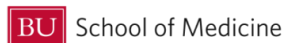# Uganda URBAN ARCH Studies

2021-2022

Presented by:

Judy Hahn, PhD MA

Winnie Muyindike, MBChB, MMED

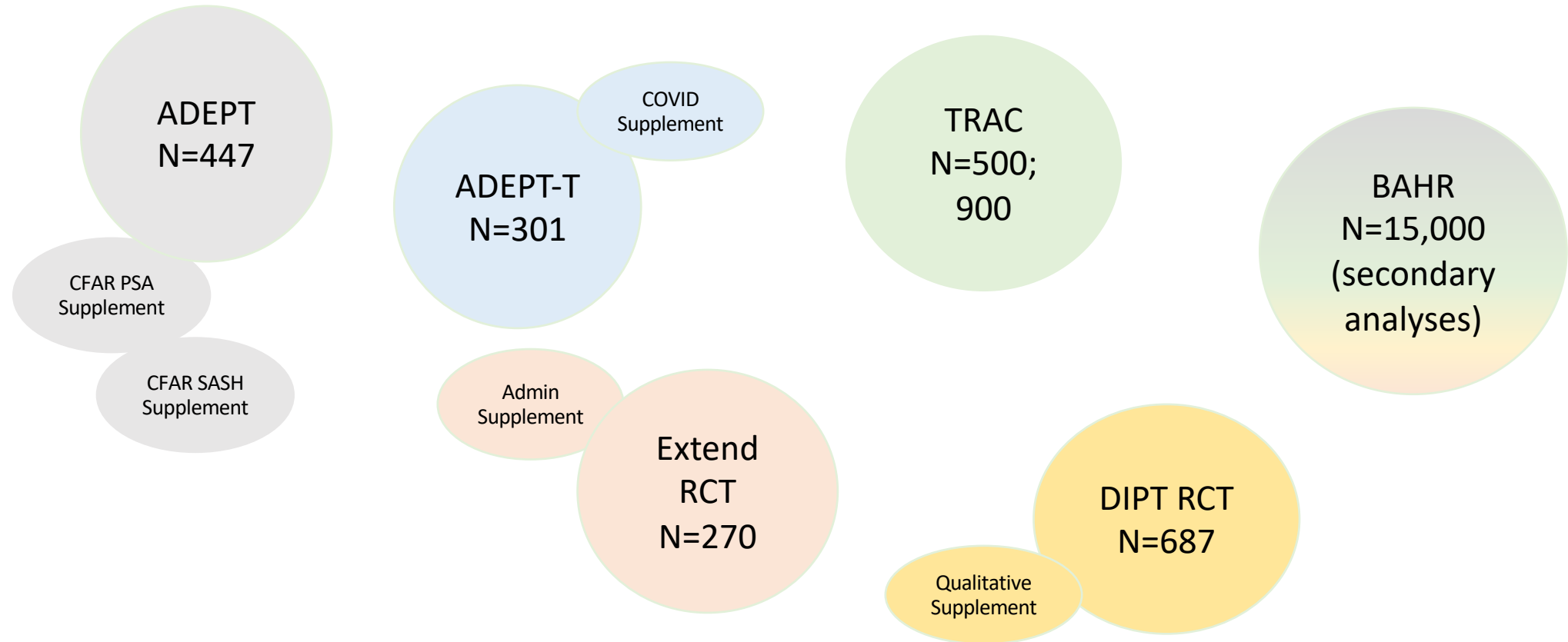## Nneka Emenyonu, DrPH, MPH

Uganda ARCH (2011 – 2022)

- 2011-2016: ADEPT (n=447)
  - HIV+, +/- alcohol use, ART-naïve
- 2016-2021: ADEPT-T (n=301)
  - HIV+, +/- alcohol use , on ART
- 2017-2022: DIPT (n=687)
  - HIV+, unhealthy alcohol use, on ART
- 2017-2022: Extend (n=270)
  - HIV+, unhealthy alcohol use, on ART
- 2021-2026: TRAC (n= 500 + 900)
  - HIV+, +/- alcohol use, on ART
- 2022-2025: BAHR
  - HIV+, +/- alcohol use, secondary data analyses

URBAN ARCH and related studies, 2011-2022

URBAN ARCH and related studies, 2011-2022

ADEPT:
Alcohol use +
Pre-ART HIV
disease
progression

ADEPT-T:
Alcohol use +
TB
preventative
therapy (TPT)

TRAC:
Alcohol use +
TB infection /
disease

BAHR:
Biomarker
measured alcohol
use: HIV
outcomes,
Intervention
efficacy, objective
measurement

Extend:
Intervention
to reduce
alcohol use

DIPT:
Intervention
to reduce
alcohol use +
increase TPT
adherence

Topics Examined

HIV Clinical Outcomes

- Pre-ART
  - Unhealthy alcohol use was *not* associated with pre-ART CD4 decline[1]
  - Unhealthy alcohol use was associated with monocyte activation[2]
  - Unhealthy alcohol was *not* associated with tryptophan metabolism[3]

  --> Mixed effects of alcohol use on inflammation, maybe less relevant in widespread ART era

[1]Hahn, et al. *JAIDS*. 2018.
[2]Carrico, et al. *ACER*. 2015.
[3]Pierre, et al. *Alcohol Alcohol*. 2022.

HIV (and other) Clinical Outcomes

- On ART
  - Alcohol use was associated with liver enzyme elevations[1]
  - Unhealthy alcohol use was *not* associated with viral suppression[2]

  → The general effects of alcohol use on PWH are important, given the high prevalence of co-morbid liver disease in PWH.
  → Newer regimens may make the impact of alcohol use on viral suppression (usually through poor adherence) less severe

[1]Freiman, et al. *Plos One*. 2021.
[2]Foley, et al. *AIDS Care,* 2020.

HIV Clinical Outcomes

- Unanswered questions
  - Adherence less of an issue with newer regimens?
  - What clinical endpoints are most relevant and measurable for PWH?

Tuberculosis

- High risk alcohol use was associated with latent TB infection,[1] but *not* moderate risk alcohol use[2]

- On INH: Unhealthy alcohol use was associated with poor INH adherence[3]

--> PWH engaging in high risk drinking may be at higher risk for TB infection and poorer adherence to INH.

[1] Puryear, et al. *CID*. 2021.
[2] Muyindike, et al. *PLoS One*. 2020.
[3] Muyindike, et al. *CROI* 2022

Tuberculosis

- Unhealthy alcohol use was *not* associated with INH hepatoxicity[1]

- Modeling study showed increased benefit versus risk for INH among PWH who consume alcohol in high TB incidence settings[2]

→ PWH should get INH in high incidence settings, regardless of alcohol use

[1] Hahn, et al. *In preparation.*
[2] Freiman, et al. *JAIDS*. 2018.

Tuberculosis

- Unanswered questions
  - How to avoid TB infection among PWH with high risk alcohol use?
  - How to improve INH adherence among PWH who consume alcohol?

Psychosocial Outcomes

- Among PWH with a range of alcohol use
  - Social support was *not* associated with unhealthy alcohol use[1]
  - Higher religious behavior was associated with lower alcohol use[2]
  - Household brewing was associated with unhealthy alcohol use[3]
  - Men compared to women had higher odds of unhealthy alcohol use[4]

→There are social pressure to drink or abstain in this setting

[1]Ngabirano, et al. *AIDS Behav*. 2022.
[2]Adong, et al. *AIDS Behav*. 2018.
[3]Thakarar, et al. *AIDS Behav*. 2016.
[4]Gnatienko, et al. *J Stud Alcohol Drugs*. 2021.

Psychosocial Outcomes

- Among PWH with high risk alcohol
  - No association of alcohol use with PTSD[1]
  - No association with recent IPV[2]

  → There may be threshold effects at the higher levels of alcohol use

[1]Allen, et al. *BMC Psychiatry.* 2022.
[2]Miller, et al. *Submitted.* 2022.

Psychosocial Outcomes

- Outstanding questions and analyses in progress:
  - Can financial incentives overcome social pressures to drink?

  - COVID, Smoking, qualitative studies reinforce gender, social and financial implications of drinking

Alcohol Consumption Self-Report

- Under-report of alcohol use common in HIV care and research[1,2, others]

- Medium and high (vs. low) social desirability associated with decreased AUDIT-C scores (adjusting for PEth) by 0.7 and 1.4 points, respectively[3]

- Unanswered questions
  - Best ways to detect and account for social desirability?
  - Ways to reduce socially desirable reporting in research and clinical care?

[1] Hahn, et al. *Addiction.* 2016.
[2] Muyindike, et al. *AIDS Care.* 2017.
[3] Adong, et al. *ACER.* 2019.

Biomarkers of Alcohol Use

- PEth is highly sensitive for unhealthy alcohol use[1]
  - Biologic factors can affect its sensitivity (IPD meta-analysis)[1]

- PEth testing is expensive and slow, though automated processing may help[2]

- EtG in urine using commercial dipsticks detects past 1-2-day alcohol, low sensitivity beyond 2 days[3]

[1] Hahn, et al. *ACER*. 2021.
[2] Fatch, et al. *Alcohol*. 2022.
[3] Alcover, et al. *AIDS Behav*. 2022.

Biomarkers of Alcohol Use

- Unanswered questions
  - Are there lower cost ways to have objective measures?
  - How to factor in biologic variability in alcohol metabolism when using biomarkers?
  - How best to use alcohol biomarkers and self-report in HIV research?
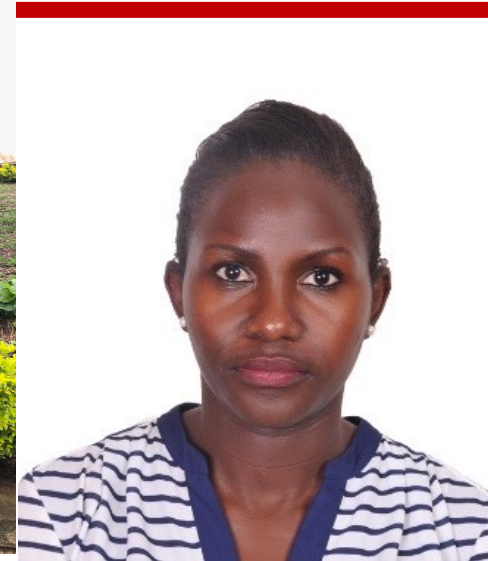 - Can biomarkers be integrated into clinical care?

What we can still learn

- How to reduce alcohol use and its impact on HIV and HIV co-morbidities – TB and liver diseases and other NCDs

- How to consider the context of the social pressures around alcohol use

- How best to measure alcohol use in settings of high social desirability

Some Uganda Studies
Team Members

Thank you! Webare mununga

- Dr. Winnie Muyindike, MUST PI, Co-I
- Dr. Julian Adong, Fellow
- UCSF co-Investigators: Dr. Gabriel Chamie, Dr. Carol Camlin, Dr. Monica Gandhi
- BMC Co-investigators: Dr. Karen Jacobson, Dr. Benjamin Linas, Dr. Jeffrey Samet
- Project Coordinators: Christine Ngabirano, Allen Kekibiina, Naomi Sanyu
- Data Managers: Adah Tumwegamire, Anita Katusiime
- Project Director: Nneka Emenyonu
- Data Manager/Statistician: Robin Fatch
- Statisticians: Debbie Cheng, Sarah Lodi, Sowmya Rao
- Dr. Jeffrey Samet, Natalia Gnatienko, International Urban ARCH Admin Core
- Kendall Bryant - NIAAA