SAIA-MH
Systems Analysis & Improvement Approach
Mental Health

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Testing **systems strategies** which use real-time **routine health data** to **optimize** the delivery of **integrated mental healthcare** in low-resource settings.

CHALLENGE:
Gaps in Care Cascade Performance

The treatment gap for people with mental disorders exceeded 50% in ALL countries of the world in 2010

CHALLENGE:
Gaps in Care Cascade Performance

小心空隙
Mind the Gap

In countries like Mozambique, treatment gaps often exceed 90%

Source: Patel V et al. (2010). Reducing the treatment gap for mental disorders: a WPA survey. PMCID: PMC2953637.
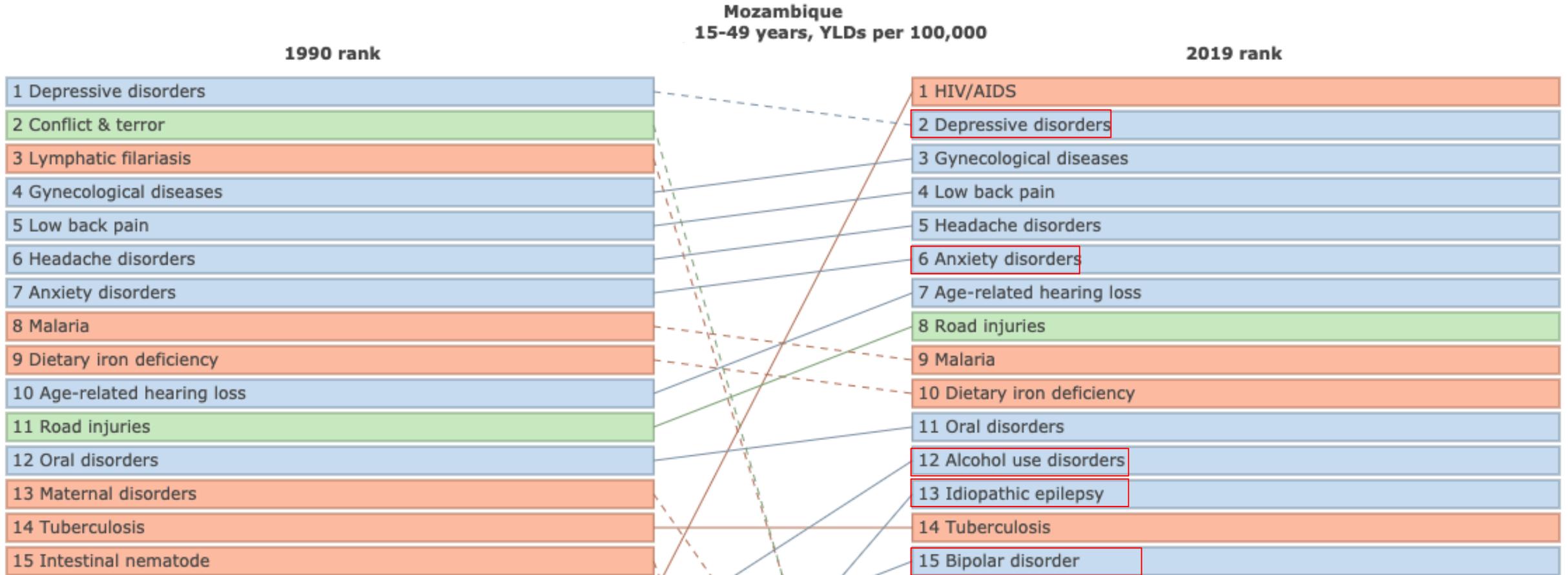
CHALLENGE:
Gaps in Care Cascade Performance

In the United States, where $10k is spent per capita on healthcare, 56% of adults with MI do not receive treatment

78% of severely depressed youth receive no or inadequate treatment

CHALLENGE:
Large mental health burden

Mozambique
15-49 years, YLDs per 100,000

1990 rank	2019 rank
1 Depressive disorders	1 HIV/AIDS
2 Conflict & terror	2 Depressive disorders
3 Lymphatic filariasis	3 Gynecological diseases
4 Gynecological diseases	4 Low back pain
5 Low back pain	5 Headache disorders
6 Headache disorders	6 Anxiety disorders
7 Anxiety disorders	7 Age-related hearing loss
8 Malaria	8 Road injuries
9 Dietary iron deficiency	9 Malaria
10 Age-related hearing loss	10 Dietary iron deficiency
11 Road injuries	11 Oral disorders
12 Oral disorders	12 Alcohol use disorders
13 Maternal disorders	13 Idiopathic epilepsy
14 Tuberculosis	14 Tuberculosis
15 Intestinal nematode	15 Bipolar disorder

- In Mozambique, 5 of the top 15 causes of years lived with disability for those aged 15-49 are mental, neurologic, or substance use disorders

Source: https://vizhub.healthdata.org/gbd-compare/

CHALLENGE:
Lack of trained human resources

30 million Mozambicans

18 Mozambican Psychiatrists = **1 per 1.7 million people**

## 300 Technicians of Psychiatry = **1 per 100,000 people**

HOW TO OVERCOME THE CHALLENGES?

- Field of global mental health has focused on increasing **_access_** to primary mental healthcare, primarily through development and testing of novel task-shifting / task-sharing clinical interventions

- Little to no attention to **_implementation strategies to improve quality_** of MH care delivered by task-shared MH providers with limited training, resources, and supervision across LMICs

HOW TO OVERCOME THE CHALLENGES?
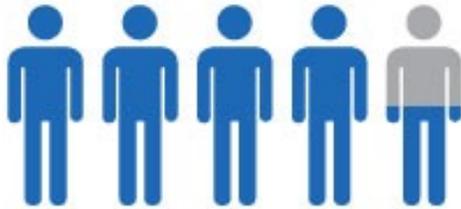
90% OF ALL living with HIV will know their HIV status

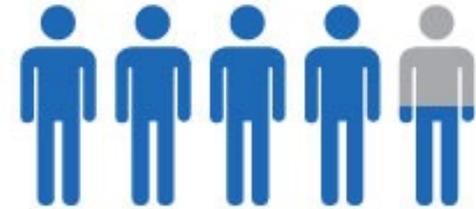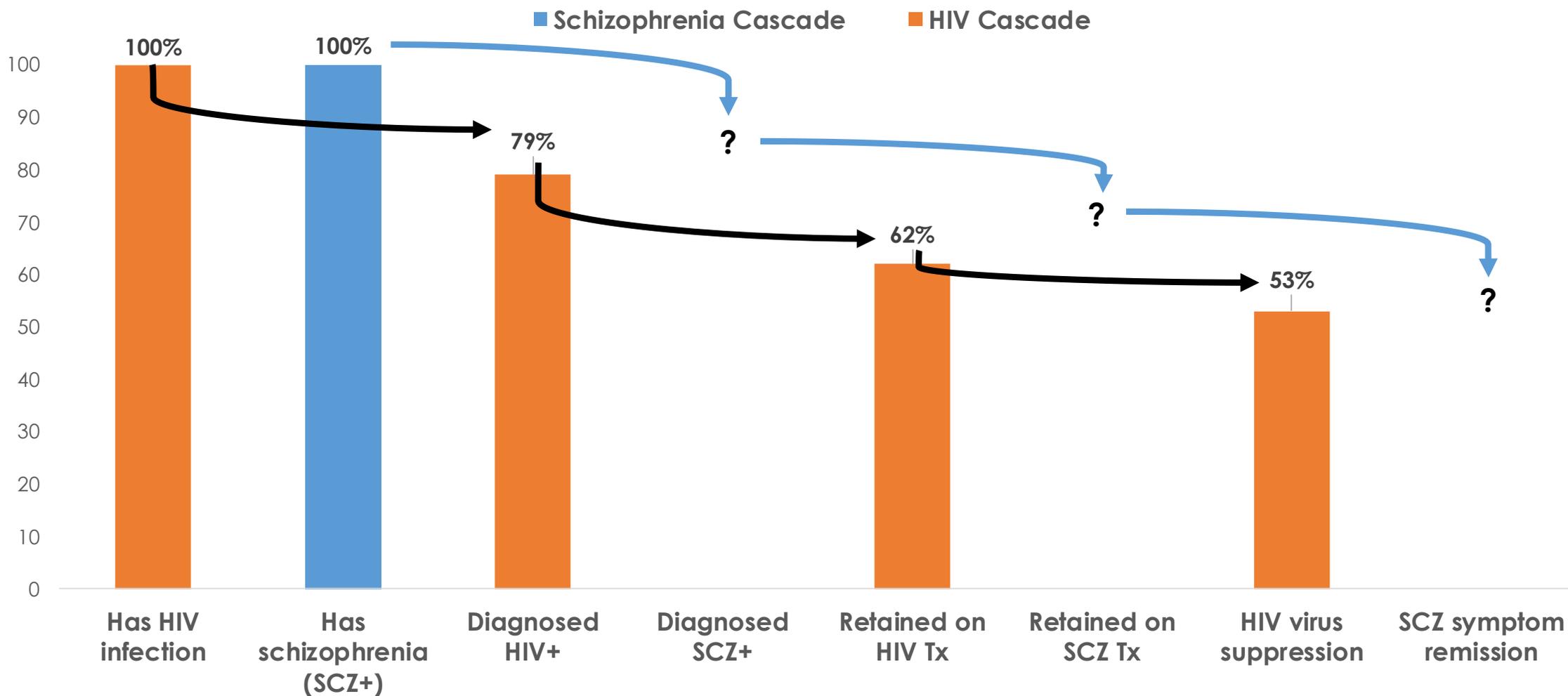90% OF ALL living with HIV will receive sustained antiretroviral therapy

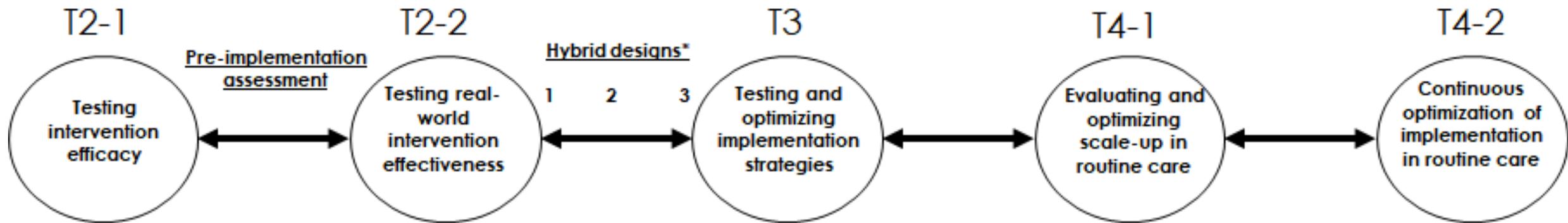90% OF ALL receiving antiretroviral therapy will have durable viral suppression

HOW TO OVERCOME THE CHALLENGES?

Legend: ■ Schizophrenia Cascade ■ HIV Cascade

- Has HIV infection: 100%
- Has schizophrenia (SCZ+): 100%
- Diagnosed HIV+: 79%
- Diagnosed SCZ+: ?
- Retained on HIV Tx: 62%
- Retained on SCZ Tx: ?
- HIV virus suppression: 53%
- SCZ symptom remission: ?

Wagenaar, B.H., Turner, M., Cumbe, VF.J. Towards 90-90-90 goals for global mental health. (2022) *JAMA Psychiatry*.

CHALLENGE:
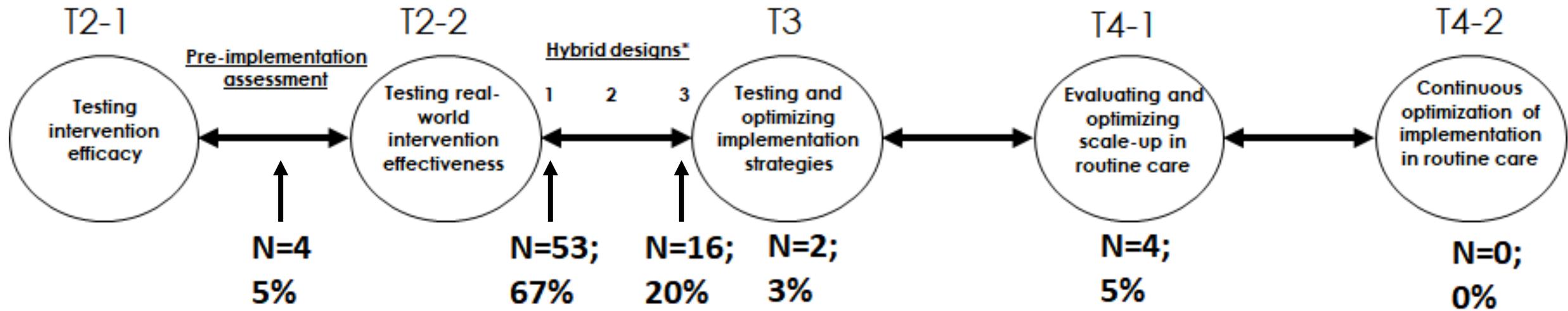## Gaps in Global Mental Health Implementation Science Literature

*Hybrid designs refers to Hybrid Type-1, 2, and 3 effectiveness-implementation designs as proposed by Curran (2012)[43]

Wagenaar, B.H., Hammett, W.H., Jackson, C., Atkins, D., Belus, J.M., Kemp, C.G. (2020). Implementation outcomes and strategies for depression interventions in low-and middle-income countries: A systematic review. *Global Mental Health*. doi: https://doi.org/10.1017/gmh.2020.1.

CHALLENGE:
Gaps in Global Mental Health Implementation Science Literature

Pre-implementation assessment

Hybrid designs*

T2-1	T2-2	T3	T4-1	T4-2
Testing intervention efficacy	Testing real-world intervention effectiveness	Testing and optimizing implementation strategies	Evaluating and optimizing scale-up in routine care	Continuous optimization of implementation in routine care

N=4
5%

N=53;
67%

N=16;
20%

N=2;
3%

N=4;
5%

N=0;
0%

*Hybrid designs refers to Hybrid Type-1, 2, and 3 effectiveness-implementation designs as proposed by Curran (2012)[43]

Wagenaar, B.H., Hammett, W.H., Jackson, C., Atkins, D., Belus, J.M., Kemp, C.G. (2020). Implementation outcomes and strategies for depression interventions in low-and middle-income countries: A systematic review. *Global Mental Health*. doi: https://doi.org/10.1017/gmh.2020.1.

Mozambique context:

- 181/189 countries globally in Human Development Index

- 12% HIV prevalence of adults

- Life expectancy of 60

- $500 GDP per capita (<$2 / day)

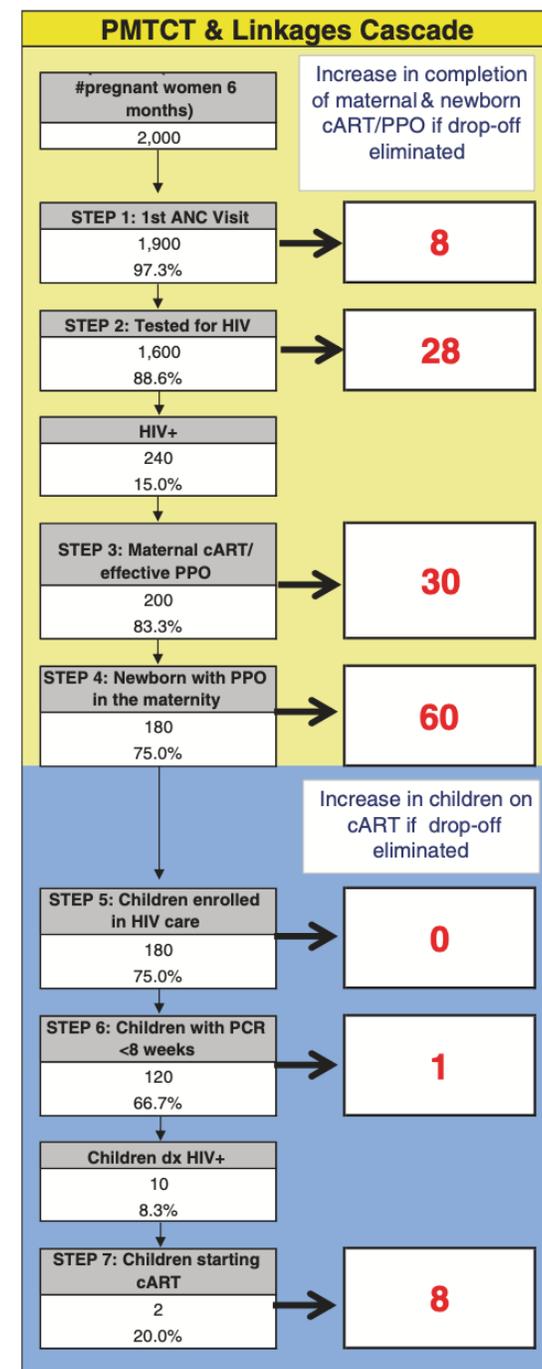- 10% of children die before age 5 in Sofala Province

Adaptation and pilot study: NIMH R21, 2018-2021

Original SAIA-HIV Trial

Systems Analysis and Improvement to Optimize pMTCT: a cluster randomized trial

NICHD R01 2013-2016

- Facility based cRCT across Mozambique, Kenya, Cote-D'Ivoire

- Significant effects on antiretroviral therapy coverage and screening of HIV-exposed infants

PMTCT & Linkages Cascade

Increase in completion of maternal & newborn cART/PPO if drop-off eliminated

Step	Value	%	Increase
#pregnant women 6 months)	2,000		
STEP 1: 1st ANC Visit	1,900	97.3%	8
STEP 2: Tested for HIV	1,600	88.6%	28
HIV+	240	15.0%	
STEP 3: Maternal cART/ effective PPO	200	83.3%	30
STEP 4: Newborn with PPO in the maternity	180	75.0%	60

Increase in children on cART if drop-off eliminated

Step	Value	%	Increase
STEP 5: Children enrolled in HIV care	180	75.0%	0
STEP 6: Children with PCR <8 weeks	120	66.7%	1
Children dx HIV+	10	8.3%	
STEP 7: Children starting cART	2	20.0%	8

Results

SAIA-MH PILOT/DEVELOPMENTAL R21

Objective: Adapt and pilot a multi-component implementation strategy – The Systems Analysis and Improvement Approach (SAIA) – for mental health systems optimization

Design: Pre-post design from September, 2018 – August, 2019 (6 months control; 6 months intervention (6 monthly change cycles)).

Units: All outpatient MH patients in 4 Ministry of Health clinics; total of 810 patients with 3,234 individual outpatient MH visits

Analysis: Clustered GLM assessing odds of achieving cascade steps pre- vs. post-intervention adjusting for patient age and sex

SAIA-MH PILOT/DEVELOPMENTAL R21

SAIA-MH includes:

Step 1: Cascade Analysis

Step 2: Map existing processes

Step 3: Use data to identify and implement system change

Step 4: Assess change effect on cascade

Step 5: Repeat analysis and improvement cycle

Facility-level learning collaboratives
Enhanced local clinical consultation
Facilitation in quality improvement

17
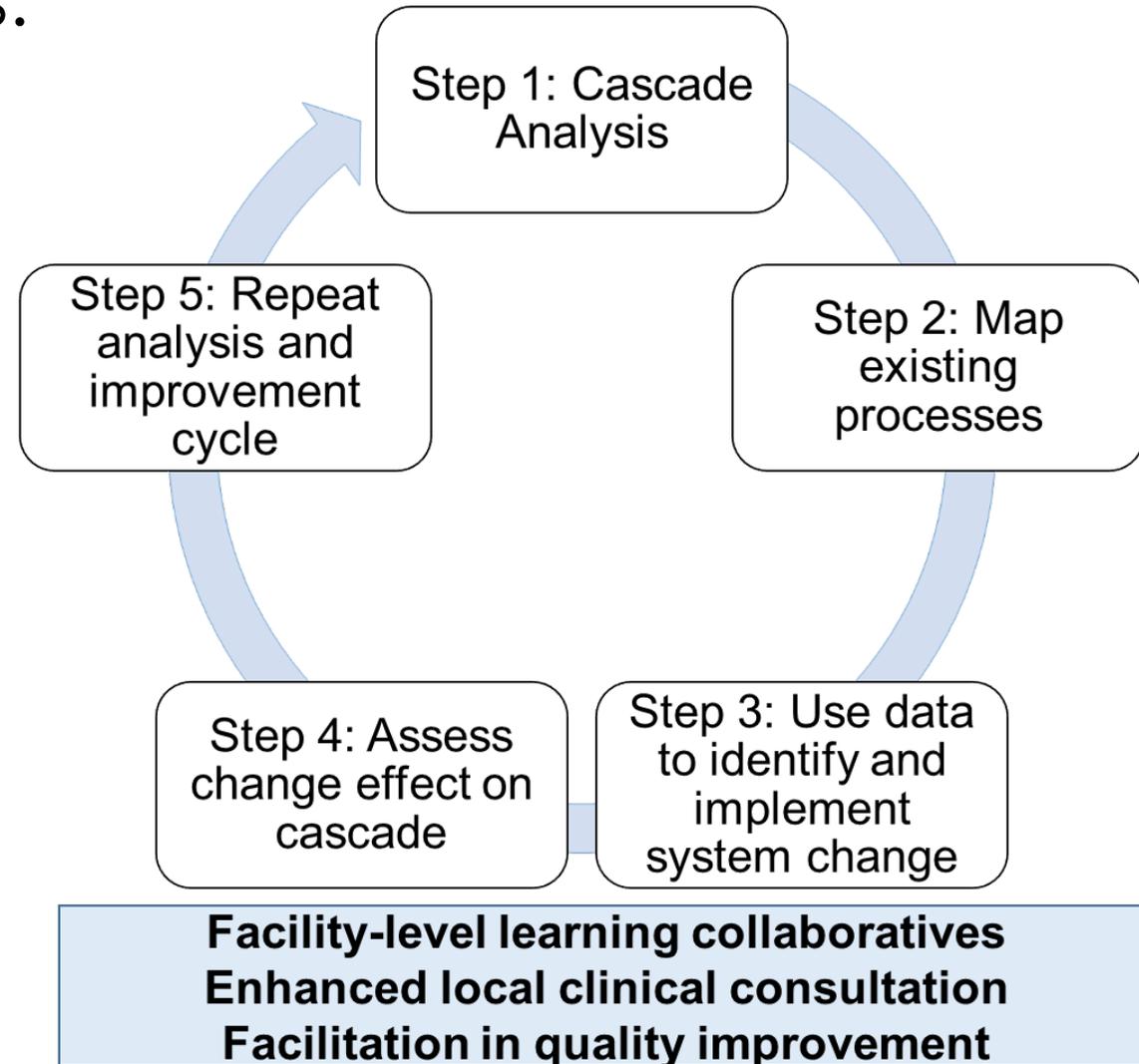
SAIA-MH PILOT/DEVELOPMENTAL R21

SAIA-MH includes:

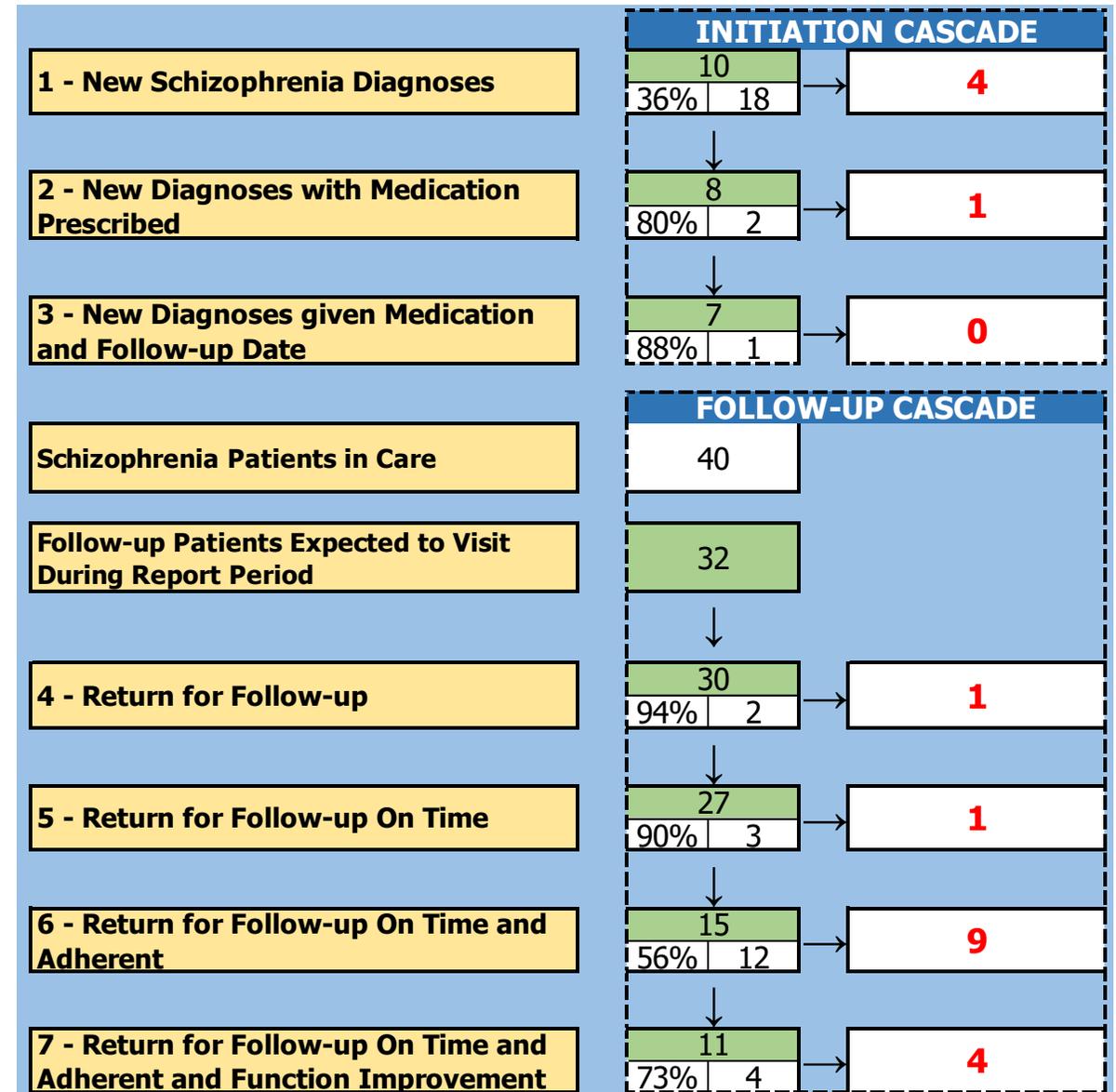| Distinct SAIA-MH Implementation Strategy coded to ERIC	Individual, organizational, or contextual barrier(s) addressed
External facilitation	Lack of knowledge of quality improvement and SAIA-MH implementation strategy
Provide ongoing clinical consultation	Clinical knowledge gaps; gaps in clinical evaluation and reporting
Organize service provider implementation team meetings	Limited teamwork: lower-level providers afraid to innovate without approval; siloing of services and providers; issues with role clarity
Step 1: Cascade analysis (ERIC: Audit and feedback; Model and simulate change; facilitate relay of clinical data to providers)	Lack of knowledge of problems; no data for prioritization; data only collected/reported but limited feedback; limited accountability
Step 2: Process mapping (ERIC: Conduct local needs assessment; assess readiness for change and identify barriers/facilitators; conduct local consensus discussions)	Lack of consensus on current system; limited teamwork; limited discussion on full system, goals, barriers, and facilitators; hard to conceptualize potential modifications
Steps 3–5: Conduct cyclical tests of change (ERIC: Conduct cyclical small tests of change; tailor strategies; develop a formal implementation blueprint; purposely reexamine the implementation)	Limited culture of quality; providers rigidly follow guidelines with no ability to innovate and improve

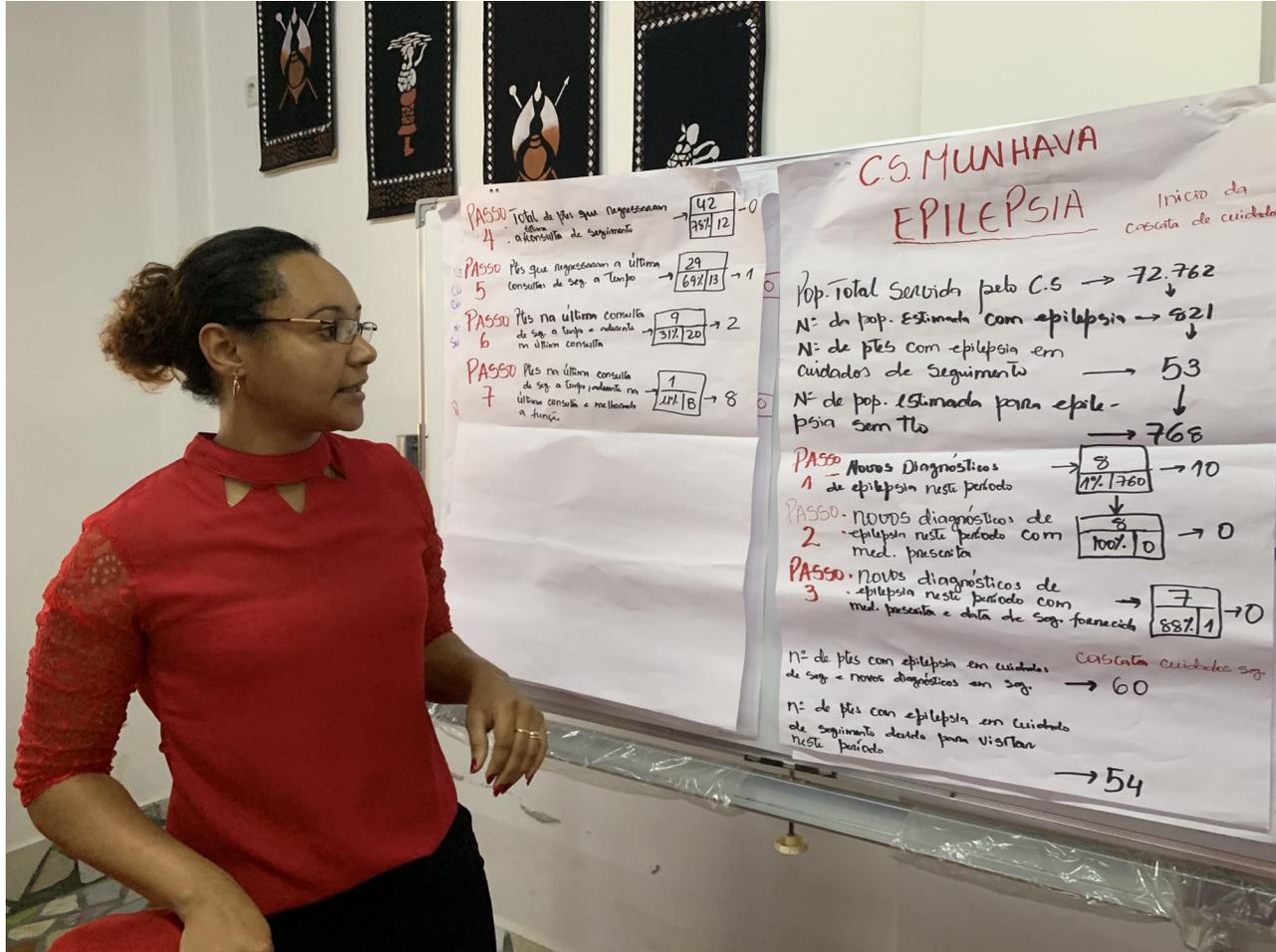# SAIA-MH PILOT/DEVELOPMENTAL R21
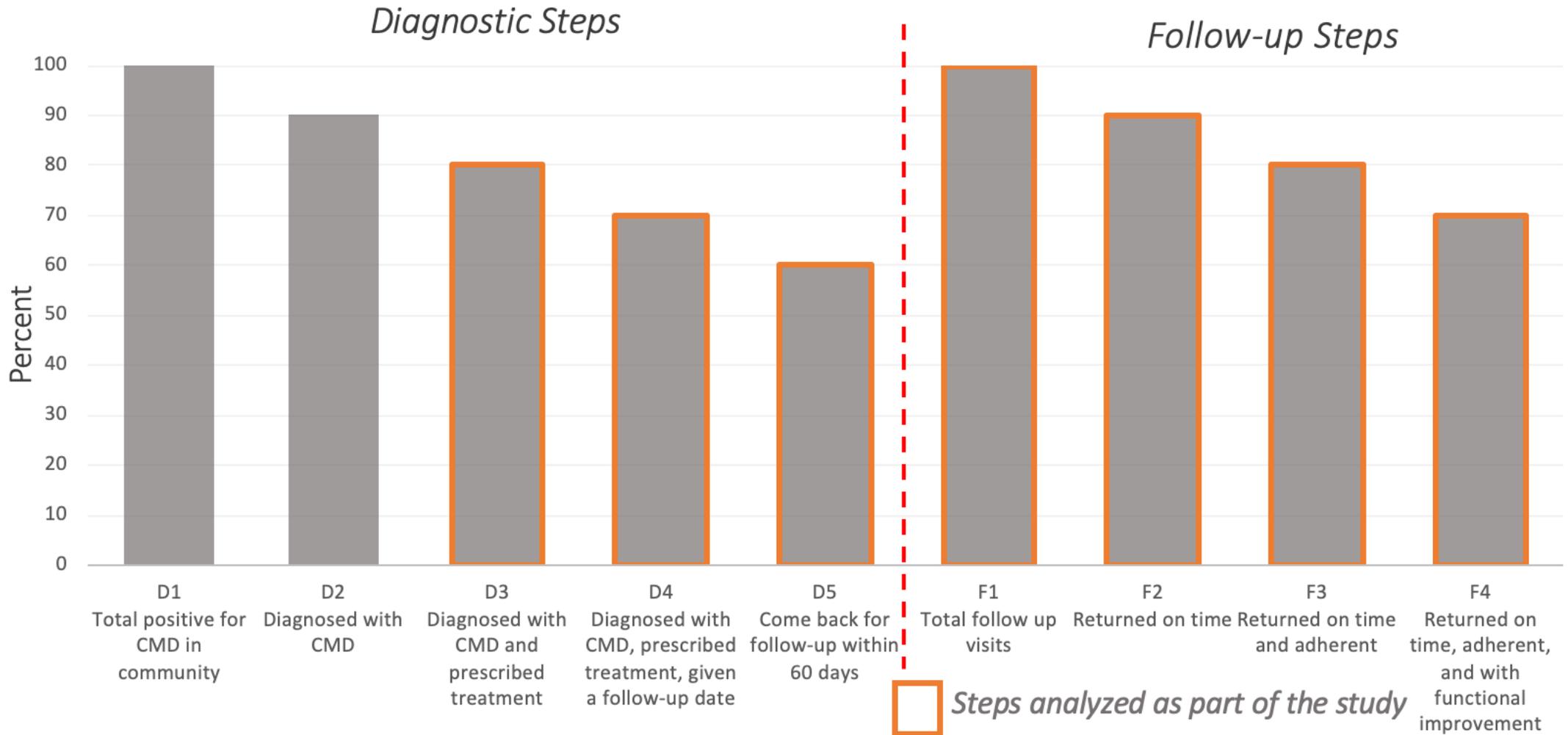
SAIA-MH PILOT/DEVELOPMENTAL R21

Step 1: Describe MH cascade performance and identify priority areas for improvement

- MH Cascade Analysis Tool (MHCAT) provides a 'systems view' of the sequential, linked MH cascade steps
- Guides targeting and evaluation of improvement efforts

INITIATION CASCADE

1 - New Schizophrenia Diagnoses	10 / 36% 18	→	4
2 - New Diagnoses with Medication Prescribed	8 / 80% 2	→	1
3 - New Diagnoses given Medication and Follow-up Date	7 / 88% 1	→	0

FOLLOW-UP CASCADE

Schizophrenia Patients in Care	40		
Follow-up Patients Expected to Visit During Report Period	32		
4 - Return for Follow-up	30 / 94% 2	→	1
5 - Return for Follow-up On Time	27 / 90% 3	→	1
6 - Return for Follow-up On Time and Adherent	15 / 56% 12	→	9
7 - Return for Follow-up On Time and Adherent and Function Improvement	11 / 73% 4	→	4

SAIA-MH PILOT/DEVELOPMENTAL R21

SAIA-MH PILOT/DEVELOPMENTAL R21

Step 2: Process Mapping

A method for health care teams to jointly describe their facility's patient care pathway
- Builds common understanding
- Improved communication/ problem solving
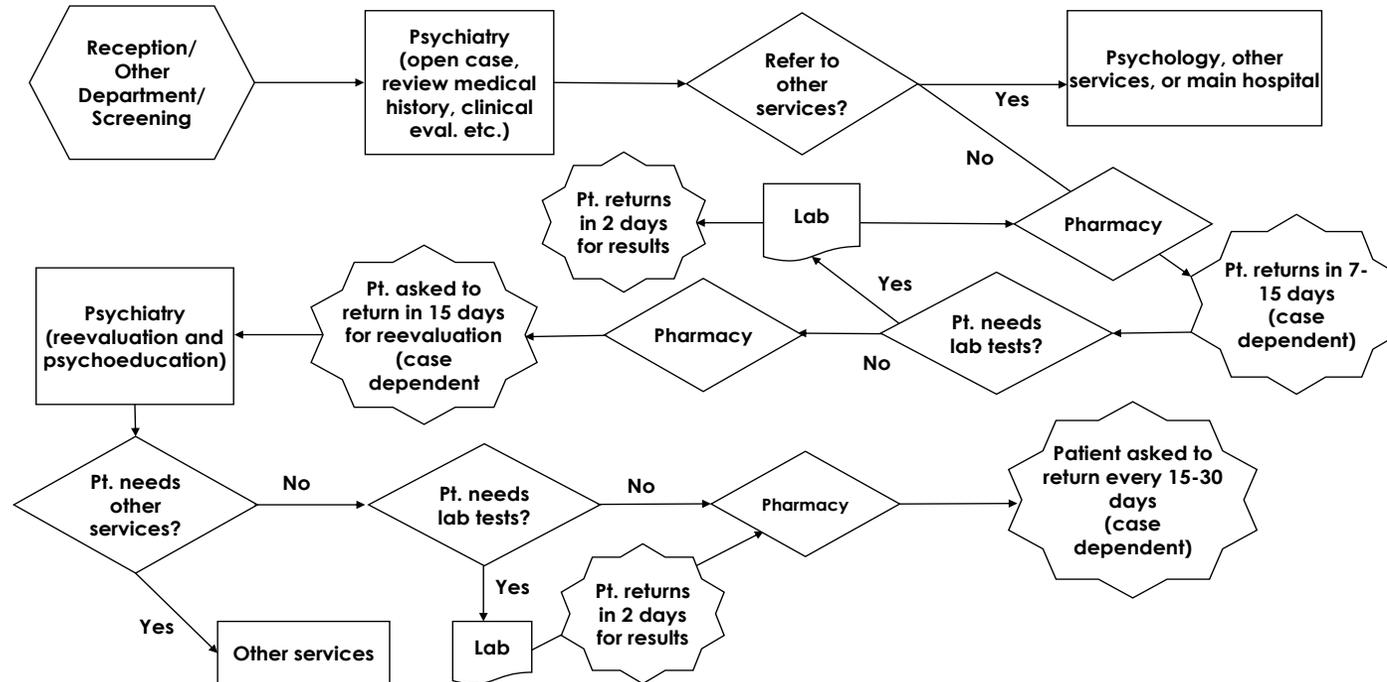
SAIA-MH PILOT/DEVELOPMENTAL R21
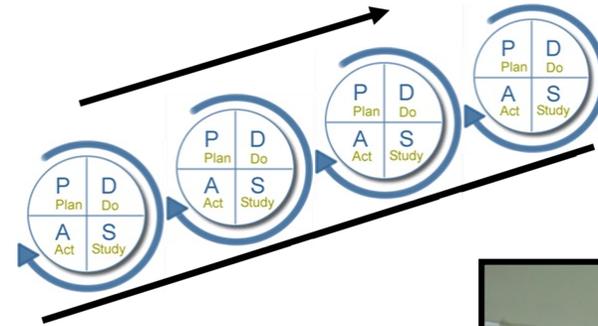
Steps 3-5: Continuous Quality Improvement

- Define & implement facility-specific workflow adaptations
- Monitor changes in performance; initiate additional iterations
- Repeat analysis and improvement cycle
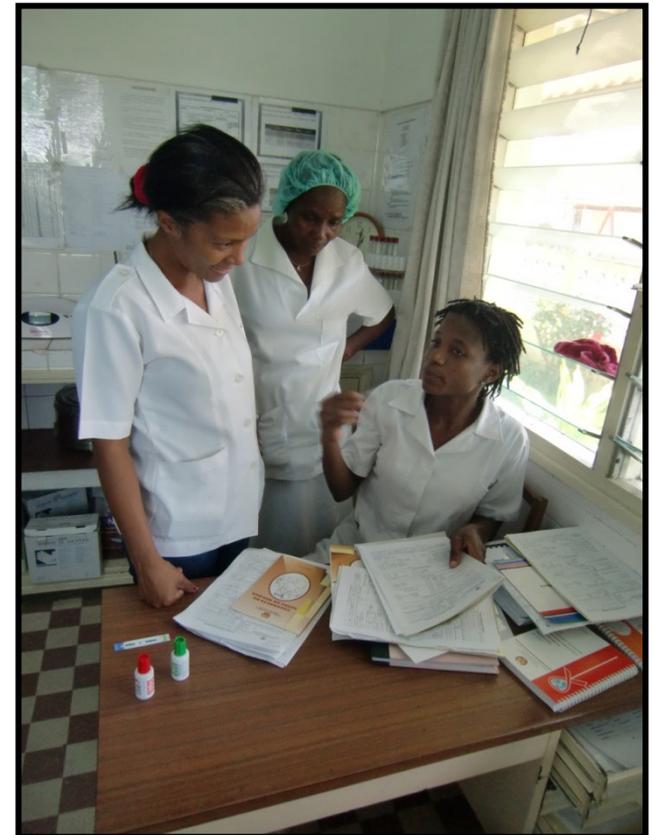
SAIA-MH PILOT/DEVELOPMENTAL R21

Example systems modifications tested in pilot:
- 63% of systems modifications targeted medication adherence (F3)

System Barrier	Type of Change	Specific Example
Patients returning late with poor adherence	Service re-organization	Provide additional 5 days of "buffer" medication or mark consultations 5 days early
Certain patients chronically miss visits leading to poor adherence	Service re-organization / new intervention	Encourage family/friend participation in consultations; integrate psychologist to provide problem-solving therapy for targeted patients

SAIA-MH PILOT/DEVELOPMENTAL R21

	Overall (n=810)
	N (%)
Total visits	3234
Sex	
Female	377 (46.5%)
Male	428 (52.8%)
Missing	5 (0.6%)
Age (years)	
Mean (SD)	29 (± 16)
Missing	5 (0.6%)
Homeless	
No	539 (66.5%)
Yes	210 (25.9%)
Missing	61 (7.5%)
Suicidal ideation	
No	728 (89.9%)
Yes	50 (6.2%)
Missing	32 (4.0%)
HIV status	
HIV+	268 (33.1%)
HIV-	280 (34.6%)
Missing / Never Tested	262 (32.4%)

Note: "Use of a sex binary and/or gender binary categorization in surveys and graphics does not capture the diverse range of identities and can inflict harm and be alienating to transgender and gender non-conforming individuals".

The Mozambican health system uses sex binary categorization in their health records currently.

SAIA-MH PILOT/DEVELOPMENTAL R21
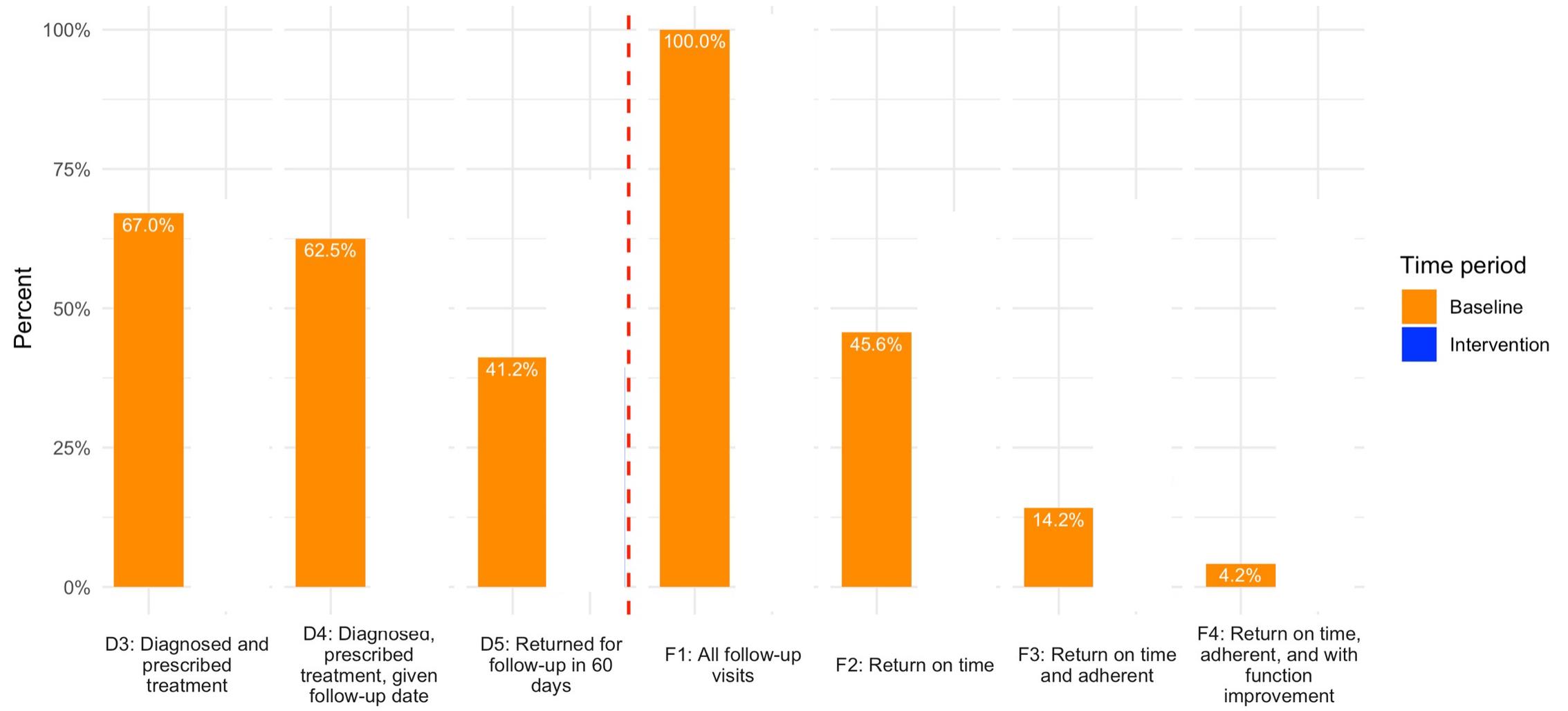
SAIA-MH PILOT/DEVELOPMENTAL R21
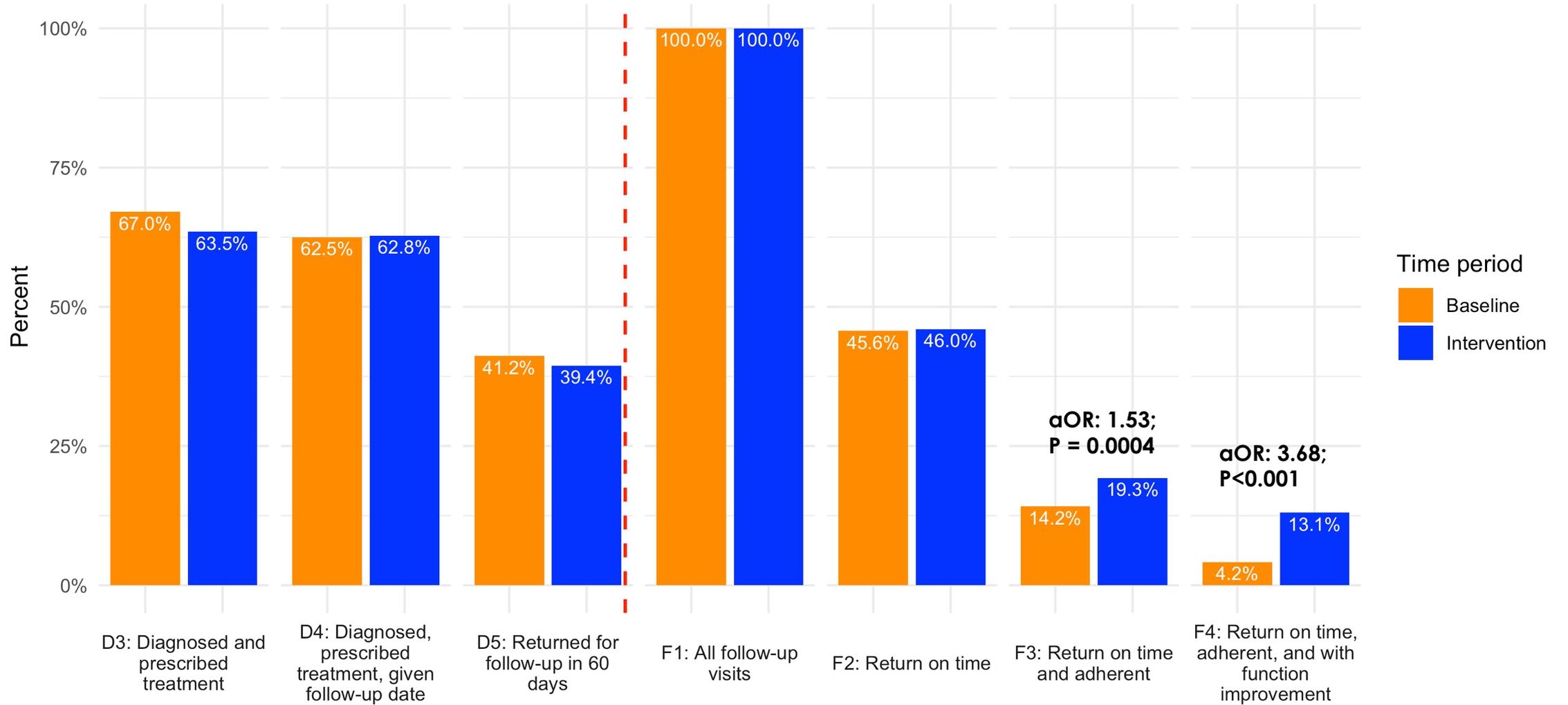
Baseline: 1 in 24 patients (4.2%) have function improvement
6 months of SAIA-MH: 1 in 8 patients (13.1%)

SAIA-MH PILOT/DEVELOPMENTAL R21

"Before SAIA we were working very hard, but the cascade shows we are not getting results. Now we are focusing our energy and making progress"

~ Psychiatric Technician, Clinic X

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NEXT STEPS (NIMH R01 cRCT)

Systems Analysis and Improvement Approach to Optimize the Task-Shared Mental Health Treatment Cascade (SAIA-MH): A Cluster Randomized Trial

NIMH R01 2021-2026

- Facility based cRCT across 16 Ministry of Health clinics in Sofala and Manica Provinces, Mozambique

- Goal: Improve **LTFU**; Visit **adherence**; Medication **adherence**; **function improvement**

- Evaluate costs, cost-effectiveness; CFIR barriers/facilitators to optimize strategy; routine maintenance (**2 year** intensive, **1 year** maintenance)
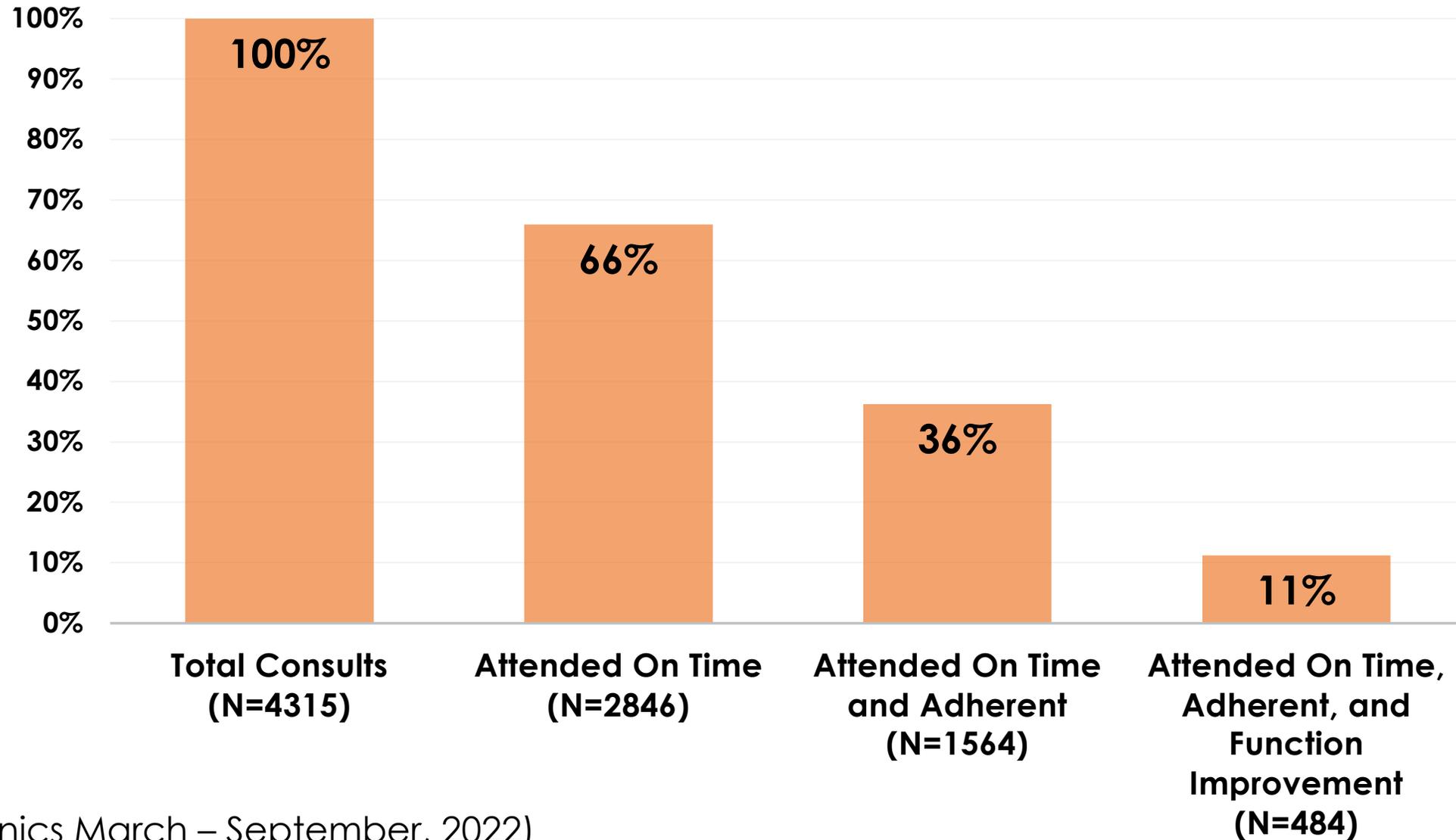
NEXT STEPS (NIMH R01 cRCT)

NIMH R01 2021-2026

- Longitudinal SEM, monthly mechanism measurement at provider level

- Evaluation of both **left side** (mechanisms activated by SAIA-MH); **right side** (mechanisms with most effect on outcomes); and **total effect of mechanism**

- Goal: Improve SAIA-MH strategy, will be combined with CFIR QUANT->qual

Hypothesized Moderators

Leadership Engagement
Staff Burnout
Staff Motivation

SAIA Multicomponent Implementation Strategy

Understanding of System Performance including Identification of System Inefficiencies and Bottlenecks

Prioritization of Inefficiencies and Bottlenecks

Generation of Potential Solutions

Teamwork

Accountability

Process Optimization via Tests of Change

Knowledge Attainment and Increased Competencies in Service Provision

Recognition of Progress, Challenges, and Lessons Learned

Mental Health Treatment Cascade Performance Improvement

Minimum Time in Job

Preconditions for Activation

Hypothesized Mechanisms

Staff Continuity

Preconditions for Outcome

BASELINE DATA (NIMH R01 cRCT)

16 MoH Clinics March – September, 2022)

NEXT STEPS (SPECIFICATION; OTHER CASCADES)

Gimbel *et al.*
Implementation Science Communications   (2023) 4:15
https://doi.org/10.1186/s43058-023-00390-x

Implementation Science Communications

SHORT REPORT   **Open Access**

The Systems Analysis and Improvement Approach: specifying core components of an implementation strategy to optimize care cascades in public health

Sarah Gimbel[1,2*†], Kristjana Ásbjörnsdóttir[2,3,4†], Kristin Banek[5], Madeline Borges[1,2], Jonny Crocker[2], Joana Coutinho[6], Vasco Cumbe[7], Aneth Dinis[2,8], McKenna Eastment[9], Douglas Gaitho[10], Barrot H. Lambdin[2,11], Stephen Pope[1,2], Onei Uetela[2], Carmen Hazim[2], R. Scott McClelland[2,4,9], Ana Olga Mocumbi[2,12,13], Alberto Muanido[6], Ruth Nduati[14], Irene N. Njuguna[2,15], Bradley H. Wagenaar[2,4], Anjuli Wagner[2], George Wanje[16] and Kenneth Sherr[2,4]

Abstract

Background Healthcare systems in low-resource settings need simple, low-cost interventions to improve services and address gaps in care. Though routine data provide opportunities to guide these efforts, frontline providers are rarely engaged in analyzing them for facility-level decision making. The Systems Analysis and Improvement Approach (SAIA) is an evidence-based, multi-component implementation strategy that engages providers in use of facility-level data to promote systems-level thinking and quality improvement (QI) efforts within multi-step care cascades. SAIA was originally developed to address HIV care in resource-limited settings but has since been adapted to a variety of clinical care systems including cervical cancer screening, mental health treatment, and hypertension management, among others; and across a variety of settings in sub-Saharan Africa and the USA. We aimed to extend the growing body of SAIA research by defining the core elements of SAIA using established specification approaches and thus improve reproducibility, guide future adaptations, and lay the groundwork to define its mechanisms of action.

Methods Specification of the SAIA strategy was undertaken over 12 months by an expert panel of SAIA-researchers, implementing agents and stakeholders using a three-round, modified nominal group technique approach to match core SAIA components to the Expert Recommendations for Implementing Change (ERIC) list of distinct implementation strategies. Core implementation strategies were then specified according to Proctor's recommendations for specifying and reporting, followed by synthesis of data on related implementation outcomes linked to the SAIA strategy across projects.

Results Based on this review and clarification of the operational definitions of the components of the SAIA, the four components of SAIA were mapped to 13 ERIC strategies. SAIA strategy meetings encompassed external facilitation,

Specification

NEXT STEPS (SPECIFICATION; OTHER CASCADES)
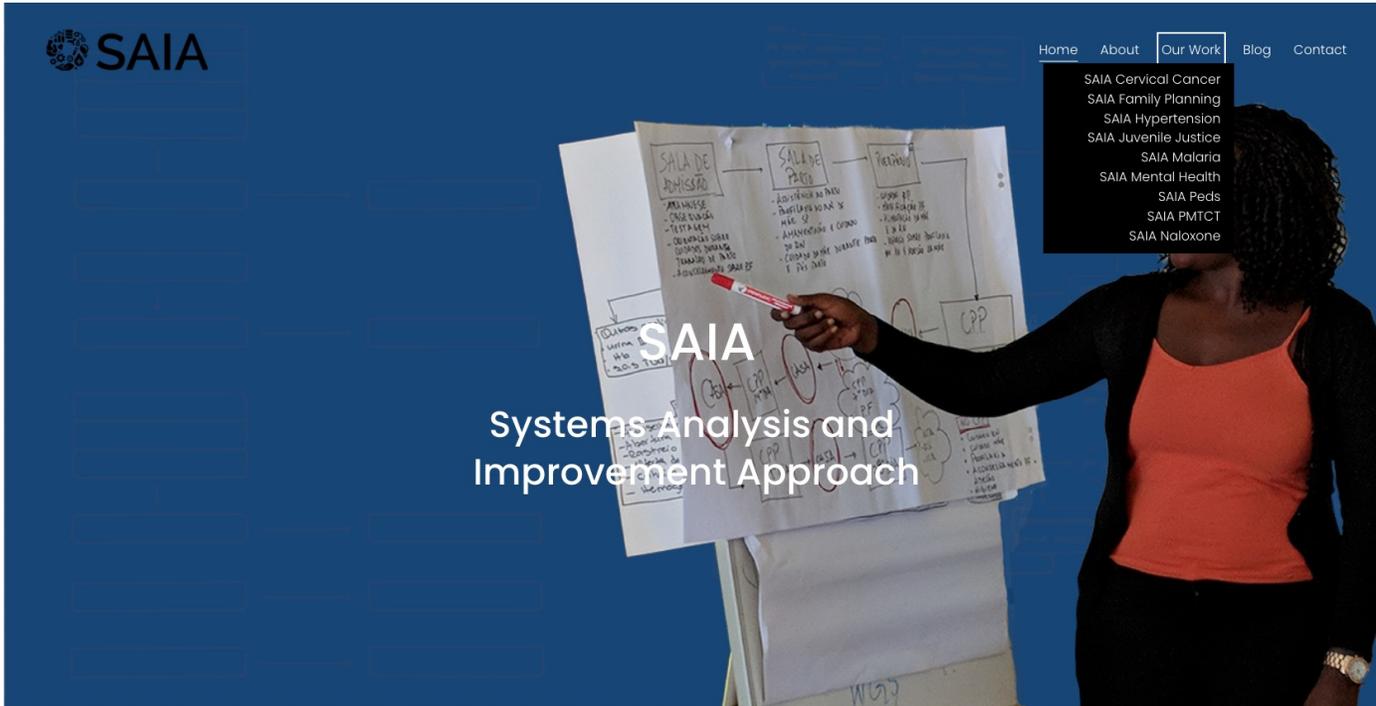
Website

https://www.saia-strategy.com/

NEXT STEPS (SPECIFICATION; OTHER CASCADES)

SUPPLEMENT ARTICLE

Cascade Analysis: An Adaptable Implementation Strategy Across HIV and Non-HIV Delivery Platforms

Anjuli D. Wagner, PhD, MPH,[a] Sarah Gimbel, PhD, MPH, RN,[a,b] Kristjana H. Ásbjörnsdóttir, PhD, MPH,[c] Peter Cherutich, PhD, MBChB, MPH,[d] Joana Coutinho, BSN,[e] Jonny Crocker, PhD, MSEE,[a] Emilia Cruz,[e] Fatima Cuembelo, MMed, MPH,[f] Vasco Cumbe, MD, MSc, PhDc,[g,h] McKenna Eastment, MD, MPH,[i] Jennifer Einberg, MS, MBA,[j] Florencia Floriano, BSN,[e] Douglas Gaitho, MMed, MBChB,[k] Brandon L. Guthrie, PhD, MPH,[a,c] Grace John-Stewart, MD, MPH, PhD,[a,c,i,l] Alex H. Kral, PhD, MPH,[m] Barrot H. Lambdin, PhD, MPH,[a,m,n] Shan Liu, PhD, SM,[o] Martin Maina, Bcom,[k] Nelia Manaca, PhD,[e] Mika Matsuzaki, PhD, MPH, MS,[p] Loris Mattox, BA,[q] Nancy Mburu, BA,[k] R. Scott McClelland, MD, MPH,[a,c,i] Mark A. Micek, MD, MPH,[r] Ana Olga Mocumbi, MD, PhD, FESC,[s] Alberto Muanido,[e] Ruth Nduati, MMed, MBChB, MPH,[k,t] Irene N. Njuguna, PhD, MBChB, MPH,[c,u] Geoffrey Oluoch, BS, MSc,[k] Laura B. Oyiengo, MMed, MD,[d] Keshet Ronen, PhD, MPH,[a] Caroline Soi, PhD, MSc, MBChB,[a] Bradley H. Wagenaar, PhD, MPH,[a,v] George Wanje, MPH,[w] Lynn D. Wenger, MSW, MPH,[m] and Kenneth Sherr, MPH, PhD[a,c,o,v]

Background: Cascades have been used to characterize sequential steps within a complex health system and are used in diverse disease areas and across prevention, testing, and treatment. Routine data have great potential to inform prioritization within a system, but are often inaccessible to frontline health care workers (HCWs) who may have the greatest opportunity to innovate health system improvement.

Methods: The cascade analysis tool (CAT) is an Excel-based, simple simulation model with an optimization function. It identifies the step within a cascade that could most improve the system. The original CAT was developed for HIV treatment and the prevention of mother-to-child transmission of HIV.

Results: CAT has been adapted 7 times: to a mobile application for prevention of mother-to-child transmission; for hypertension screening and management and for mental health outpatient services in Mozambique; for pediatric and adolescent HIV testing and treatment, HIV testing in family planning, and cervical cancer screening and treatment in Kenya; and for naloxone distribution and opioid overdose reversal in the United States. The main domains of adaptation have been technical—estimating denominators and structuring steps to be binary sequential steps—as well as logistical—identifying acceptable approaches for data abstraction and aggregation, and not overburdening HCW.

Cascade Analysis

NEXT STEPS (SPECIFICATION; OTHER CASCADES)

ARTICLE IN PRESS

American Journal of
Preventive Medicine

CURRENT ISSUES

A Cascade of Care Model for Suicide Prevention

Emily E. Haroz, PhD, MA, MHS,[a,b] Liina M. Sarapik, MA,[b] Leslie B. Adams, PhD, MPH,[b] Paul S. Nestadt, MD,[b,c] Alison Athey, PhD,[b] Kiara Alvarez, PhD,[c,d] Eric P. Slade, PhD,[e,f] Mary Cwik, PhD, MA,[a] Alan L. Berman, PhD,[c] Holly C. Wilcox, PhD[b,c]
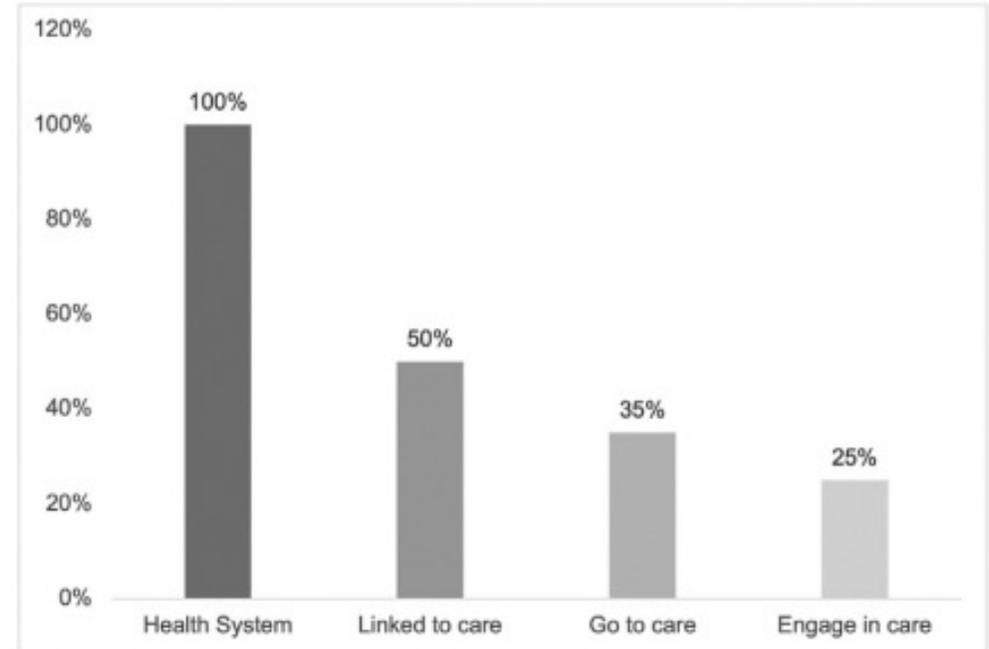

Figure 1. An approximate Cascade of Care for individuals at risk of suicide.

SUMMARY

- SAIA-MH is a promising strategy to rapidly improve MH care cascade performance in low-resource settings

- Particularly urgent given the poor baseline care cascade performance (**~10%** of visits with function improvement)

- SAIA-MH is an efficient strategy in resource-limited settings given it utilizes existing resources to improve quality / efficiency

- Field of global mental health urgently needs more studies testing strategies to improve quality and efficiency of **routine MH care delivery.**

- The SAIA implementation strategy appears feasible across various disease conditions and cascade, with significant effectiveness data to be generated in the next few years.

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- Alberto Muanido
- Isaias Ramiro
- Entire CSM team in Mozambique
- Kenneth Sherr
- Sarah Gimbel
- Steve Gloyd
- MH providers in Mozambique
- MH patients
- UW faculty

Contact:

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Discussion, questions?

Aptly named Mount Mystery, North Cascades, WA