Estimation of timely EID and mortality among HIV-exposed infants in Mashonaland East Province, Zimbabwe: a sampling-based approach

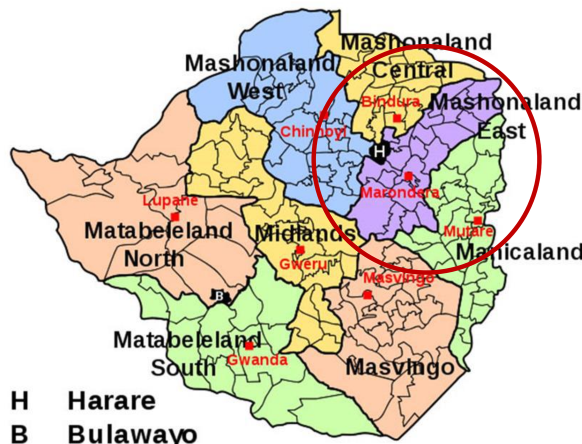
Karen Webb[1], Vivian Chitiyo[1], Theresa Ndoro[1], Simukai Zizhou[2], Nyika Mahachi[3], Wendy Hartogensis[4], Barbara Engelsmann[1], Elvin Geng[4]

[1]Organisation for Public Health Interventions and Development Trust, Harare, Zimbabwe; [2]Ministry of Health and Child Care, Mashonaland East Province, Zimbabwe; [3]Ministry of Health and Child Care, National PMTCT Program, Zimbabwe; [4]University of California San Francisco, USA

Families and Communities for Elimination of HIV – FACE HIV Program

BACKGROUND

- HIV prevalence among women attending antenatal care (ANC) in Zimbabwe is 15.9%.[1]
- Mashonaland East Province has high infant mortality rates:[2]
  - **Neonatal mortality (first month of life):** 20 per 1,000 live births
  - **Infant mortality (birth to one year):** 39 per 1, 000 live births



- In the absence of timely Early Infant Diagnosis (EID) and antiretroviral therapy (ART) initiation 1/3 of HIV infected infants die before their 1st birthday[3]
- Multiple, paper-based registers document health services received by HIV positive pregnant women and their exposed-infants in Zimbabwe
- The proportion of HIV-exposed infants who survive early infancy long enough to receive timely EID services at 6 weeks of age is not routinely reported, but is estimated to be as low as 45%.
- Little is known about the vital status outcomes among HIV positive mother – HIV exposed infant pairs in Zimbabwe's PMTCT program.

OBJECTIVE

To estimate timely uptake of EID and infant mortality among HIV exposed infants with no documented uptake of timely EID before 3 months of age.

METHODS

From September to November 2014, we conducted a population-based survey among a probability sample of all HIV infected mothers enrolled in ANC from April 2012 to May 2013.

- 45/193 health sites in Mashonaland East Province were selected using a modified probability proportional to size schema based upon number of HIV positive women accessing ANC at each facility over the previous year.
- All HIV positive women at these facilities were manually traced through facility registers to determine documented uptake of EID for their HIV-exposed infant within three months of birth.
- From March to May 2015, Village Health Workers (VHWs) attempted to trace a random sample of 555 HIV positive women with no documented EID at household level to determine vital status outcomes and true EID status using a pre-tested standardized questionnaire.
- Data was entered into Open Data Kit (ODK) and analysis conducted using Stata v.13.
- We use weighted population estimates to indicate cumulative incidence of timely EID and death by 3 months of age among the population of HIV-exposed infants.

RESULTS

Documented EID among population of HIV positive women in ANC

- 14.7% (n=2,651/18,065) of women in ANC were HIV positive;
- The majority of HIV positive women tested positive in ANC (n=1,621; 61.1%), with 1,023/2,651 (38.6%) entering ANC with a known positive status;
- Only 31.2% (828/2,651) of HIV positive women had documented uptake of EID before 3 months of age for their HIV-exposed infant in facility registers.

Tracing outcomes of mother-baby pairs with no documented EID

- Among 555 women for whom VHWs attempted community tracing, 31.9% (n=177) of mothers could not be located (95%CI: 25.0 to 38.7);
- Vital status information was obtained for 66.8% (n=371; 95%CI: 62.0 to 71.6) of mother-baby pairs for whom tracing was attempted.

Uncorrected estimates of EID

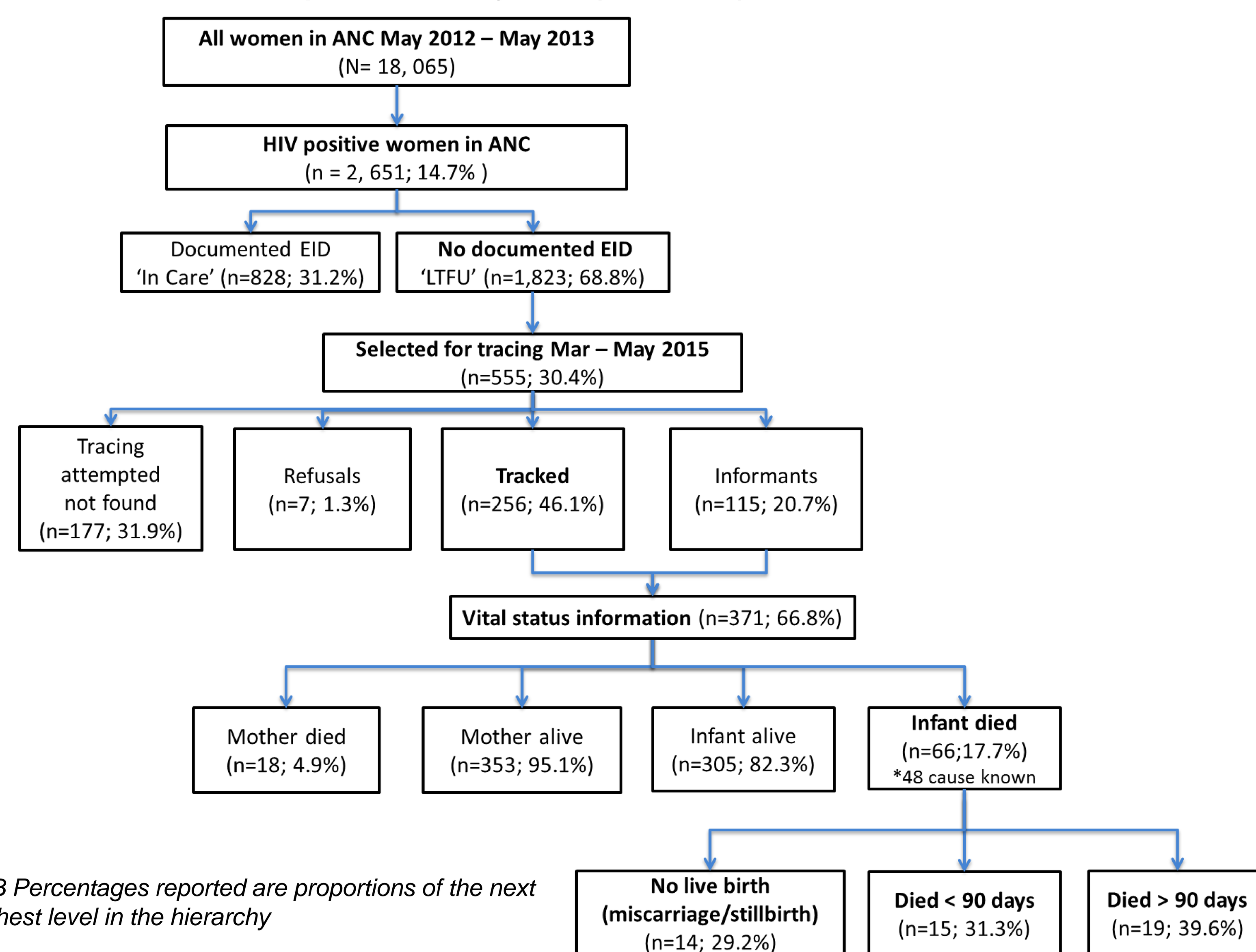
- Among 256 HIV positive mothers interviewed, 34.0% of HIV-exposed infants traced had received EID (n=87; 95%CI: 29.0 to 44.1) before 3 months of age;
- 25.8% of HIV-exposed infants had not received HIV testing at any time (n=66; 95%CI: 19.9 to 32.8);
- Among the 66 infants with no HIV testing, n=32 (48.5%) were deceased at the time of interview.
- 16.3% (34/208) of infants alive at the time of interview had not had HIV testing at any time, the age range of these infants was 14.6-35.8 months.

RESULTS continued

Uncorrected mortality estimates

- 4.9% of HIV positive mothers (n=18; 95%CI: 2.9 to 7.7) and 17.7% of HIV-exposed infants (n=66; 95%CI: 13.8 to 22.6) for whom vital status outcomes could be ascertained were deceased; (Figure 1)
- The majority of infant deaths occurred after birth (70.9%), greater than three months of age (39.6%).

Figure 1. Flow of HIV positive mother-HIV exposed infant pair vital status outcomes among population of women in antenatal care April 2012 – May 2013 (N=18, 065)



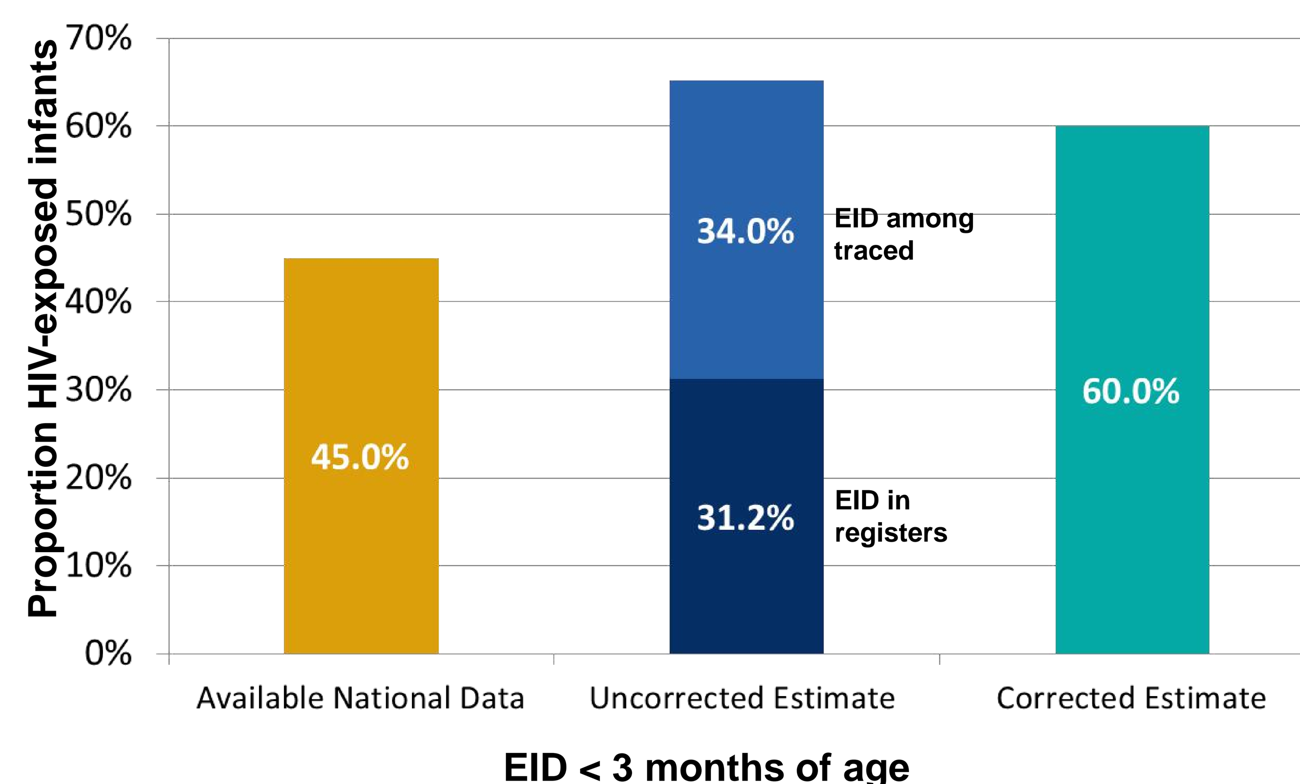
EID and infant mortality

- The primary reason for failure to have EID was infant death prior to scheduled testing;
- The majority of deceased infants 61.9% (n=26) did not have EID;
- Among living infants, the primary reason for no EID was "I didn't know I should bring my child".

Weighted population estimates of timely EID and infant mortality

- Cumulative incidence of infant death by 90 days: 3% (95%CI: 3.4% to 4.4%)
- Annual infant mortality rate: 7.7% (95%CI: 4.7%- 13.5%);
- Cumulative incidence of timely EID with death as a competing risk: 60% (95%CI: 58.7% to 61.3%)

Figure 2. Comparative estimates of EID completion



CONCLUSIONS

- Our findings indicate uptake of timely EID among HIV-exposed infants is currently underestimated in Zimbabwe;
- Discrepant rates of EID completion by data source indicate need to strengthen aggregate-based health information systems to allow routine reporting of individual outcomes among HIV positive mother-HIV exposed baby pairs;
- High, early mortality among HIV-exposed infants indicates need to identify pregnant HIV positive women at high risk of adverse outcomes and loss to follow up;
- Further analysis is required to identify risk factors for no EID and infant mortality among HIV positive women in ANC;
- Sampling-based approaches are valuable tools for providing a better picture of PMTCT program effectiveness.

REFERENCES

[1]Zimbabwe Ministry of Health and Child Care. National Survey of HIV and Syphilis Prevalence among Women attending Antenatal Clinics in Zimbabwe 2012. Harare: MOHCC; 2013.
[2]ZIMSTAT, 2015. Zimbabwe Multiple Indicator Cluster Survey; 2014.
[3]WHO/UNAIDS/UNICEF. Global HIV/AIDS Response: Epidemic update and health sector progress towards Universal Access, 2011.

Acknowledgements: We gratefully acknowledge support from the President's Emergency Plan for AIDS Relief (PEPFAR) through USAID and Families and Communities for Elimination of HIV in Zimbabwe (AID-613-A-12-00003, *FACE HIV*)

For more information contact:
Organisation for Public Health Interventions and Development
20 Cork Road, Belgravia, Harare, Zimbabwe
www.ophid.co.zw/; Email: kwebb@ophid.co.zw