Ya Tsie BCPP Summary and Update

IAPAC Summit, October 2015

Presenter: M. J. Makhema
Principle Investigator Botswana Harvard Partnership

Botswana Combination Prevention Project

Participating Institutions: Harvard T.H. Chan School of Public Health, Botswana-Harvard AIDS Institute Partnership (BHP), Centers for Disease Control and Prevention (CDC), Botswana Ministry of Health (MOH)

Funded by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the Office of the Global AIDS Coordinator (OGAC)

Sponsored through the U.S. Centers for Disease Control and Prevention (CDC)

Primary Research Objectives

- To determine whether a package of combination prevention (CP) interventions (including expanded ART) can significantly reduce population-level, cumulative HIV incidence in adults in Botswana over 36 months.
- To estimate population-level uptake of HIV testing, ART, male circumcision, and enhanced PMTCT services and compare service uptake between enhanced care communities and combination prevention communities.
- To estimate the cost per additional infection averted in each study arm.
- To use viral phylogenetics to estimate extent of transmission within vs. from outside the community, and the association between VL and transmission.

Study Design Overview

- Pair-matched community-randomized trial in 30 communities (15 Combination Prevention [CP] and 15 Enhanced Care [EC])
- Baseline and annual surveys conducted in ~20% of households (randomly selected) in all 30 communities, allowing comparison of
  - HIV incidence
  - Uptake of components of interventions over time
- Rapid scale-up of prevention interventions in CP communities begins immediately following baseline household survey (BHS)
- End of study survey in all residents of 4 community pairs to compare uptake (and viral load, cross-sectional incidence)

Study Design: Interventions in Combination Prevention Communities

- Household and mobile HIV testing and counseling (HTC; 100% of households)
- Linkage to care support (point of care [POC] CD4; SMS appointment reminders; phone air-time incentive; supportive counseling, calls, home visits)
- Expanded **ART** for residents with **CD4351-500; or >500 and HIV RNA≥10,000 (protocol in process of being amended to offer universal ART)**
- Expanded Male Circumcision (MC)

Study Design: Endpoints/Outcomes

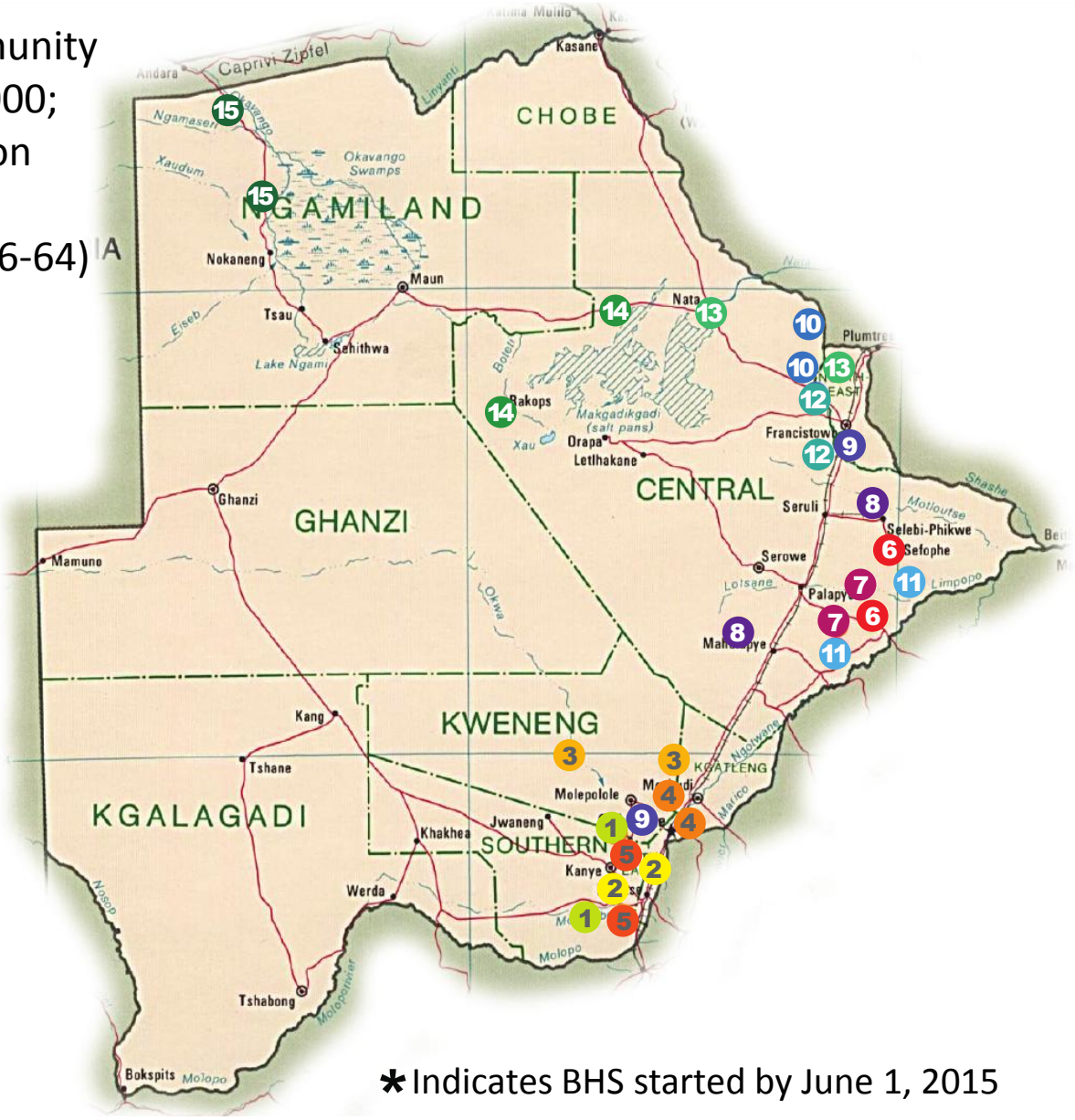
- **HIV incidence** measured via longitudinal follow-up of community-based HIV Incidence Cohort **(HIC)** of ~9,000 adults enrolled from **random ~20% sample of community households Primary study endpoint =** cumulative HIV incidence over 36 months

- **"Coverage" parameters (intervention uptake)** measured in 20% household survey (BHS), end of study survey, and using program monitoring data

- **Clinical outcomes in HIV-infected residents** through routinely-collected medical information on other ART patients and measured in 20% household survey

Communities Participating in the Study

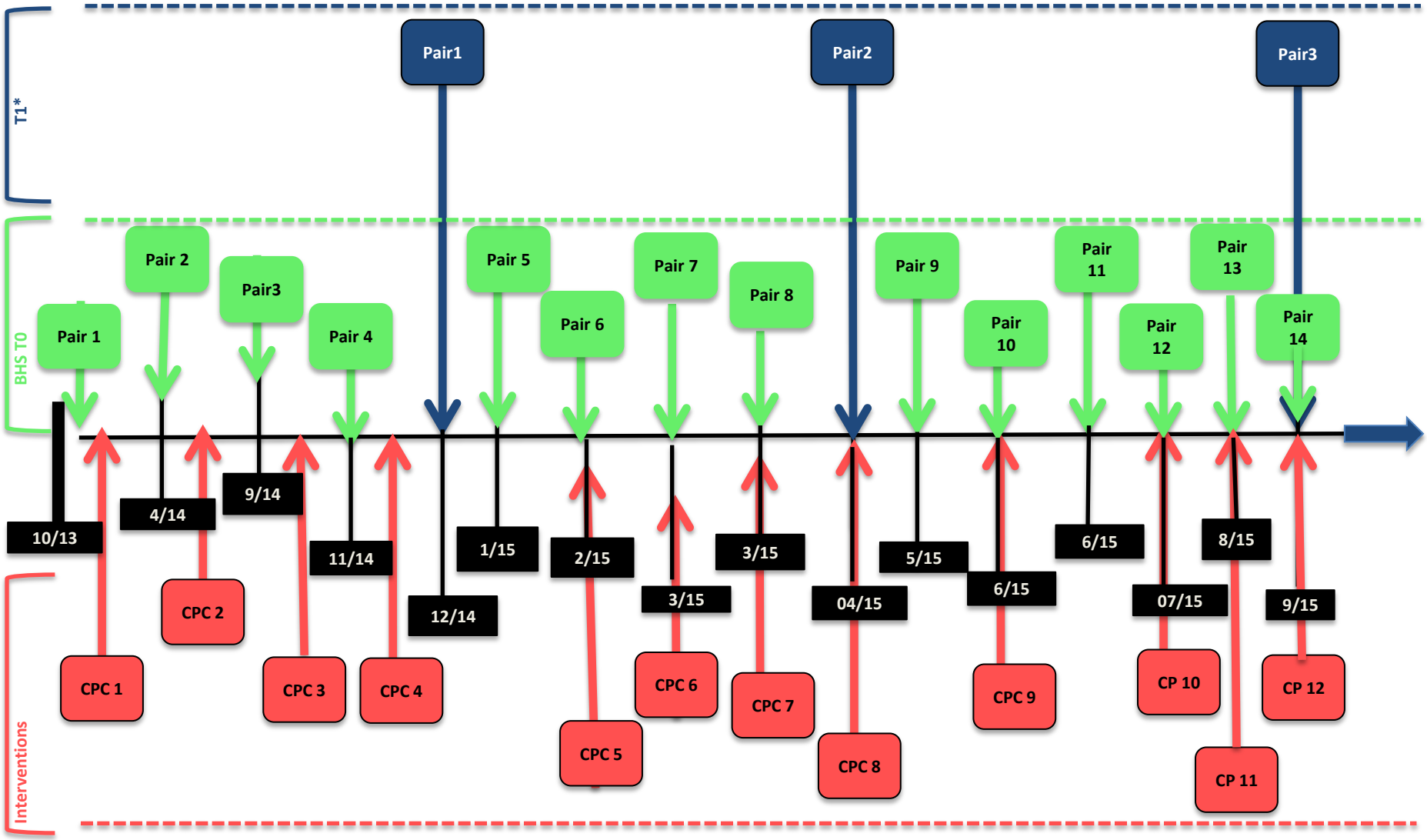
- Average community population 6,000;
- Total population ~180,800;
- Age-eligible (16-64) ~105,000



1 Ranaka Digawana *
2 Molapowabojang Otse *
3 Letlhakeng Lentswelatau *
4 Bokaa Oodi *
5 Mmathethe Mmankgodi *
6 Sefophe Lerala *
7 Ramokgonami Maunatlala *
8 Mmadinare Shoshong *
9 Metsimotlhaba Tati Siding *
10 Sebina Nkange *
11 Tsetsebjwe Sefhare
12 Mandunyane Mathangwane
13 Nata Masunga
14 Rakops Gweta
15 Shakawe Gumare

*Indicates BHS started by June 1, 2015

Summary of Study Rollout to Date



- Baseline household survey completed in 13 of 15 Pairs
- Interventions conducted in 12 of 15 Combination Prevention Communities (CPCs)
- Annual household survey completed in 1st two pairs (on schedule)

Strengths or Unique Contributions of BCPP

- Study based in small communities/villages
- Individual-level data to demonstrate HIV testing and treatment cascades
- Viral load: pre-treatment and for virologic monitoring
- Viral phylogenetics
- Retention and adherence support among those receiving Option B+ and expanded ART

Enrollment, 20% Baseline Household Survey and HIV Incidence Cohort, First 12 Community Pairs

- Enrolled 9,780 individuals into BHS (6,241 females, 3,539 males)
- 11% of enumerated residents (of 20% households) refused participation, and 10% were not enrolled due to absence despite 3 visits
- Reached 95% of target enrollment of HIV incidence cohort
  - **Re-tested** and interviewed **92% of HIV Incidence Cohort** participants during first annual household survey in two community pairs

Assumed vs. Observed Key Baseline Parameters From Baseline Household Survey, Pairs 1-12

BASELINE Coverage	Assumed	Observed	Numerator/ Denominator for Observed Column
HIV prevalence	25%	28%	2,727/9,745
HTC coverage			
Among residents with a documented HIV positive or HIV negative status in past 12 months	37%	37%	3,579/9,780
ART coverage			
Among residents known to be HIV-positive and eligible for ART	80%	94%	1,933/2,065
Among residents known to be HIV-positive or newly identified and eligible for ART	60%	86%	1,933/2,255
Male circumcision among HIV-negative men aged 16-64 years	13%	35%	964/2,802

Cross-sectional HIV incidence: 0.97% (95% CI: 0.41% – 1.53%) estimated annual HIV incidence at baseline based on limiting-antigen (LAg) recency testing (Duong, 2015)

90–90–90 Lessons from BCPP

1. By 2020, 90% Diagnosed

What % of adults (16–64) living with HIV know their status as of 2015?

82% (2,226/2,727)*

- 28% HIV prevalence (among 9,780 adults tested)*
- 79% of eligible participants enrolled in BHS (11% refusal)

*From 20% Baseline Household Survey (BHS) in 24 villages (among citizens aged 16–64)

90–90–90 Lessons from BCPP

2. By 2020, 90% on Treatment

What % of adults diagnosed with HIV infection were receiving ART as of 2015?

86% (1,915/2,226)*

- 95% of ART-eligible residents (by national guidelines) who knew they were positive (1,915 / 2,022)
- 85% of ART-eligible residents (by national guidelines) who knew they were positive or were newly diagnosed as positive in BHS (1,915 / 2,265)
- 70% of all positives (from previous and new tests: 1,915 / 2,727)

*From 20% Baseline Household Survey (BHS) in 14 villages (among citizens aged 16–64) prior to roll-out of interventions in CP arm.

90–90–90 Lessons from BCPP

3. By 2020, 90% of Treated with Viral Suppression

What % of adults treated with ART have complete viral suppression as of 2015?

95% (1,838 / 1,926)*

- Based on ≤400 copies/ml
- Based on current national guidelines (CD4 ≤350)
- 92% if based on ≤40 copies/ml (1,764 / 1,926)

*From 20% Baseline Household Survey (BHS) in 14 villages (among citizens aged 16-64).

Conclusion: Current 90-90-90 Coverage

Best current estimate for Botswana
based on BCPP BHS:

82 – 86 – 95

2020 UNAIDS goal:	90% x 90% x 90%	= 73%
Current Botswana:	79% x 86% x 96%	= 67%
Current US:	86% x 43% x 81%	= 30%

Intervention Coverage, First 7 Communities

- HTC: 91% of enumerated community residents either had documented positive HIV status or underwent HTC
- Linkage to care: 76% of HIV-infected persons not on ART linked to care at their local clinic
- ART start: 54% of all ART-naïve persons with CD4≤350 started ART, and 57% of those eligible for expanded ART started ART
    - Likely underestimates actual ART start

Botswana Combination Prevention Project

Participating Institutions: Harvard T.H. Chan School of Public Health, Botswana-Harvard AIDS Institute Partnership (BHP), Centers for Disease Control and Prevention (CDC), Botswana Ministry of Health (MOH).

Funded by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the Office of the Global AIDS Coordinator (OGAC).

Sponsored through the U.S. Centers for Disease Control and Prevention (CDC) **.**

Executive Committee

P. Bachanas
S. El-Halabi
M. Essex
R. Lebelonyane
S. Lockman
J. Makhema
L. Mills
J. Moore
M. Pretorius Holme
E. Tchetgen Tchetgen

Other Major Contributors – BHS

K. Bennett
V. DeGruttola
S. Dryden-Peterson
T. Gaolathe
N. Khan
Q. Lei
M. Mmalane
S. Moyo
V. Novitsky
L. Okui
R. Plank
K. Powis
R. Wang
E. van Widenfelt
K. Wirth

Thank You