LESSONS FROM IMPLEMENTATION SCIENCE: KEY TO CURBING THE GLOBAL HIV EPIDEMIC

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Global HIV epidemic

- About 38 million people living with HIV (PLHIV) worldwide
- Out of UNAIDS treatment 90-90-90 goals for 2020:
  - 79% knew status
  - 62% access antiretroviral therapy (ART)
  - 53% virally suppressed
- Prevention? 1.7 million people acquired HIV in the past year
- 940,000 people died from HIV-related illness in last year

Source: UNAIDS epidemiological estimates, 2020 (see https://aidsinfo.unaids.org/); UNAIDS special analysis, 2020
The Population Council conducts biomedical, social science, and public health research. We deliver solutions that lead to more effective policies, programs, and technologies that improve lives around the world.
Definitions of Implementation Science (IS)

- IS as evolving field that includes clinical research but also identifies and addresses barriers to and facilitators of uptake (Bauer & Kirchner 2020).
  - Confronts common challenge of evidence-based intervention not taken/scaled up or when scaled not effective

- Not only to improve program effectiveness / uptake, but also to explain what worked, why, and under what circumstances (Padian et al. 2011).

- Substantial overlap with ‘Operations Research’ which identifies and diagnoses program problems, tests solutions, and promotes research uptake (Fisher & Foreit 2002).

Wide range of study designs/goals

- Diagnostic assessments to highlight specific risk/need
- Formative research to inform intervention design
- Process evaluations to assess who is (and isn’t) being reached with activities
- Intervention/evaluation studies to test program effects and cost-effectiveness, in one or more contexts
Research utilization as hallmark of IS

Key to uptake in programs/policy

- Involvement of stakeholders at all stages of research process
  - E.g., study design; data interpretation workshops
- Fosters champions to promote use of findings
- Maximizes relevance and applicability of findings

http://www.projsoar.org/resources/resource-type/guide-and-tools/
Applied research that acknowledges different stakeholder perspectives

**RESEARCH**
- Controlled
- Empirical
- Objective

**RU**
- Highlights context
- Engages stakeholders
- Supports use of findings
- Builds ownership

**PROGRAM**
- Practical
- Urgent
- Action-Oriented

**POLICY**
- Prioritizing
- Compromising
- Champions
Project SOAR (2014–21)—HIV IS to inform program and policy

70 studies in 21 countries
Focus on HIV risk reduction for adolescent girls/young women and their partners

10 research activities across 7 DREAMS countries
1. Documenting barriers/facilitators of HIV program success

- PLHIV Stigma Index: survey tool to quantify stigma and effects
  - Used for advocacy, inform service delivery
  - Developed by community & administered to PLHIV by PLHIV
  - Examples of stigma: gossip, social exclusion, physical harassment, inadequate/insensitive care

Effects of multiple and intersecting stigmas

Stigma experienced by sex workers in the Dominican Republic (n=216)

- Family members made discriminatory remarks:
  - Due to your selling sex: 32%
  - Due to your HIV status: 34%

- Physically abused:
  - Due to your selling sex: 17%
  - Due to your HIV status: 11%

- Blackmailed:
  - Due to your selling sex: 15%
  - Due to your HIV status: 25%

- Verbally harassed:
  - Due to your selling sex: 12%
  - Due to your HIV status: 27%

Sex workers living with HIV in the Dominican Republic reported stigma in healthcare services significantly more than did other women.

Internalized stigma is common and impactful

Higher internalized stigma was significantly associated (p<0.001) with:

- Greater depression/anxiety (in all 4 countries)
- Lower current ART use (in the DR and Tanzania)

"I am ashamed that I am HIV positive." (example scale item)
Understanding what leads to resiliency

- Factors at individual, interpersonal, and structural levels affect whether PLHIV report resilience

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>FACTOR</th>
<th>CAMBODIA (n=1,207)</th>
<th>DOMINICAN REPUBLIC (n=891)</th>
<th>UGANDA (n=391)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDIVIDUAL</td>
<td>Internalized stigma</td>
<td>-0.28*</td>
<td>-0.31***</td>
<td>-0.41*</td>
</tr>
<tr>
<td>INTERPERSONAL</td>
<td>HIV-related stigma from close family</td>
<td>0.10</td>
<td>-0.73*</td>
<td>-1.44</td>
</tr>
<tr>
<td>STRUCTURAL/ POLICY</td>
<td>Awareness of legal protections for PLHIV in community</td>
<td>1.41***</td>
<td>0.62*</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*p<0.05  **p<0.01  ***p<0.001

Beta coefficients from multivariate models, including controls for sociodemographic characteristics
2. Identifying who to prioritize reaching, where, and with what

- Innovative analysis (latent class analysis) for better identification of sub-groups even within high prevalence contexts
- Segmentation based on multiple characteristics

<table>
<thead>
<tr>
<th>SOCIODEMOGRAPHICS</th>
<th>Schooling status, age, income, geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTITUDES</td>
<td>Beliefs, perspectives</td>
</tr>
<tr>
<td>BEHAVIORS</td>
<td>Risk behaviors, service use/non-use</td>
</tr>
</tbody>
</table>

Nuanced context-specific profiles to inform differentiated programming and evaluation
HIV risk profiles to tailor/target programming (men in South Africa; n=1,846)

- Distinct subgroups/profiles where not all have equal risk
- Risk profiles of older and younger men don’t look the same
  - Differentiated programming

Gender attitudes as major distinguishing factor

Highest-risk group = most gender-inequitable

- Older high risk: 26%
- Younger high risk: 38%
- Younger moderate risk: 25%
- Older low risk: 7%

Endorsement of highly inequitable gender norms
3. Assessing reach of programming

- Do programs identify and recruit most at-risk AGYW?
- Cross sectional surveys with AGYW recruited from DREAMS program rosters and within the community

<table>
<thead>
<tr>
<th>Country</th>
<th>Kenya</th>
<th>Malawi</th>
<th>Zambia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>Kisumu County</td>
<td>Machinga &amp; Zomba Districts</td>
<td>Lusaka &amp; Ndola regions</td>
</tr>
<tr>
<td>Study sites</td>
<td>Urban &amp; peri-urban communities</td>
<td>Rural communities</td>
<td>Urban communities</td>
</tr>
<tr>
<td>Sample size</td>
<td>1,778</td>
<td>1,653*</td>
<td>1,951</td>
</tr>
</tbody>
</table>

*Only recruited from DREAMS rosters
DREAMS package: Combination of “evidence-based” interventions layered in same location

Mobilize Communities for change

Empower Adolescent Girls & Young Women (AGYW) and reduce risk

Reduce risk of Male sexual partners

Strengthen Families

Adapted from: Preventing HIV in Adolescent Girls and Young Women: Guidance for PEPFAR Country Teams on the DREAMS Partnership, March 2015
Many at risk reached but gaps remained

- DREAMS reaching many at-risk AGYW
  - High STI experience
  - Multiple partnerships
  - Experienced sexual violence in the last 12 months

- Some sub-populations of AGYW not as well represented

<table>
<thead>
<tr>
<th></th>
<th>Zambia DREAMS</th>
<th>Zambia Non-DREAMS</th>
<th>Kenya DREAMS</th>
<th>Kenya Non-DREAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>2%</td>
<td>18%</td>
<td>19%</td>
<td>42%</td>
</tr>
<tr>
<td>Sexually active</td>
<td>41%</td>
<td>66%</td>
<td>62%</td>
<td>78%</td>
</tr>
<tr>
<td>Alcohol use before sex</td>
<td>18%</td>
<td>26%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Consistent condom use</td>
<td>24%</td>
<td>12%</td>
<td>16%</td>
<td>9%</td>
</tr>
</tbody>
</table>
4a. Effects of innovative intervention: Improving access to treatment among FSWs

• Reaching key populations with ongoing care/treatment challenging

• Community-based ART promising strategy, but not approved in Tanzania

• Study to test feasibility/acceptability, and effectiveness of bringing HIV treatment to sex workers in community settings (e.g., mobile clinics, brothel-based)
## Methods and sample

Mixed-methods, quasi-experimental prospective cohort design

<table>
<thead>
<tr>
<th></th>
<th>Intervention (Njombe)</th>
<th>Comparison (Mbeya)</th>
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</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td>n=309</td>
<td>n=308</td>
</tr>
<tr>
<td>Interviewed at 6 months</td>
<td>256 (83%)</td>
<td>253 (82%)</td>
</tr>
<tr>
<td>Interviewed at 12 months</td>
<td>265 (86%)</td>
<td>262 (85%)</td>
</tr>
<tr>
<td>Participants interviewed at BOTH 6 &amp; 12 months</td>
<td>246 (80%)</td>
<td>234 (76%)</td>
</tr>
<tr>
<td>Participants who had viral load (VL) taken at:</td>
<td>84% (6 months)</td>
<td>96% (6 months)</td>
</tr>
<tr>
<td></td>
<td>76% (12 months)</td>
<td>87% (12 months)</td>
</tr>
</tbody>
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- Loss to follow-up comparable across both arms
- Good participation in study VL testing
Community-based services successful in reducing HIV treatment barriers

![Bar charts](https://example.com/bar-charts.png)

- **ART initiation**
  - Midline: 72% (Comparison), 100% (Intervention)
  - Endline: 87% (Comparison), 99% (Intervention)

- **ART retention**
  - Midline: 95% (Comparison), 100% (Intervention)
  - Endline: 77% (Comparison), 99% (Intervention)

Government of Tanzania used findings from this study with sex workers to inform national ART guidelines.

4b. Effects of innovative interventions: gender focused community-based programming to improve HIV service use

- At baseline, endorsement of inequitable gender norms associated with lower odds of treatment (ART) use

<table>
<thead>
<tr>
<th></th>
<th>HIV-positive WOMEN (n=122)</th>
<th>HIV-positive MEN (n=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEM Scale (mean score, 23 items)</td>
<td>0.2** (0.1, 0.5)</td>
<td>0.6 (0.1, 3.8)</td>
</tr>
<tr>
<td>Higher=more inequitable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men’s violence and control over women</td>
<td>0.3* (0.1, 1.0)</td>
<td>1.1 (0.2, 5.4)</td>
</tr>
<tr>
<td>Men as decision-maker in a couple</td>
<td>0.2** (0.1, 0.5)</td>
<td>0.3* (0.1, 0.9)</td>
</tr>
<tr>
<td>Men’s toughness and avoidance of help-seeking</td>
<td>0.4* (0.1, 1.0)</td>
<td>0.8 (0.2, 4.1)</td>
</tr>
</tbody>
</table>

*p<0.05  **p<0.01  ***p<0.001; Controlling for age, marital status, education

Population-level shifts in gender norms found

- Cluster randomized controlled trial of Tsima showed large increases in support for equitable gender norms in both intervention and control communities.

Qualitative research suggested shifts were influenced by recent, rapid increase in access to media (satellite TV, smartphones).

Intervention led to decreases in partner violence

- Among women ages 18–29, the intervention was associated with half the odds of IPV
  - Adj. Odds Ratio 0.48 (p<0.05)
- Qualitative findings:
  - Reduced IPV in intervention villages was attributed to couples learning to communicate more constructively through Tsima
  - Broader shifts in norms may have been critical enabler of reduced IPV

*Note that analyses still underway for effects on HIV testing and treatment outcomes.*

*I was not communicating with her...She was always complaining about it, arguing and sometimes I was abusing her physically when she complained, but Tsima has changed that, we always communicate nowadays.*

—Male community member
Concluding thoughts...

• Still notable challenges to address before global and US-based HIV epidemic under control

• Many similar issues put people at risk of HIV and inhibit service use/program success both globally and in the US—e.g., stigma, healthcare access, gender dynamics

• Lessons learned and strategies used globally can be applied in the US
  – E.g., Gender-transformational program for young men in Pittsburgh
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