Wired Mothers

Mobile phones as a health communication tool to improve maternal and neonatal health in Zanzibar

DIPS
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MATERNAL AND NEONATAL HEALTH

Maternal deaths

273 500

Neonatal deaths

3.072.000

Stillbirths

2.650.000

Sources: *Lozano et al. Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. Lanet 2011

** Lui et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. Lancet 2012

MATERNAL AND NEONATAL HEALTH IN ZANZIBAR

99% attend one time ANC

51% institutional delivery

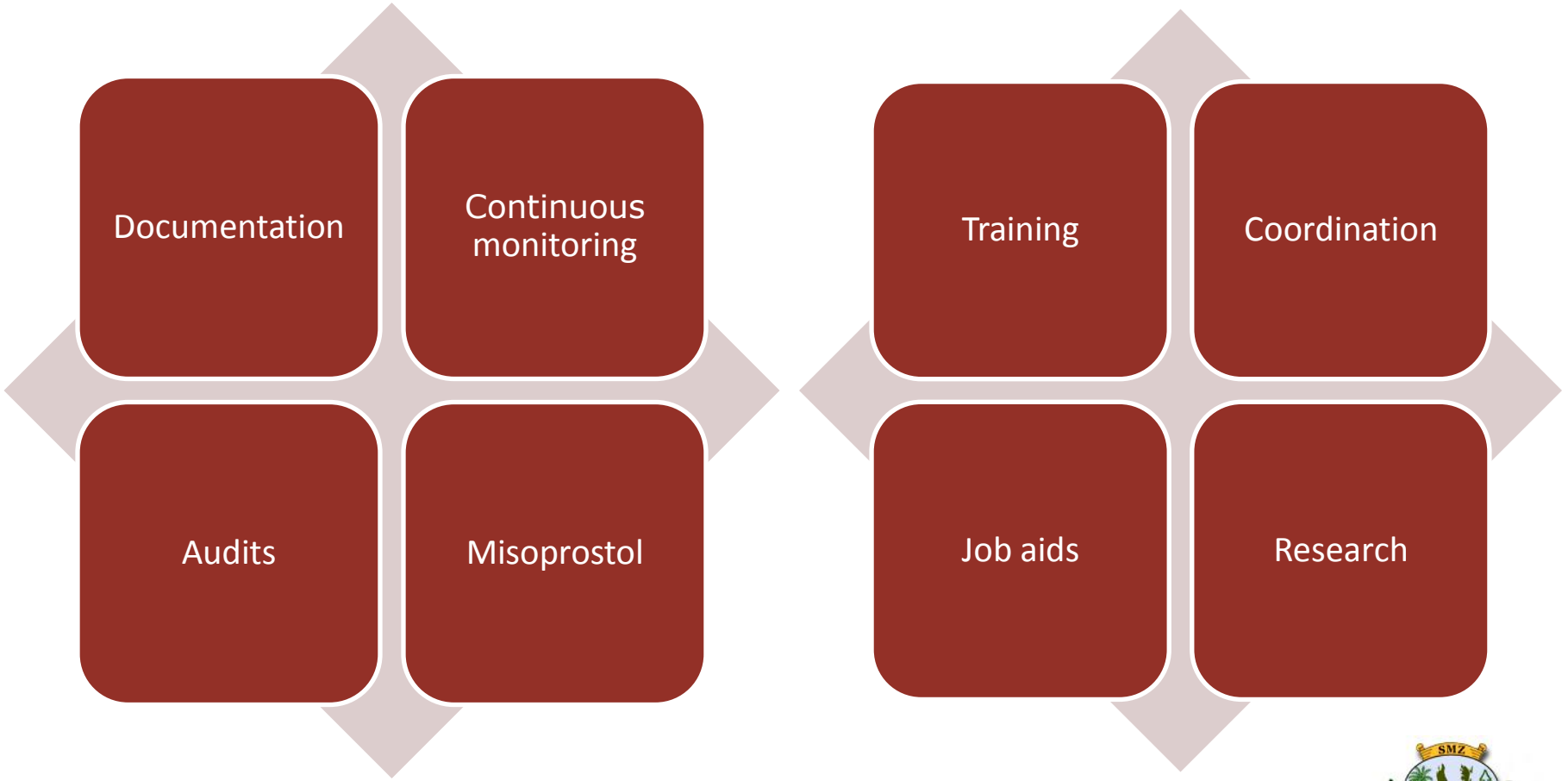
MMR [2006]: 528 / 100,000

NMR: 28 / 1,000

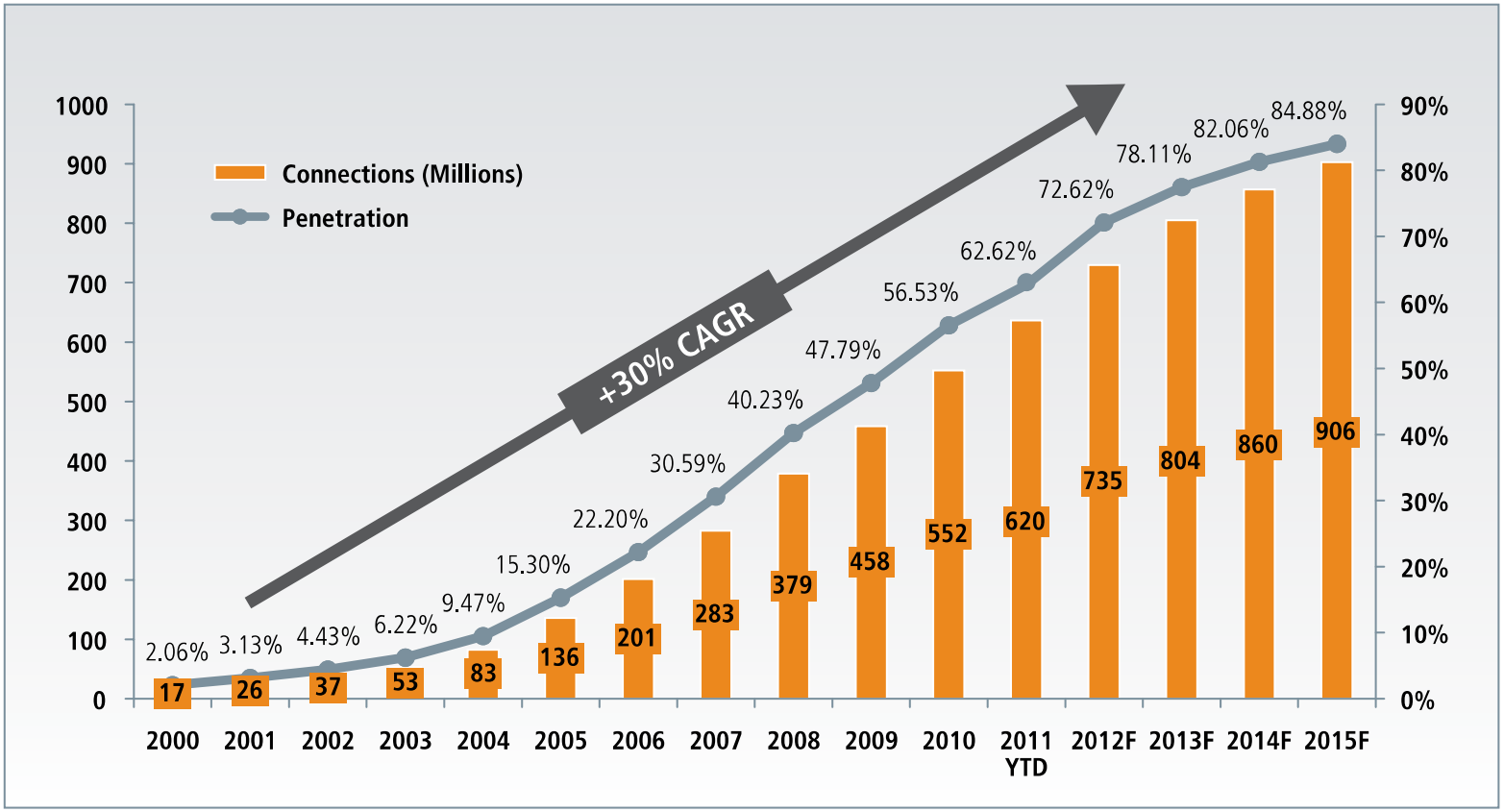
Stillbirths ????

Sources: Tanzania Demographic and Health Service 2010
Zanzibar Ministry of Health. Annual Health Bulletin 2010
Lund et al. Facility Based Maternal Mortality in Zanzibar 2005-2007

STRATEGIC INITIATIVE



AFRICAS MOBILE REVOLUTION



Sources: GSMA African Mobile Observatory 2011

mHEALTH

Health Info Systems

Health Education

Diagnosis and Treatment

Access to Services

mHEALTH

Data and Image Transfer Using Mobile Phones

Images sent by mobile internet

Feedback to sender by text message

Strengthen Microscopy-Based Diagnostics such as malaria, tb, bacterial vaginosis, stool parasites and eggs

Sources: Tuijn et al. Data and Image Transfer Using Mobile Phones to Strengthen Microscopy-Based Diagnostic Services in Low and Middle Income Country Laboratories. PLOS December 2011

mHEALTH

Very few studies of sufficient quality

Limited evidence of actual and wide-scale impacts/outcomes

Even less from developing countries

Sources: Noordam et al. Improvement of maternal health servcies throug
Health, 2011
Tamrat et al. An Analysis of mHealth in Maternal and Newborn Health Programs and Their Outcomes Around the World. Matern Child Health J 2011

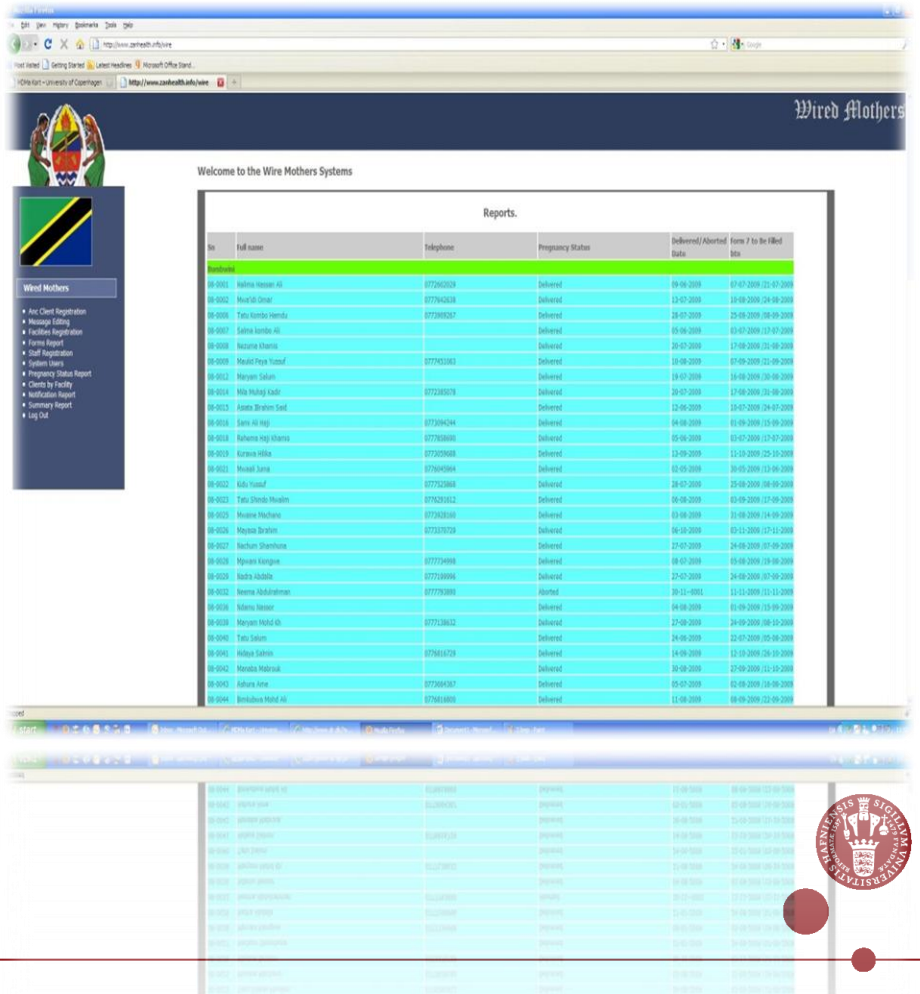
WIRED MOTHERS OBJECTIVES

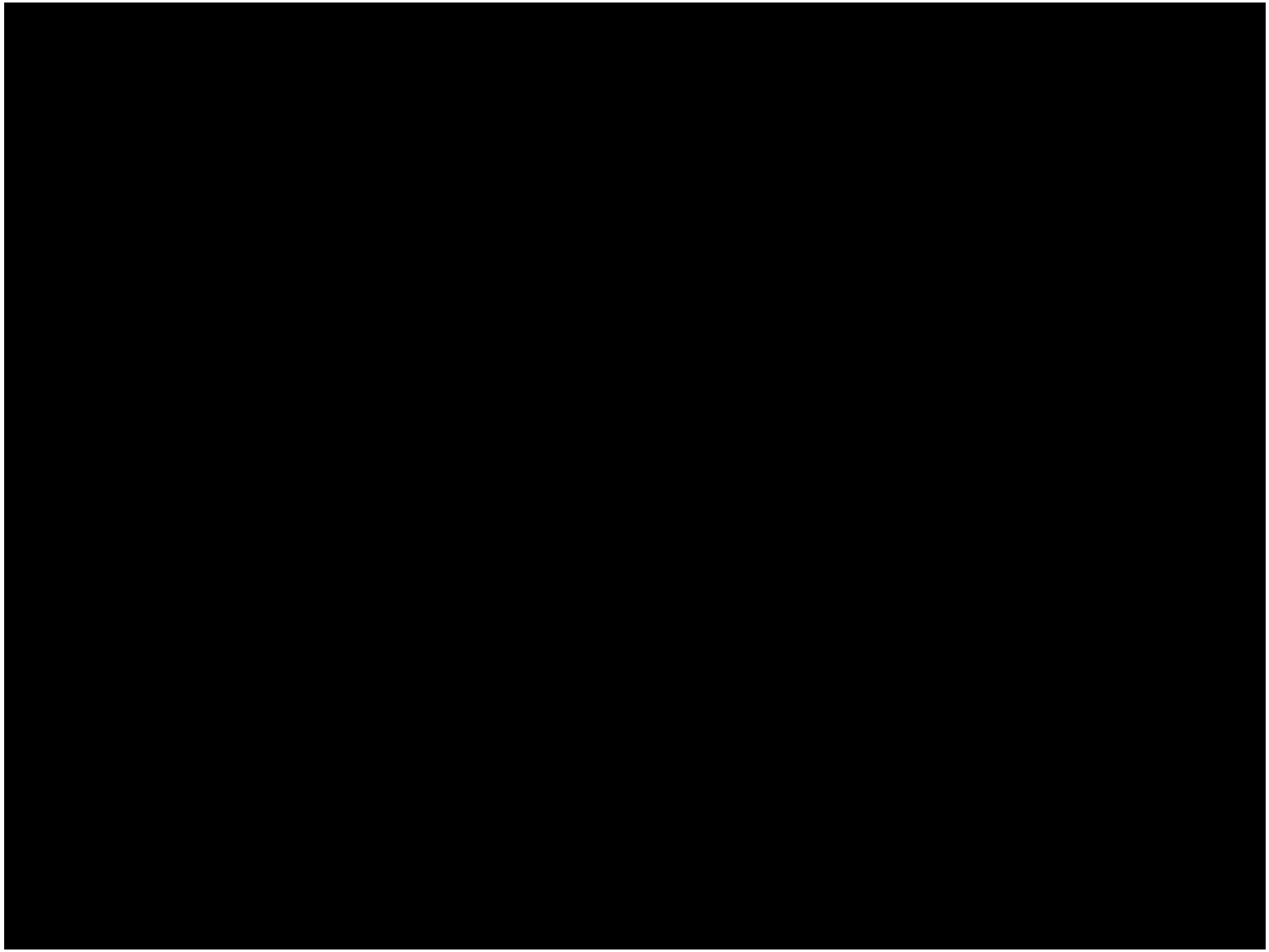
To link pregnant women to the health care system through mobile phones

To improve attendance to antenatal and postnatal care

To improve attendance to skilled delivery attendance

To improve access to emergency obstetric care





Jina - a wired mother

WIRED MOTHERS

Text Messages

Health Education

Person

Person

Person

Person

Community

- Pregnant Women

Health Center

- Midwife

Hospital

- Doctor
- Nurse
- Ambulance

METHODOLOGY

Cluster randomised-controlled trial

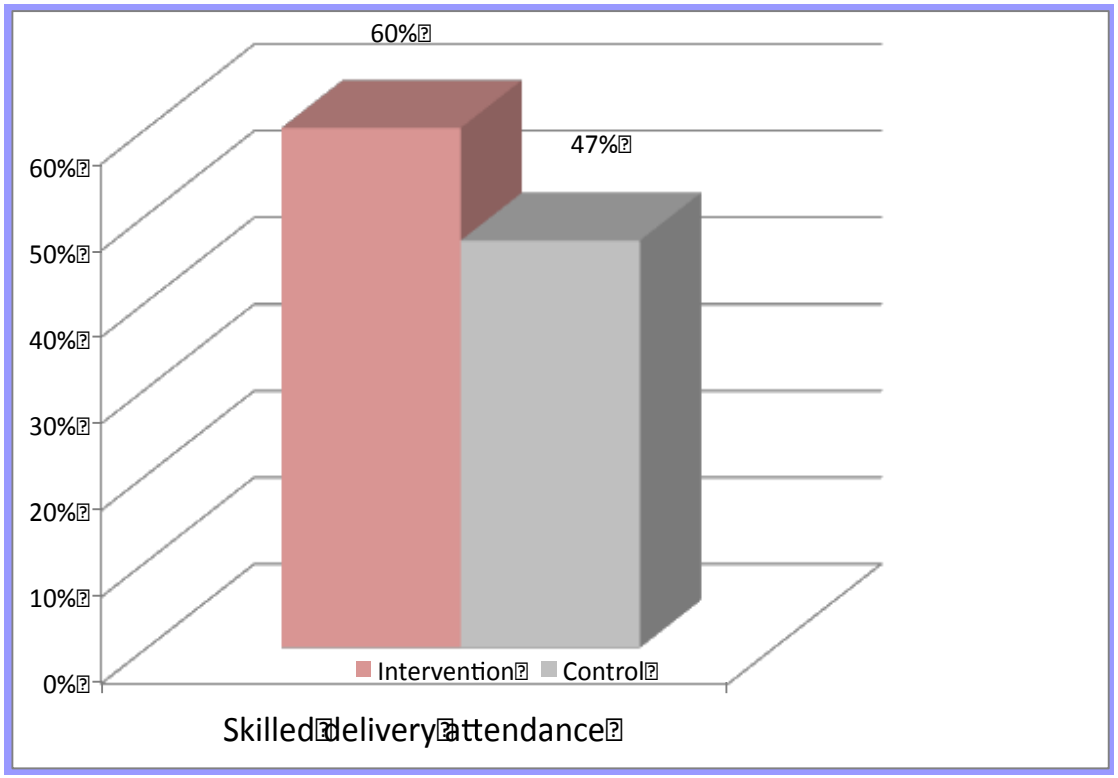
24 health facilities, 2550 women

Randomisation at facility level

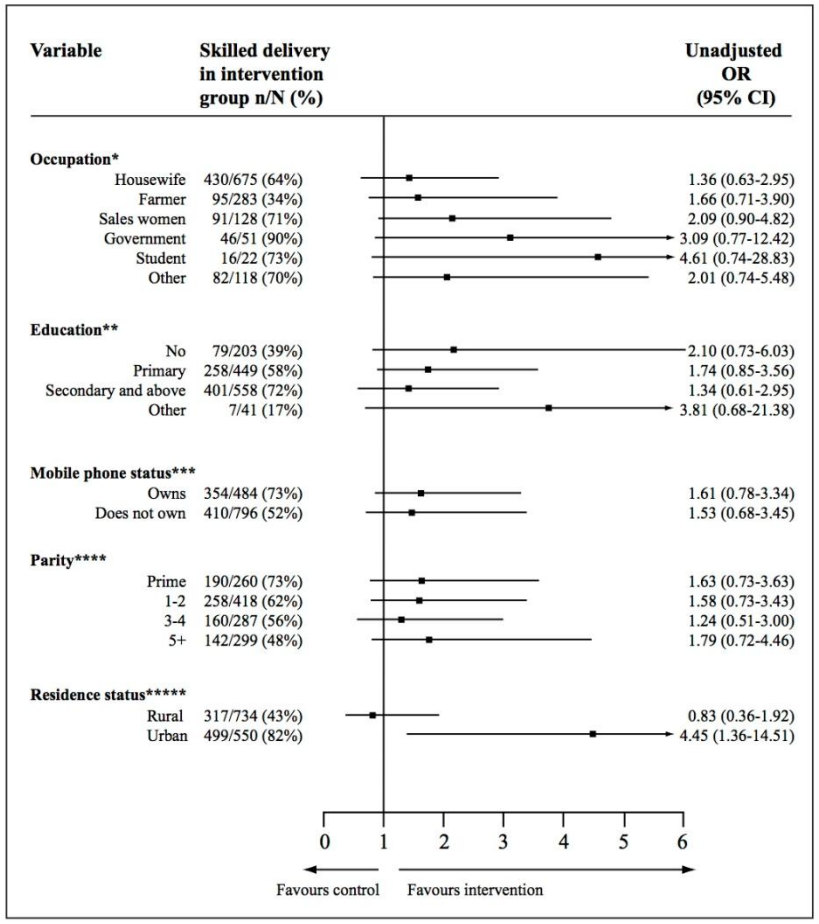
Participants women attending 1st ANC visit

Followed until 42 days after delivery

SKILLED DELIVERY ATTENDANCE



SOCIO-ECONOMIC SUBGROUPS



Source: Lund S et al Mobile phones as a health communication tool to improve skilled attendance at delivery in Zanzibar: a cluster-randomised controlled trial. BJOG 2012; DOI: 10.1111/j.1471-0528.2012.03413.x.

SKILLED DELIVERY ATTENDANCE

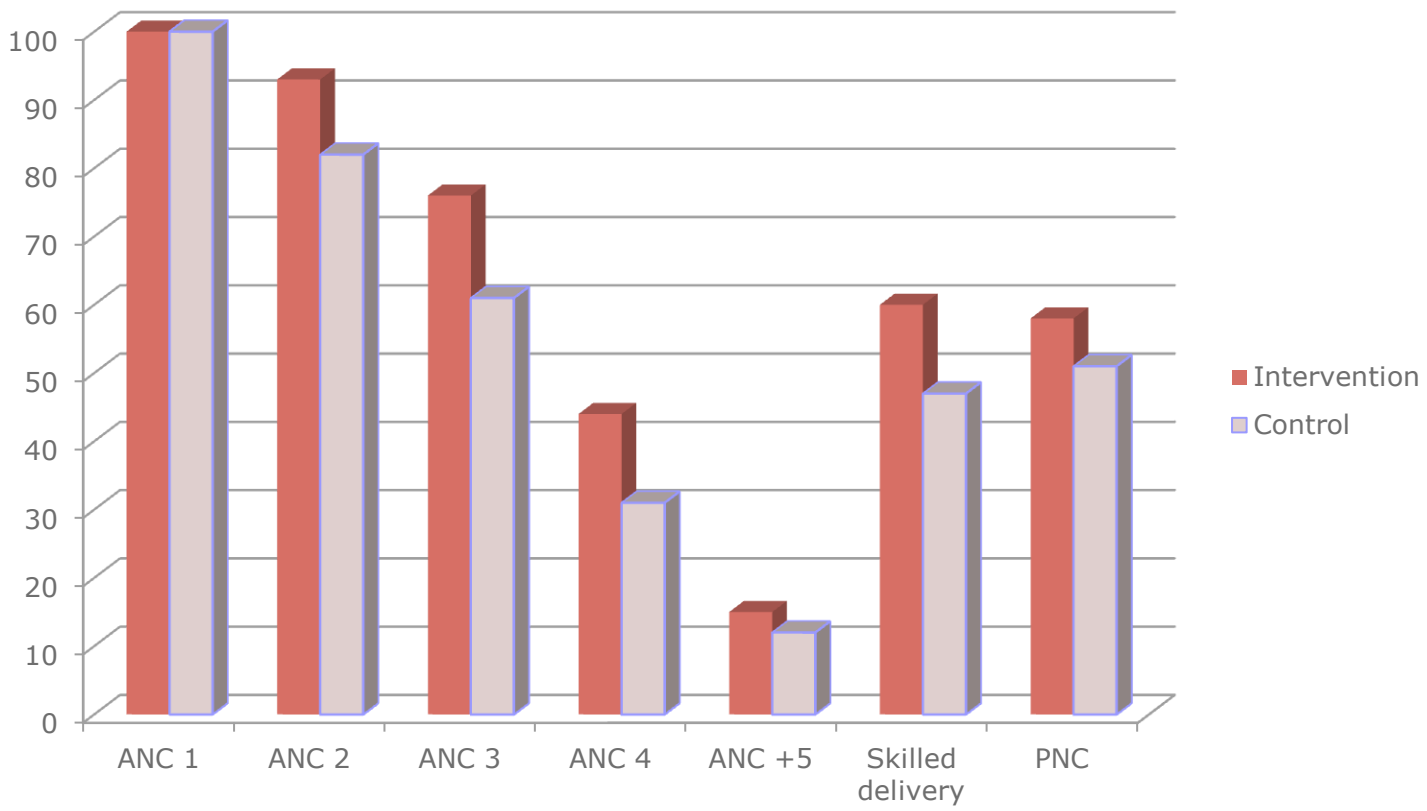
Table 2. Association between mobile phone intervention and skilled delivery attendance by residence status*

	Skilled delivery (%)	Unskilled delivery (%)	Unadjusted OR** (95% CI)	Adjusted OR*** (95% CI)
All women	**1326 (53)**	**1159 (47)**		
Intervention	766 (60)	518 (40)		
Control	560 (47)	641 (53)		
Rural residence	**630 (44)**	**812 (56)**		
Intervention	317 (43)	417 (57)	0.83 (0.36–1.92)	0.85 (0.42–1.71)
Control	313 (44)	395 (56)	1	1
Urban residence	**696 (67)**	**347 (33)**		
Intervention	449 (82)	101 (18)	4.45 (1.36–14.51)****	5.73 (1.51–21.81)****
Control	247 (50)	246 (50)	1	1

CI, confidence interval; OR, odds ratio.
*Missing cases 65, intervention and control group.
**Adjusted for within-cluster effect and intervention interaction with residence status.
***Adjusted for significant variables associated with skilled delivery attendance, within-cluster effect and intervention interaction with residence status.
****$P < 0.01$.

Source: Lund S et al Mobile phones as a health communication tool to improve skilled attendance at delivery in Zanzibar: a cluster-randomised controlled trial. BJOG 2012; DOI: 10.1111/j.1471-0528.2012.03413.x.

CONTINUITY OF CARE



ANTENATAL CARE

Table 3. Association between mobile phone intervention and primary and secondary outcomes

Variable	Intervention No (%)	Control No (%)	Unadjusted* OR (95% CI)	Adjusted OR** OR (95% CI)
Primary outcome				
Four or more antenatal care visits	574 (44)	385 (31)	1.54 (0.80-2.96)	2.39 (1.03-5.55)

ANTENATAL CARE

Table 3. Association between mobile phone intervention and primary and secondary outcomes

Variable	Intervention No (%)	Control No (%)	Unadjusted* OR (95% CI)	Adjusted OR** OR (95% CI)
Secondary outcomes				
Tetatnus toxoid vaccination of primigravida				
TT1[1]	223/232 (96)	195/208 (94)	1.38 (0.39-4.87)	1.58 (0.41-6.01)
TT2[2]	155/215 (72)	112/201 (56)	1.67 (0.84-3.33)	1.62 (0.81-3.26)
Intermittent Preventive Treatment in pregnancy				
IPTp1	1191 (91)	1060 (86)	1.78 (0.49-6.52)	1.10 (0.35-3.43)
IPTp2	846 (65)	640 (52)	1.69 (0.82-3.48)	1.97 (0.98-3.94)
Gestational age 36 or more at last ANC visit	366 (28)	248 (20)	1.45 (0.88-2.37)	1.48 (0.89-2.45)
Antepartum referral	127 (10)	57 (5)	1.58 (0.61-4.09)	1.66 (0.68-4.06)

[1]Missing cases 5, 52 not eligible, [2]missing cases 13, 68 not eligible, [3]missing cases 13. All missing cases intervention and control group

*Adjusted for within cluster effect

**Adjusted for significant variables associated with antenatal care attendance and within cluster effect

VOICE CALLS

39% called their midwife

- Bleedings before and after delivery
- Eclampsia
- Obstructed labor
- Abortion
- Abdominal pain
- In labour
- Medicines
- PV discharge

3% emergency referrals

STILLBIRTHS

Table. Association between mobile phone intervention and delivery outcome

Variable	Intervention No (%)	Control No (%)	Unadjusted* OR (95% CI)	Adjusted OR** OR (95% CI)
Born alive	1277 (98%)	1197 (97%)		
Abortion	14 (1%)	11 (1%)		
Stillbirths	16 (1%)	29 (2%)	0.52 (0.29-0.94)	0.48 (0.27-0.88)

[1] Missing cases 6. All missing cases intervention and control group
*Adjusted for within cluster effect
**Adjusted for significant variables associated with antenatal care attendance and within cluster effect

Source: Lund S et al. Preliminary analyses.

MORTALITY

	Study	Tanzania	Africa
Stillbirth rate	18	17*	28**
Neonatal Mortality rate	15	24***	28***

*TDHS 2010

**Coucens et al. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: a systematic analysis. Lancet 2011

*** Lozano et al. Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. Lancet 2011

Source: Lund S et al. Preliminary analyses.

CONCLUSIONS

Urban women more than 5 times likely to delivery with SBA in intervention group

Increased antenatal care attendance and adherence to procedures

Reduction in stillbirths

Intervention widely accepted amongst health workers and women

POLICY IMPLICATIONS

Mobile phone solutions may contribute to saving women's and newborn lives and towards achievement of MDG 4 and 5

mHealth solutions should be considered by maternal health policy makers in developing countries

THANK YOU