Safe Surgery 2020

Outcomes of a multicomponent safe surgery intervention in Tanzania's Lake Zone

December 6 2019

DISCLOSURES

- Safe Surgery 2020 is funded by the GE Foundation

SAFE SURGERY 2020 PARTNERS

Lead partners…

Country partners…

Implementation partners…

Funded by…

SURGICAL QUALITY IN GLOBAL CONTEXT

Patients in Africa **2x as likely to die** after surgery compared to global average[1]
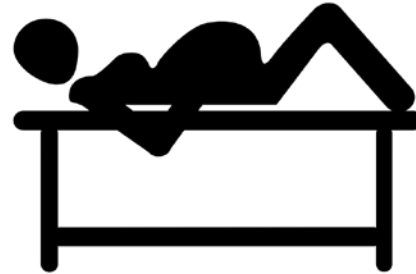
Maternal **mortality rate** after C-section **50x higher** in Africa than HICs[2]

1 in 5 patients in Africa has post-surgical complications; **infections** are most common and **2-10X higher** than HICs[3]

SAFE SURGERY 2020 APPROACH

- Partnership with the Tanzanian government

- Focus on local surgical priorities

- Multicomponent intervention

- Build local capacity and empower surgical teams

- Evaluate to promote learning about how best to strengthen surgical services in LMICs
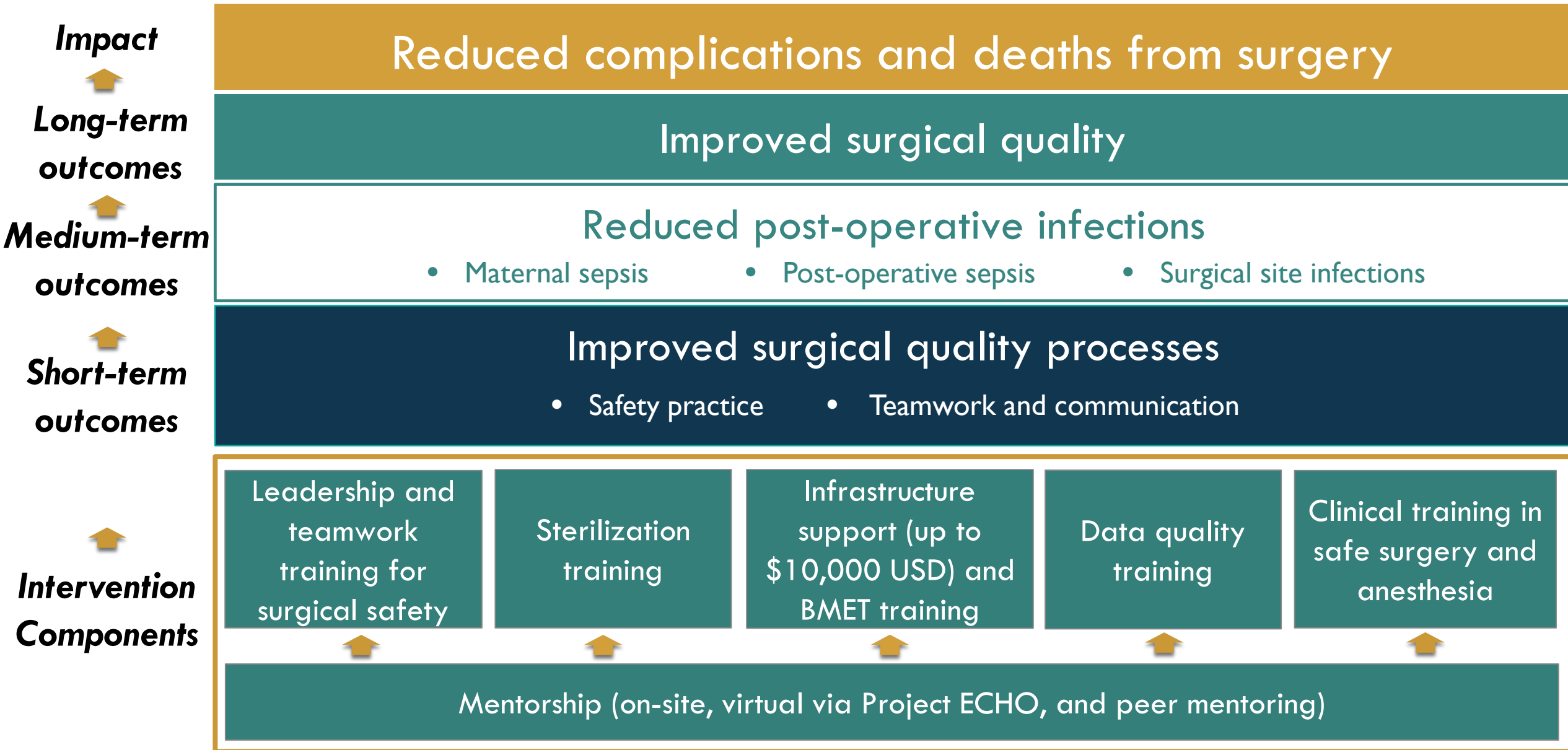
RESEARCH AIMS

To assess the impact of the Safe Surgery 2020 multicomponent intervention on the quality of surgical care

- Short-term outcomes: surgical quality processes
    - Safety and team work & communication
- Medium-term outcomes: surgical complications
    - Maternal sepsis, post-operative sepsis and surgical site infections (SSI)
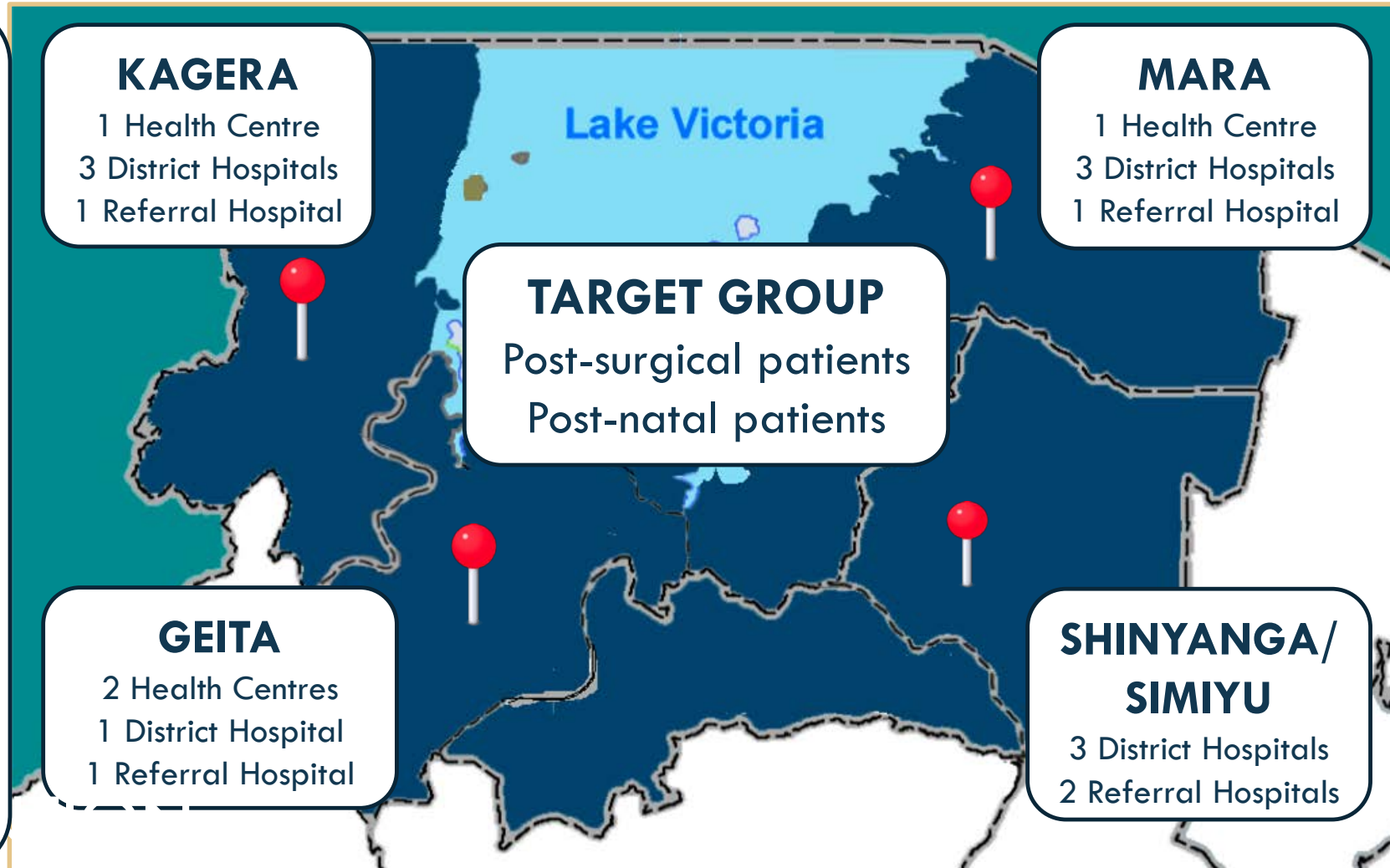
THEORY OF CHANGE

Impact

Reduced complications and deaths from surgery

Long-term outcomes

Improved surgical quality

Medium-term outcomes

Reduced post-operative infections

- Maternal sepsis
- Post-operative sepsis
- Surgical site infections

Short-term outcomes

Improved surgical quality processes

- Safety practice
- Teamwork and communication

Intervention Components

| Leadership and teamwork training for surgical safety | Sterilization training | Infrastructure support (up to $10,000 USD) and BMET training | Data quality training | Clinical training in safe surgery and anesthesia |

Mentorship (on-site, virtual via Project ECHO, and peer mentoring)

STUDY SETTING

POPULATION
10 million people
2/3 live in rural areas
1/3 live below poverty line

KAGERA
1 Health Centre
3 District Hospitals
1 Referral Hospital

MARA
1 Health Centre
3 District Hospitals
1 Referral Hospital

TARGET GROUP
Post-surgical patients
Post-natal patients

GEITA
2 Health Centres
1 District Hospital
1 Referral Hospital

SHINYANGA/ SIMIYU
3 District Hospitals
2 Referral Hospitals

Lake Victoria

STUDY DESIGN

High quality evidence
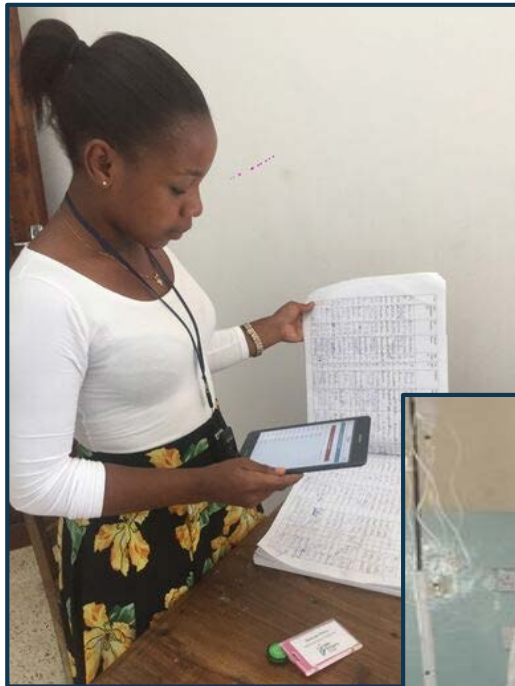Longitudinal, multi-site, quasi-experimental design

Knowledge for scale up
Mixed quantitative and qualitative methods

High quality primary data
Prospective; direct observation; weekly data quality checks

DATA COLLECTION TEAM

40

Tanzanian medical doctors trained
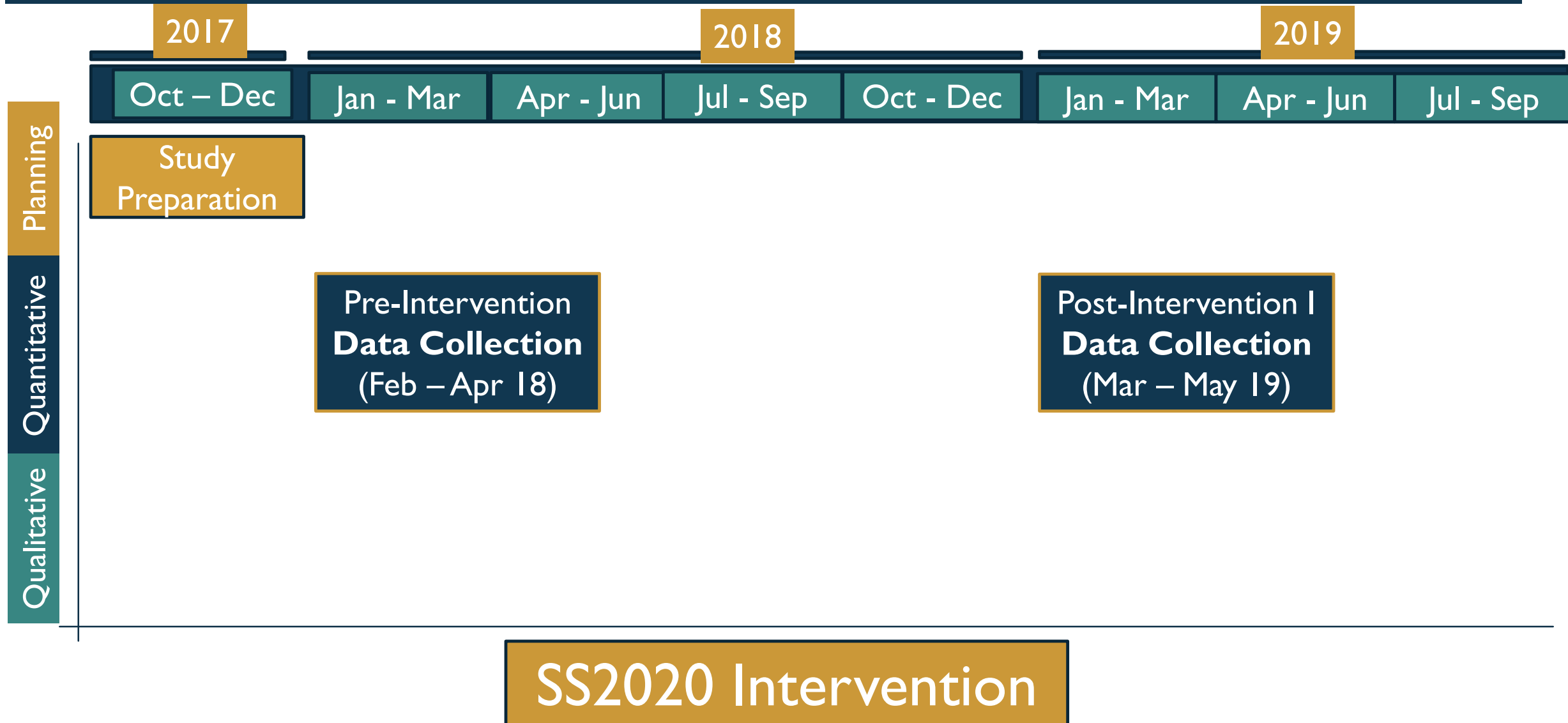
QUANTITATIVE DATA COLLECTION

SSC

Observation tool

Maternal sepsis/ Sepsis/SSI

Screening tool

STUDY TIMELINE

	2017		2018					2019	
	Oct – Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec		Jan - Mar	Apr - Jun	Jul - Sep

Planning

Study Preparation

Quantitative

Pre-Intervention **Data Collection** (Feb – Apr 18)

Post-Intervention I **Data Collection** (Mar – May 19)

Qualitative

SS2020 Intervention

DATA ANALYSIS

Observed trend in intervention group

Observed trend in control group

Intervention Effect

Outcome

Pre-intervention

Post-intervention

SUMMARY

20 study facilities

40 Tanzanian medical doctors trained

200+ days of on-site data collection

2,712 surgeries observed

18,864 study participants enrolled

SAFETY, TEAMWORK & COMMUNICATION

Safety Indicators

1) Pulse oximeter used

2) Prophylactic antibiotic administration within 60 minutes before incision

3) Confirmation by team of patient's identity, site, and procedure

4) Instrument, sponge, and needle count completed

5) Operative site cleaned

6) Appropriate vaginal cleansing (C/S)

Teamwork & Communication Indicators

1) Risk of airway difficulty or aspiration

2) Risk of blood loss

3) Patient specific concerns – anesthesia provider

4) Patient specific concerns- surgical provider

5) Sterility of instruments and equipment

6) Equipment problems during surgery

7) Post-operative recovery concerns

8) Duration and difficulty of procedure

ADHERENCE TO SAFETY DOMAIN
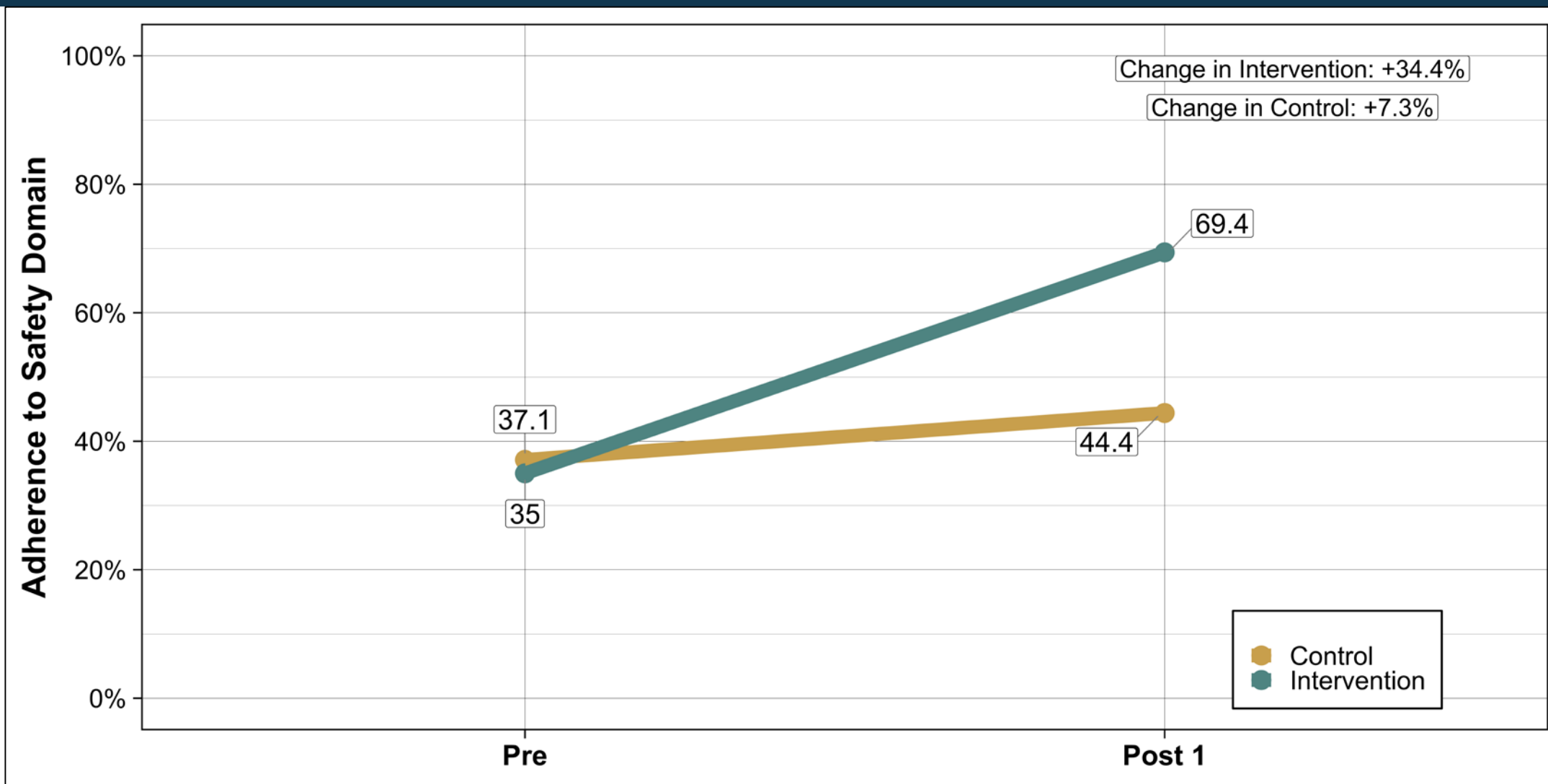
ADHERENCE TO TEAMWORK AND COMMUNICATION DOMAIN
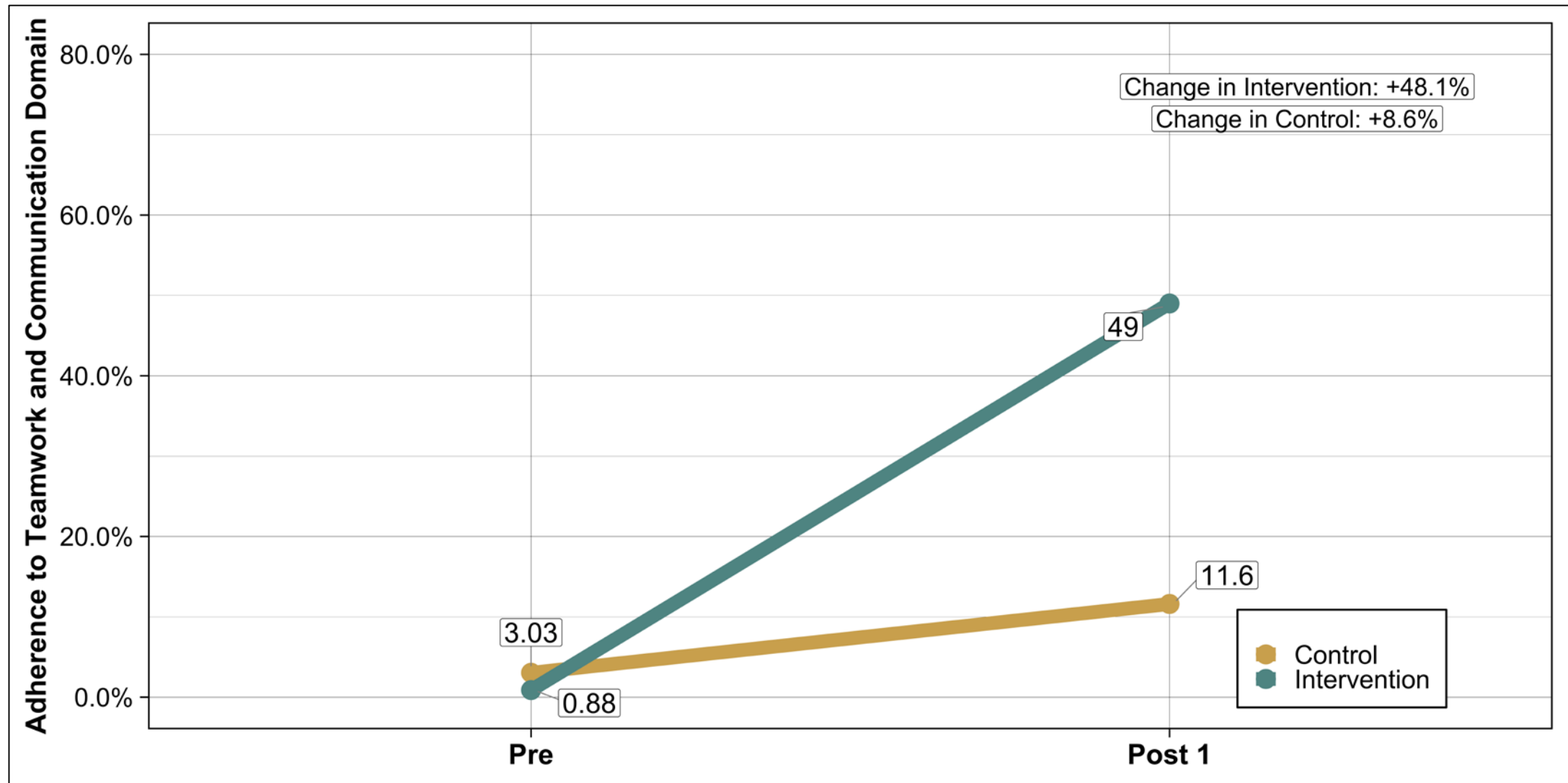
DIFFERENCE –IN-DIFFERENCE RESULTS

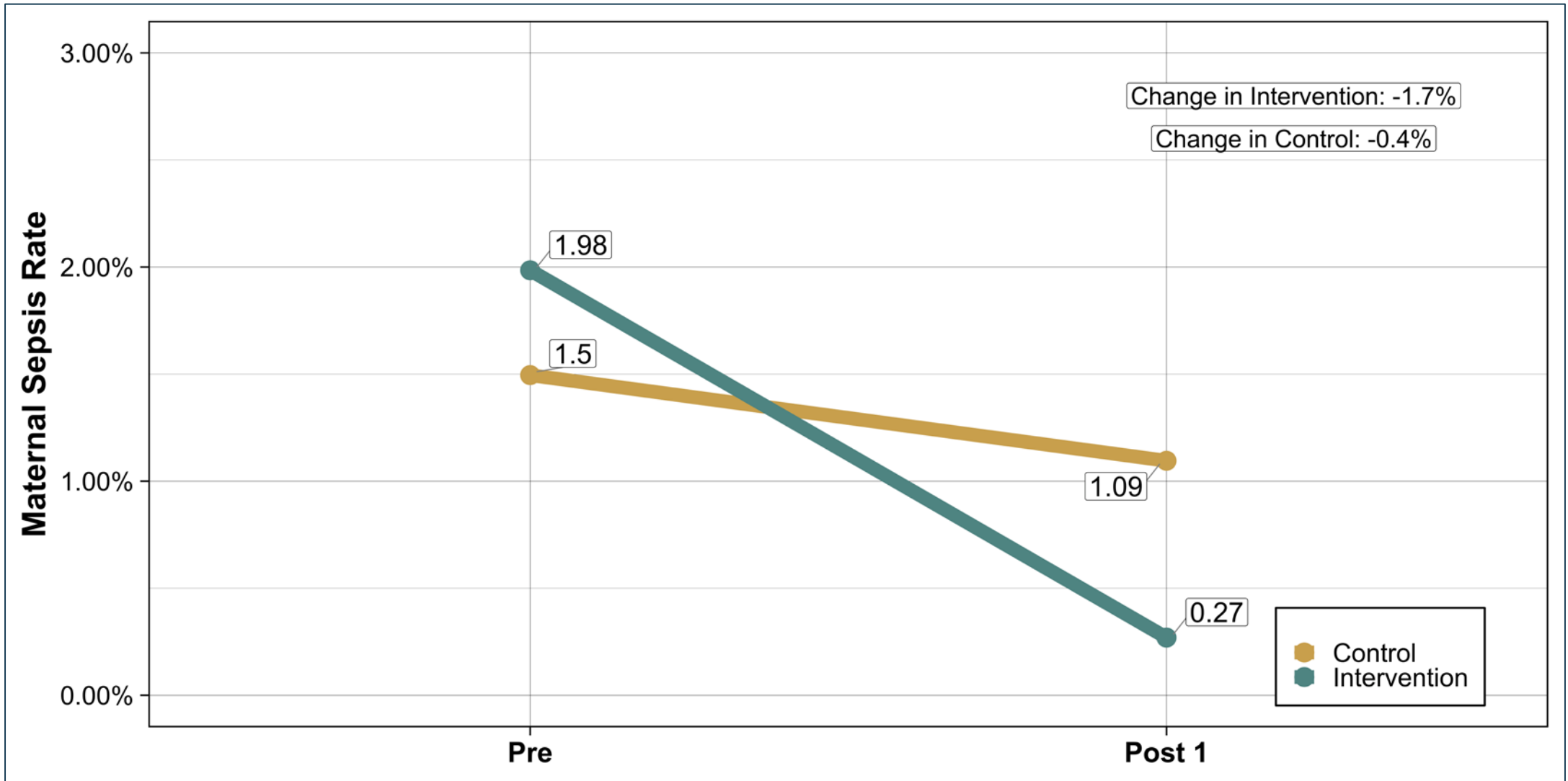| Outcome	Change in Adherence from pre to post intervention in <u>Intervention</u> sites	Change in Adherence from pre to post intervention in <u>control</u> sites	P-value
Safety Adherence	34.4%	7.3%	<0.0001***
Teamwork and Communication Adherence	48.1%	8.6%	<0.0001***

MANYAMANYAMA TEAMWORK

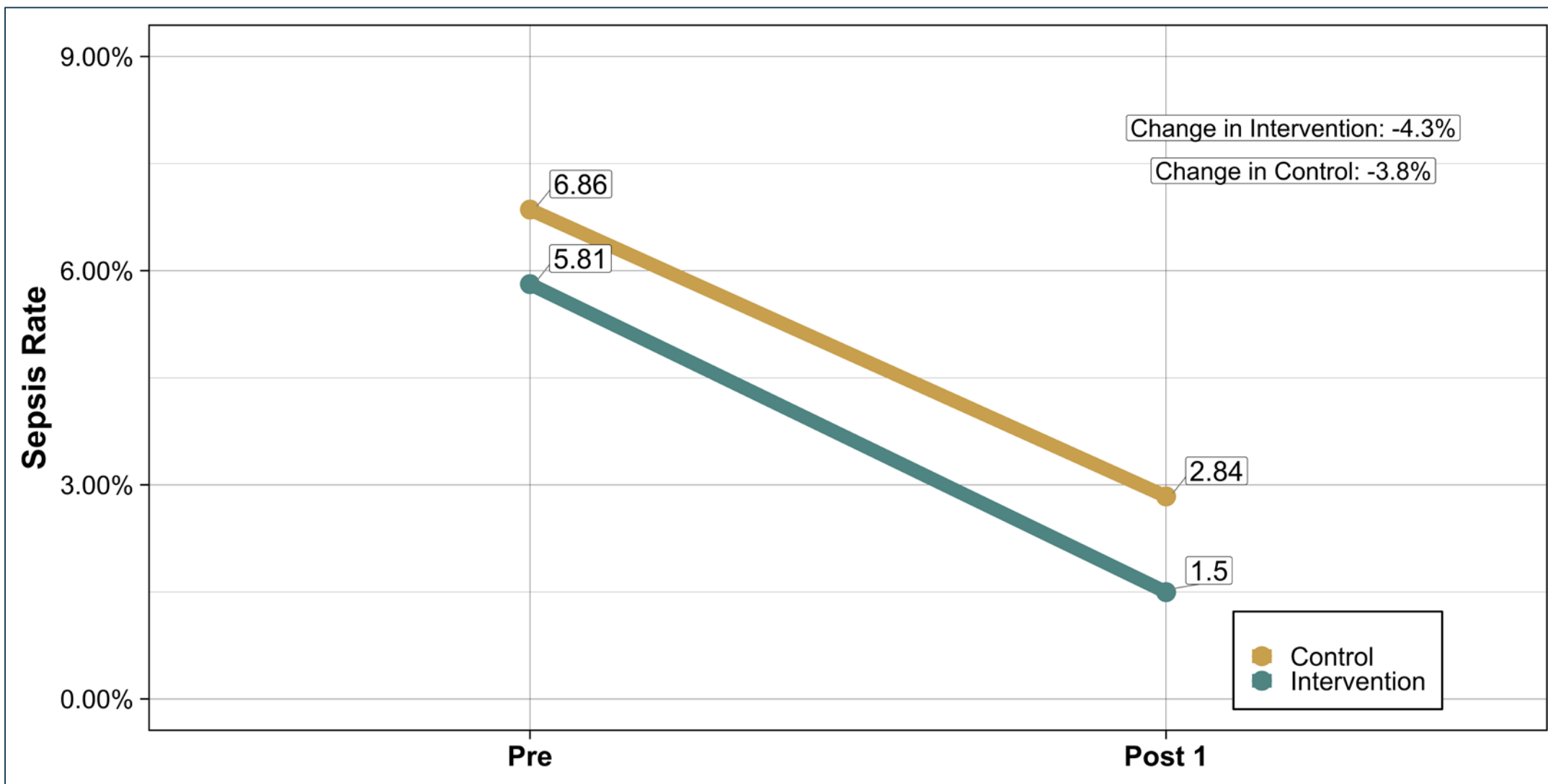"The SSC implementation has become an obligatory practice for all my surgeries… **everyone in the theatre understands their roles prior to surgery.** The SSC is an imperative tool that I can no longer leave behind for my surgeries. "

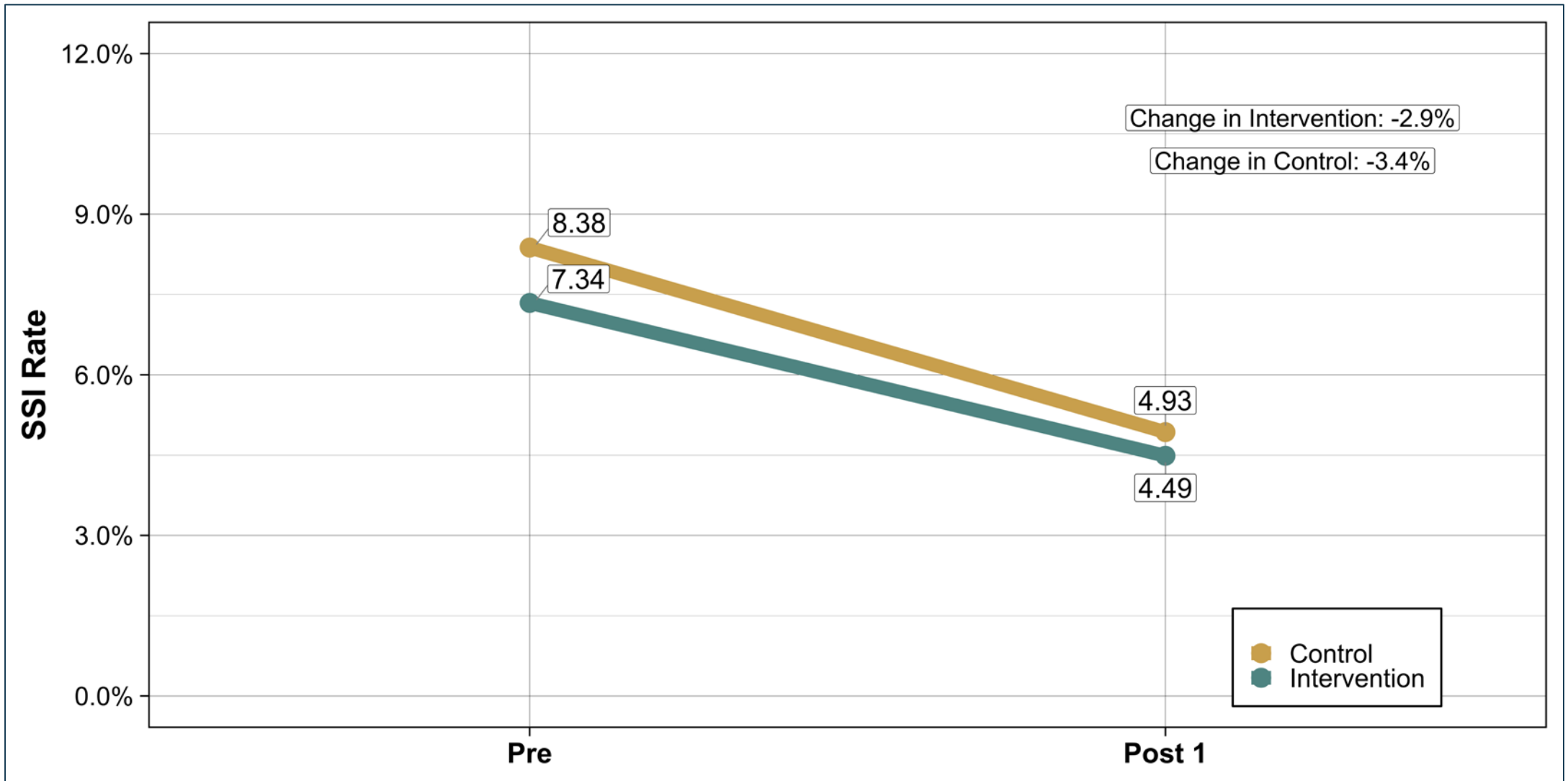Dr. Tubeti Chacha, Surgical Team Leader

MATERNAL SEPSIS RATE

SEPSIS RATE

SSI RATE

DIFFERENCE-IN-DIFFERENCE RESULTS

Outcome	Change in rates from pre to post intervention in <u>Intervention</u> sites	Change in rates from pre to post intervention in <u>Control</u> sites	P-value
Maternal Sepsis	-1.7	-0.4	0.023*
Sepsis	-4.3	-3.8	0.61
SSI	-2.9	-3.4	0.69

BUKOBA
"WE WATCH FOR SSI"

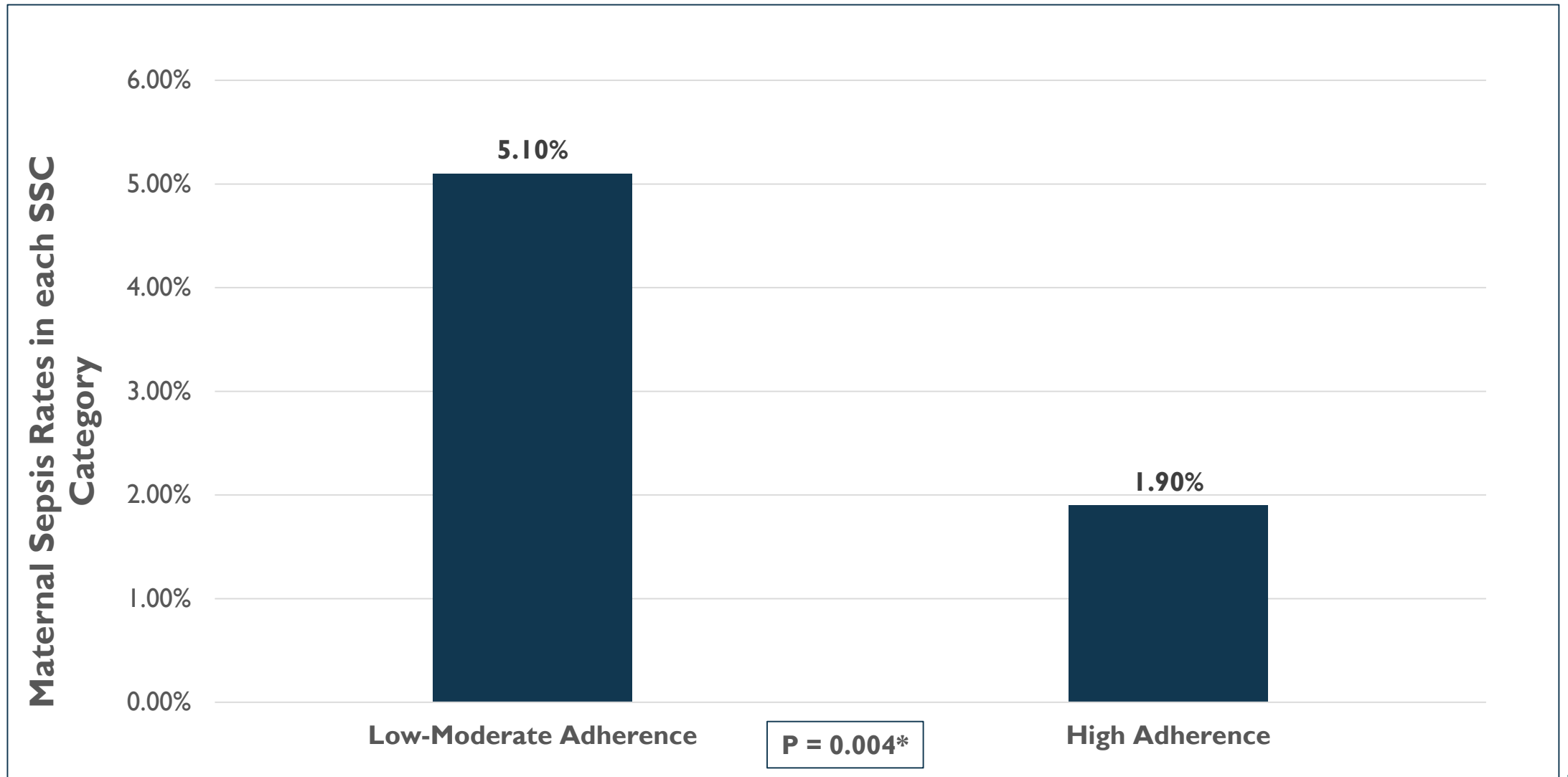"Thanks to the training, the clinician knew he was dealing with an SSI and septic shock…

Her relatives did not expect her to survive…

Without losing a single minute, he organized a team… and we are always prepared."

- Bukoba Regional Referral

SSC ADHERENCE AND MATERNAL SEPSIS

KAGONDO
PROBLEM-SOLVING

"The mother would not stop bleeding…
The **mentors trained us on managemen**
of PPH intra-operatively by using a B-
Lynch suture. This knowledge

helped the doctor save the life

of a new mother with twins."

Dr. Ladislaus Buberwa

LIMITATIONS

- Intervention and control sites were not randomized

- No post-discharge follow-up of patients

- Potential for Hawthorne Effect

- Potential cross-contamination

- QI interventions often need time for changes; intervention time might not have been long enough

CONCLUSION

- One of the largest global surgery studies in a LMIC

- Safe Surgery 2020 was associated with meaningful improvements in surgical quality
  - Safety practices improved
  - Teamwork and communication improved
  - Maternal sepsis declined

- Post-operative sepsis and SSI improved but the change was not statistically significant
  - Control sites improved also: Hawthorne effect? Contamination?
  - QI interventions require time

- Safe Surgery 2020 is a promising approach to improving surgical quality in LMICs in contexts that are similar to the Lake Zone region

IMPLICATIONS FOR SCALING SURGICAL QUALITY

- A multicomponent intervention may be a promising approach to improving surgical quality in LMICs

- Safe Surgery 2020 is a journey. It takes time to build a 'quality infrastructure'(e.g. use of teams, data, training), transform culture and change existing routines

- Interventions should be tailored to meet the needs of individual facilities.

- It is important to build a receptive implementation climate by facilitating leadership support, buy-in & a multi-step implementation process

- To scale surgical quality, there is a need for research to guide successful implementation of interventions

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REFERENCES

- [1]Biccard, B. M., Madiba, T. E., Kluyts, H. L., Munlemvo, D. M., Madzimbamuto, F. D., Basenero, A., … Zubia, N. Z. (2018). Perioperative patient outcomes in the African Surgical Outcomes Study: a 7-day prospective observational cohort study. *The Lancet, 391*(10130), 1589–1598. https://doi.org/10.1016/S0140-6736(18)30001-1

- [2]Bishop, D., Dyer, R. A., Maswime, S., Rodseth, R. N., van Dyk, D., Kluyts, H. L., … Zubia, N. Z. (2019). Maternal and neonatal outcomes after caesarean delivery in the African Surgical Outcomes Study: a 7-day prospective observational cohort study. *The Lancet Global Health*, 7(4), e513–e522. https://doi.org/10.1016/S2214-109X(19)30036-1

- [3]WHO. (2011). Report on the Burden of Endemic Health Care-Associated Infection Worldwide Clean Care is Safer Care. *World Health Organization*, 1–40.

ASANTE SANA