knowledge: A Research Dissemination Toolkit. https://www.american.edu/provost/ogps/graduate-studies/upload/dissemination-toolkit.pdf

C27P69 *The University of Regina's Community Research Unit's "Exchanging Knowledge: A Research Dissemination Toolkit" provides guidance on dissemination planning for community-based research.*

C27P70 The Health Foundation. https://www.health.org.uk/publications/communicating-your-research-a-toolkit

C27P71 *The Health Foundation, a UK-based independent charity, produced the "Communicating Your Research—A Toolkit" to help increase influence and impact in health and healthcare.*

C27P72 IM-Adapt. https://www.imadapt.org/#/

C27P73 *The University of Texas Health Science Center at Houston's IM-Adapt is an online program based on intervention mapping designed to guide identification and adaptation of cancer control interventions that fit the needs of the population and setting.*

C27P74 TDR. Communications and Advocacy. http://adphealth.org/irtoolkit/communications-and-advocacy/

C27P75 *TDR is a program supported by UNICEF, UNDP, World Bank, and the WHO and created the TDR Implementation Research Toolkit. Part of the toolkit includes a section on communications and advocacy to guide policy advocacy and strategic communications to specific stakeholders and audiences.*

C27P76 Translational Sciences Benefits Model. Translating for Impact Toolkit. https://translationalscienceb enefits.wustl.edu/toolkit/

C27P77 *Washington University in St. Louis's Translational Sciences Benefits Model website includes a Translating for Impact Toolkit, useful for mapping stakeholder needs, benefits, products, and impacts and planning for dissemination.*

REFERENCES **C27S21**

1. Brownson RC, Colditz GA, Proctor EK. **C27P78** *Dissemination and Implementation Research in Health: Translating Science to Practice.* Oxford University Press; 2018.

2. Fraser I. Organizational research with impact: **C27P79** working backwards. *Worldviews Evid Based Nurs.* 2004;1:S52–S59.

3. Tabak RG, Stamatakis KA, Jacobs JA, Brownson **C27P80** RC. What predicts dissemination efforts among public health researchers in the United States? *Public Health Rep.* 2014;129(4):361–368.

4. Glasgow RE, Estabrooks PE. Pragmatic appli- **C27P81** cations of RE-AIM for health care initiatives in community and clinical settings. *Prev Chronic Dis.* 2018;15:170271. doi:https://doi.org/10.5888/pcd15.170271

5. Padek M, Colditz G, Dobbins M, et al. Developing **C27P82** educational competencies for dissemination and implementation research training programs: an exploratory analysis using card sorts. *Implement Sci.* 2015;10(1):1–9.

6. Koorts H, Naylor P-J, Laws R, Love P, Maple J-L, **C27P83** van Nassau F. What hinders and helps academics to conduct dissemination and implementation (D&I) research in the field of nutrition and physical activity? An international perspective. *Int J Behav Nutr Phy.* 2020;17(1):7.

7. Baumann AA, Cabassa LJ. Reframing implemen- **C27P84** tation science to address inequities in healthcare delivery. *BMC Health Serv Res.* 2020;20(1):1–9.

8. Brownson RC, Fielding JE, Green LW. Building **C27P85** capacity for evidence-based public health:

reconciling the pulls of practice and the push of research. *Annu Rev Public Health*. 2018;39:27–53.

C27P86 9. Bero LA, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ*. 1998;317(7156):465–468.

C27P87 10. Lehoux P, Denis J-L, Tailliez S, Hivon M. Dissemination of health technology assessments: identifying the visions guiding an evolving policy innovation in Canada. *J Health Polit Policy Law*. 2005;30(4):603–642.

C27P88 11. Farrelly MC, Chaloupka FJ, Berg CJ, et al. Taking stock of tobacco control program and policy science and impact in the United States. *J Addict Behav Ther*. 2017;1(2).

C27P89 12. National Cancer Institute. Designing for dissemination: conference summary report. In: National Cancer Institute 2002.

C27P90 13. Brownson RC, Jacobs JA, Tabak RG, Hoehner CM, Stamatakis KA. Designing for dissemination among public health researchers: findings from a national survey in the United States. *Am J Public Health*. 2013;103(9):1693–1699.

C27P91 14. Kerner J, Rimer B, Emmons K. Introduction to the special section on dissemination: dissemination research and research dissemination: how can we close the gap? *Health Psychol*. 2005;24(5):443.

C27P92 15. Nutbeam D. Achieving "best practice" in health promotion: improving the fit between research and practice. *Health Educ Res*. 1996;11(3):317–326.

C27P93 16. Bauman AE, Nelson DE, Pratt M, Matsudo V, Schoeppe S. Dissemination of physical activity evidence, programs, policies, and surveillance in the international public health arena. *Am J Prev Med*. 2006;31(4):57–65.

C27P94 17. Koorts H, Eakin E, Estabrooks P, Timperio A, Salmon J, Bauman A. Implementation and scale up of population physical activity interventions for clinical and community settings: the PRACTIS guide. *Int J Behav Nutr Phy*. 2018;15(1):51.

C27P95 18. Knoepke CE, Ingle MP, Matlock DD, Brownson RC, Glasgow RE. Dissemination and stakeholder engagement practices among dissemination & implementation scientists: results from an online survey. *PLoS One*. 2019;14(11):e0216971.

C27P96 19. Lobb R, Colditz GA. Implementation science and its application to population health. *Annu Rev Public Health*. 2013;34:235–251.

C27P97 20. Proctor E, Silmere H, Raghavan R, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm Policy Ment Health*. 2011;38(2):65–76.

C27P98 21. Stirman SW, Kimberly J, Cook N, Calloway A, Castro F, Charns M. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implement Sci*. 2012;7(1):1–19.

C27P99 22. Scheirer MA. Is sustainability possible? A review and commentary on empirical studies of program sustainability. *Am J Eval*. 2005;26(3):320–347.

C27P100 23. Reis RS, Salvo D, Ogilvie D, Lambert EV, Goenka S, Brownson RC. Scaling up physical activity interventions worldwide: stepping up to larger and smarter approaches to get people moving. *Lancet*. 2016;388(10051):1337–1348.

C27P101 24. Goodman RM, Steckler A. A model for the institutionalization of health promotion programs. *Fam Community Health*. 1989;11(4):63–78.

C27P102 25. Chambers DA, Glasgow RE, Stange KC. The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implement Sci*. 2013;8(1):1–11.

C27P103 26. Luke DA, Calhoun A, Robichaux CB, Elliott MB, Moreland-Russell S. The Program Sustainability Assessment Tool: a new instrument for public health programs. *Prev Chronic Dis*. 2014;11:130184. doi:http://dx.doi.org/10.5888/pcd11.130184

C27P104 27. Palinkas LA, Chou C-P, Spear SE, Mendon SJ, Villamar J, Brown CH. Measurement of sustainment of prevention programs and initiatives: the sustainment measurement system scale. *Implement Sci*. 2020;15(1):1–15.

C27P105 28. Malone S, Prewitt K, Hackett R, et al. The Clinical Sustainability Assessment Tool: measuring organizational capacity to promote sustainability in healthcare. *Implement Sci Commun*. 2021;2:77.

C27P106 29. Braithwaite J, Ludlow K, Testa L, et al. Built to last? The sustainability of healthcare system improvements, programmes and interventions: a systematic integrative review. *BMJ Open*. 2020;10(6):e036453.

C27P107 30. Shelton RC, Lee M. Sustaining evidence-based interventions and policies: recent innovations and future directions in implementation science. *Am J Public Health*. 2019;109(S2):S132–S134.

C27P108 31. Balis LE, Strayer TE 3rd, Ramalingam N, Harden SM. Beginning with the end in mind: contextual considerations for scaling-out a community-based intervention. *Front Public Health*. 2018;6:357–357.

C27P109 32. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic

review and recommendations. *Milbank Q.* 2004;82(4):581–629.

C27P110 33. Simmons R, Fajans P, Ghiron L. *Scaling Up Health Service Delivery: From Pilot Innovations to Policies and Programmes.* World Health Organization; 2007.

C27P111 34. Koorts H, Rutter H. A systems approach to scale-up for population health improvement. *Health Res Policy Syst.* 2021;19(1):27.

C27P112 35. Geerligs L, Rankin NM, Shepherd HL, Butow P. Hospital-based interventions: a systematic review of staff-reported barriers and facilitators to implementation processes. *Implement Sci.* 2018;13(1):36.

C27P113 36. Leahy AA, Eather N, Smith JJ, et al. School-based physical activity intervention for older adolescents: rationale and study protocol for the Burn 2 Learn cluster randomised controlled trial. *BMJ Open.* 2019;9(5):e026029.

C27P114 37. Rabin BA, Brownson RC. Terminology for dissemination and implementation research. In: Brownson RC, Colditz GA, Proctor EK, eds. Dissemination and Implementation Research in Health: Translating Science to Practice. Vol. 2. Oxford University Press; 2017:19–45.

C27P115 38. Birken SA, Bunger AC, Powell BJ, et al. Organizational theory for dissemination and implementation research. *Implement Sci.* 2017;12(1):62.

C27P116 39. Kreuter MW, Bernhardt JM. Reframing the dissemination challenge: a marketing and distribution perspective. *Am J Public Health.* 2009;99(12):2123–2127.

C27P117 40. Wolfenden L, Yoong SL, Williams CM, et al. Embedding researchers in health service organizations improves research translation and health service performance: the Australian Hunter New England Population Health example. *J Clin Epidemiol.* 2017;85:3–11.

C27P118 41. Brownson RC, Chriqui JF, Stamatakis KA. Understanding evidence-based public health policy. *Am J Public Health.* 2009;99(9):1576–1583.

C27P119 42. Haynes A, Rowbotham SJ, Redman S, Brennan S, Williamson A, Moore G. What can we learn from interventions that aim to increase policymakers' capacity to use research? A realist scoping review. *Health Res Policy Syst.* 2018;16(1):31.

C27P120 43. Mummah SA, Robinson TN, King AC, Gardner CD, Sutton S. IDEAS (Integrate, Design, Assess, and Share): a framework and toolkit of strategies for the development of more effective digital interventions to change health behavior. *J Med Internet Res.* 2016;18(12):e317.

C27P121 44. Kilbourne AM, Braganza MZ, Bowersox NW, et al. Research lifecycle to increase the substantial real-world impact of research: accelerating innovations to application. *Med Care.* 2019;57(10) (suppl 3):S206–S212.

45. Moullin JC, Dickson KS, Stadnick NA, Rabin B, **C27P122** Aarons GA. Systematic review of the exploration, preparation, implementation, sustainment (EPIS) framework. *Implement Sci.* 2019;14(1):1–16.

46. Laycock A, Harvey G, Percival N, et al. **C27P123** Application of the i-PARIHS framework for enhancing understanding of interactive dissemination to achieve wide-scale improvement in Indigenous primary healthcare. *Health Res Policy Syst.* 2018;16(1):1–16.

47. World Health Organization. *Practical Guidance* **C27P124** *for Scaling Up Health Service Innovations.* World Health Organization; 2009.

48. Dearing JW. Improving the state of health pro- **C27P125** gramming by using diffusion theory. *J Health Commun.* 2004;9(S1):21–36.

49. Feldstein AC, Glasgow RE. A practical, robust **C27P126** implementation and sustainability model (PRISM) for integrating research findings into practice. *Jt Comm J Qual Patient Saf.* 2008;34(4):228–243.

50. Bodkin A, Hakimi S. Sustainable by design: a **C27P127** systematic review of factors for health promotion program sustainability. *BMC Public Health.* 2020;20(1):1–16.

51. Klesges LM, Estabrooks PA, Dzewaltowski DA, **C27P128** Bull SS, Glasgow RE. Beginning with the application in mind: designing and planning health behavior change interventions to enhance dissemination. *Ann Behav Med.* 2005;29(2):66–75.

52. Escoffery C, Lebow-Skelley E, Udelson H, et al. A **C27P129** scoping study of frameworks for adapting public health evidence-based interventions. *Transl Behav Med.* 2019;9(1):1–10.

53. Chambers DA, Norton WE. The adaptome: **C27P130** advancing the science of intervention adaptation. *Am J Prev Med.* 2016;51(4):S124–S131.

54. Perez Jolles M, Lengnick-Hall R, Mittman BS. **C27P131** Core functions and forms of complex health interventions: a patient-centered medical home illustration. *J Gen Intern Med.* 2019;34(6):1032–1038.

55. Owen N, Goode A, Sugiyama T, et al. Designing **C27P132** for dissemination in chronic disease prevention and management. In: Brownson RC, Colditz GA, Proctor EK, eds. *Dissemination and Implementation Research in Health: Translating Science to Practice.* Oxford University Press; 2017:107–120.

56. Nooraie RY, Kwan BM, Cohn E, et al. Advancing **C27P133** health equity through CTSA programs: opportunities for interaction between health equity, dissemination and implementation, and translational science. *J Clin Transl Sci.* 2020;4(3):168–175.

57. Shelton RC, Chambers DA, Glasgow RE. An **C27P134** extension of RE-AIM to enhance sustainability:

addressing dynamic context and promoting health equity over time. *Front Public Health.* 2020;8:134.

C27P135 58. Weiner BJ, Lewis CC, Stanick C, et al. Psychometric assessment of three newly developed implementation outcome measures. *Implement Sci.* 2017;12(1):1–12.

C27P136 59. Kastner M, Estey E, Hayden L, et al. The development of a guideline implementability tool (GUIDE-IT): a qualitative study of family physician perspectives. *BMC Fam Pract.* 2014;15(1):19.

C27P137 60. Kastner M, Sayal R, Oliver D, Straus SE, Dolovich L. Sustainability and scalability of a volunteer-based primary care intervention (Health TAPESTRY): a mixed-methods analysis. *BMC Health Serv Res.* 2017;17(1):1–21.

C27P138 61. Porat T, Marshall IJ, Sadler E, et al. Collaborative design of a decision aid for stroke survivors with multimorbidity: a qualitative study in the UK engaging key stakeholders. *BMJ Open.* 2019;9(8):e030385.

C27P139 62. Rosenbaum SE, Glenton C, Nylund HK, Oxman AD. User testing and stakeholder feedback contributed to the development of understandable and useful Summary of Findings tables for Cochrane reviews. *J Clin Epidemiol.* 2010;63(6):607–619.

C27P140 63. Mazzucca S, Tabak RG, Pilar M, et al. Variation in research designs used to test the effectiveness of dissemination and implementation strategies: a review. *Front Public Health.* 2018;6:32.

C27P141 64. Brownson RC, Eyler AA, Harris JK, Moore JB, Tabak RG. Getting the word out: new approaches for disseminating public health science. *J Public Health Manag Pract.* 2018;24(2):102–111.

C27P142 65. McNeal DM, Glasgow RE, Brownson RC, et al. Perspectives of scientists on disseminating research findings to non-research audiences. *J Clin Transl Sci.* 2021;5(1):E61. doi:10.1017/cts.2020.563

C27P143 66. Craven MP, Goodwin R, Rawsthorne M, et al. Try to see it my way: exploring the co-design of visual presentations of wellbeing through a workshop process. *Perspect Public Health.* 2019;139(3):153–161.

C27P144 67. Hodgkins M, Khoury C, Katz C, Lloyd S, Barron M. Health care industry requires a roadmap to accelerate the impact of digital health innovations. *Health Affairs Blog.* 2018. doi:10.1377/hblog20180606.523635

C27P145 68. Ramanadhan S, Davis MM, Armstrong R, et al. Participatory implementation science to increase the impact of evidence-based cancer prevention and control. *Cancer Causes Control.* 2018;29(3):363–369.

C27P146 69. Concannon TW, Fuster M, Saunders T, et al. A systematic review of stakeholder engagement in comparative effectiveness and patient-centered outcomes research. *J Gen Intern Med.* 2014;29(12):1692–1701.

C27P147 70. Kwan BM, Ytell K, Coors M, et al. A stakeholder engagement method navigator webtool for clinical and translational science. *J Clin Transl Sci.* 2021;5(1):E180. doi:10.1017/cts.2021.850

C27P148 71. Parsons JA, Lavery JV. Brokered dialogue: a new research method for controversial health and social issues. *BMC Med Res Methodol.* 2012;12(1):92.

C27P149 72. Robertson T, Darling M, Leifer J, Footer O. Behavioral design teams: the next frontier in clinical delivery innovation? *Issue Brief (Commonwealth Fund).* 2017;2017:1–16.

C27P150 73. Green AE, Fettes DL, Aarons GA. A concept mapping approach to guide and understand dissemination and implementation. *J Behav Health Serv Res.* 2012;39(4):362–373.

C27P151 74. Carter N, Lavis JN, MacDonald-Rencz S. Use of modified Delphi to plan knowledge translation for decision makers: an application in the field of advanced practice nursing. *Policy Polit Nurs Pract.* 2014;15(3–4):93–101.

C27P152 75. Daly-Smith A, Quarmby T, Archbold VSJ, et al. Using a multi-stakeholder experience-based design process to co-develop the Creating Active Schools Framework. *Int J Behav Nutr Phy.* 2020;17(1):13.

C27P153 76. Robinson K, Elliott SJ, Driedger SM, et al. Using linking systems to build capacity and enhance dissemination in heart health promotion: a Canadian multiple-case study. *Health Educ Res.* 2005;20(5):499–513.

C27P154 77. Sanders MR, Kirby JN. Consumer engagement and the development, evaluation, and dissemination of evidence-based parenting programs. *Behav Ther.* 2012;43(2):236–250.

C27P155 78. Pfadenhauer LM, Gerhardus A, Mozygemba K, et al. Making sense of complexity in context and implementation: the context and implementation of complex interventions (CICI) framework. *Implement Sci.* 2017;12(1):1–17.

C27P156 79. Nilsen P, Bernhardsson S. Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC Health Serv Res.* 2019;19(1):1–21.

C27P157 80. Bergström A, Dinh H, Duong D, et al. The Context Assessment for Community Health tool—investigating why what works where in low- and middle-income settings. *BMC Health Serv Res.* 2014;14(2):1–2.

C27P158 81. Evans-Agnew RA, Johnson S, Liu F, Boutain DM. Applying critical discourse analysis in health policy research: case studies in regional,

organizational, and global health. *Policy Polit Nurs Pract.* 2016;17(3):136–146.

C27P159 82. Luke DA, Harris JK. Network analysis in public health: history, methods, and applications. *Annu Rev Public Health.* 2007;28:69–93.

C27P160 83. Nearing K, Rainwater J, Morrato E, et al. I-Corps@NCATS: a novel designing-for-dissemination learning laboratory for clinical and translational researchers to increase intervention relevance and speed dissemination. *Implement Sci.* 2020;15(suppl 1):25.

C27P161 84. Osterwalder A, Pigneur Y, Bernarda G, Smith A. *Value Proposition Design: How to Create Products and Services Customers Want.* John Wiley & Sons; 2014.

C27P162 85. Salloum RG, Theis RP, Pbert L, et al. Stakeholder engagement in developing an electronic clinical support tool for tobacco prevention in adolescent primary care. *Children.* 2018;5(12):170. https://doi.org/10.3390/children5120170

C27P163 86. Northridge ME, Metcalf SS. Enhancing implementation science by applying best principles of systems science. *Health Res Policy Syst.* 2016;14(1):1–8.

C27P164 87. Luke DA, Stamatakis KA. Systems science methods in public health: dynamics, networks, and agents. *Annu Rev Public Health.* 2012;33:357–376.

C27P165 88. Willis CD, Mitton C, Gordon J, Best A. System tools for system change. *BMJ Qual Saf.* 2012;21(3):250–262.

C27P166 89. Best A, Berland A, Herbert C, et al. Using systems thinking to support clinical system transformation. *J Health Organ Manag.* 2016;30(3):302–323.

C27P167 90. Zimmerman L, Lounsbury DW, Rosen CS, Kimerling R, Trafton JA, Lindley SE. Participatory system dynamics modeling: increasing stakeholder engagement and precision to improve implementation planning in systems. *Adm Policy Ment Health.* 2016;43(6):834–849.

C27P168 91. Naumann RB, Austin AE, Sheble L, Lich KH. System dynamics applications to injury and violence prevention: a systematic review. *Curr Epidemiol Rep.* 2019;6(2):248–262.

C27P169 92. Quanbeck A, Brown RT, Zgierska AE, Johnson RA, Robinson JM, Jacobson N. Systems consultation: protocol for a novel implementation strategy designed to promote evidence-based practice in primary care. *Health Res Policy Syst.* 2016;14(1):1–10.

C27P170 93. Valente TW. Network interventions. *Science.* 2012;337(6090):49–53.

C27P171 94. Luke DA, Wald LM, Carothers BJ, Bach LE, Harris JK. Network influences on dissemination of evidence-based guidelines in state tobacco control programs. *Health Educ Behav.* 2013;40(1)(suppl):33S–42S.

95. Bland DJ, Osterwalder A. *Testing Business Ideas: A Field Guide for Rapid Experimentation.* John Wiley & Sons; 2019. **C27P172**

96. McCormack L, Sheridan S, Lewis M, et al. *Communication and Dissemination Strategies to Facilitate the Use of Health-Related Evidence.* Agency for Healthcare Research and Quality. 2013. Evidence Report/Technology Assessment 213. **C27P173**

97. Botsis T, Fairman JE, Moran MB, Anagnostou V. Visual storytelling enhances knowledge dissemination in biomedical science. *J Biomed Inform.* 2020;107:103458. **C27P174**

98. Berman J, Mitambo C, Matanje-Mwagomba B, et al. Building a knowledge translation platform in Malawi to support evidence-informed health policy. *Health Res Policy Syst.* 2015;13:73. **C27P175**

99. Dobbins M, DeCorby K, Robeson P, Husson H, Tirilis D, Greco L. A knowledge management tool for public health: health-evidence.ca. *BMC Public Health.* 2010;10(1):1–16. **C27P176**

100. Guerry JD. Another way through the two-way mirror: a review of psychotherapy.net. *Cogn Behav Pract.* 2016;23(2):256–261. **C27P177**

101. Chan TM, Dzara K, Dimeo SP, Bhalerao A, Maggio LA. Social media in knowledge translation and education for physicians and trainees: a scoping review. *Perspect Med Educ.* 2020;9(1):20–30. **C27P178**

102. Kapp JM, Hensel B, Schnoring KT. Is Twitter a forum for disseminating research to health policy makers? *Ann Epidemiol.* 2015;25(12):883–887. **C27P179**

103. Archibald MM, Caine V, Scott SD. The development of a classification schema for arts-based approaches to knowledge translation. *Worldviews Evid Based Nurs.* 2014;11(5):316–324. **C27P180**

104. Kukkonen T, Cooper A. An arts-based knowledge translation (ABKT) planning framework for researchers. *Evid Policy.* 2019;15(2):293–311. **C27P181**

105. Ninomiya MEM. More than words: using visual graphics for community-based health research. *Can J Public Health.* 2017;108(1):e91–e94. **C27P182**

106. Turck CJ, Silva MA, Tremblay SR, Sachse SL. A preliminary study of health care professionals' preferences for infographics versus conventional abstracts for communicating the results of clinical research. *J Contin Educ Health Prof.* 2014;34:S36–S38. **C27P183**

107. Kinsinger LS, Jones KR, Kahwati L, et al. Design and dissemination of the MOVE! weight-management program for veterans. *Prev Chronic Dis.* 2009;6(3):A98. **C27P184**

108. Crear-Perry J, Correa-de-Araujo R, Lewis Johnson T, McLemore MR, Neilson E, Wallace M. Social and structural determinants of health **C27P185**

inequities in maternal health. *J Womens Health.* 2021;30(2):230–235.

C27P186 109. Dutta MJ. Communicating about culture and health: theorizing culture-centered and cultural sensitivity approaches. *Commun Theory.* 2007;17(3):304–328.

C27P187 110. Canfield KN, Menezes S, Matsuda SB, et al. Science communication demands a critical approach that centers inclusion, equity, and intersectionality. *Front Commun.* 2020;5:2.

C27P188 111. Wallerstein N, Duran B, Oetzel JG, Minkler M. *Community-Based Participatory Research for Health: Advancing Social and Health Equity.* John Wiley & Sons; 2017.

C27P189 112. Costanza-Chock S. *Design Justice: Community-Led Practices to Build the Worlds We Need.* MIT Press; 2020.

C27P190 113. Kwan BM, Brownson RC, Glasgow RE, Morrato EH, Luke DA. Designing for dissemination and sustainability to promote equitable impacts on health. *Annu Rev Public Health.* 2022;43(1):331–353.

C27P191 114. Alonge O, Frattaroli S, Davey-Rothwell M, Baral S. A trans-disciplinary approach for teaching implementation research and practice in public health. *Pedagogy Health Promot.* 2016;2(2):127–136.

115. National Academies of Sciences, Engineering, **C27P192** and Medicine. Exploring Equity in Multisector Community Health Partnerships: Proceedings of a Workshop. Washington, DC: The National Academies Press; 2018. https://doi.org/10.17226/24786

116. Pauwels L, Mannay D. *The SAGE Handbook of* **C27P193** *Visual Research Methods.* Sage; 2019.

117. Kwan BM, Dickinson LM, Glasgow RE, et al. **C27P194** The Invested in Diabetes study protocol: a cluster randomized pragmatic trial comparing standardized and patient-driven diabetes shared medical appointments. *Trials.* 2020;21(1):1–14.

118. Kwan BM, Rementer J, Ritchie ND, et al. **C27P195** Adapting diabetes shared medical appointments to fit context for practice-based research (PBR). *J Am Board Fam Med.* 2020;33(5):716–727.

119. Glasgow RE, Gurfinkel D, Waxmonsky J, et al. **C27P196** Protocol refinement for a diabetes pragmatic trial using the PRECIS-2 framework. *BMC Health Serv Res.* 2021;21:1039.