

The Implementation Research Research Logic Model (IRLM)

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MPI, Mental Health, Earlier (MHE) ALACRITY Research Center (P50MH132502)

MPI, Lifestyle Change Implementation Research Network Coordinating Center (U48DP006789)



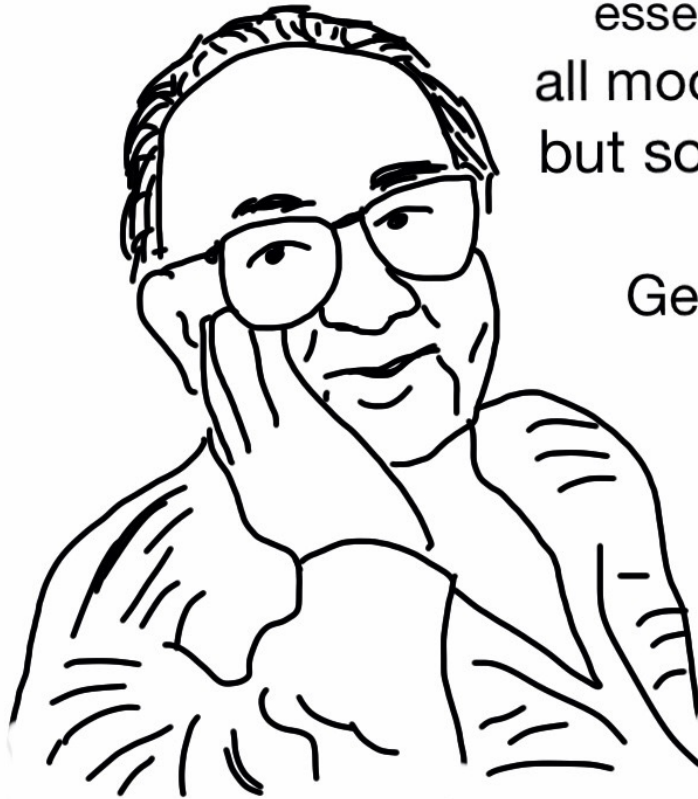
Acknowledgements

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Collaborators: Dennis Li, Miriam Rafferty, James Merle, Olutobi Sanuade, Elizabeth Sloss, Paul Estabrooks, Rebecca Lengnick-Hall, Chelsey Schlechter, Jennie Hill, Allison Carroll, Ashley Knapp, Hendricks Brown, Rosemary Meza, Natalie Taylor, and many others

Conflicts of interest: Prof. Smith provides consultation services on research projects concerning the IRLM, trial design, and other methods.

Do We Really Need Another Model?



essentially,
all models are wrong,
but some are useful

George E. P. Box

The Implementation Research Logic Model: a method for planning, executing, reporting, and synthesizing implementation projects

Research | [Open access](#) | Published: 25 September 2020

Volume 15, article number 84 (2020) [Cite this article](#)

Justin D. Smith , Dennis H. Li & Miriam R. Rafferty



- Required in multiple FOAs in the US NIH, AHRQ, CDC, and the VA
- >800 citations (Google Scholar, June 2026)

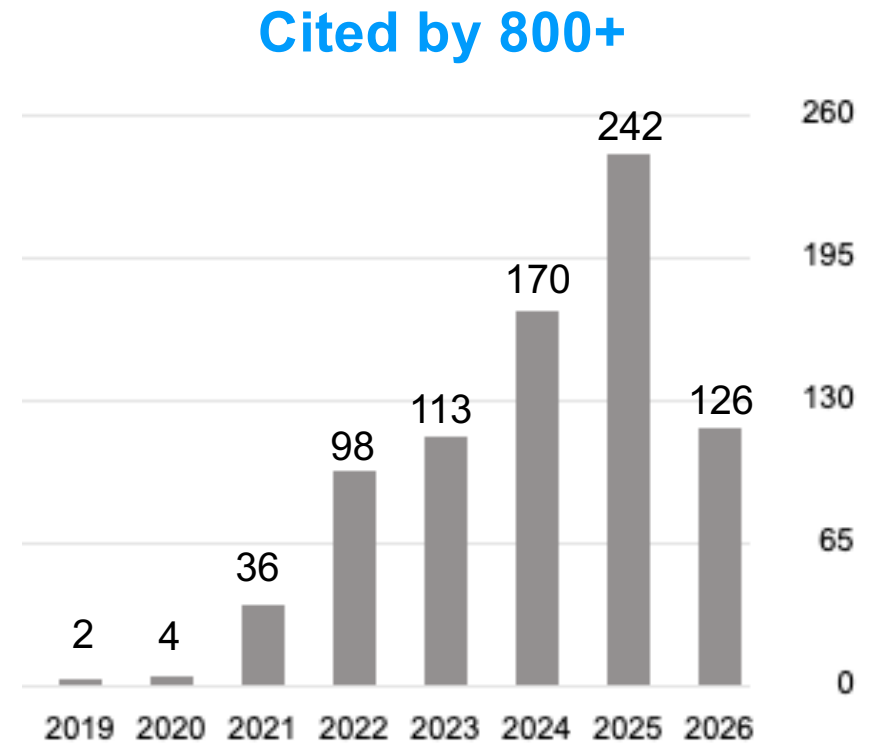
Five years of the Implementation Research Logic Model: a citation analysis and systematic scoping review of its use in implementation research and practice

Systematic review | [Open access](#) | Published: 10 June 2026

[James L. Merle](#), [Catlin A. Golden](#), [Rebecca Simmons](#), [Elizabeth A. Sloss](#), [Olutobi A. Sanuade](#), [Teresa Winning Verry](#), [Anthony J. Nixon Jr.](#), [Mary M. McFarland](#), [Rebecca Lengnick-Hall](#), [Rosemary Meza](#), [Jennie L. Hill](#), [Paul A. Estabrooks](#), [Miriam R. Rafferty](#), [Dennis Li](#) & [Justin D. Smith](#) 



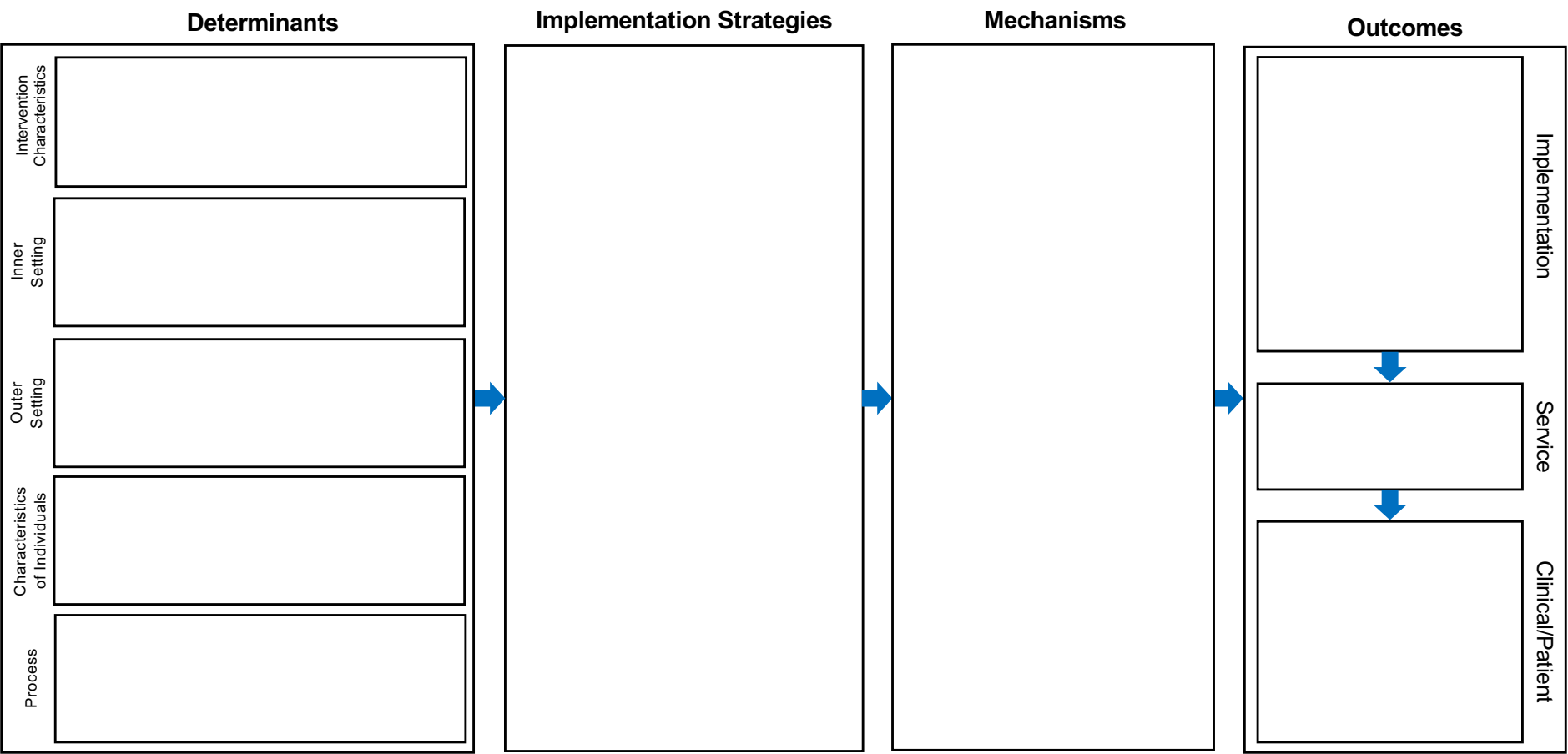
IRLM Annual Citation Growth 2020–2026



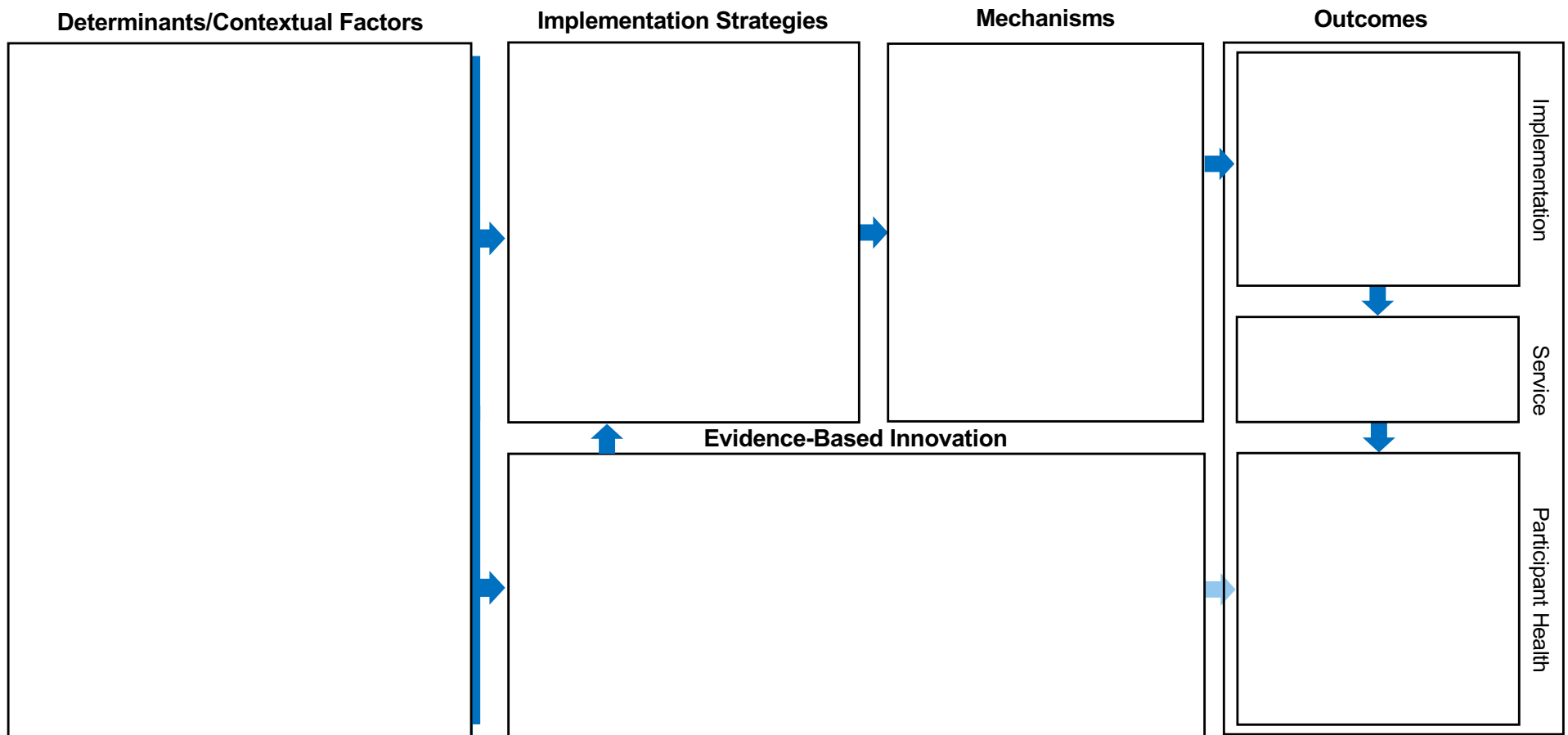
Purposes of the IRLM

- Tool to integrate the necessary elements (more on this shortly) and multiple models and frameworks of implementation research
- Improve the specification of implementation phenomena necessary to inform our understanding of how implementation strategies work, for whom, under what determinant conditions, and on what implementation and clinical outcomes
- Aid in the specification of the conceptual and empirical relationships (logic) between elements of an implementation initiative or research project

Implementation Research Logic Model (IRLM)

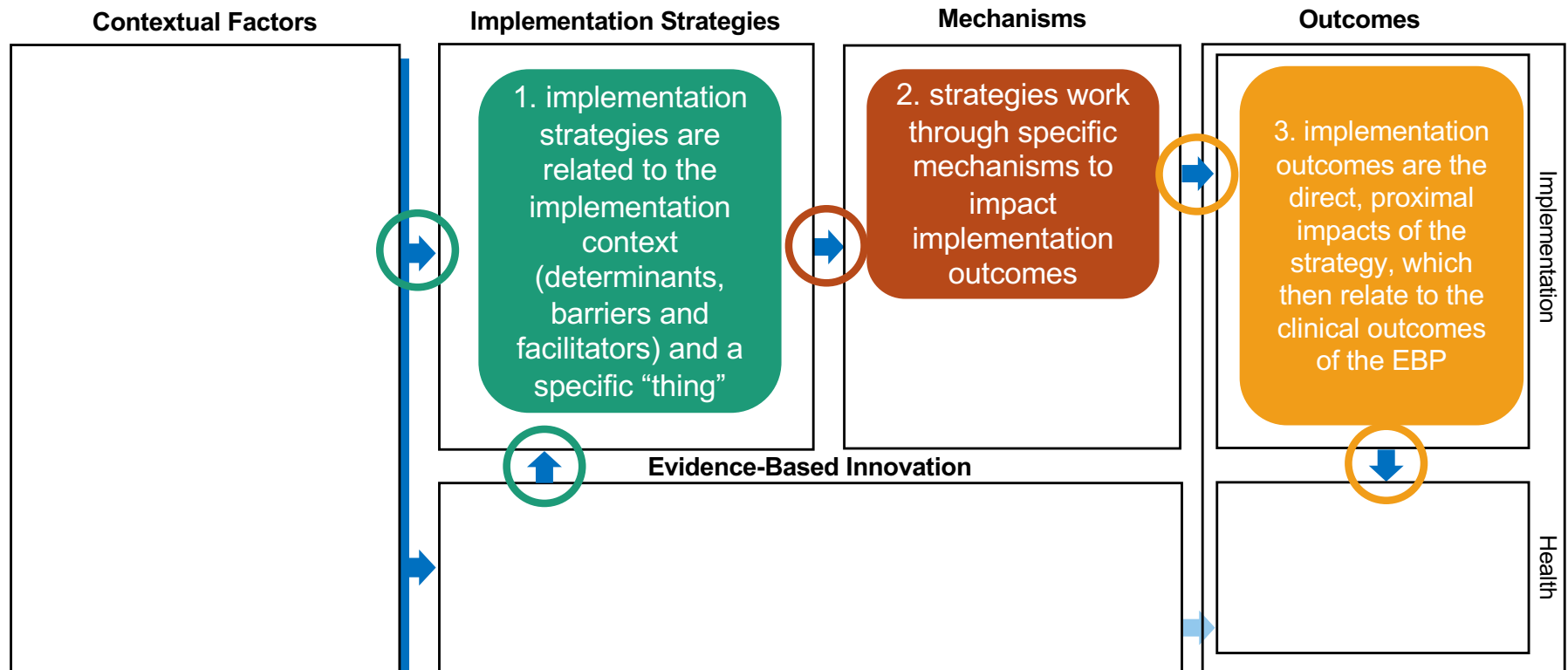


Implementation Research Logic Model (IRLM) w/Innovation



Smith, Li, & Rafferty, 2020, *Implement Sci*

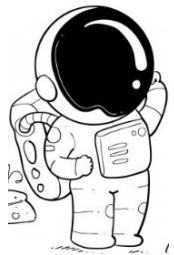
Generalized Theory of Implementation Research in the IRLM



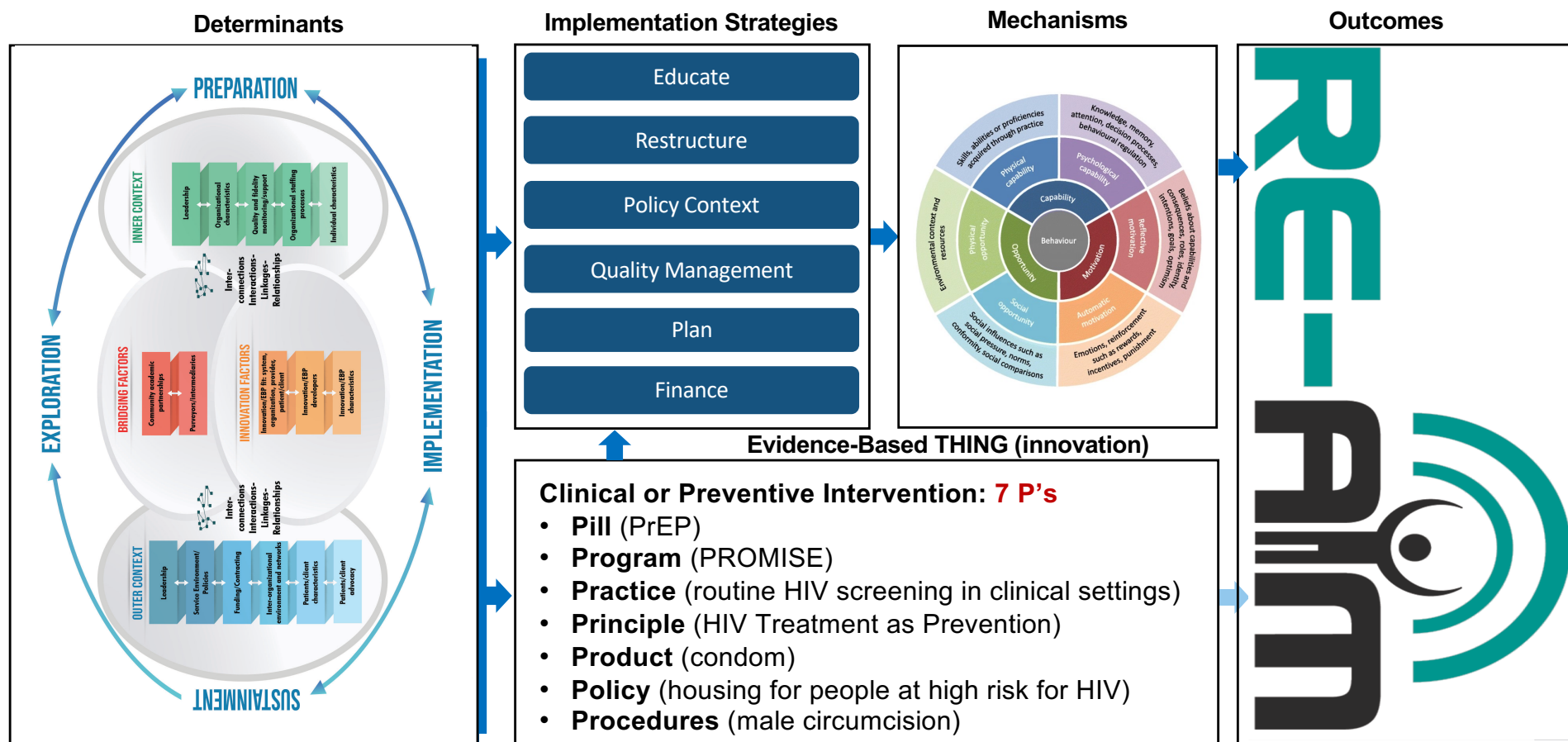
CoSMOs linking (coined by Paul Estabrooks)

Context → Implement. **Strategy(ies)** → **Mechanism(s)** → Implement. **Outcomes**

Smith, Li, & Rafferty, 2020, *Implement Sci*



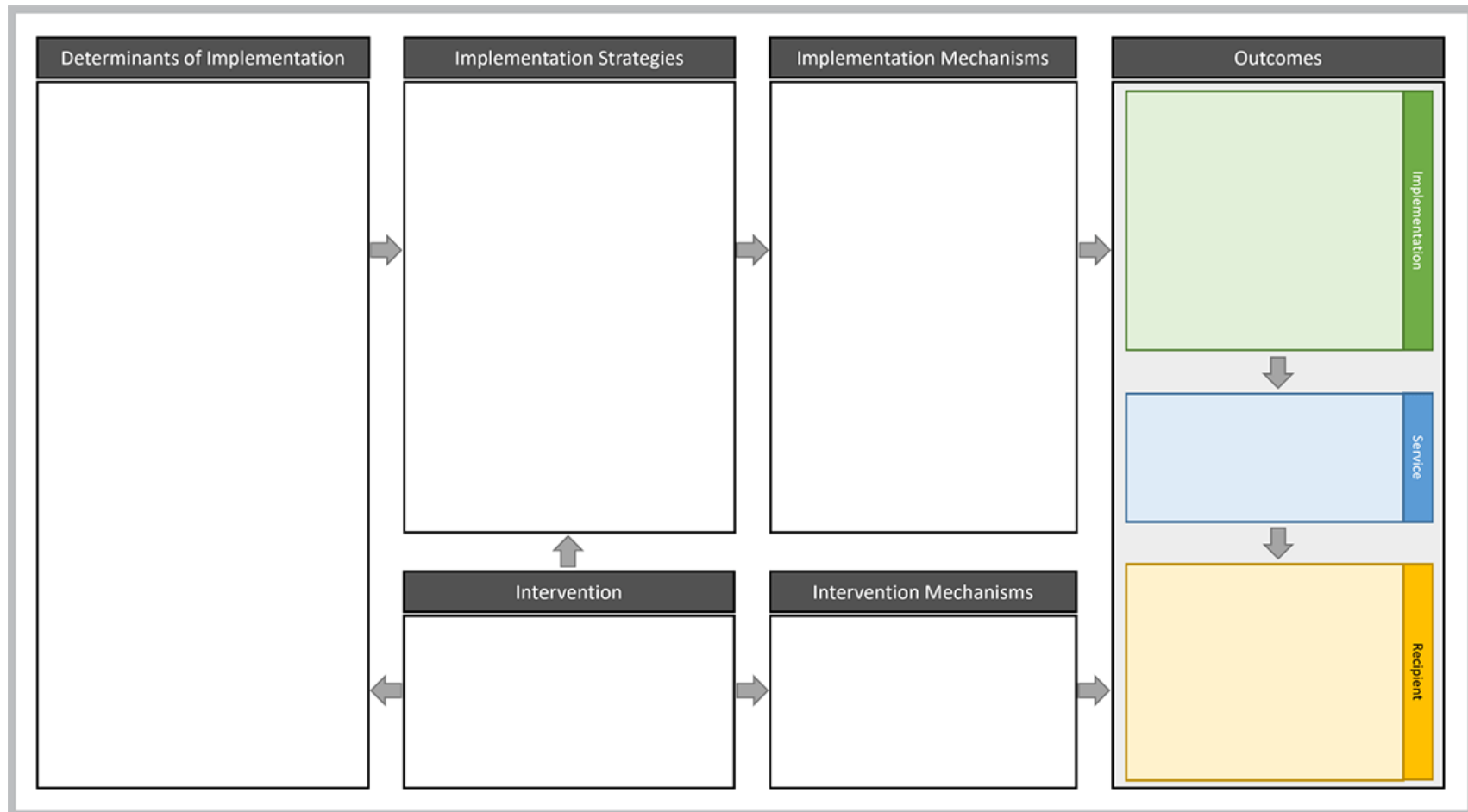
Implementation Research Logic Model (IRLM)



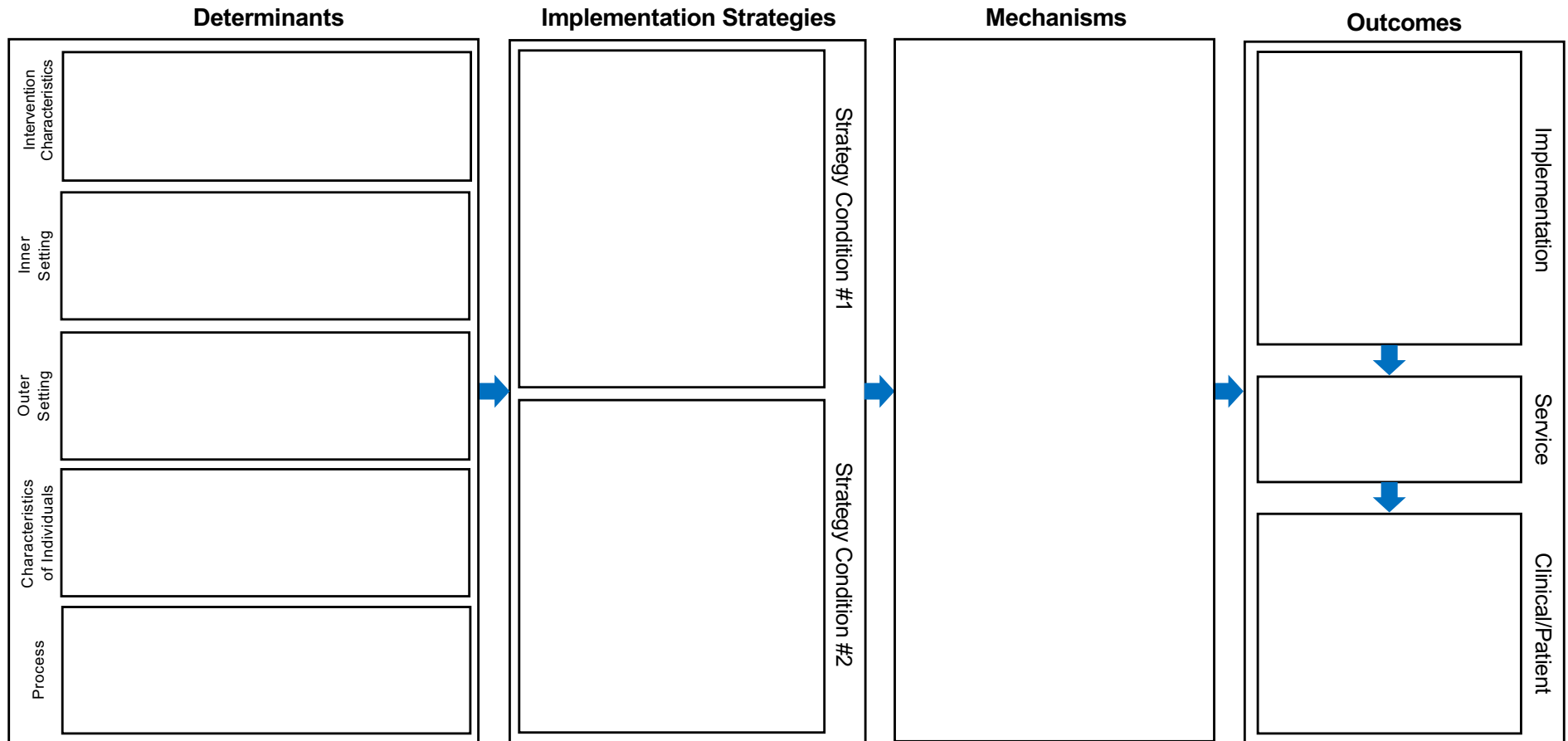
Smith, Li, & Rafferty, 2020, *Implement Sci*

IRLM Formats for Different Scenarios and Study Designs

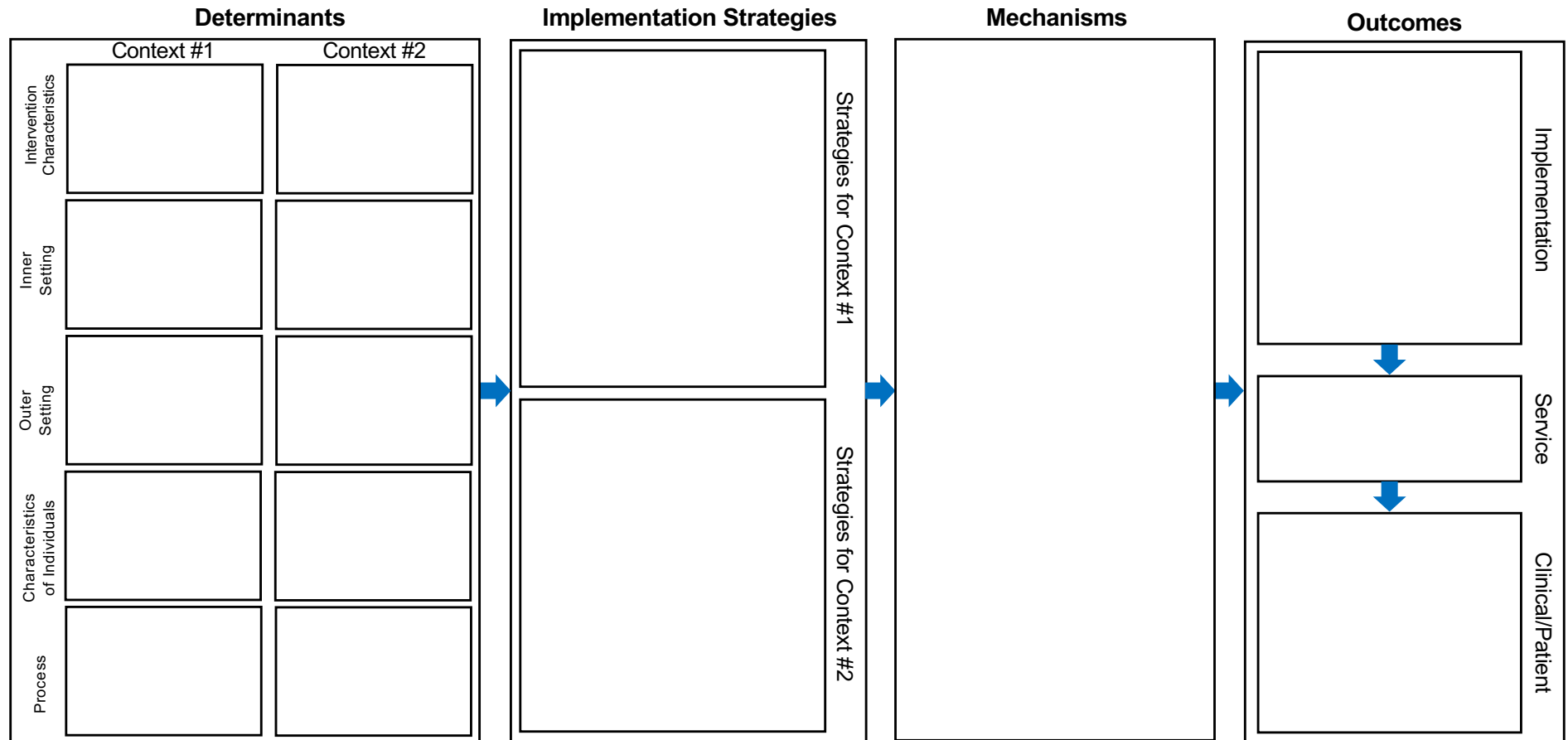
IRLM w/Intervention Mechanisms



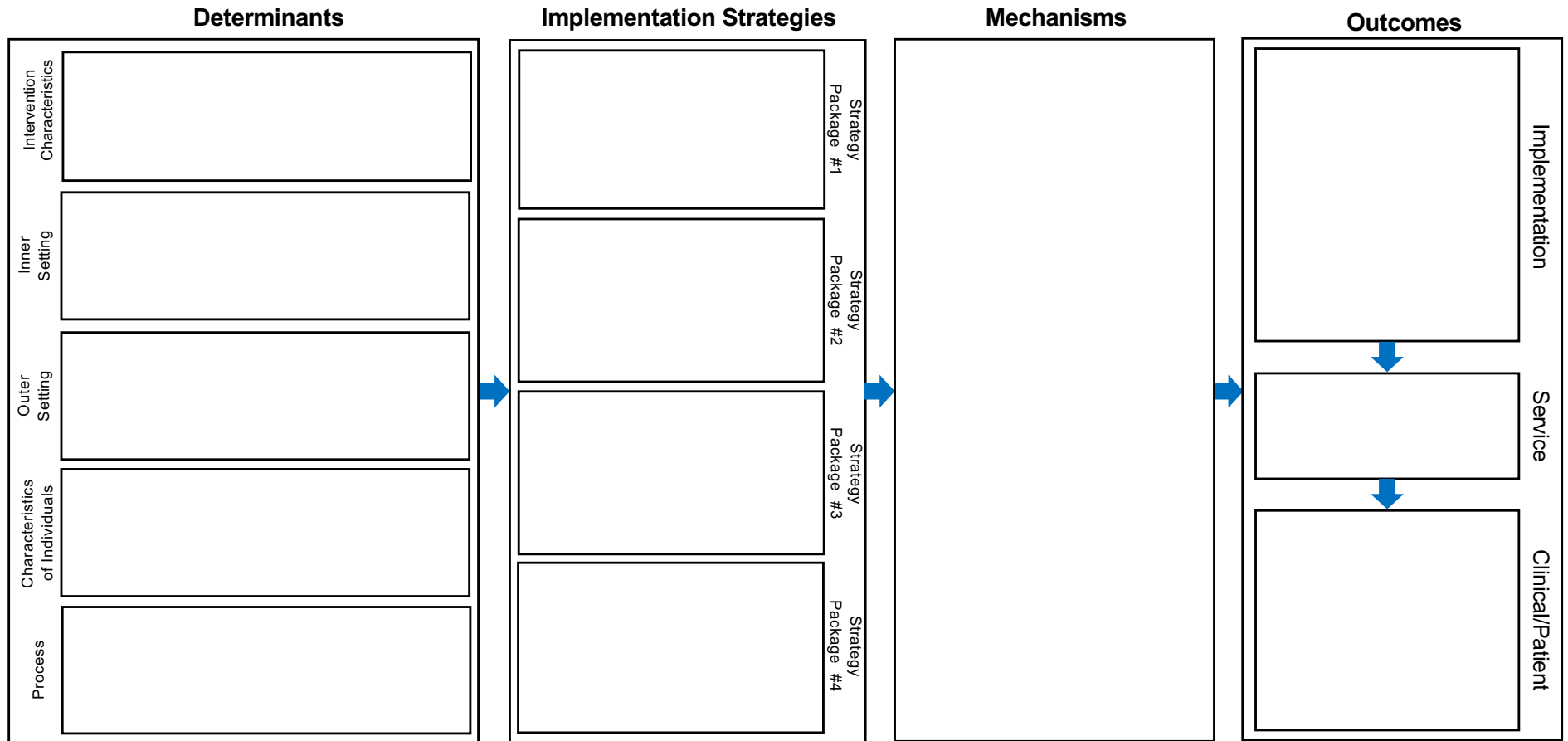
IRLM for Comparative Implementation



IRLM for Multi-Context Implementation of Single Intervention



IRLM for Implementation Optimization Trial (4 clusters; 1 setting)



Citation Analysis and Systematic Scoping Review

- **Aim:** Assess the uptake, application, and adaptation of the IRLM.
- **Methods:** Citation analysis and scoping review using a forward citation search of 331 articles citing Smith et al. (2020), and a separate scoping review of 124 additional studies using other logic models. Articles were coded for how the IRLM was used, phase of application, CoSMOs linking, sources of data used to populate the IRLM, degree of community engagement, and integration of IS and other frameworks.
- **Results:** Of the 331 citing articles, 118 (36%) included a completed IRLM as a figure; 213 articles cited but did not include an IRLM.

Using the IRLM for Different Purposes and Stages of Research

Planning, Executing, Reporting, Synthesizing

- **Planning (68%)**

- Work with community partners and/or organization stakeholders to fill in the implementation strategies (e.g., Feichtner et al. 2021; Knapp et al. 2022; Simmons et al. 2023; Smith, Agrawal, et al. 2023)

- **Executing (6%)**

- Completed IRLM can serve as "protocol" and means of tracking what occurs, modifications, etc. (e.g., Fish et al. 2023; Tiruneh et al. 2022)

- **Reporting (22%)**

- Study results; facilitates communication of findings (Indraratna et al. 2022; Smith, Merle, et al. 2022)

- **Synthesizing (4%)**

- Draw conclusions for the implementation of an EBP/similar EBPs in a particular context/across contexts that are shared/generalizable to provide a guide for future implementation (Czosnek et al. 2022; Nelson et al. 2023)

24% used IRLM across multiple phases/for multiple purposes

Smith, Li, & Rafferty, 2020, *Implement Sci*; Merle et al. 2026, *Implement Sci*

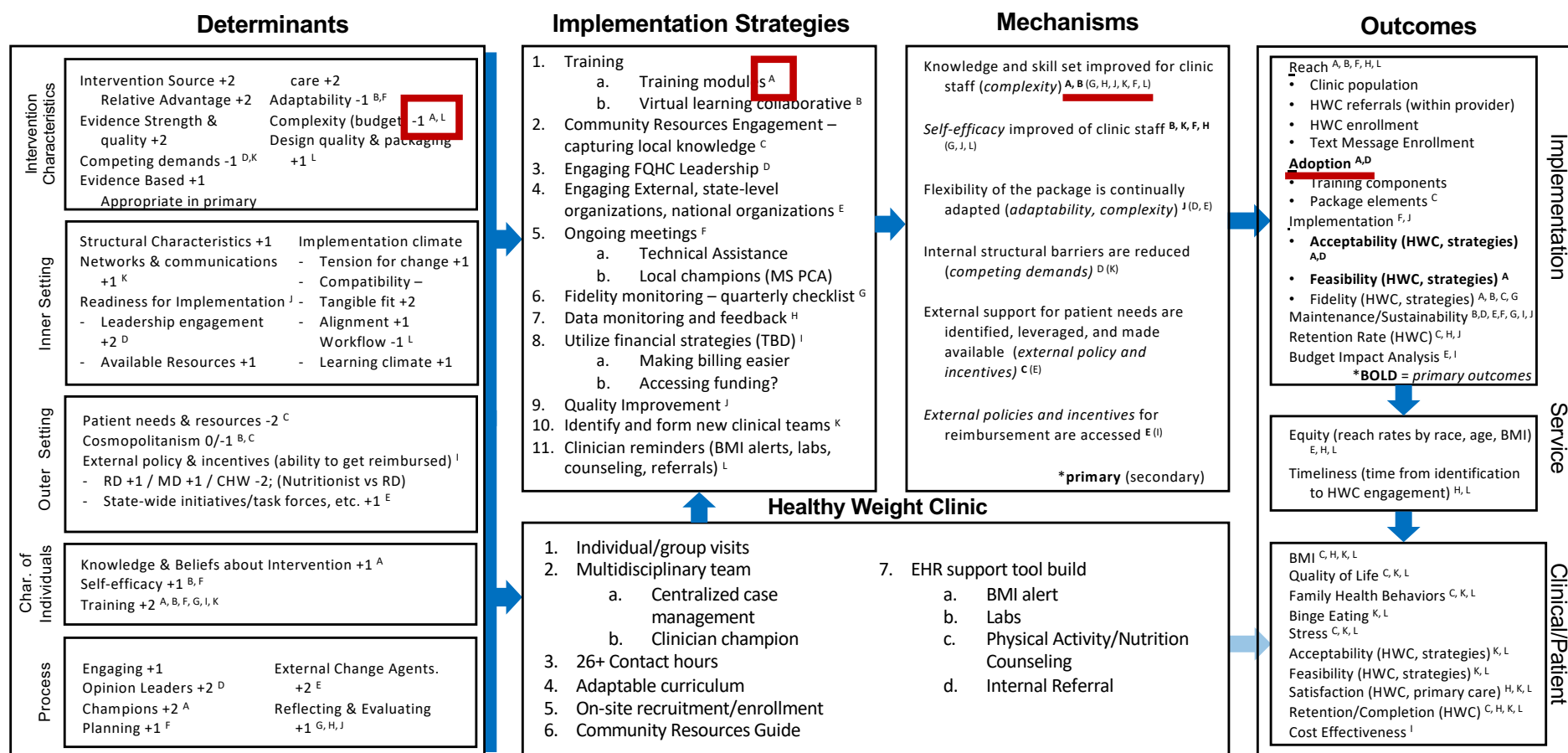
Examples of Comprehensive IRLMs

(essentially) Fully worked IRLMs

Disclaimers

- IRLMs are intended to be “living”
- Comprehensive IRLMs
 - Great for guiding project teams
 - Useful (sometimes) in grant applications
 - Way to report many of the findings of implementation projects
 - Not always necessary
- Examples shown required:
 - Primary data collection
 - Partner-engaged activities/work
 - 10-20 hours of team meetings (+ any data collection/analysis time)

IRLM for Healthy Weight Clinic Implementation in FQHCs



* Feichtner et al., 2021 *Childhood Obesity*, CDC U18DP006424 to Feichtner

Community Intervention to
Reduce CardiovascuLar
disease in Chicago
Implementation Research Center



"What's good for your heart, is good for your soul"



NIH/NHLBI DECIPHeR Alliance UG3/UH3HL154297 to Smith, Kho, & Davis



Community-Health System-Academic Partnership

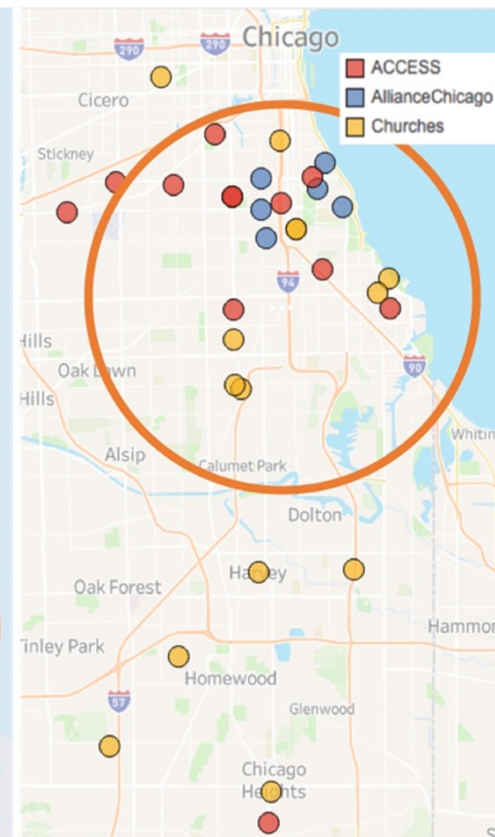
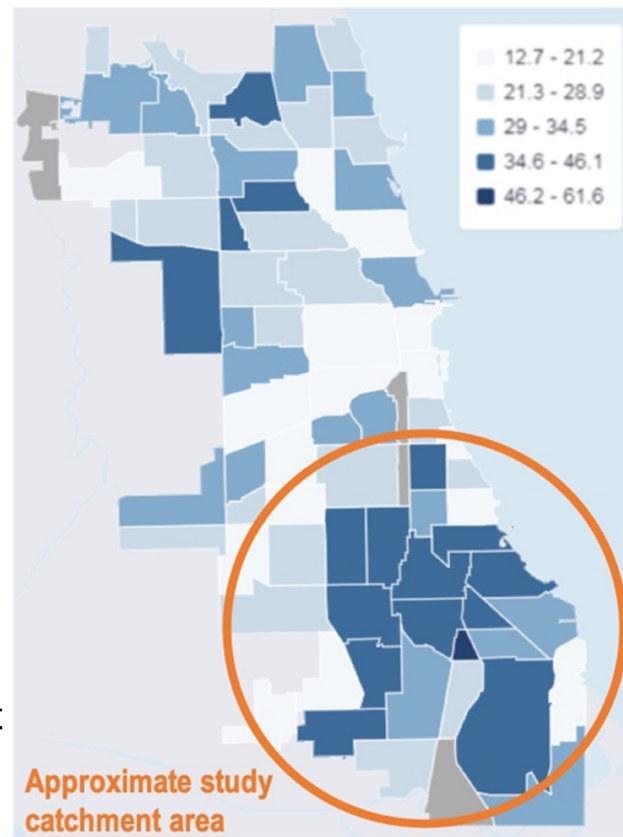
- Faith-Based Organizations (FBOs) in the South Side Community
 - Total Resource Community Development Organization (TRCDO)
 - Pastors 4 Patient-Centered Outcomes Research (P4P) Community Health Outreach
- Community Health Center Networks
 - ACCESS Community Health Network
 - Advocate Aurora Atrium Health
- Academic
 - Northwestern University
 - University of Utah
 - University of Chicago
 - Vanderbilt University Medical Center



Chicago's South Side



Left: Data from the Chicago Health Atlas demonstrating the higher neighborhood rates of HTN in Chicago's South Side neighborhoods. Neighborhood estimates are based on Behavior Risk Factor Surveillance data weighted to represent the surrounding population.



Right: Expanded view of CIRCL-Chicago study area with participating FBOs and CHCs from ACCESS Community Health and Advocate Aurora Atrium Health.

Kaiser Permanente BP Control “Bundle”

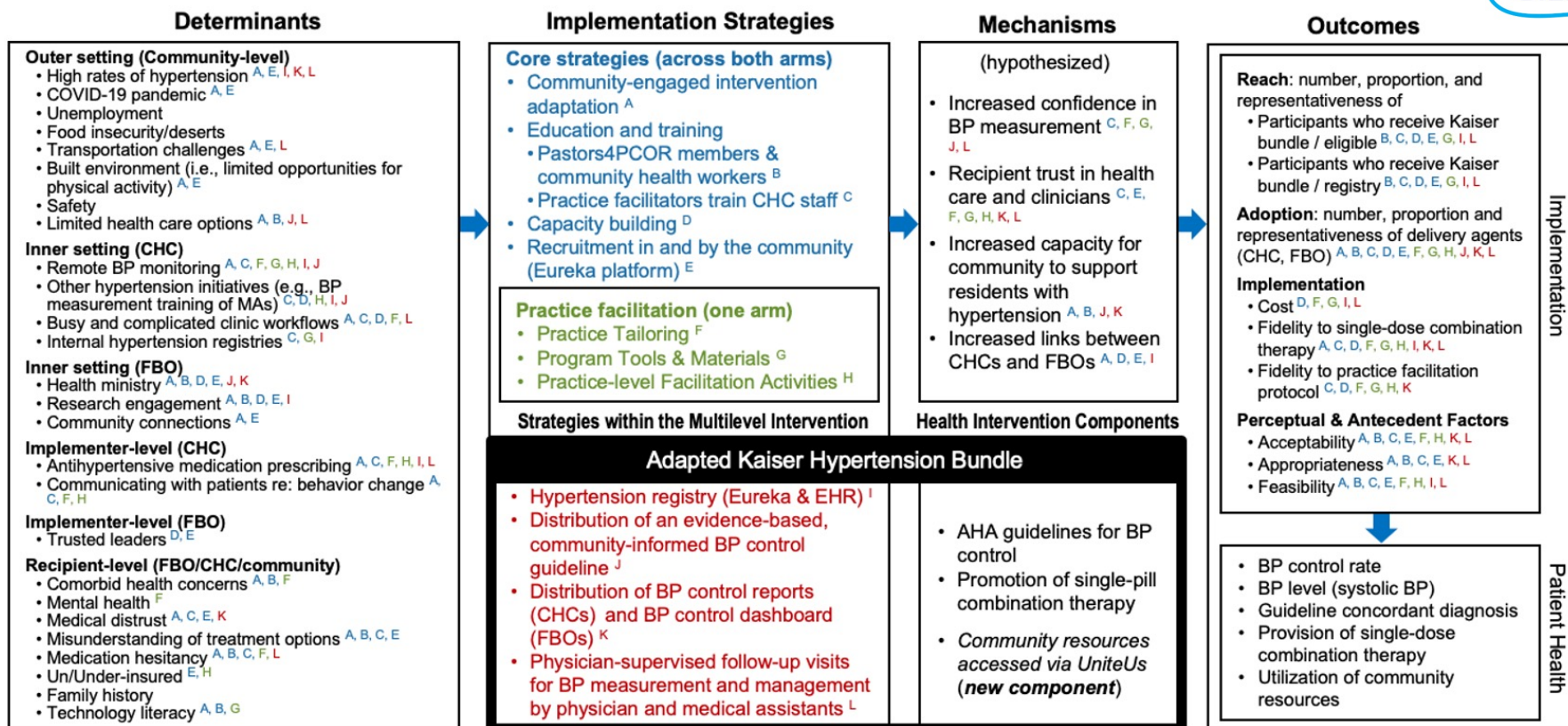
(Jaffe et al. 2013)

1. Patient registry (CHCs and community – Eureka)
2. Audit and feedback to implementers (BP control reports)
3. Accurate blood pressure measurement/monitoring
4. Simplified treatment regimens (single pill combination therapy)
5. HIT-facilitated care coordination between churches and CHCs



- Adaptations guided by our community
 - Coordination between CHCs and FBOs
 - Getting patients into care
 - Coordination of **community resources** for health-related social needs (TRCDO)
 - Delivery strategies/roles of local CHCs and Research Ministry Ambassadors from P4P

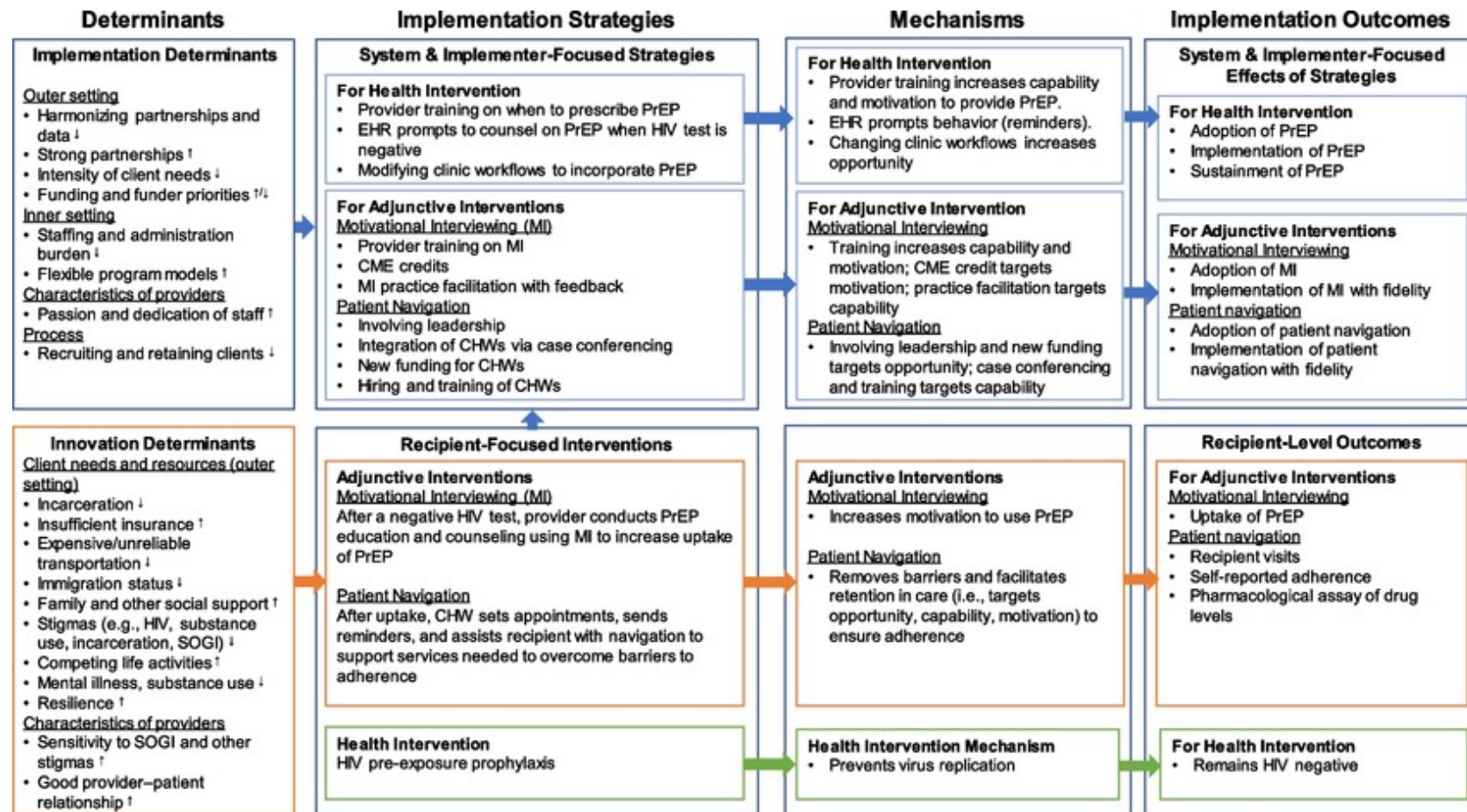
IRLM for Multilevel Kaiser BP “Bundle” Intervention



Notes. Color coding indicates strategies in the Kaiser bundle multilevel intervention (red), strategies across both arms of the parallel cluster randomized trial (blue), and strategies in the practice facilitation arm of the trial (green). Superscripts indicate causal paths associated with each strategy as the anchor. AHA = American Heart Association, BP = blood pressure, CHC = community health center, EHR = electronic health record, FBO = faith-based organization.

Smith et al. 2025, *Implement Sci*; Smith, et al. 2023, *Eth & Dis*

IRLM for Adjunctive Interventions



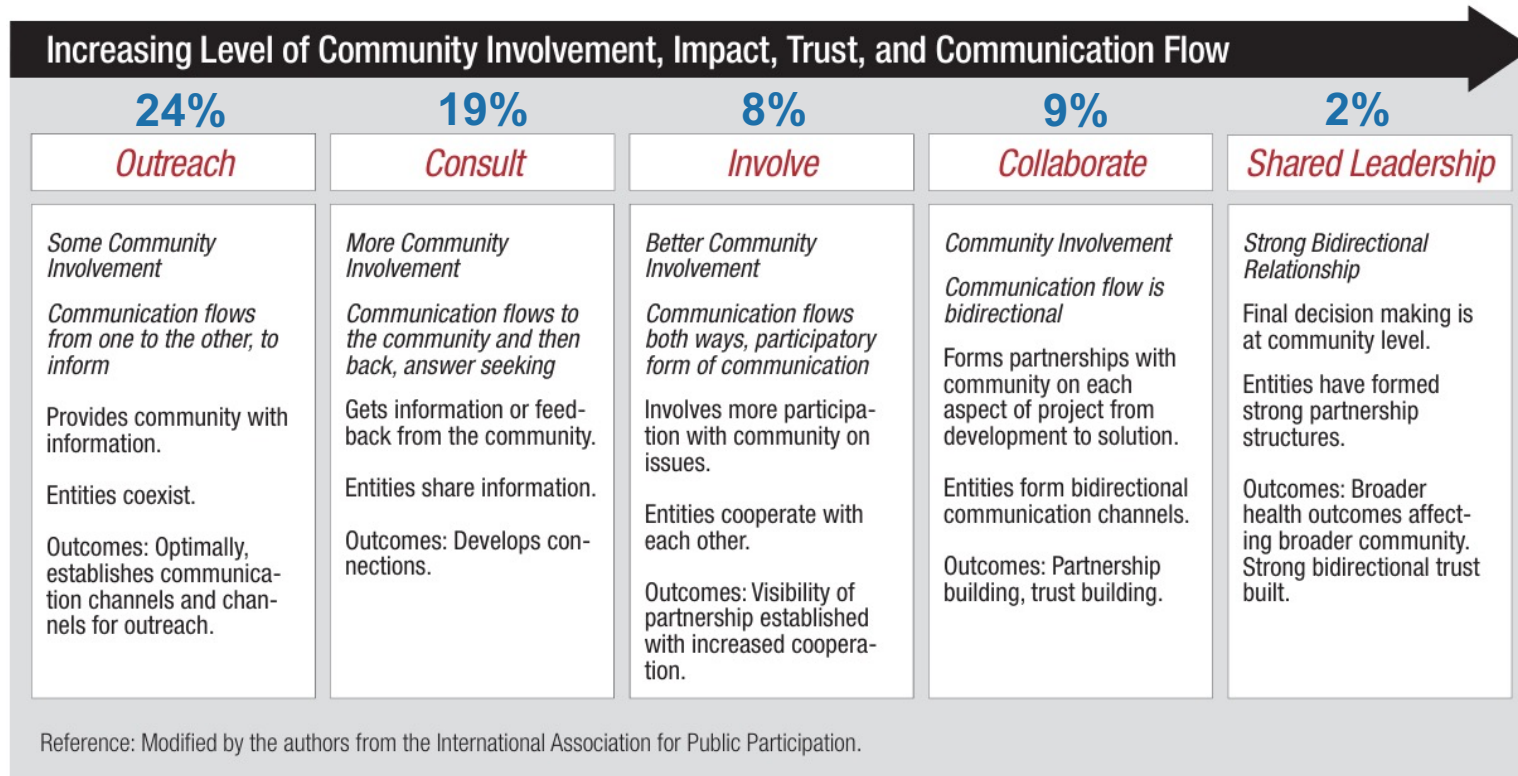
Methodology for using the IRLM for Implementation Planning

Selecting strategies and building out an IRLM for a study proposal/protocol

Methods from Systematic Scoping Review

- Single method of data collection (n=55, 47%), multiple methods (n=54, 46%), unspecified data source (n=9, 8%)
 - interviews with implementation and community partners (n=55)
 - surveys (n=39)
 - systematic, scoping, or literature reviews (n=27)
 - focus groups (n=22)
 - observational assessments (n=20)
 - workshops or workgroups (n=14)
 - advisory panels or other teams (n=10)

Involvement of Community/Partners



- Did not include or describe engagement with the community in the creation of use of their IRLM (39%)

Merle et al. 2026, *Implement Sci*

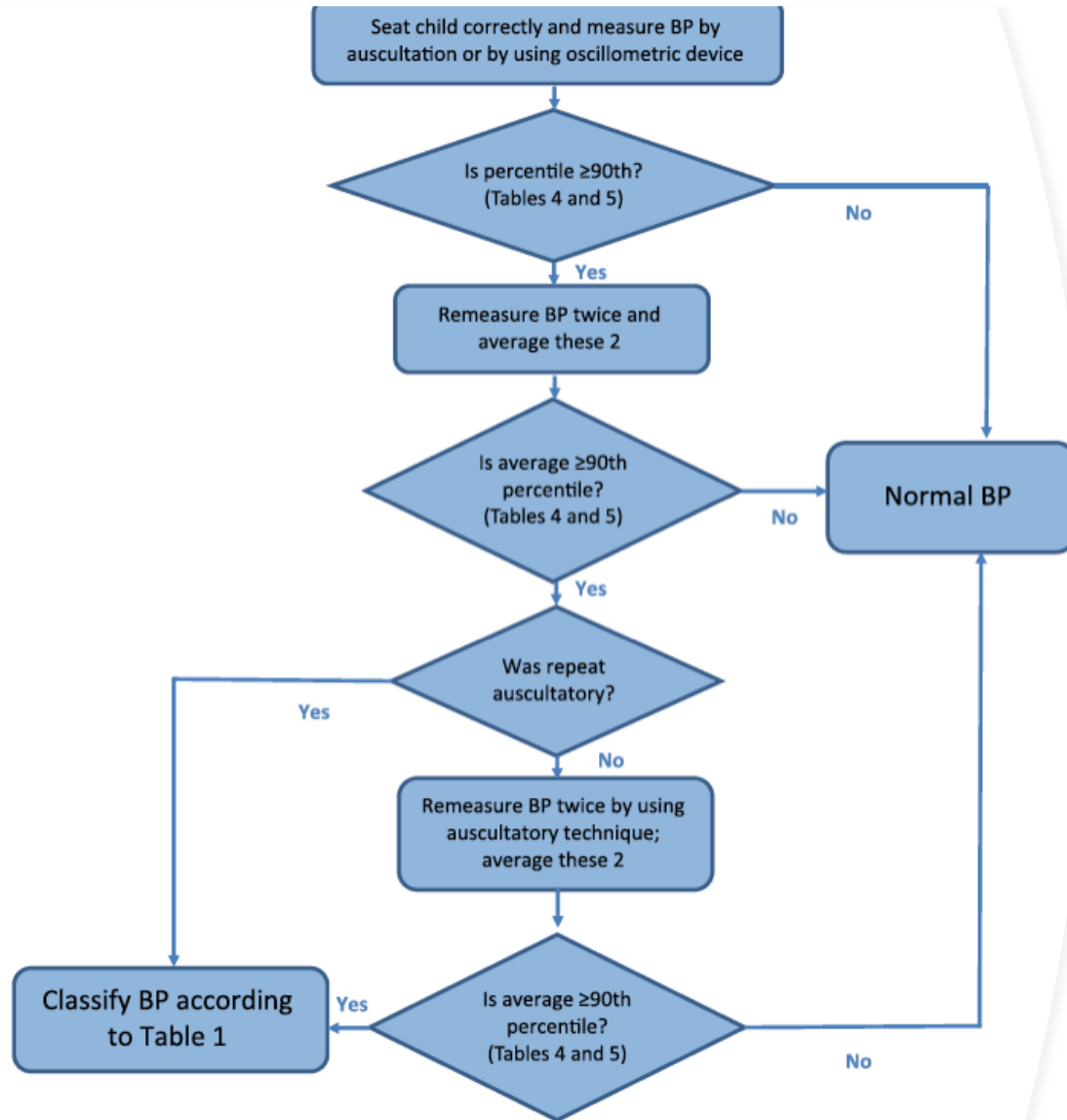


Under-diagnosis of pediatric hypertension (pHTN)

- Estimated population prevalence of pHTN is ~4%
 - 25-50% meeting diagnostic criteria for HTN receive a diagnosis
 - Follow-up care is <50% for those with diagnosis
 - pHTN persists into adulthood and is associated with an increased risk for heart failure/cardiovascular disease when untreated/uncontrolled

* Carroll et al. 2023, *JAMA Netw*

American Academy of Pediatrics (AAP) 2017 Clinical Practice Guidelines for Pediatric Hypertension



- 30 Key Action Statements + 27 Additional Consensus Opinion Recommendations
- 3-page document
 - Difficult to follow
 - Referencing multiple tables

Flynn et al., 2017, *Pediatrics*

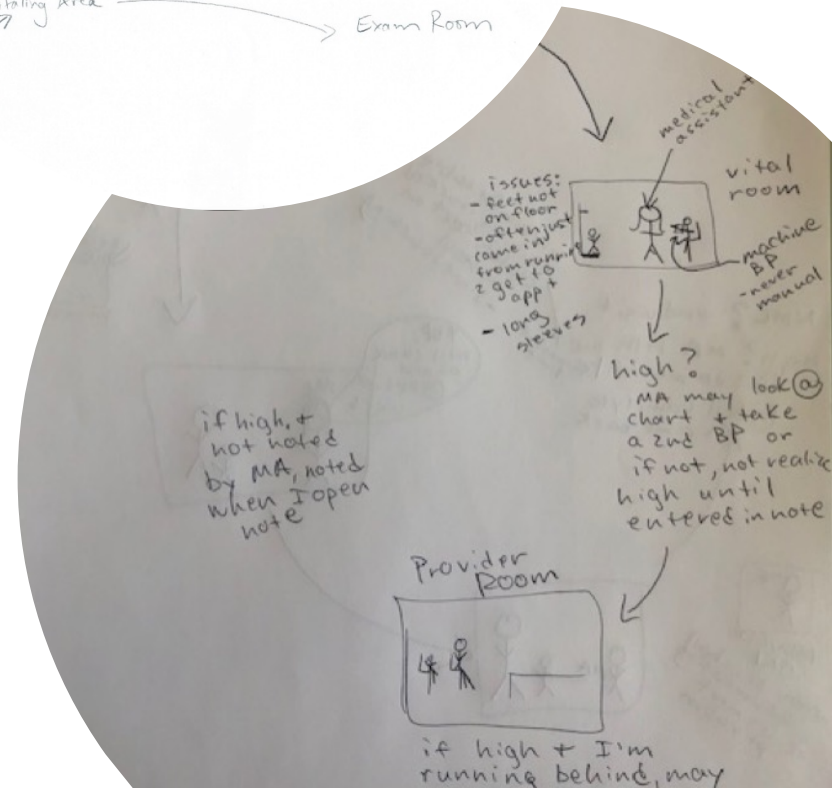
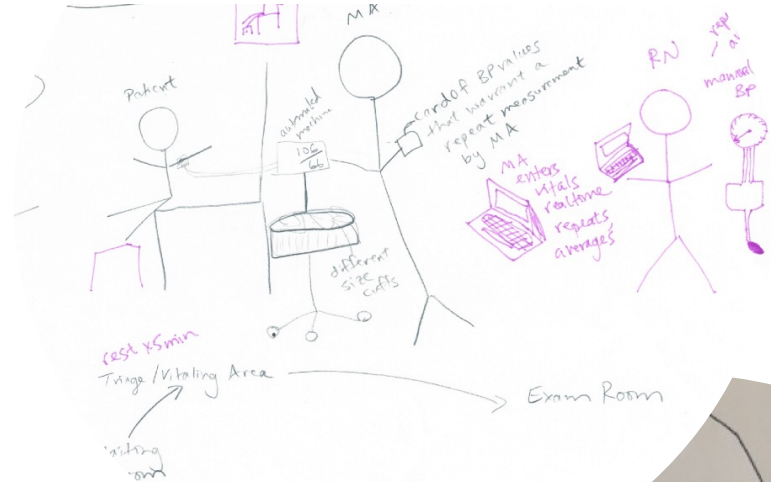


Implementation of the AAP Pediatric Hypertension Guidelines in Urban Community Health Centers



Step 1: Design Workshops

- Three Patient Workflows:
 - Vitals (BP measurement)
 - Provider-Patient Encounter (when BP is elevated)
 - End-of-visit Summary and Treatment Plan (for child with pHTN)



Determinants & Strategies identified through Rapid Qualitative Analysis of Journey Mapping

• Barriers

- Poor adherence to CPG
- BP measurement technique
- Equipment and clinic structure/layout limitations
- MAs/nurses not aware of elevated BP values
- Communication between MA/nurse and provider
- Providers do not trust BP values
- Limited time for BP repeats
- Poor patient f/u
- Patients no-show/cancel
- Provider responsible for ensuring f/u
- Limited continuity of care
- Inconsistent use of diagnosis codes
- Coordination/consults for pHTN
- Patient/family not invested in health
- Lack of buy-in from clinic/organization
- Time to set up Population Health Tool
- Person to set up population health tool
- Providers have limited time

• Strategies

- Staff training
- Provider training
- Workflow changes
- Staffing changes / task shifting
- Visual reminders/guides/materials
- Population health tool
- HIT solutions/features
- HIT / data staff
- Leadership support
- Financial support (incentives, equipment)

Steps 3-4: Barriers x Potential Strategies

STRATEGIES

BARRIERS	IDENTIFIED BARRIER
	Poor adherence to CPG for pediatric HTN (Guidelines are lengthy and confusing)
	BP measurement technique (Providers do not trust BP measurements/values)
	Equipment and clinic structure/layout limitations
	MA's/nurses not aware of elevated BP values
	Limited time for BP repeats and during patient encounters

Steps 3-4: Barriers x Potential Strategies

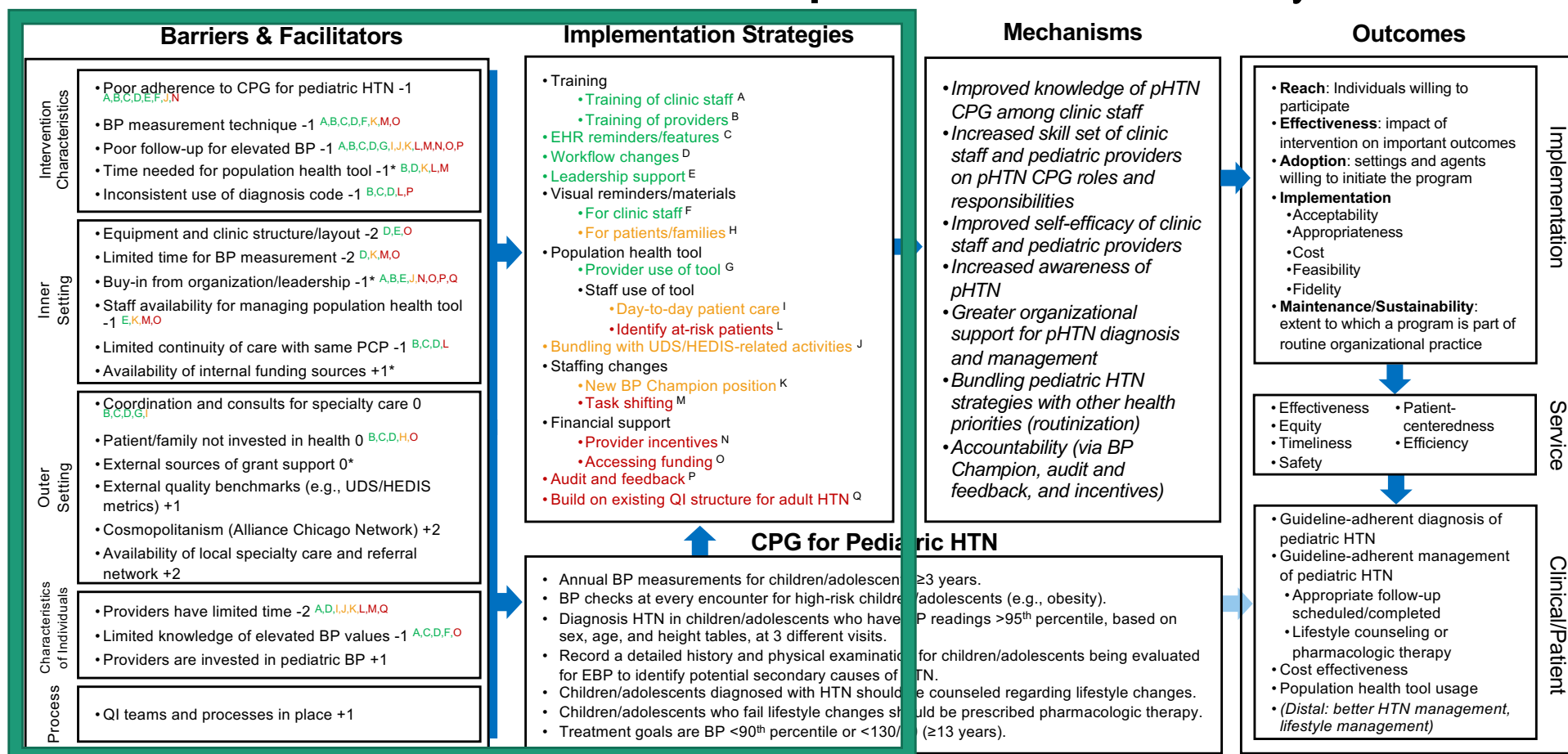
IDENTIFIED BARRIER	Potential solutions (Implementation strategies)										
	Staff training	Provider training	Audit & Feedback	Workflow changes	Staffing changes/ task shifting	HIT/ data staff	Visual reminders/ guides/ materials (non-digital)	HIT solutions/ features	Population Builder (population health tool)	Leadership support (for pediatric HTN as priority)	Financial support/ incentives/equipment
BP measurement technique (Providers do not trust BP measurements/values)	Training/education for MAs/nurses in 1) measurement technique (more frequent due to high turnover) and 2) appropriate context	Training in appropriate techniques for measuring in child/adolescent		Spot-check of MAs/nurses for BP accuracy Select primary BP values	Designated BP champion Designated provider/staff member to do follow-up BP checks		Infographic/poster with appropriate techniques visualized located in vitals area (in view of parents)	provide context for measurement (e.g., pain scores, patient disposition) Select primary BP values			Funding for position (BP checker, BP champion) and/or training

Step 6: Modified Delphi

Clinical partner survey

- Determinants:
 - -2 = strong, negative impact on implementation (strong barrier)
 - -1
 - 0
 - +1
 - +2 = strong, positive impact on implementation (strong facilitator)
 - Strategies:
 - Effectiveness (1 to 4)
 - Feasibility (1 to 4)
 - Priority (1 to 4)
-  Tier 1 = High priority, high effectiveness, higher feasibility
Tier 2 = Moderate priority, moderate effectiveness, moderate feasibility
Tier 3 = Lower priority, moderate effectiveness, low feasibility

IRLM for Pediatric HTN Guideline Implementation in Primary Care



Notes. *Significant variation between clinics. **Tier 1** = High priority, high effectiveness, higher feasibility; **Tier 2** = Moderate priority, moderate effectiveness, moderate feasibility; **Tier 3** = Lower priority, moderate effectiveness, low feasibility. IRLM is incomplete per the guidelines of Smith, Li, & Rafferty (2020); depiction is accurate to the progress made with the Stakeholder Advisory Panel (SAP) to this stage of the project, as described in this article.

* Knapp et al. 2022, *Implement Sci Comm*

Adapted Versions of the Method

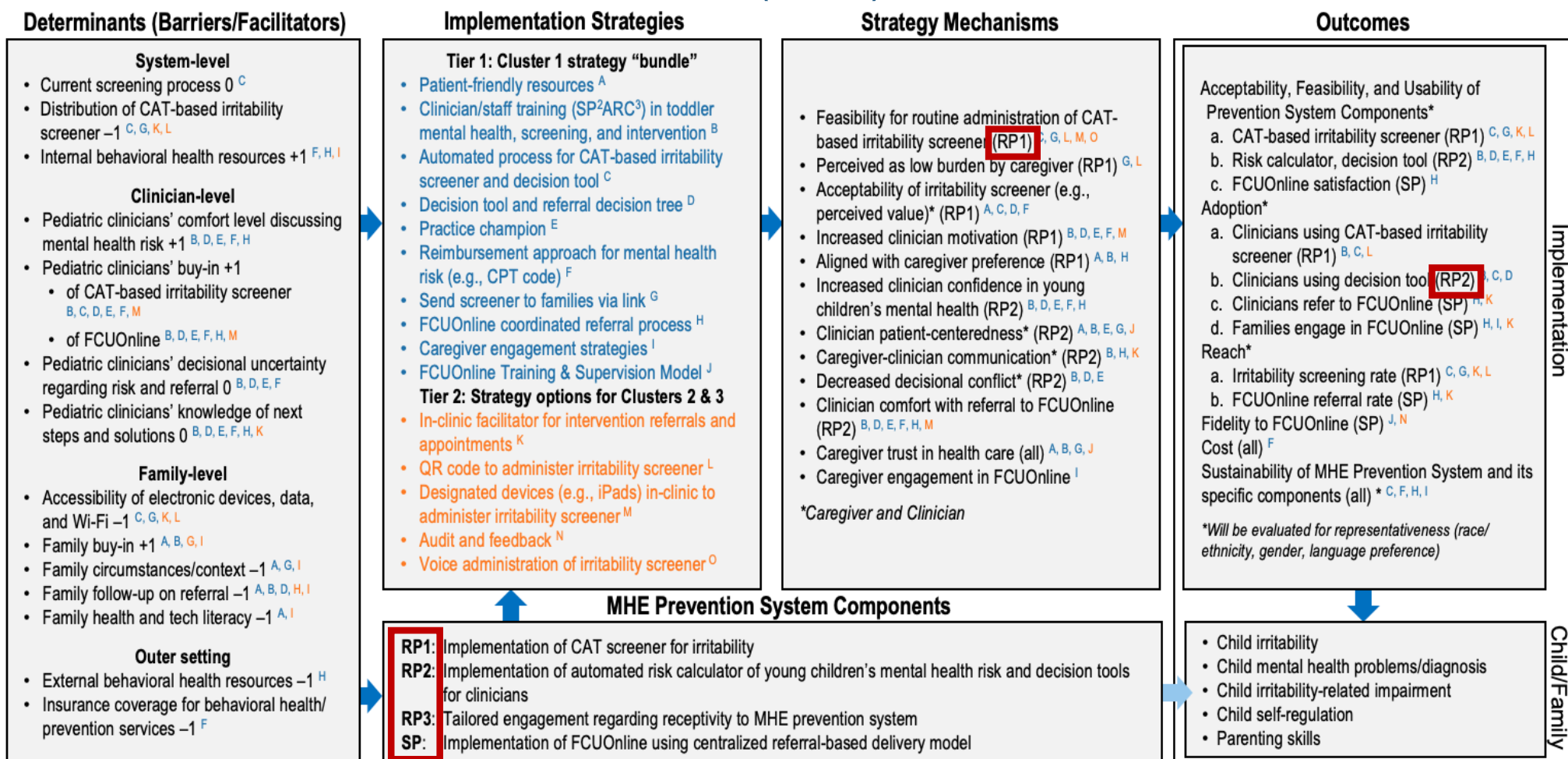
Carroll et al. 2024, *Families, Systems, and Health*

- Focused on toddler social-emotional screening and referral in pediatrics
- Same core method but shortened to 3 sessions / ~4 hours.
- Added usability testing of the electronic screening tool
- Added explicit health equity probes and equity considerations during strategy specification
- Produced 16 determinants and 14 strategies

Sanuade et al. 2026, *Implement Sci Comm*

- Applied the method to hypertension control in Ghanaian primary healthcare centers.
- Expanded stakeholder base: patients, providers, policymakers, community leaders
- 5 meetings / ~13 hours over 9 months.
- Engaged the work group in selecting and prioritizing implementation outcomes
- Produced 45 determinants and 29 strategies

IRLM for the Mental Health, Earlier (MHE) Center



NIH/NIMH P50132503 to Smith & Wakschlag, * Carroll et al. 2024, *Families, Systems, & Health*

Common Challenges (and a tip or two)

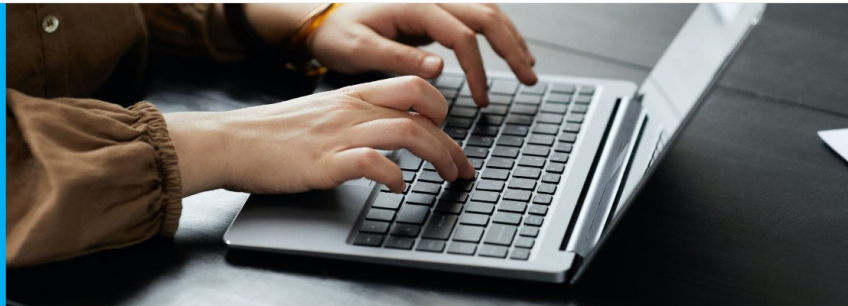
- Differentiating strategies from THE THING
 - Sometimes THE THING involves strategies 🤔
 - Clearly indicate which is which (differentiate health intervention from strategies – guidance in Smith et al. 2024, *Implement Sci*)
- Conceptual links and Relationships
 - Just throw it all in the boxes 🧠 😞
 - CoSMOs linking in **only 14%!** (* Merle et al. under review)
- Consider indicating strategies at multiple levels, bundles, phase of deployment, outcome target, etc.
- EVERYONE struggles with mechanisms
 - Resources coming thanks to Rebecca and Rosemary 😊

IRLM in Grant Proposals?

- Purposes
 - Way of organizing and visually displaying the many components of often complex studies
 - Place to present preliminary data and pilot work findings
 - Organizing theory (generalized theory of IR - CoSMOs)
- Considerations
 - Non-IS reviewers – might be too much?
 - A picture (might be) worth a thousand words
 - Worth next to nothing if not done well and not properly presented/integrated
 - Can always describe how IRLM has been or will be used without including the IRLM figure itself
 - Be sure the IRLM is integrated throughout the proposal if you include it
 - Comprehensive or abbreviated
 - If not comprehensive, be sure to note this for reviewers!

Interactive Web-Based IRLM Tool!

Implementation Research Logic Model



The Implementation Research Logic Model (IRLM) is an organizing tool developed to improve the specification, rigor, reproducibility, and transparency of implementation research projects of various study designs and at various stages of research. The IRLM is a required component of the FY2020 1- and 2-year Ending the HIV Epidemic ARC/CFAR supplement announcement. To assist you in developing an IRLM for your project, we've curated a number of tools and resources here.

Templates and Guides

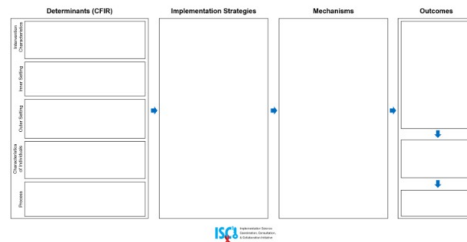
Templates

- Fillable PDF (standard format)
- Blank PPTs (various formats; updated 4/15/2020)

Worksheets

- IRLM Guide and Example (updated 3/27/20)
- IRLM Worksheet - Outcomes (updated 3/30/20)
- IRLM Worksheet - Determinants (updated 3/30/20)
- IRLM Worksheet - Strategies (updated 3/30/20)

Logic Model for Implementation Research



HIV Implementation Science
Coordination Initiative

<https://hivimpsci.northwestern.edu/implementation-research-logic-model/>



Thank you!

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