Data for decision-making in digital health programs:
Safer Deliveries in Zanzibar, Tanzania

GLOBAL DIGITAL HEALTH FORUM | DECEMBER 4, 2017

SAVING LIVES AT BIRTH: A GRAND CHALLENGE FOR DEVELOPMENT

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Main learning objectives from this session

- The importance of identifying and collecting data on meaningful indicators to demonstrate program success
- How to effectively monitor a digital health program so that areas of success and difficulty can identified and addressed
- When to apply statistical methods to help assess program effectiveness

D-tree International began the Safer Deliveries program in 2011

D-tree International is a digital health organization specializing in developing and implementing digital health systems to improve the quality of healthcare delivery and strengthen health systems.

Geographic Areas	***Disease Areas***
Tanzania	Maternal health
Malawi	Chronic care
Sri Lanka	Child health
Benin	HIV/AIDS
India	Family planning

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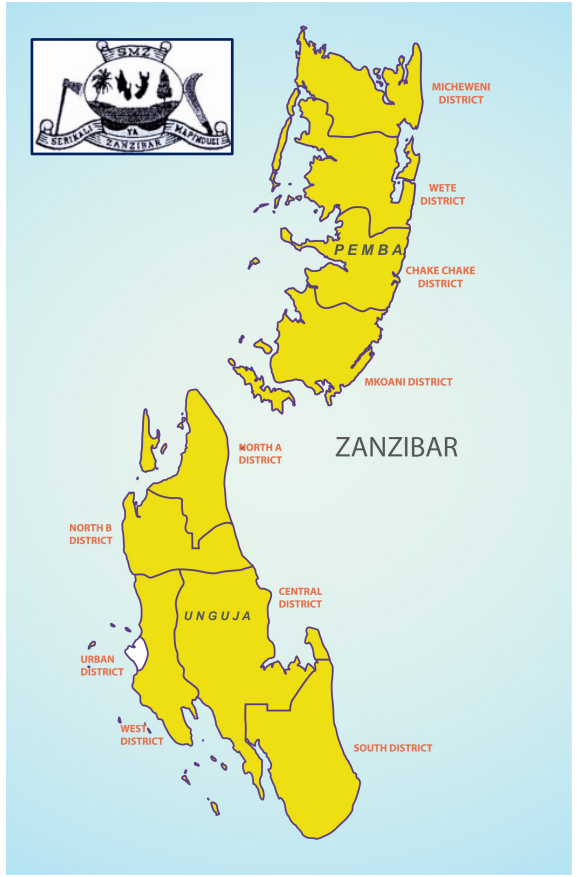
The Safer Deliveries program functions in Zanzibar, Tanzania



Maternal health landscape in Zanzibar

50% of women deliver at home[1]

307 maternal deaths per 100,000 live births[2]

29 neonatal deaths per 1,000 live births[1]

Program Goal

Reduce high rates of maternal and neonatal mortality in Zanzibar by increasing health facility delivery and pre- and post-natal care visits

[1] Road map to accelerate the reduction of maternal, newborn, and child mortality in Zanzibar (2008-2015)

[2] Mortality and Health, Dar es Salaam: National Bureau of Statistics; 2015.

Safer Deliveries Program Overview

From February 2016 to today,

- 20.3k women enrolled
- 12k deliveries
- 401 community health volunteers
- 39k home visits

Monitoring, evaluating, and improving programs in 3 steps

1. Design a mobile application for CHWs and supervisors to improve point of care interactions and generate useful data for the program based on program goals and past research

2. Monitor the program through the use of an online dashboard system and engage the Ministry of Health in programmatic decision-making

3. Leverage statistical methods to address specific questions about program effectiveness that cannot be answered by the dashboard alone

Design a mobile application to improve decision-making and generate useful data

Program Goal

Reduce high rates of maternal and neonatal mortality in Zanzibar by increasing health facility delivery and pre- and post-natal care visits

Design a mobile application to improve decision-making and generate useful data

Program Goal

Reduce high rates of **maternal and neonatal mortality** in Zanzibar by increasing health facility delivery and pre- and post-natal care visits

Maternal and neonatal mortality

- Cause of death
- Danger signs / referrals
- Incomplete referrals
- Risk factors (obstetric history, disease status, etc.)

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Health facility delivery

- Location of delivery
- Reason for home delivery
- Past delivery location
- Partner permission
- Transportation to facility
- Monetary savings

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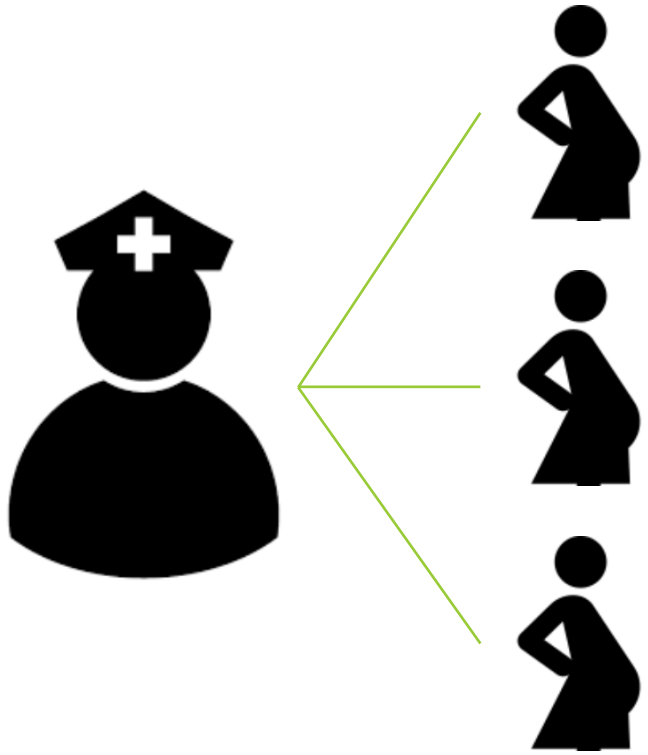
Pre- and post-natal care visits

- Number of ANC visits
- Number of postpartum visits
- Services at visits
- Transportation to visits

Additionally, D-tree collects data on programmatic factors

Community Health Volunteers

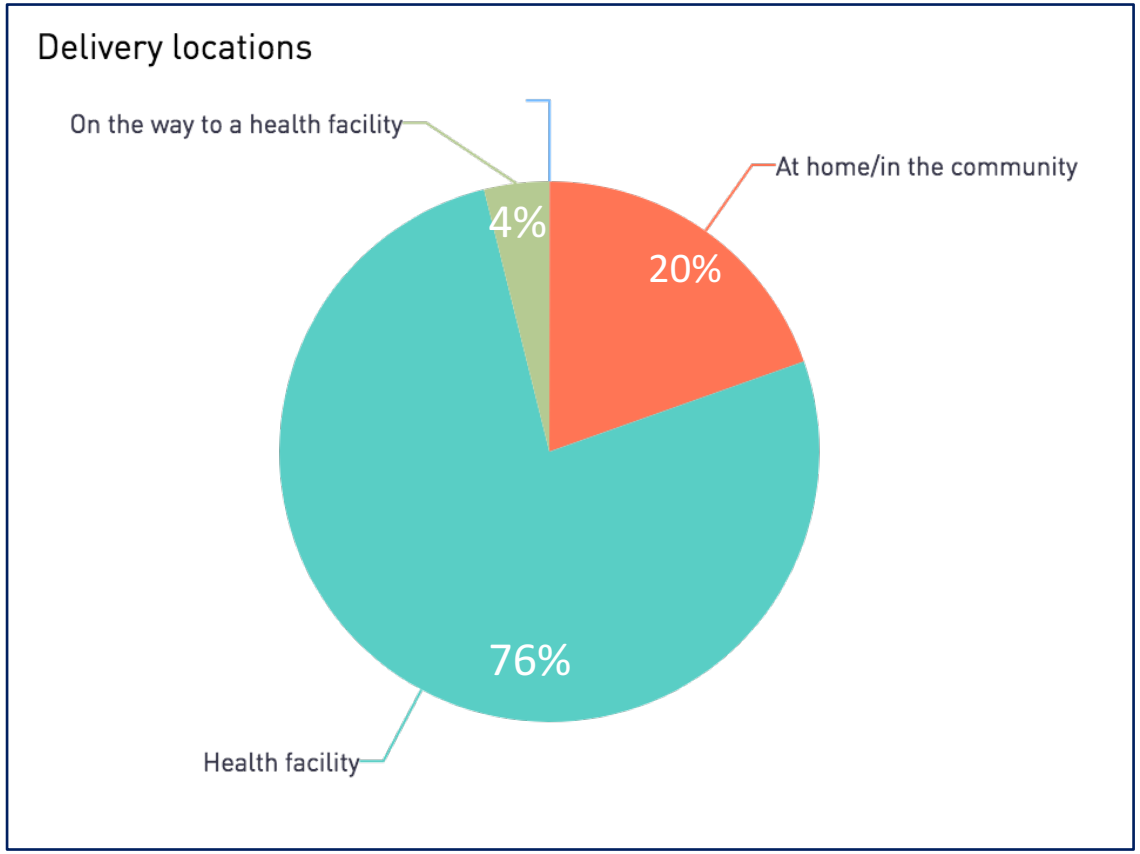
- Number of clients enrolled
- Number of visits to clients
- Training attendance

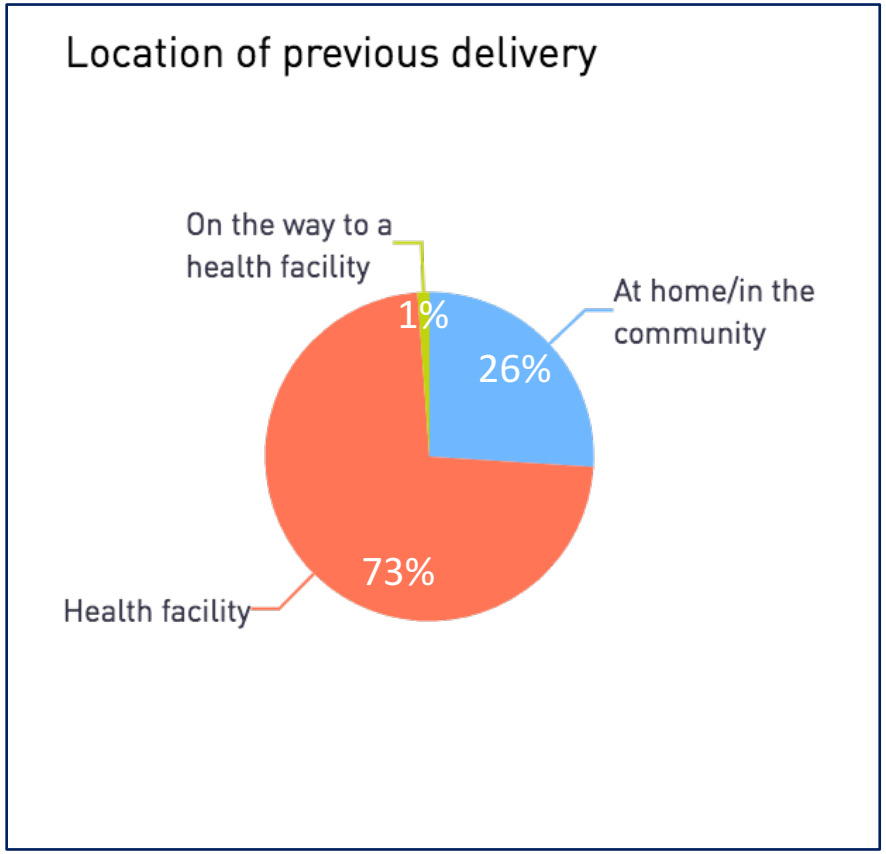


Client

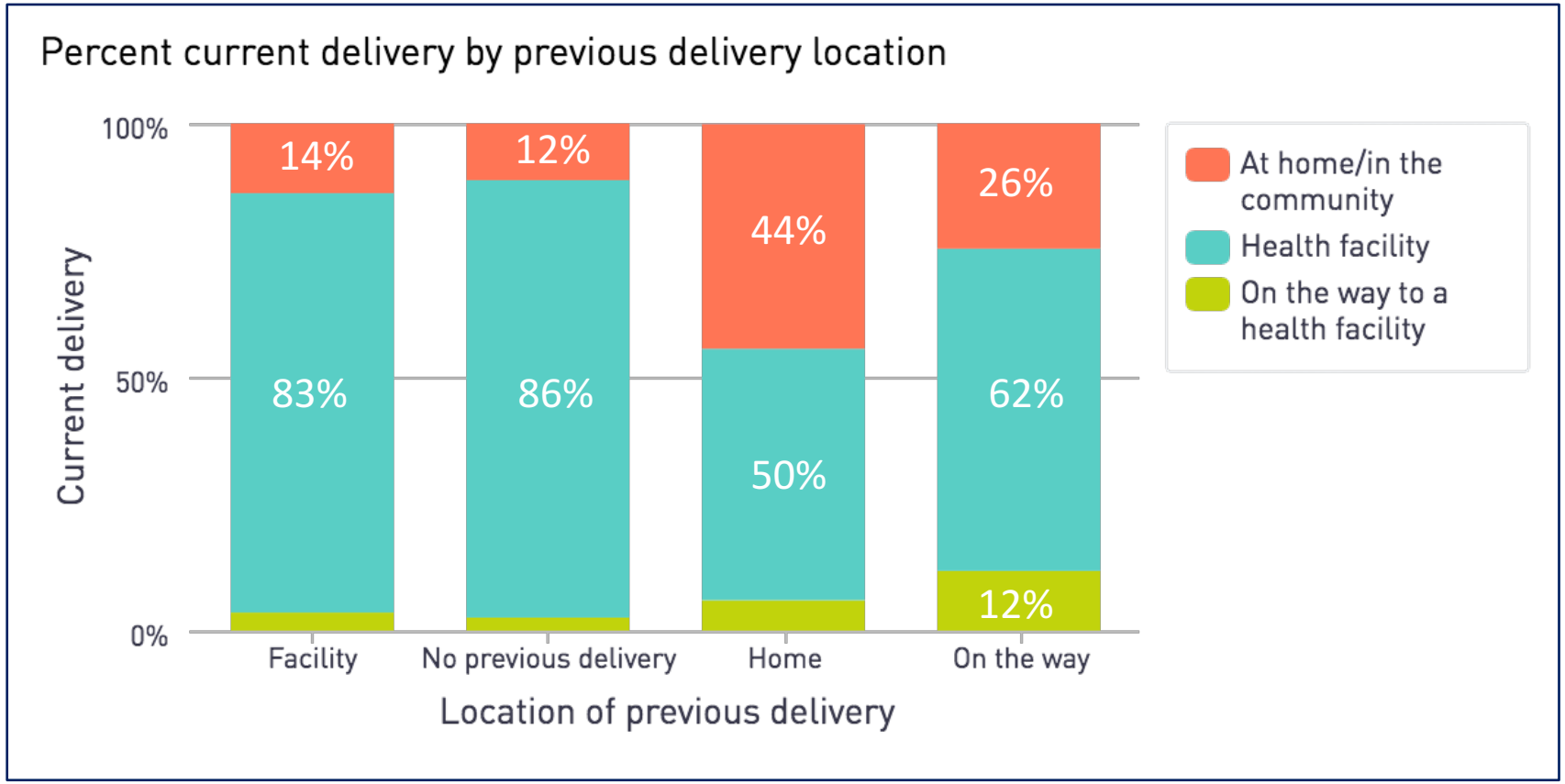
- Recommended delivery location
- Recommended monetary savings
- Number of CHV visits
- Timing of CHV visits

The program is monitored on a day-to-day basis through an online dashboard system



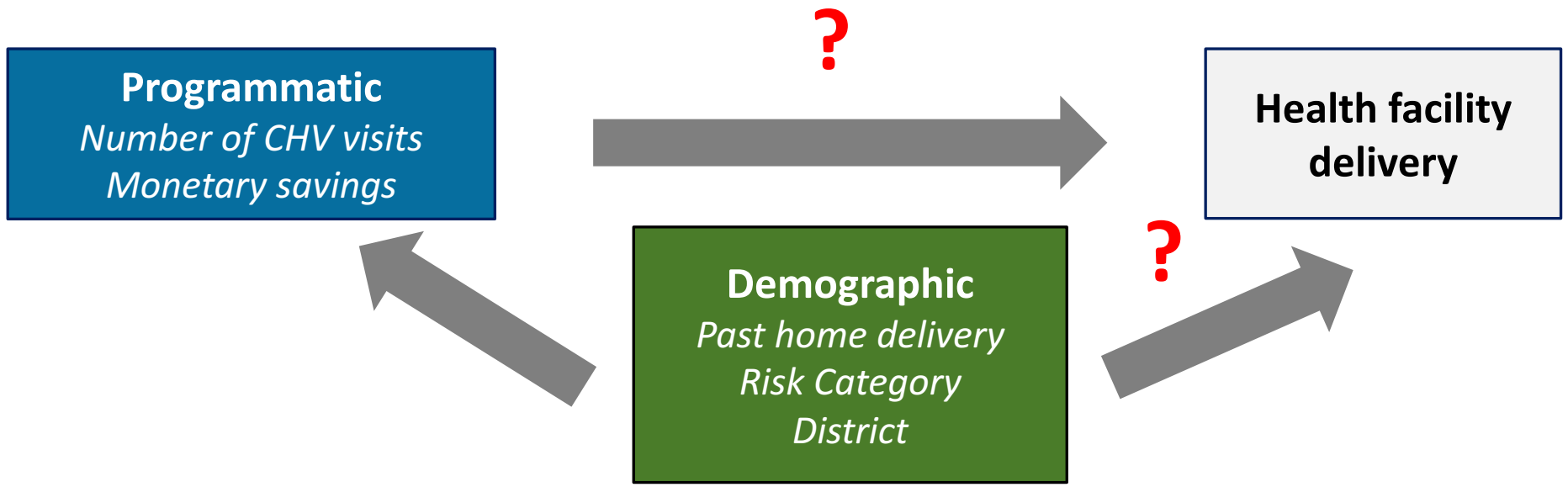


The dashboard can provide quick high level analyses



What demographic and programmatic factors are associated with health facility delivery?

- To answer this question we need more advanced tools as the dashboard cannot readily relay this information
- By using statistical methods, we can jointly evaluate the relationship between multiple factors and an outcome



All demographic and programmatic factors are significantly associated with facility delivery

Estimated odds ratios comparing facility delivery by programmatic and demographic variables (n=2,754*)

	OR	95% CI	p-value
Saved 100% of recommended savings	1.36	(1.09, 1.71)	**0.007**
Number of CHV visits			
2 (vs. 1)	1.43	(0.95, 2.15)	0.089
3+ (vs. 1)	1.60	(1.03, 2.46)	**0.036**
Past delivery was home delivery	0.31	(0.24, 0.38)	**<0.001**
Risk Category			
Medium (vs. Low)	1.88	(1.45, 2.43)	**<0.001**
High (vs. Low)	1.19	(0.91, 1.54)	0.203
District			
North B (vs. North A)	0.98	(0.63, 1.51)	0.919
Central (vs. North A)	0.98	(0.62, 1.54)	0.916
West (vs. North A)	1.70	(1.05, 2.73)	**0.028**
South (vs. North A)	3.32	(1.31, 8.40)	**0.011**

* This analysis was conducted based on May 31, 2017 data and this analysis is **preliminary**

Data for decision-making using the results from this and similar analyses

- Current programmatic changes
  - Encouraging community health volunteers to visit women at least 3 times during pregnancy
  - CHV visits as close as possible to delivery (estimated dates of delivery, more frequent visits)
  - Focus efforts on women who have previously delivered at home
  - Capturing partner permission for delivery and money savings more accurately

- Future research questions to investigate
  - What reasons, if any, are community health workers not reaching 3 visits?
  - Why are women unable to save the recommended amount by the time of delivery? Can we help change this?
  - What is driving differences between districts?

Building capacity at D-tree: Statistical training and mentorship program

- The training focuses on implementing statistical analyses in Stata in order to answer research questions relating to the Safer Deliveries project
- Trainees work in pairs on specific research questions to understand factors associated with,
  - Perinatal deaths
  - Home deliveries
  - Incomplete referrals during pregnancy
- To aid in investigation of the research questions, trainees attend one 3-hour training sessions and complete weekly homework related to their chosen questions




Main takeaways

- Digital health programs have the ability to collect meaningful data in real-time
- This can help aid in program monitoring and evaluation on a rolling basis via the use of dashboard systems
- Statistical analyses can also be leveraged for deeper level decision making
- Employee training programs can be utilized to allow these analyses to be done in-house

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