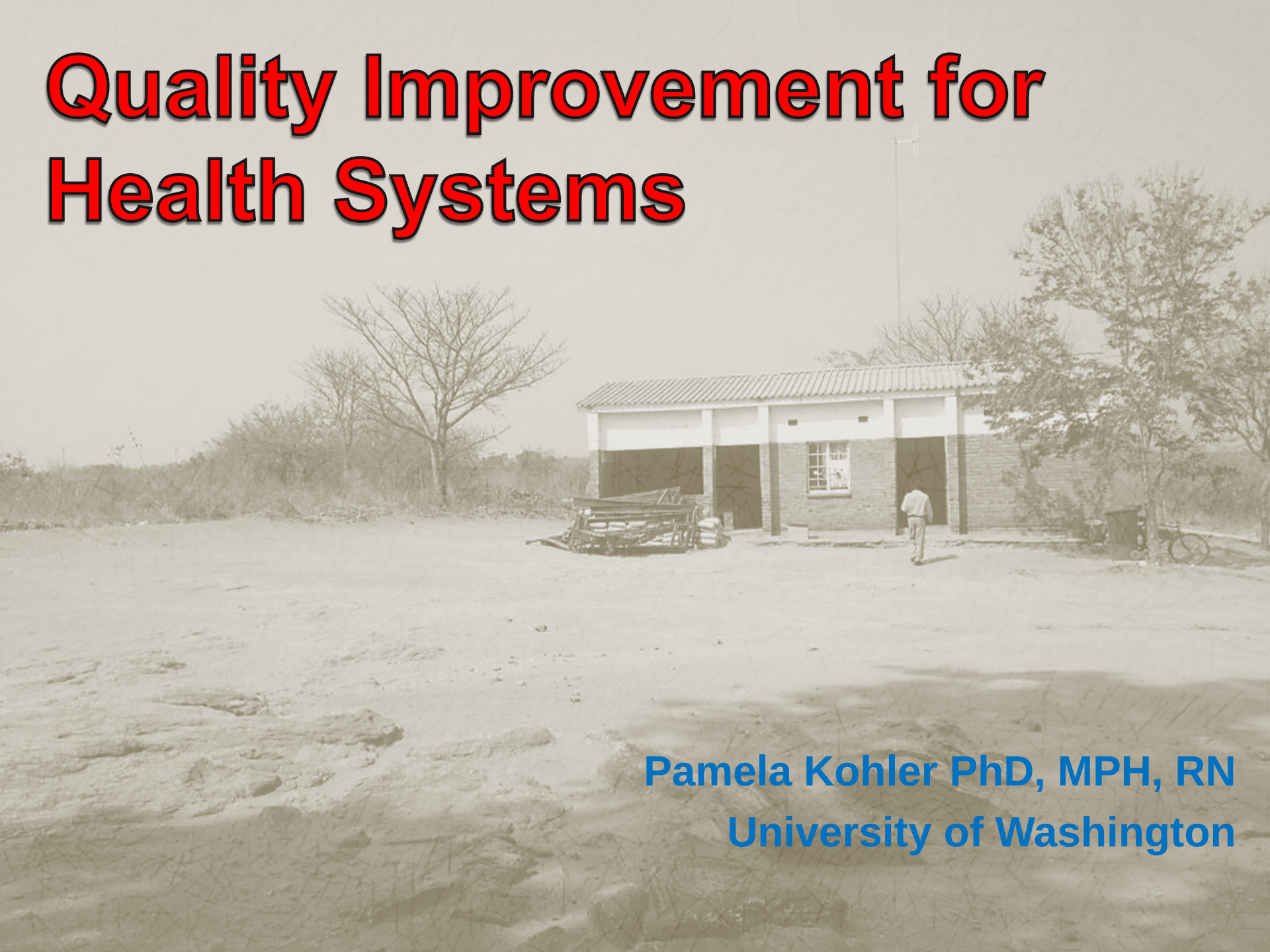
Quality Improvement for Health Systems



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Outline

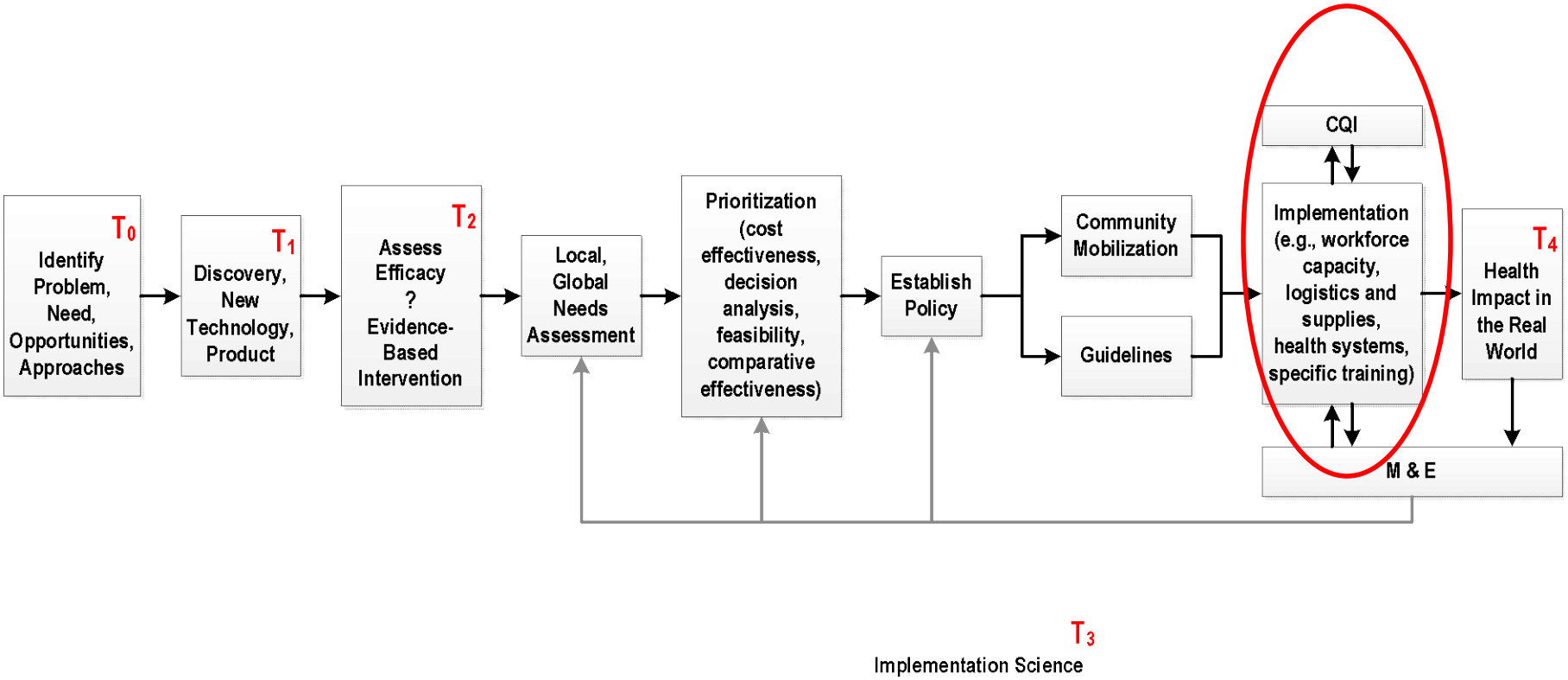
- Definitions and framework
  - PDSA
  - Six Sigma
  - LEAN
- Tools
  - Value Stream Mapping
  - Model for Improvement
- Example
  - Malawi MC
- Tips and Resources

Quality in Health Care

"Doing the right thing, at the right time, in the right way, for the right person – and having the best possible results"

-US Agency for Healthcare Research and Quality

Translational science



Courtesy of King Holmes and Pirie Hart

General Principles of QI

- A formal approach to the analysis of performance
- Systematic efforts involving identification and testing of ideas for change
- Demonstrate whether improvement efforts
  - Lead to change in the primary end point (and in the desired direction)
  - Contribute to unintended results in other parts of the system
  - Require additional efforts to bring a process back to acceptable ranges

Continuous QI (CQI)

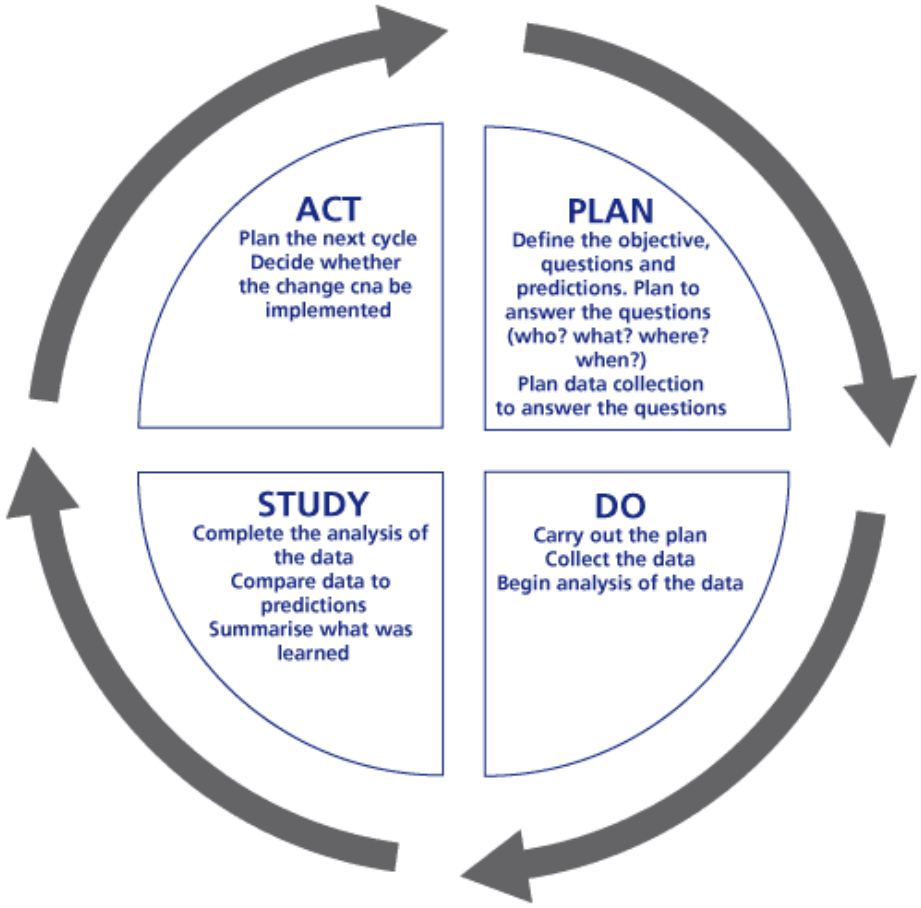
- A commitment to constantly improve operations, processes, and activities to meet patient needs
- Efficient, consistent and cost effective
- Opportunity for improvement exists in every process on every occasion
- Health care is a process
- Focus on the system and not individuals

3 common approaches to QI

- Six-sigma (Motorola)
  - Designed to reduce cost, decrease process variation, eliminate defects
  - Calculate Defects per Million Opportunities (DPMO)
- PDSA: Plan, Do, Study, Act
  - Rapid cycle trial and learning
  - Hypothesis or solution is tested on a small scale before changes are made to the whole system
- Lean (Toyota)
  - Driven by identified needs of the customer
  - Aims to improve processes by removing non-value added activities

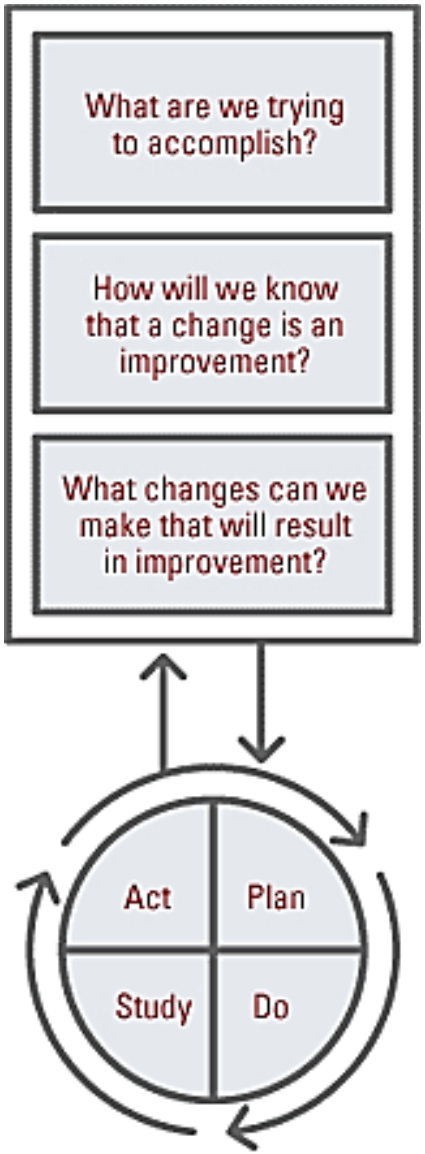
PDSA

- PLAN
  - Detail ideas for improvement
  - Assign tasks and confirm expectations
  - Select measures for improvement
- DO
  - Implement the plan
  - Document deviations
- STUDY
  - What went right or wrong?
  - What will be changed?
- ACT
  - Incorporate lessons learned



Model for Improvement

- Form the team
- Set aims
- Establish Measures
- Select Change
- Test Change
- Implement Change
- Spread Change



LEAN

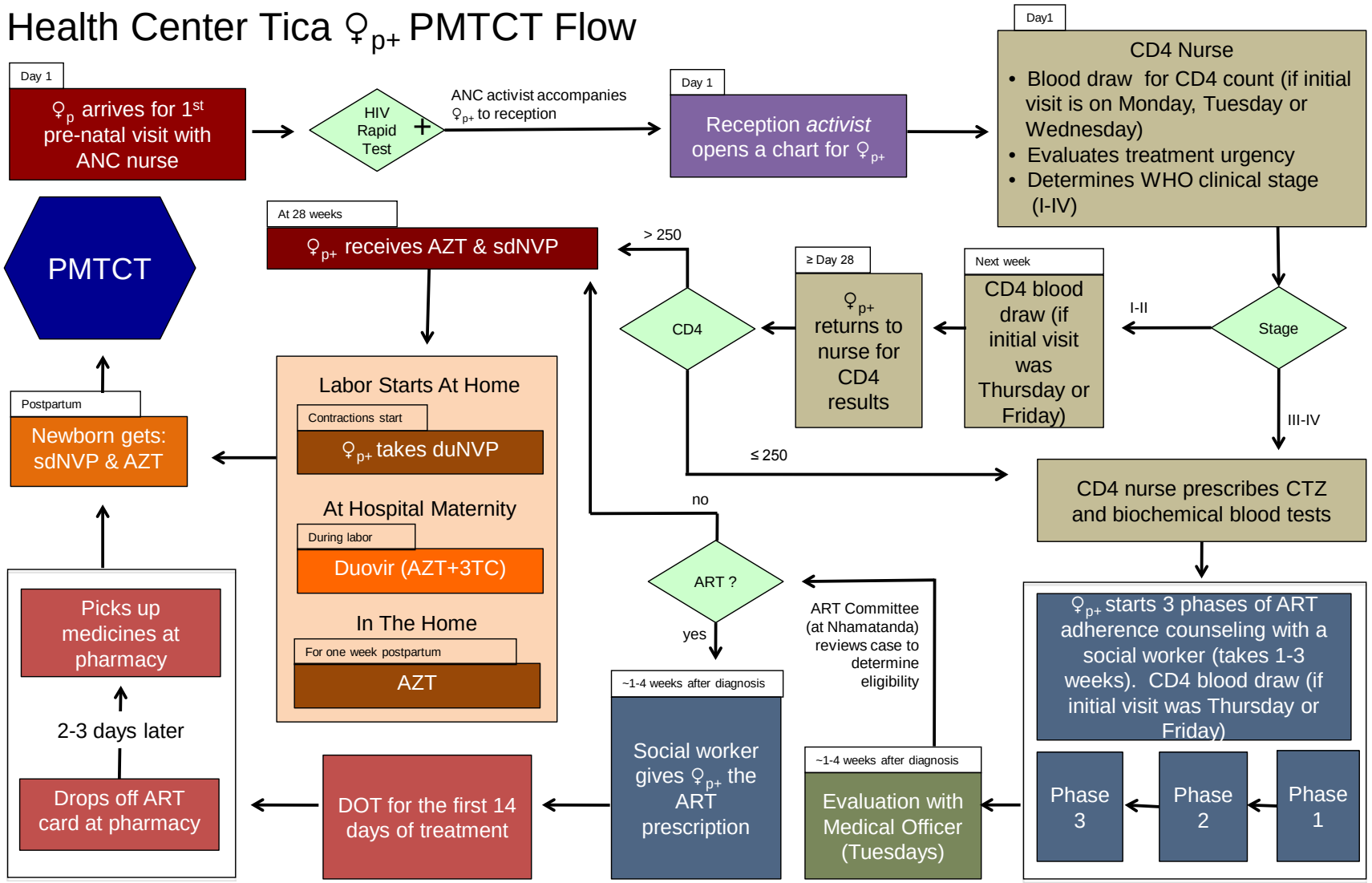
- Non value-added activities (“waste”)
  - Overproduction or underproduction
  - Wasted inventory, rework, or rejects
  - Wasted motion
  - Waiting
  - Outdated policies, procedures, or processes
  - Transport and handling

- 5 S’s for an organized cost-efficient workplace
  - Sort
  - Shine
  - Straighten
  - Systemize
  - Sustain

Value Stream Mapping

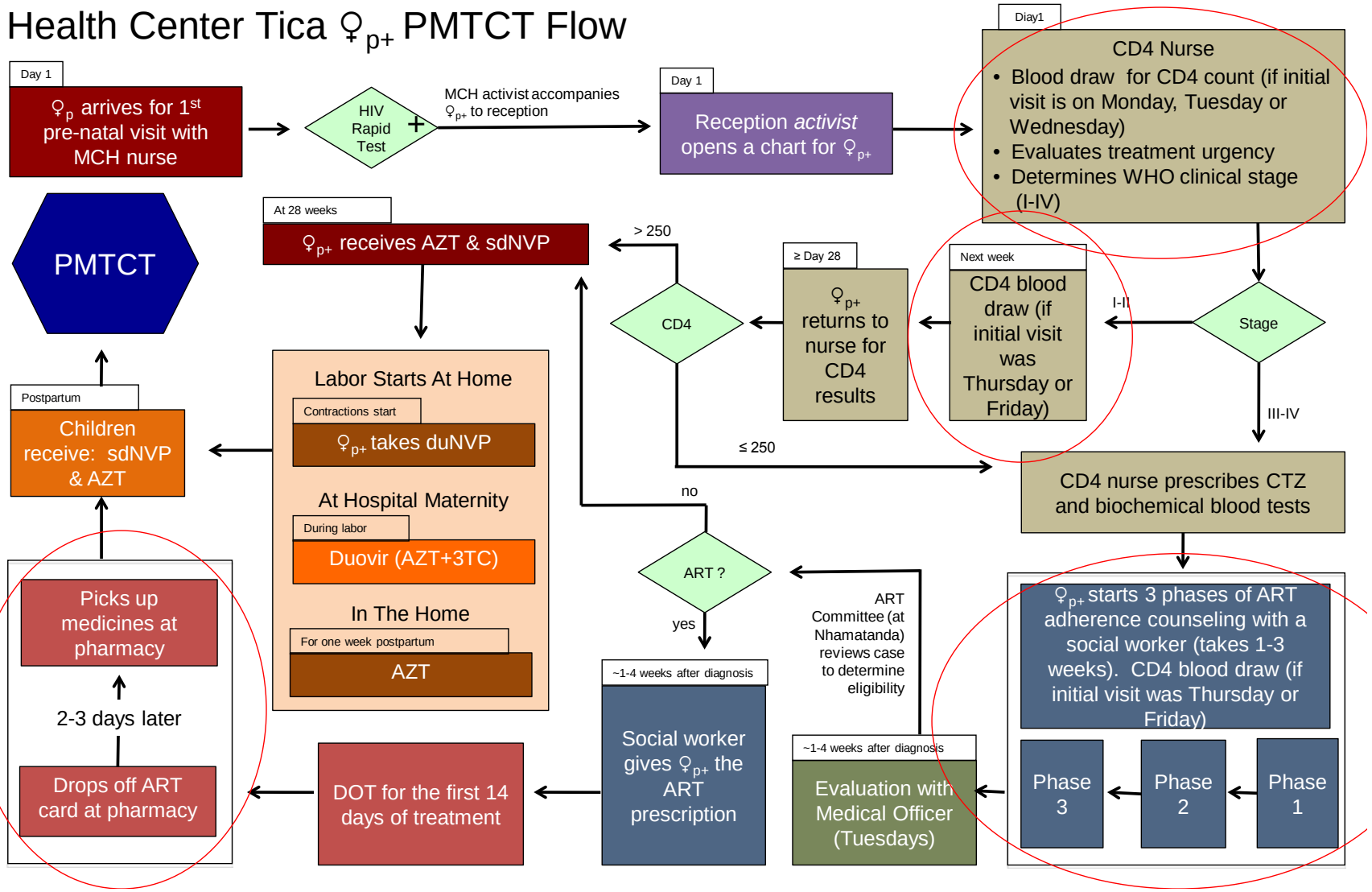
- Tool to identifies processes, often used in clinic flow or time-space mapping
- Highlights “waste”
  - Time – Waiting for care or results
  - Money – Wasted supplies
  - Clients lost to care
- Streamlines processes
- Builds consensus – facilitates communication between front line personnel and facility managers

VSM of HIV Testing in ANC rural Mozambique



Courtesy of Sarah Gimbell-Sherr

Potential Areas For Improvement



Value Stream Mapping

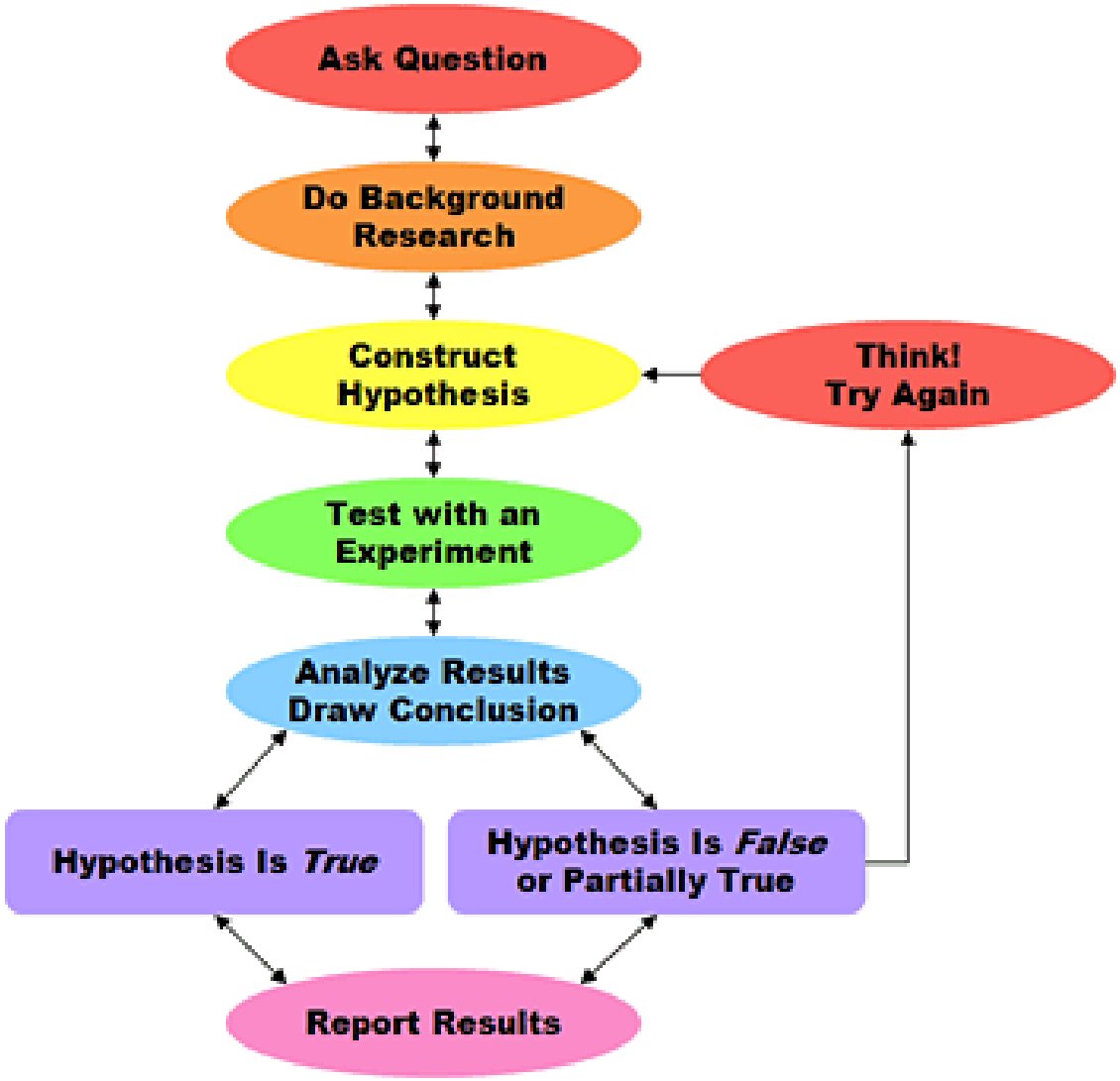
- *Five Steps For Value Stream Mapping*

1. Decide which care process to map. Ask: Has it been done before?
2. Collect information and create a current process map
3. Analyze the current process map with local managers and frontline health professionals
4. Create future process map and work towards it by implementing tests of change (PDSA)
5. Continuous incremental improvement

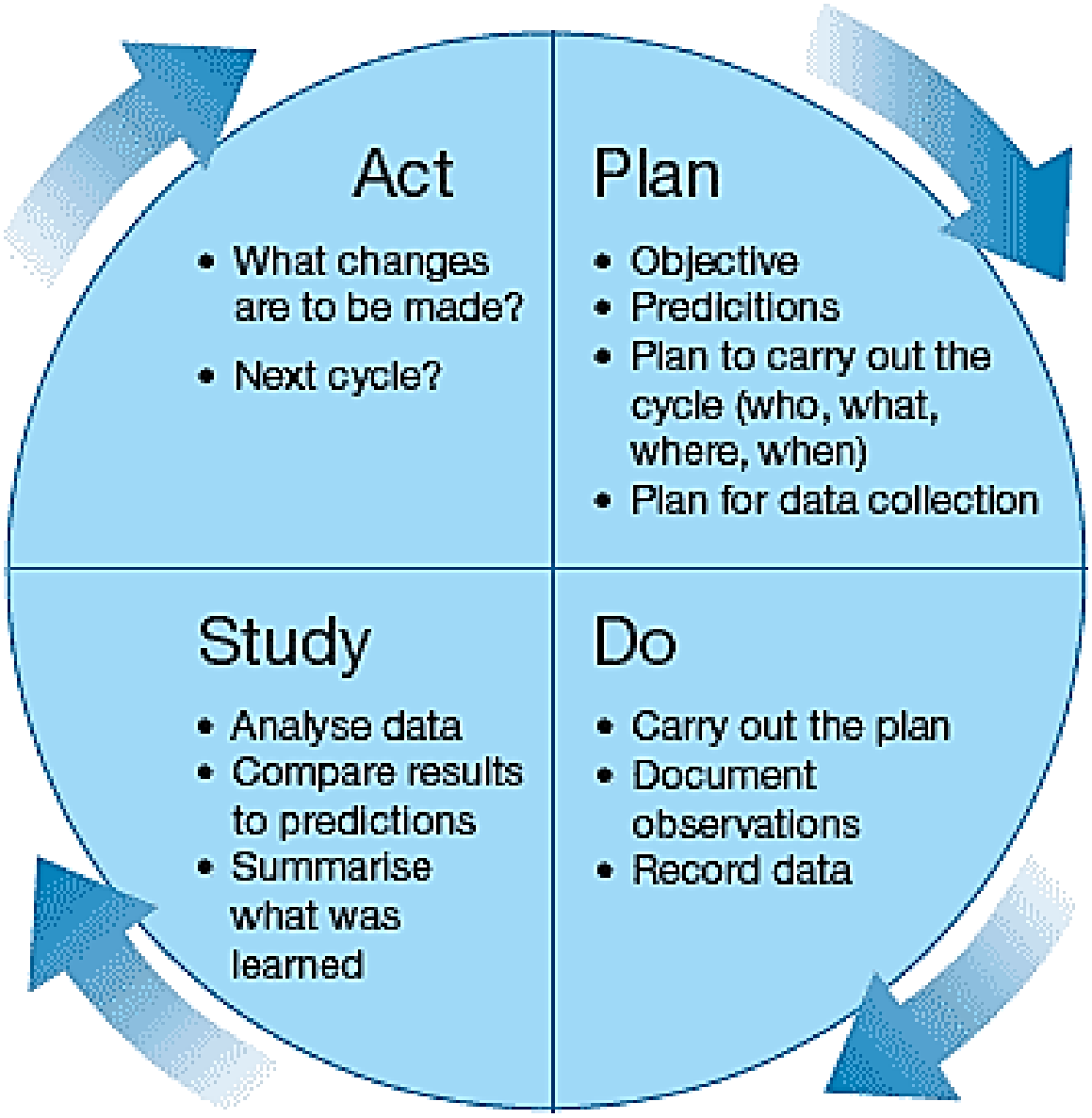
Research and QI

- Research methods can be applied to clinical settings as a means of measuring QI outcomes
  - Baseline and longitudinal data collection
  - Pre- post-intervention studies
- Challenges
  - Frequent changes in protocol / intervention
  - Discarding poor ideas
  - Pursuing new ideas

Steps of the scientific method

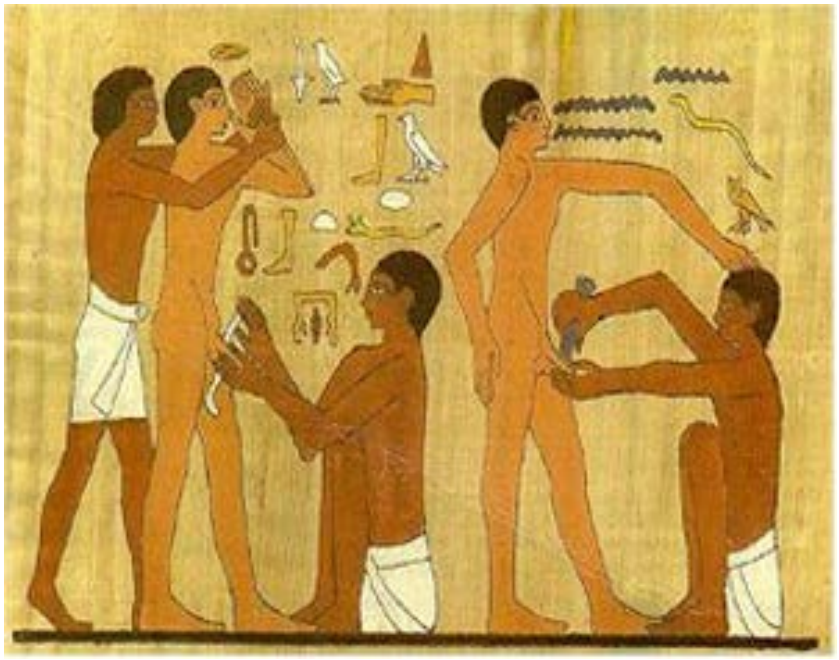


PDSA


Act
What changes are to be made?
Next cycle?
Plan
Objective
Predicitions
Plan to carry out the cycle (who, what, where, when)
Plan for data collection
Study
Analyse data
Compare results to predictions
Summarise what was learned
Do
Carry out the plan
Document observations
Record data

Male circumcision

- In 2007, the WHO and UNAIDS recommended MC as a strategy to prevent HIV in men
- 14 high priority countries were identified based on low rates of MC and high HIV prevalence
- Goal of MC for 80% of 15-49 year old males requires > 20 million circumcisions by 2015

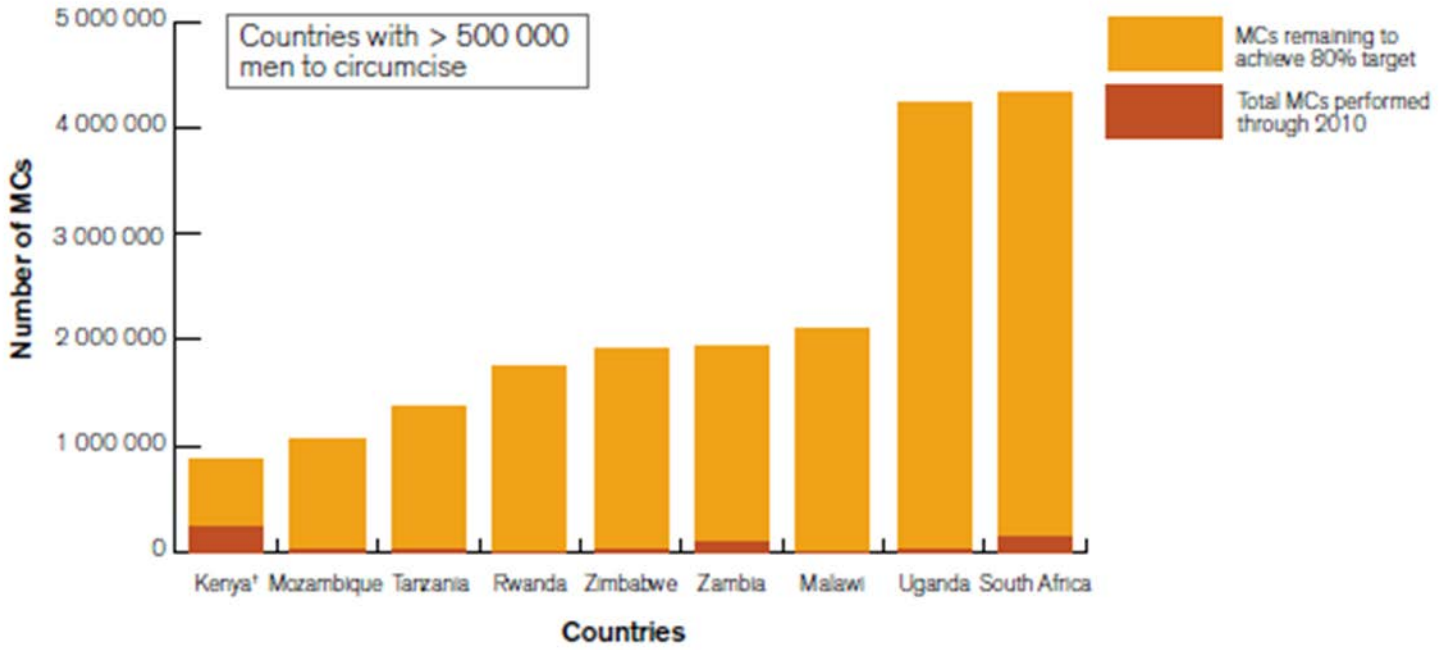


Malawi target > 2million

Fig 1b. Number (000s) of male circumcisions performed by country and number remaining to achieve target*

(countries ordered by total number of male circumcisions needed to achieve target)

* target is 80% of males 15 - 49 years



† The goal in Kenya is 94% of males 15 to 49 years old.

Source: PEPFAR and Ministries of Health

Safety outcomes in MC programs

- These large MC targets are occurring in context of low health infrastructure and resources
- Clinical trials of MC demonstrated adverse event rates of 1.5% - 8%
- Program data are sparse, though task shifting studies have revealed rates between <1% and 38%
- With rapid expansion to resource-limited settings, it will be important to assess safety outcomes as a component of MC programs

Bwaila VMMC Center, Lilongwe

Aims

- To assess safety and quality of care in a Malawi MC clinic
- To identify structural and individual barriers to quality care as well as interventions to address them
- To assess data quality in monitoring of adverse events

Methods

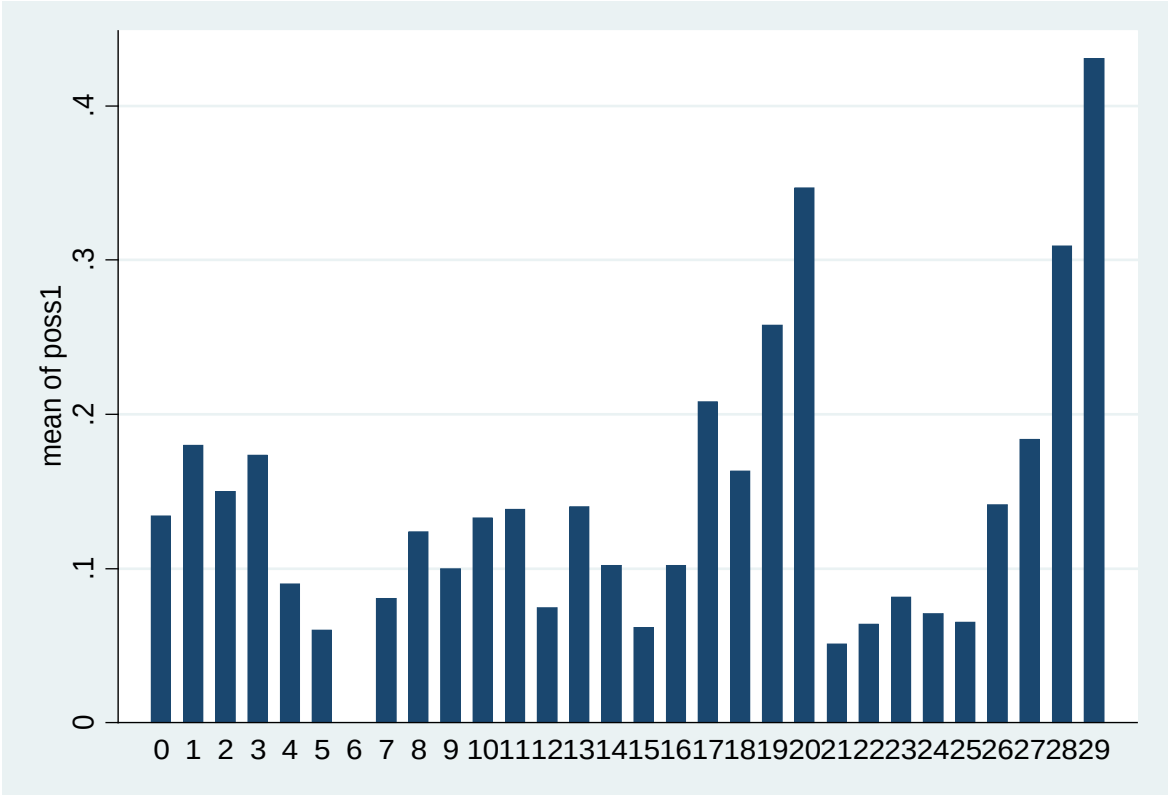
- Retrospective chart review of first 3,000 surgeries at a joint I-TECH / MOH clinic in Lilongwe, Malawi
- Team evaluated each chart for possible AE
- A case report form for each possible was completed and presented at case conference
- At case conference, AEs were defined as
  - Not an AE, Possibly an AE, Definitely an AE
  - Mild (no or local tx), Moderate (clinic intervention), Severe (hospital or surgical intervention)

Results

- Out of 3,000 MCs we documented 418 (14%) AEs
- Almost all infection and treated with 2 or more antibiotics
  - Flagyl x 7 days
  - Gentamycin 240mg IM
  - Ciprofloxacin or Doxycycline
- Antibiotic choice surprising until we found:
  - National guidelines for treatment of urethral discharge
  - Staff had attended national training on STI treatment
  - As MC was part of the HIV Department, the only antibiotics available were the STI formulary
- Clinical assessment most often “wetness” or “mild inflammation”

Outbreak?

- Spikes in AE rates over time
- Not correlated with surgeon
- Not correlated with day of surgery
- Correlated with nurse making diagnosis at follow-up visit



Case Definition:

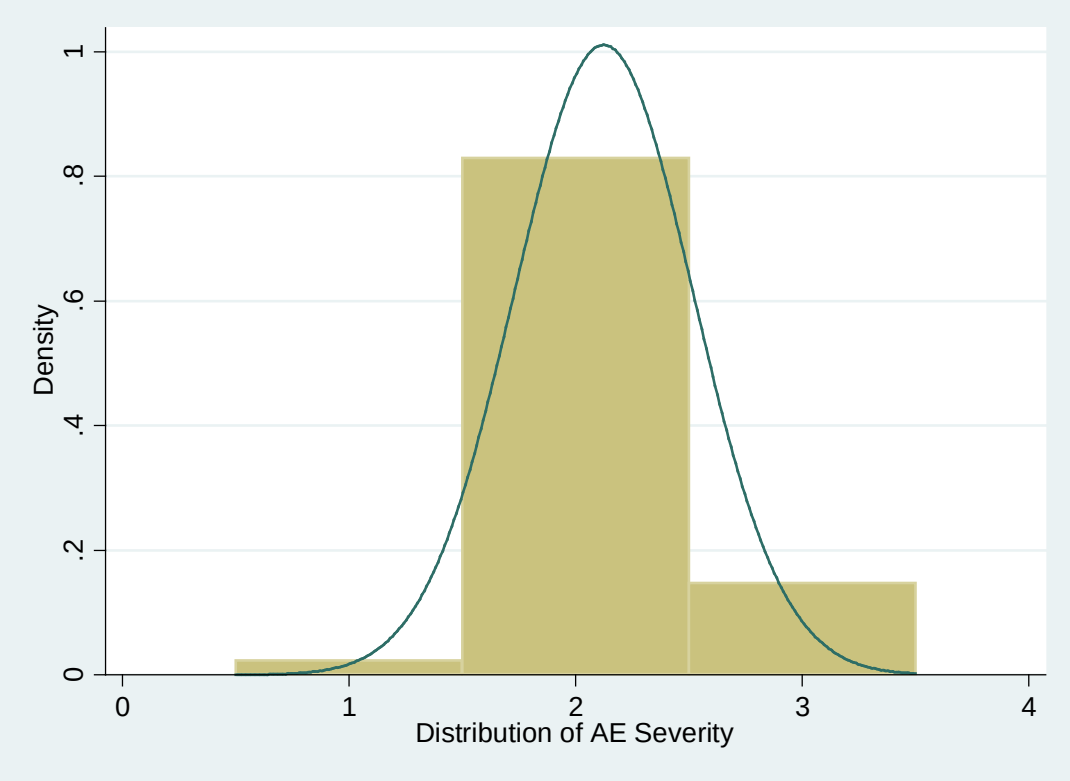
- Infection diagnosis at Day 7
- Treated with Cipro and Flagyl
- Resolved next visit

“Outbreak” investigation

- Screened all 3,000 charts again for cases
- 289/418 met this definition
- 152/289 were from the same nurse and considered highly suspicious for misdiagnosis of infection
- Evidence
  - Confirmed clinical assessment of patients while on site and found none warranting antibiotic use
  - Several chart notes where a second nurse intervened and held antibiotics
- The remaining 266 charts were reviewed in case conference
  - 17% Not an AE
  - 4% Possibly an AE
  - 80% Definitely an AE

Severity

- Out of 221 possible or definite AEs, 217 were classified
  - <1% mild
  - 6% moderate
  - 1% severe



Evidence that moderate AEs are likely mild

- 89% of cases reviewed in conference were determined by the clinical team to be inappropriately treated
- 36/45 deemed **not** to be an AE in case review received 1 or more antibiotics
- 19/24 designated **appropriately** treated were given **no** antibiotics
- 170/170 designated **inappropriately** treated were given **1-6 antibiotics**

Intervention

- Based on Final case conference, clinical team suggested what they wanted to do
  - 2nd opinion on all AEs
  - Institute a regular case conference mechanism
  - Training and availability of antibiotics for wound infection
  - Training and availability of supplies for local wound care
- Plans to reassess in 3-6 months

Tips

- Define your outcome clearly – be specific
- Establish a non-blaming culture
- Avoid the confirmation trap – establish rigorous data collection designed to answer the question
- Diagram out the intervention and mechanism of action all the way to the outcome

Pitfalls of QI

- Planning in enough detail to distinguish between a failure to execute and an ineffective idea
- Identification of the questions you want to answer
- Data collection
- Failure to involve the do-ers in the analysis
- Failure to act on the next cycle

http://www.ihi.org/knowledge/Pages/ImprovementStories/QandAonQISixQuestionsForIHIImprovementAdvisor.aspx

Resources

- Institute for Healthcare Improvement

http://www.ihi.org/knowledge/Pages/HowtoImprove/default.aspx

- National Coalition of County & City Health Officials

http://www.naccho.org/topics/infrastructure/accreditation/quality.cfm

- Varkey, P et al (2007). Basics of Quality Improvement in Health Care. *Mayo Clin Proc,* June 2007;82(6)735-739.

www.mayoclinicproceedings.com

Quiz

- Which study outcome would BEST determine the quality of care in a antenatal syphilis screening program?

- A. The proportion of pregnant women enrolled in ANC
- B. The incidence of congenital syphilis in a community
- C. The number of clinic visits per year related to syphilis
- D. The number of Penicillin injections delivered

Quiz

- Which one of the following is the BEST example of a QI project?

- A. A cluster randomized trial of partner-initiated therapy for STI treatment
- B. A patient survey to assess the prevalence of HIV-related stigma in the community
- C. An intervention to reduce the rates of loss to follow up in an HIV treatment program
- D. Delivery of a new PI-based regimen shown to be effective in animal studies