Generation of a malaria-negative African birthweight standard for diagnosis of small for gestational age

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Background

- Placental malaria (PM) is a risk factor for small for gestational age (SGA) neonates
- Current international and African birthweight standards do not consistently control for PM and many lack obstetrical ultrasound dating

Objective

- Develop a neonatal birthweight standard based on obstetrically dated singleton pregnancies that exclude clinical malaria, asymptomatic parasitemia (AP), and PM infection

Hypothesis

- Currently available curves underestimate true birthweight and the prevalence of SGA.

Study Design

- Secondary analysis of two double-blind randomized control trials of intermittent preventive therapy during pregnancy in HIV-negative women in Uganda
- Gestational age confirmed by ultrasound dating at enrollment between 12 – 20 weeks
- Women followed through pregnancy and delivery for clinical malaria, AP, and PM
- Malaria-negative cohort: women without clinical malaria, AP, or PM
  - This cohort was used to create the Ugandan birthweight standard
- The Ugandan standard was used to determine the prevalence of SGA neonates in a PM positive cohort
  - Compared to the SGA prevalence calculated in:
    - Schmiegelow, based on a Tanzanian population
    - WHO international standard
    - Williams' US-based curve

Results

- 943 women had complete delivery data
  - 516 (55%) met criteria for the malaria-negative cohort
  - 394 (42%) had PM
- Ugandan standard diagnosed SGA in 17.2% of placental malaria cases
  - Schmiegelow 14.7% (p = 0.368)
  - WHO 14.5% (p = 0.316)
  - Williams 28.4% (p = <0.001)

Conclusion

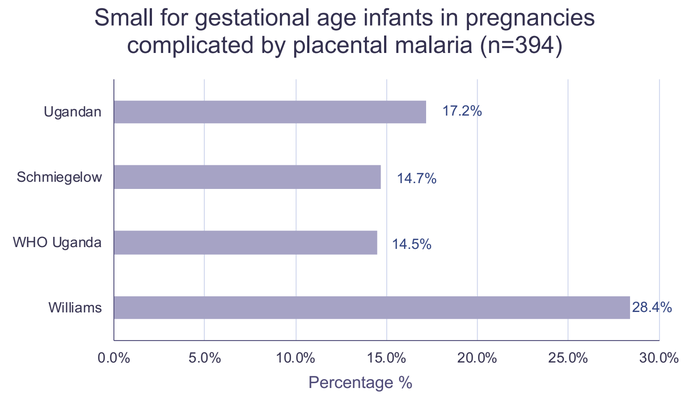
- Ugandan standard performed similarly to African and international birthweight standards
- Williams' US-based curve may over-diagnose the prevalence of SGA in Africa

Current birthweight standards may underestimate the prevalence of SGA in malaria-endemic countries.

Questions?
Take a picture of this QR code to access the poster
or email Dr. Zakama at arthurine.zakama@UCSF.edu

Birthweight Standard Population Characteristics				
	Ugandan	Schmiegelow	WHO	Williams
Population (n)	Uganda (516)	Tanzania (583)	Multinational (237,025)	United States (37,862)
Malaria Excluded	Yes	Yes	No	No
Malarial Infection Testing	BS(pe,pl) HP LAMP(pe,pl)	BS(pe) RDT	---	---

BS: blood smear | pe: peripheral | pl: placenta | HP histopathology | LAMP: loop-mediated isothermal amplification
RDT: Rapid diagnostic tests



Odds ratios for SGA in placental malaria cohort	
Birth Weight Standard	Odds ratio (95% CI, p value,
Ugandan	(reference)
Schmiegelow	0.86 (0.62 – 1.20, 0.368)
WHO Uganda	0.84 (0.61 – 1.18, 0.316)
Williams	1.66 (1.26 – 2.18, <0.001)