

Assessing the effectiveness of decentralised antenatal ultrasound in a primary health care clinic compared with a hospital-based service in rural South Africa: an interrupted time series analysis

Dr Christopher Westwood

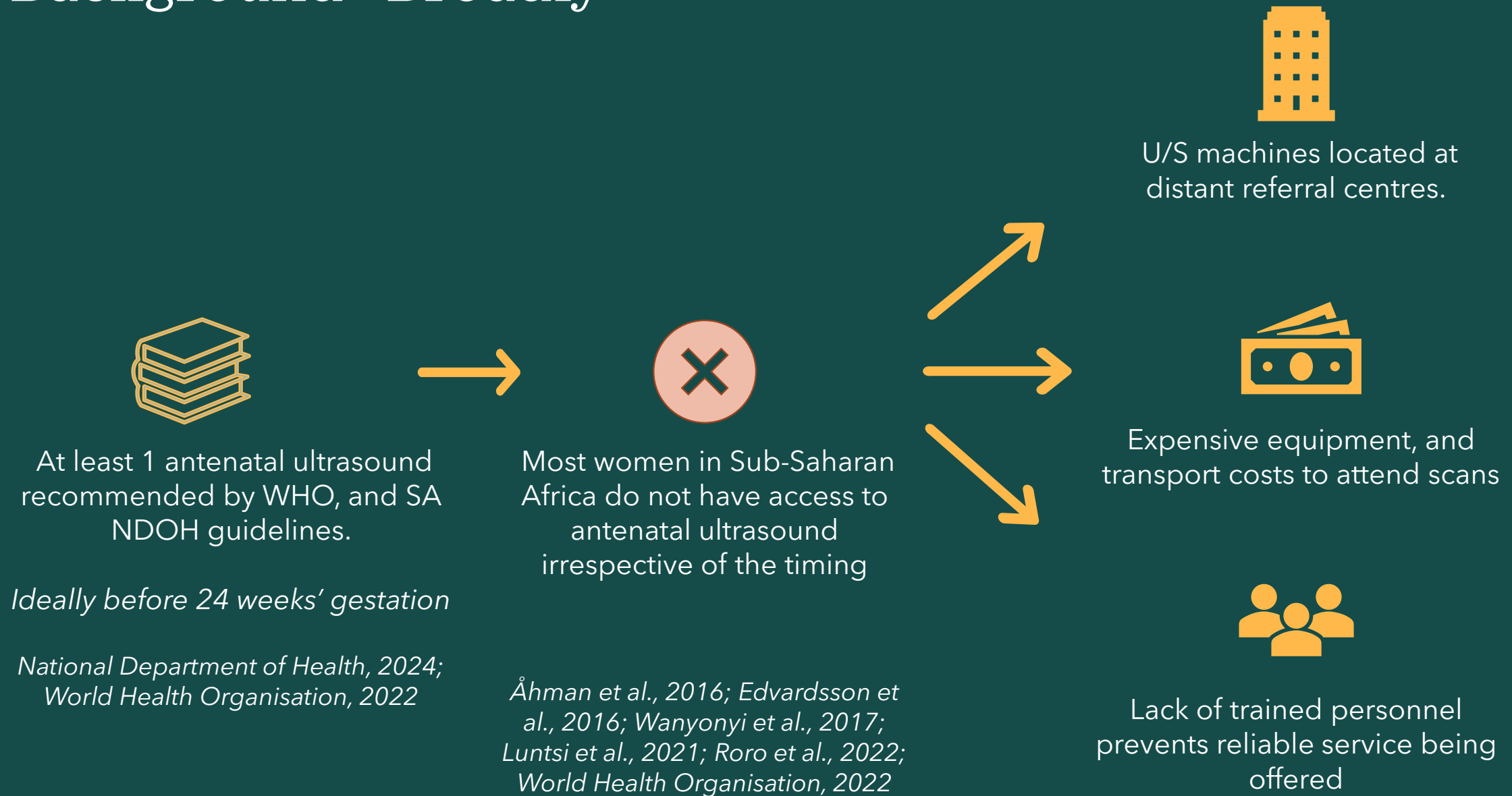
Department of Family Medicine and Rural Health

Walter Sisulu University

Supervised by Dr James Porter and Dr Andrew Miller



Background - Broadly





De-centralised antenatal ultrasound has been associated with:

- ✓ Increased antenatal clinic attendance
- ✓ Increased antenatal appointment adherence
- ✓ Increased identification and referral of high-risk pregnancies
- ✓ Increased institutional deliveries
- ✓ Increased postnatal care attendance

Ross et al., 2013; Mbuyita et al., 2015; Kawooya et al., 2015; Amoah et al., 2016; Luntsi et al., 2022; Yitbarek et al., 2022, Abawollo et al., 2023

However,

- ❖ None of these looked at the timing of scans
- ❖ No recent studies in South Africa

Background - Locally

A rural District Hospital offering a free walk-in antenatal ultrasound service based at the hospital.

- Most women have at least one antenatal ultrasound scan (*unpublished hospital data*)
- 1 in 2 have first antenatal scan after 24-weeks of gestation (*unpublished hospital data*)

In November 2018, an antenatal ultrasound outreach program to the local CHC was started.

- Medical officer visits every 2nd week
- Ultrasound machine available at clinic
- Hospital-based service unchanged



Research Objectives

- To assess the effect of a decentralised antenatal ultrasound program on the percentage of women who:

SA NDOH + WHO
Recommendation

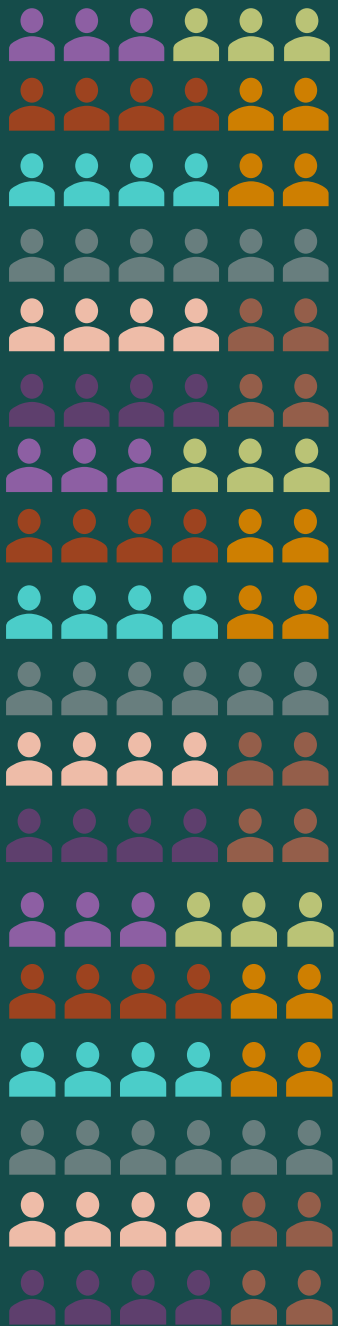
Have U/S before
24-weeks of gestation

Book their pregnancy
before 24-weeks of
gestation

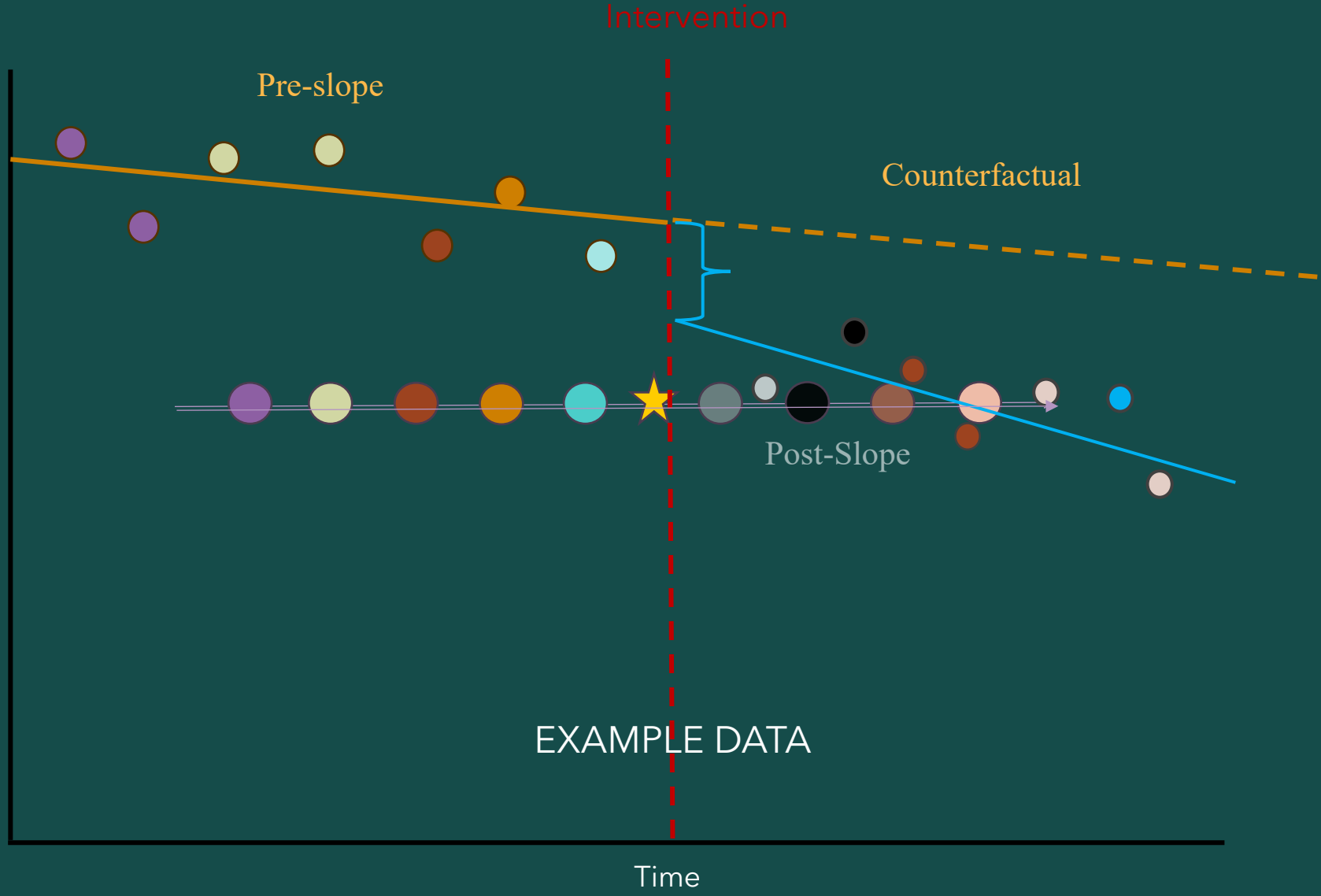
Have at least 1 antenatal
U/S

Attend 4 or more
antenatal visits

Proxy for
engagement with
care



Outcome Measure



- Our hypothesis? A step change at the time of intervention and maybe a continued improvement over time
 - Three-Delays Model by Thaddeus and Maine (1994)
 1. Delay in decision to seek care
 2. Delay in reaching the healthcare facility
 3. Delay in receiving appropriate treatment
 - Expected a sudden improvement in access, and a step in the post-intervention cohort



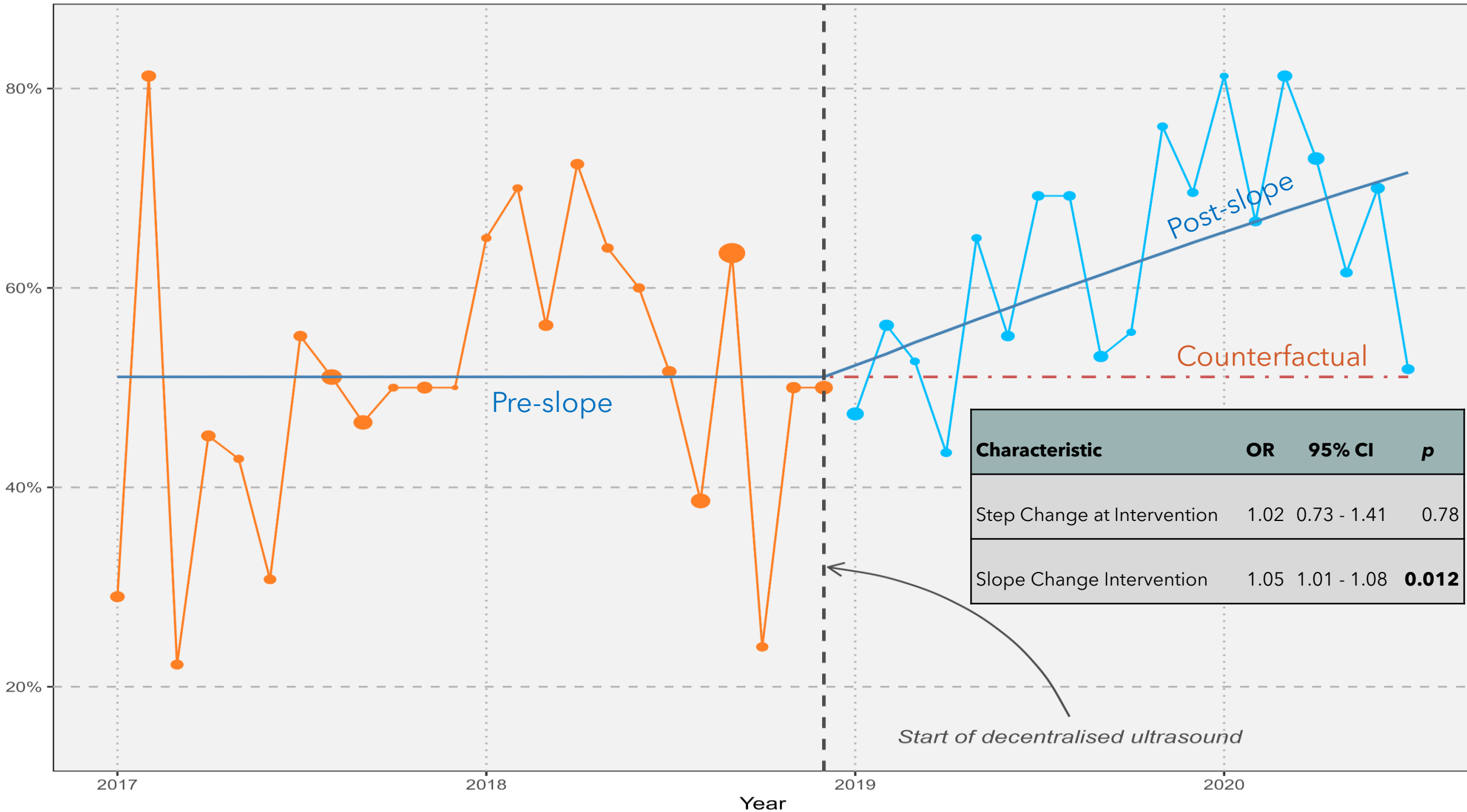
Results – Baseline Characteristics

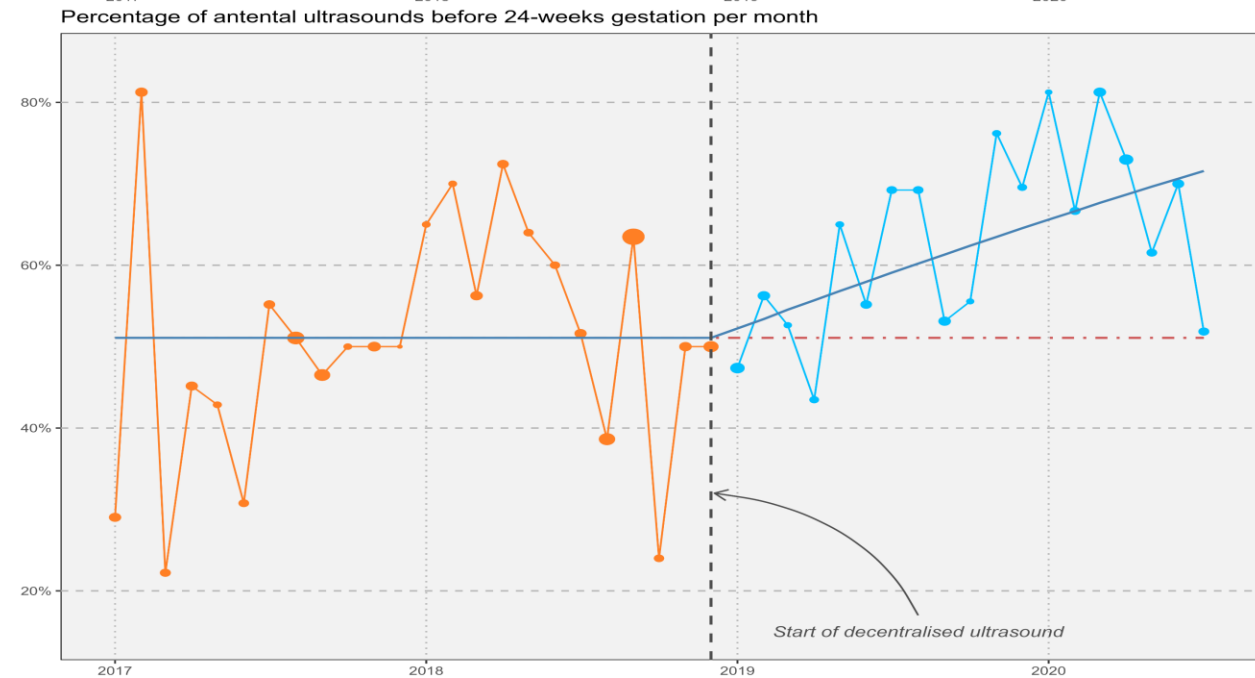
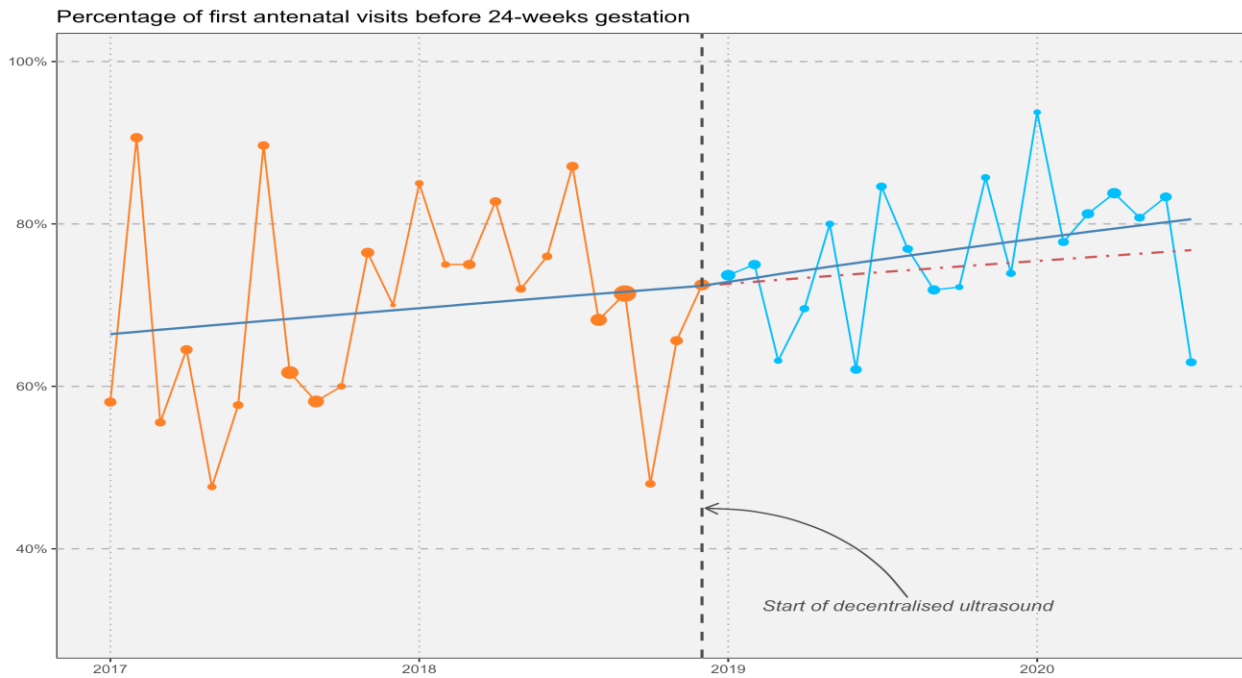
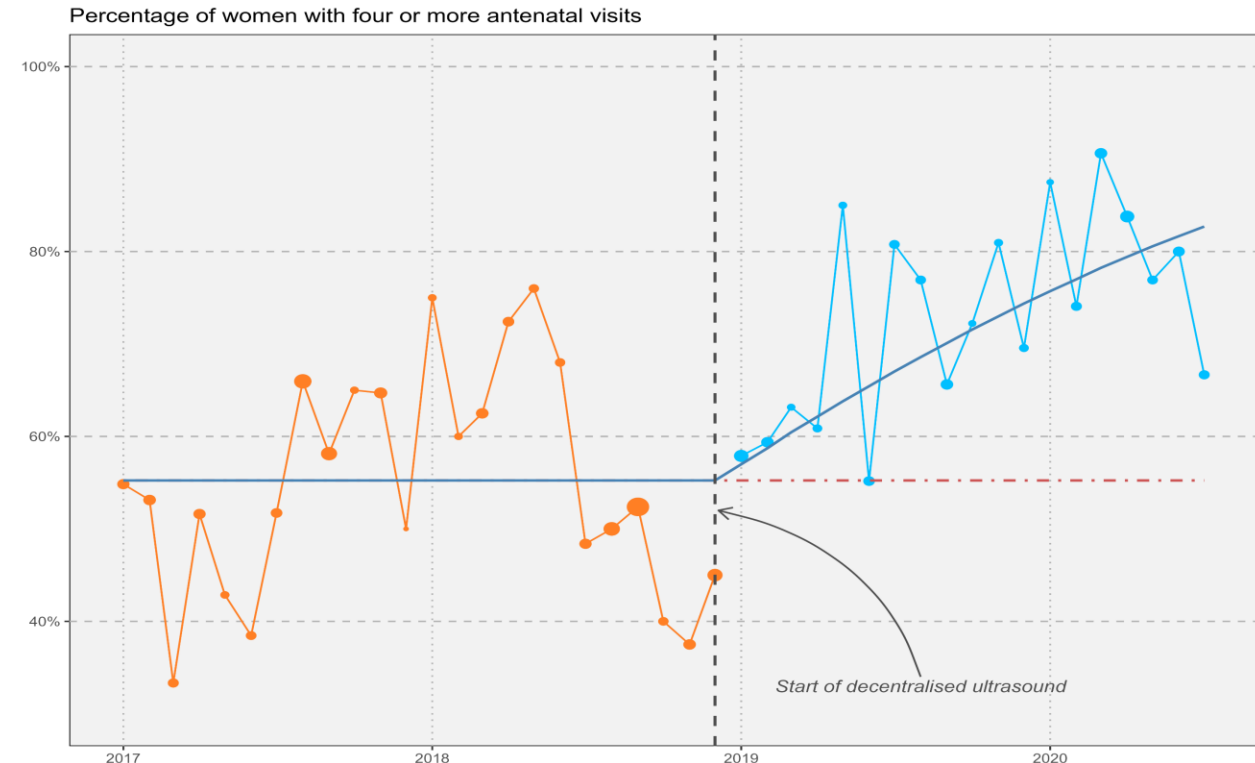
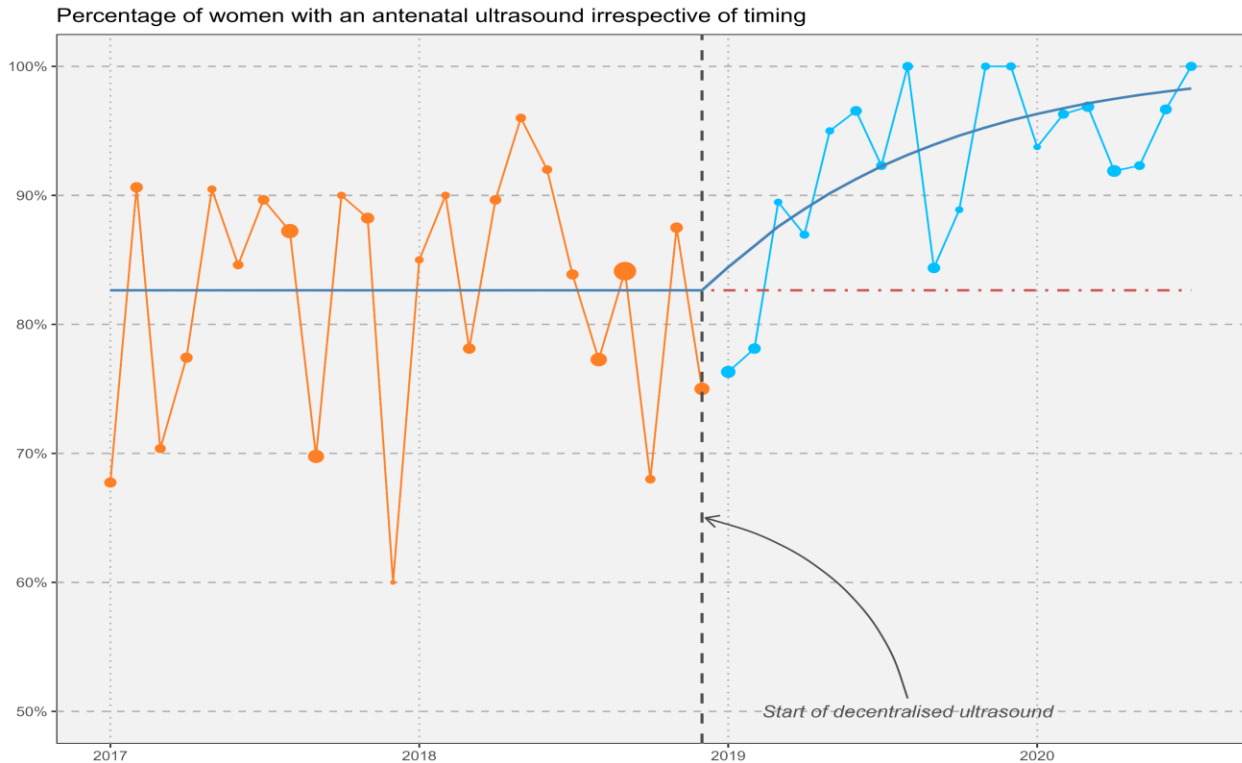
	Pre-Intervention	Post-Intervention	p
Demographics			
n	697	542	
Age (years)	25 (21 - 31)	26 (21 - 31)	0.14
Teenage Pregnancy	139 (20%)	88 (16%)	0.09
HIV +	263 (38%)	194 (36%)	0.52
High Risk Pregnancy	115 (16%)	98 (18%)	0.51
Parity			
0	238 (34%)	176 (32%)	0.53
1	201 (29%)	165 (30%)	0.54
2	133 (19%)	93 (17%)	0.31
3 +	125 (18%)	108 (20%)	0.37

1239 deliveries identified across study period

No differences in characteristics of pre and post intervention cohorts.

Percentage of antenatal ultrasounds before 24-weeks gestation per month





Main findings

The effects of a decentralised antenatal ultrasound program on the percentage of women who:

Have U/S before
24-weeks of gestation

Have at least 1 antenatal
U/S

Book their pregnancy
before 24-weeks of
gestation

Attend 4 or more
antenatal visits

- Findings show a consistent pattern across multiple outcomes
- Interrupted Time Series approach increases the robustness of the temporal link between the intervention and outcome
- Incremental improvement differed to hypothesised effect

Limitations

- x Added a doctor not only ultrasound
- x No direct perinatal outcomes
- x No control group
- x Single subdistrict
- x Retrospective
- x Population-level

Strengths

- √ Adequate sample size and time-points sampled
- √ Quasi-experimental design
- √ Consistent pattern of results
- √ Strong temporal-link
- √ Cohorts similar at baseline

Thank you



SOUTH AFRICAN ACADEMY OF
FAMILY PHYSICIANS

Percentage of antenatal ultrasounds before 24-weeks gestation per month

