Implementation science models, methods, and strategies for meaningful community engagement in co-creation of culturally responsive public health solutions

Borsika Rabin, PharmD, PhD, MPH & Nicole Stadnick, PhD, MPH
University of California San Diego
ACTRI Dissemination and Implementation Science Center
1. Provide an overview of implementation science models, methods, and strategies to meaningfully engage community partners in the co-creation of culturally responsive public health solutions.

2. Present a case study from two public health implementation studies among underserved communities in San Diego using innovative study designs.
OUR PARTNERS

• The Global Action Research Center: Non-profit, social change organization committed to environmental, social, and health justice

• San Ysidro Health: Second largest Federally Qualified Health Center in San Diego County

• University of California San Diego: Researchers spanning across fields of public health, implementation science, health equity, child and maternal health, clinical psychology, data science, infectious disease
PRACTICAL, ROBUST IMPLEMENTATION AND SUSTAINABILITY MODEL

CO-CREATE/EX
Community-driven optimization of COVID-19 testing to reach and engage underserved areas for testing equity
• Overarching goal: To co-create a sustainable, community-engaged COVID-19 testing program that is flexible to address emerging public health guidance/priorities.

• Phase 1-2 (CO-CREATE)—completed
  • Prospective, non-randomized intervention (co-created testing program) design offered at 1 clinic
  • Primarily Latino/a/x, Spanish-speaking community near the US-Mexico border
  • >24,000 tests performed (>13,000 unique participants)
  • Trusted sources of public health information and social determinants of health were significant contributors
  • Top reasons for testing: getting early treatment; knowing I will not spread COVID-19 to friends, family and others

Salgin et al, 2023; Lomeli et al, 2023; Stadnick et al., 2022
CO-CREATE-EX STUDY AIMS

To refine strategies and outcome metrics for COVID-19 testing.

To evaluate the impact of co-created strategies to optimize COVID-19 testing among underserved communities in San Diego.
• Phase III (CO-CREATE-Ex)—ongoing
  • Roll-out optimization implementation (ROIO) of 3 strategies across 4 clinics
    1. Phase 1 walk-up testing
    2. Vend-a-kit (self-service vending machines)
    3. Promotora-guided health counseling

• 3 strategies prioritized using implementation mapping with the study’s Community and Scientific Advisory Board

Funding: U01MD018308-01
COMMUNITY AND SCIENTIFIC ADVISORY BOARD

• 13 members who are:
  • Patient advocates
  • Clinical staff and administrators
  • Public health researchers
  • Policy partners
  • County Public Health Department ambassador

• Meet every 2-3 months
• Guided by Appreciative Inquiry, facilitated by the Global ARC
• Members are compensated $100 for each meeting
Community-engaged optimization of COVID-19 rapid evaluation and testing experiences: roll-out implementation optimization trial

Nicole A. Stadnick1,2,3*, Louise C. Laurent4, Kelli L. Cain5, Marva Seifert6, Maria Linda Burola4, Linda Salgin7,8, Paul Watson9, William Oswald9, Fatima A. Munoz7, Sharon F. Velasquez7, Justin D. Smith10, Jingjing Zou5 and Borsika A. Rabin1,5
## CLINIC SITES

Table 1. Clinic Characteristics (3/21-3/22)

<table>
<thead>
<tr>
<th>Clinic Site</th>
<th>San Ysidro 92173</th>
<th>Chula Vista 91911</th>
<th>Lincoln Park 92114</th>
<th>Logan Heights 92113</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total # Patients</strong></td>
<td>18,124</td>
<td>20,102</td>
<td>8,328</td>
<td>8,120</td>
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<tr>
<td><strong>Patient Race/Ethnicity</strong></td>
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</tr>
<tr>
<td>Latino</td>
<td>91.6%</td>
<td>79.0%</td>
<td>61.2%</td>
<td>74.3%</td>
</tr>
<tr>
<td>Black</td>
<td>1.3%</td>
<td>3.0%</td>
<td>16.9%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Asian</td>
<td>1.5%</td>
<td>4.7%</td>
<td>4.7%</td>
<td>2.2%</td>
</tr>
<tr>
<td>White</td>
<td>14.4%</td>
<td>15.0%</td>
<td>29.4%</td>
<td>15.3%</td>
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<tr>
<td><strong>Patient Preferred Language</strong></td>
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</tr>
<tr>
<td>Spanish</td>
<td>70.1%</td>
<td>56.7%</td>
<td>36.0%</td>
<td>48.8%</td>
</tr>
</tbody>
</table>

**Adult Preventive Health Services (% of “active” patients who completed a medical visit and had a preventive health service in the past 18 months)**

<table>
<thead>
<tr>
<th>Service</th>
<th>San Ysidro 92173</th>
<th>Chula Vista 91911</th>
<th>Lincoln Park 92114</th>
<th>Logan Heights 92113</th>
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</thead>
<tbody>
<tr>
<td>Blood Pressure Screening</td>
<td>55.4%</td>
<td>62.3%</td>
<td>58.2%</td>
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<tr>
<td>HbA1c Screening</td>
<td>78.9%</td>
<td>79.3%</td>
<td>72.8%</td>
<td>81.6%</td>
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<tr>
<td>Flu Immunization</td>
<td>25.0%</td>
<td>15.5%</td>
<td>16.2%</td>
<td>24.9%</td>
</tr>
<tr>
<td>COVID-19 Cases/100,000 (2/20-4/22)</td>
<td>48,219</td>
<td>31,623</td>
<td>34,209</td>
<td>35,716</td>
</tr>
<tr>
<td>RATs distributed since 1/22</td>
<td>785 (M=196/month)</td>
<td>499 (M=125/month)</td>
<td>244 (M=61/month)</td>
<td>192 (M=48/month)</td>
</tr>
</tbody>
</table>
Figure 1: CO-CREATE-Ex participatory (Aim 1) and ROIO (Aim 2) design and timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>1-3</th>
<th>4-6</th>
<th>7</th>
<th>8-10</th>
<th>11</th>
<th>12-14</th>
<th>15</th>
<th>16-18</th>
<th>19-21</th>
<th>22-24</th>
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<tbody>
<tr>
<td>Months</td>
<td>Clinic 1</td>
<td>ROLL OUT STRATEGY 2 &amp; 3</td>
<td>CONTINUE STRATEGY 2 (LOW INTENSITY) &amp; STRATEGY 3</td>
<td>STRATEGY 1: ONSITE WALK-UP CLINIC (REDUCED INTENSITY STARTING 4-6 MONTHS)</td>
<td>DATA ANALYSIS and DISSEMINATION TO COMMUNITY AND SCIENTIFIC AUDIENCES</td>
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<tr>
<td></td>
<td>Clinic 2</td>
<td>PREPARE FOR CLINIC 2 IMPLEMENTATION</td>
<td>ROLL OUT STRATEGY 2 &amp; 3</td>
<td>CONTINUE STRATEGY 2 (LOW INTENSITY) &amp; STRATEGY 3</td>
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<td></td>
<td>Clinic 3</td>
<td>PREPARE FOR CLINIC 3 IMPLEMENTATION</td>
<td>ROLL OUT STRATEGY 2 &amp; 3</td>
<td>CONTINUE STRATEGY 2 (LOW INTENSITY) &amp; STRATEGY 3</td>
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<td>Clinic 4</td>
<td>PREPARE FOR CLINIC 4 IMPLEMENTATION</td>
<td>ROLL OUT STRATEGY 2 &amp; 3</td>
<td>CONTINUE STRATEGY 2 (LOW INTENSITY) &amp; STRATEGY 3</td>
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**Strategies:**
- **Strategy 1:** Current, walk-up testing protocol
- **Strategy 2:** Promotora led testing navigation and general preventive care reminders
- **Strategy 3:** No cost self-testing kit vending machines

- PRISM Fit Assessment with SYH operational leader, clinic providers/staff, and promotore
- Patient/community member and provider/staff interviews
- Initiate ongoing data collection on testing strategies (promotore database, REDCap database, vending machine log)
- Periodic reflections with promotores, medical assistant, and onsite testing staff
ROIO IN THE WILD

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<tr>
<td>Promoters (high)</td>
<td>Walk-up</td>
<td>Promoters (low)</td>
<td>Vend-a-Kit (high)</td>
<td>Promoters (low)</td>
<td>Vend-a-Kit (high)</td>
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Clinic 2

Clinic 3

Clinic 4

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Clinic 4

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<tr>
<td>Post-Interviews; On-site Periodic Reflections</td>
<td>Post-Interviews; On-site Periodic Reflections</td>
<td>Post-Interviews; On-site Periodic Reflections</td>
<td>Post-Interviews; On-site Periodic Reflections</td>
<td>Post-Interviews; On-site Periodic Reflections</td>
<td>Post-Interviews; On-site Periodic Reflections</td>
<td>Post-Interviews; On-site Periodic Reflections</td>
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Clinic 2

Clinic 3

Clinic 4
CHALLENGES & SALVAGE STRATEGIES

Challenges
1. Randomization of clinics to order of implementation
2. Collecting and using data as co-variates in modeling
3. Understanding how much change is too much change

Salvage Strategies
1. Use analytic techniques to adjust for the lack of random assignment to order of implementation
2. Expanded data collection and developed a barrier inventory
3. Explore core functions and forms and prospective collection of adaptation information
WEAVE

Funding: NIMHD R01 MD017222-01A1
Scaling and sustaining COVID-19 vaccination through meaningful community engagement and care coordination for underserved communities: hybrid type 3 effectiveness-implementation sequential multiple assignment randomized trial

Borsika A. Rabin\textsuperscript{1,2}\textsuperscript{*}, Kelli L. Cain\textsuperscript{1}, Paul Watson Jr.\textsuperscript{3}, William Oswald\textsuperscript{3}, Louise C. Laurent\textsuperscript{4}, Audra R. Meadows\textsuperscript{4,5}, Marva Seifert\textsuperscript{5}, Fatima A. Munoz\textsuperscript{6}, Linda Salgin\textsuperscript{6}, Jeannette Aldous\textsuperscript{6}, Edgar A. Diaz\textsuperscript{6}, Miguel Villodas\textsuperscript{7,8}, Santosh Vijaykumar\textsuperscript{9}, Sean T. O’Leary\textsuperscript{10} and Nicole A. Stadnick\textsuperscript{2,8,11}
1. Optimize a multicomponent health program to promote COVID-19 vaccine uptake and engagement in preventive healthcare using our established co-creation approach to address multi-level barriers to vaccine uptake and preventive care engagement.

2. Evaluate the implementation, effectiveness, and sustainment of the multicomponent COVID-19 vaccine and preventive care engagement program using a hybrid type 3 SMART design across communities of color.
• San Ysidro Health Clinics
  • Escondido (Spanish)★★
  • El Cajon (Arabic)★★
  • City Heights (Vietnamese)★★
• Community Advisory Board for each community led by a Cultural Weaver
OVERALL STUDY DESIGN

PRISM Determinants
- Explanatory models of health including vaccine attitudes and care engagement
- Structural and systemic challenges to vaccine uptake and preventive care engagement
- COVID-19 vaccines; Healthy People 2030 goals on vaccination and preventive care practices
- Underserved, multicultural FQHC communities located in Community Heights, El Cajon, Escondido

(Multicomponent Health Program)
1. Cultural Weaver-led Co-creation
2. mHealth Outreach
3. Care Coordination

Mechanisms
- Increased vaccine confidence and acceptance
- Increased intention to engage in preventive care
- Increased service navigation support

PRISM Outcomes
- Implementation:
  - Reach
  - Adoption
  - Implementation
  - Maintenance
- Clinical:
  - Increased COVID-19 Vaccine Completion
  - Increased Engagement in Preventive Health Services
# Preventive Health Behaviors and Recommendations

<table>
<thead>
<tr>
<th>Flu Vaccine</th>
<th>COVID Vaccine</th>
<th>Colorectal Cancer Screening</th>
<th>Depression</th>
<th>Mammogram</th>
<th>Cervical Cancer Screening (Pap test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended for:</td>
<td>All, vaccinated in last 12 months</td>
<td>All, received both doses plus booster</td>
<td>45-75 years, received screening in last 12 months, or a colonoscopy in the last 10 years</td>
<td>18+ years, received screening in last 12 months</td>
<td>50-74 years, received every 2 years [FEMALE ONLY]</td>
</tr>
</tbody>
</table>
MEET OUR WEAVERS!

**Men Nguyen**
- 14 years working as an ESL lecturer and interpreter in Vietnam and 7 years working as an RA at Texas Tech.
- M.A. in English linguistics (Vietnam National University) and PhD in Curriculum and Instruction for ESL (Texas Tech).
- Loves working for the Vietnamese community development and has a great passion for work related to education, research, communication, and interpretation.

**Zainab Altemimi**
- Mother of three who is very active in her El Cajon community.
- Worked with the Islamic Center of San Diego-East County and volunteered with Somali Family Services to help educate and talk to the community about COVID-19 vaccinations.
- Community Health Worker with experience helping her community become educated about vaccines and booster shots.

**Marina Ibarra**
- Community Engagement Coordinator at the Global Action Research Center.
- Serves on the board of directors for Latinos y Latinas En Acción promoting the immigrant vote, filling out immigration forms, providing citizenship classes, and more.
- Long time advocate in her community teaching residents about community organizing, urban gardens, and how to advocate for their children’s education.
Aim 1: Co-Creation Activities

SMS/Voice Message Library
- Co-created health messages in Spanish, Arabic, Vietnamese
- Reviewed and updated monthly to align with public health guidelines

Enrollment of SYH Patients for Aim 2 Trial

One Drive

SMS/Voice Message Programming
- Programmed rules about message selection and frequency of delivery

Ongoing Distribution and Tracking

Salesforce Customer Relationship Management

Message deployment
- # messages sent to participants
- # user engagement with received messages

Message tracking

Twilio Messaging Center

Patient Contact Details

One Drive

Aim 2: Ongoing Distribution and Tracking

- Text and voice messages in priority languages
- Voice messages recorded by the weavers and/or members of the CABs
- Messages will change over time and focus on the missing preventive care behaviors

“Protect your loved ones by getting the COVID-19 vaccine. Proteja a sus seres queridos con vacunarse contra el COVID-19.”

“Remember to ask for your flu shot. Recuerde pedir su vacuna contra la influenza.”
1) Eligibility pre-screening
   - 18+ years of age
   - FQHC clinic patient
   - Have incomplete COVID-19 vaccination series/bivalent booster
   - AND missing at least 1 recommended preventive service based on age and gender
   - Fluent in one of the priority languages (Spanish, Arabic, Vietnamese)

2) Recruitment
   - Eligibility verification and recruitment of 100 individuals per clinic with roughly equal numbers in each language group

3) Consent

4) Baseline Survey
   - Collect cell phone information
   - Paper (self-administered)
   - Online
   - Interview (phone or in person)

5) Stratify by COVID/Preventive Services Risk Score

6) Randomize

---

<table>
<thead>
<tr>
<th>Pre-Randomization</th>
<th>1st Stage Intervention</th>
<th>Intermediate Outcome</th>
<th>2nd Stage Intervention</th>
<th>Sustainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months</td>
<td>4 months</td>
<td>4 months</td>
<td>24 months</td>
<td>1 year</td>
</tr>
</tbody>
</table>

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**SMART DESIGN**

- **mHealth Outreach**
  - 1st Stage Intervention: 4 months
  - Intermediate Outcome: 4 months
  - 2nd Stage Intervention: 24 months
  - Sustainment: 1 year

- **Standard of Care (SOC)**
  - 150 participants
  - 50 per site

- **Not Respond**
  - mHealth Outreach + Care Coordination

- **Respond**
  - mHealth Outreach

- **Not Respond**
  - mHealth Outreach + Care Coordination

- **SOC**

---

**Legend**

- S = Stratification based on risk score
- R = Randomization

**Assessment of New FQHC Standard of Care**

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**Flowchart**

- **mHealth Outreach**
  - n=150
  - n=50 per site

- **Standard of Care (SOC)**
  - n=150
  - n=50 per site

---

**Flowchart Notes**

- **S** = Stratification based on risk score
- **R** = Randomization
# Messaging Format

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Text</strong></td>
<td>Words sent in a text message</td>
</tr>
<tr>
<td><strong>Text (voice)</strong></td>
<td>Voice recording sent in text message</td>
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<tr>
<td><strong>Text (image)</strong></td>
<td>Images sent in text message with no words</td>
</tr>
<tr>
<td><strong>Text (video)</strong></td>
<td>Video message sent through text</td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td>Computer or phone</td>
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</tbody>
</table>
| **Printed materials** | - Emailed  
|                  | - Handed out at clinic or community gathering                              
|                 | - Mailed                                                                    |
CHALLENGES & SALVAGE STRATEGIES

Challenges
1. Prioritizing preventive behaviors; risk and sequelae are not equal
2. Tailoring versus general content for mHealth messages
3. Language and access needs for our distinct communities engaged

Salvage Strategies
1. Consult with clinicians, statisticians, and design experts; no correct answer; weigh pros/cons
2. In development, planning to expand message vehicles and tailor thoughtfully
3. CAB meetings are conducted in non-English language of community’s preference; invested in multilingual translation devices
SUMMARY & DISCUSSION

• Both studies build on meaningful and ongoing community engagement:
  • Partnership with FQHC and community partners
  • Assessment of engagement and ongoing adjustments

• Common IS methodological themes:
  • Use of shared implementation science model
    • Practical, robust implementation and sustainability model
  • Use of designs that allow for iterative adaptations and assignments to accommodate learning and change in context
  • Documentation of adaptations systematically
  • Use of mixed methods approaches to guide adaptations, fit with context, etc
• Key challenges to consider:

  • “Moving at the pace of trust.”

  • Working in multiple languages

  • Incorporating community priorities

  • On the ground changes (e.g., change in EHR system, change in vaccine schedule for COVID-19)

  • Design ideals versus feasibility (e.g., can we randomize sites for starting time, can we wait the exact number of months for the cycle to end, can we collect data)
THANK YOU!

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nstadnic@health.ucsd.edu

Borsika Rabin
barabin@health.ucsd.edu