



Strathmore
UNIVERSITY
BUSINESS SCHOOL

**MULTIPLE FIRST LINE
TREATMENT OF
UNCOMPLICATED MALARIA:
PILOT STUDY IN KENYA**

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REPUBLIC OF KENYA



MINISTRY OF HEALTH



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Pharmacy and
Poisons Board

KEMSA

KENYA MEDICAL SUPPLIES AUTHORITY YOUR PARTNER IN HEALTHCARE

REPUBLIC OF KENYA



MIGORI COUNTY
GOVERNMENT



MMV



Medicines for Malaria Venture

PRESENTATION OUTLINE

1. Background:- Why MFTs?
2. Research Questions
3. Objectives
4. Study Design
5. Results
6. Recommendations

WHAT IS THE ISSUE?

1. ACTs are first line treatment for uncomplicated malaria in sub-Saharan Africa (SSA)
2. Parasite resistance to ACTs reported in some SSA(e.g Rwanda)
3. Need to mitigate spread of resistance to ACTs
4. MFTs has been recommended as one way to mitigate spread of resistance. However, no evidence to support policy changes



Literature Reports on Potential advantages and disadvantages of MFTs

Delayed emergence
and spread of
resistance

Increase in overall
treatment seeking

Multiple First
Line Treatment

Higher costs of
program
implementation

Higher cost of
procurement,
inventory holding



STUDY OBJECTIVES

1. To assess the Health Systems challenges associated with deployment of MFTs
2. To determine the cost of deployment of MFTs

RESEARCH QUESTIONS FOR MFT PILOT STUDY

- 1. What are the Health Systems challenges associated with deployment of MFTs??**
- 2. How much would it cost to deploy the MFTs and Can Health Systems in Kenya and SSA accommodate MFTs?**

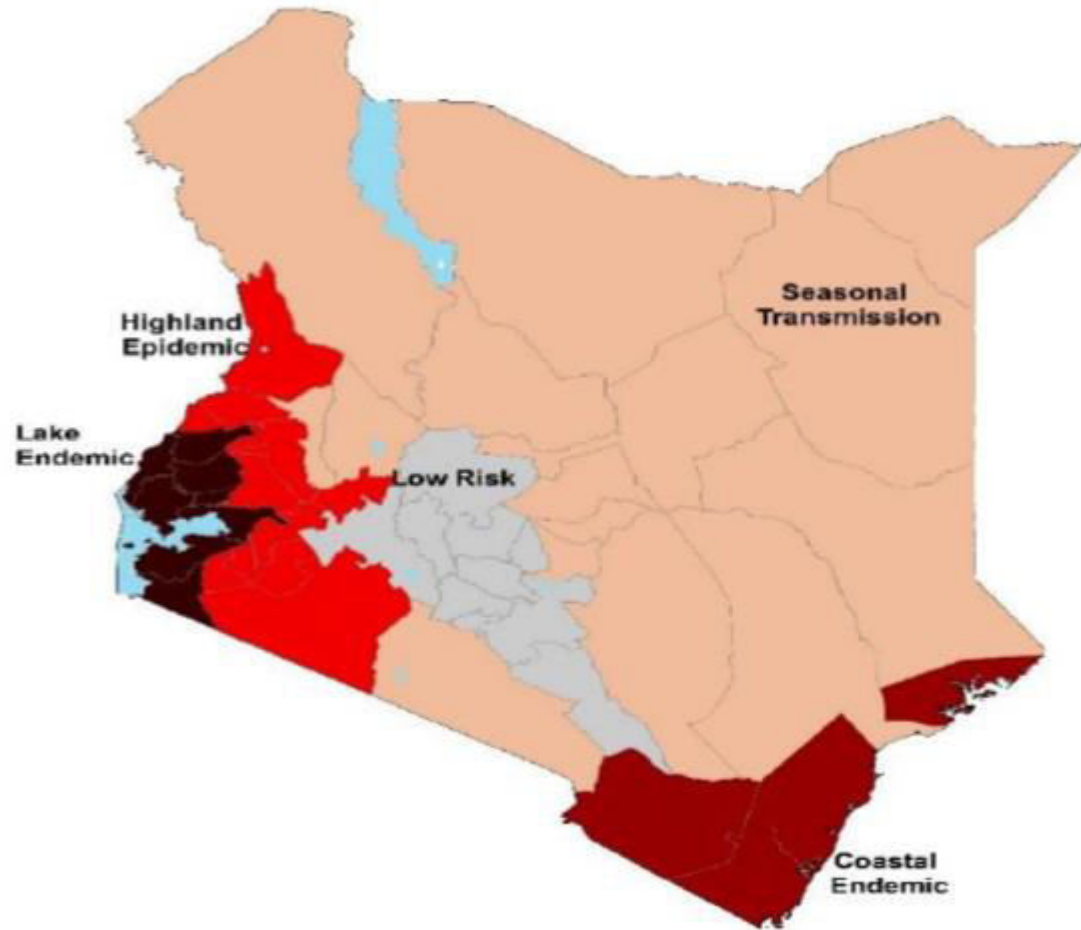


STUDY DESIGN

1. Study sites
2. Methodology
3. Timelines



Study design (1): Study sites

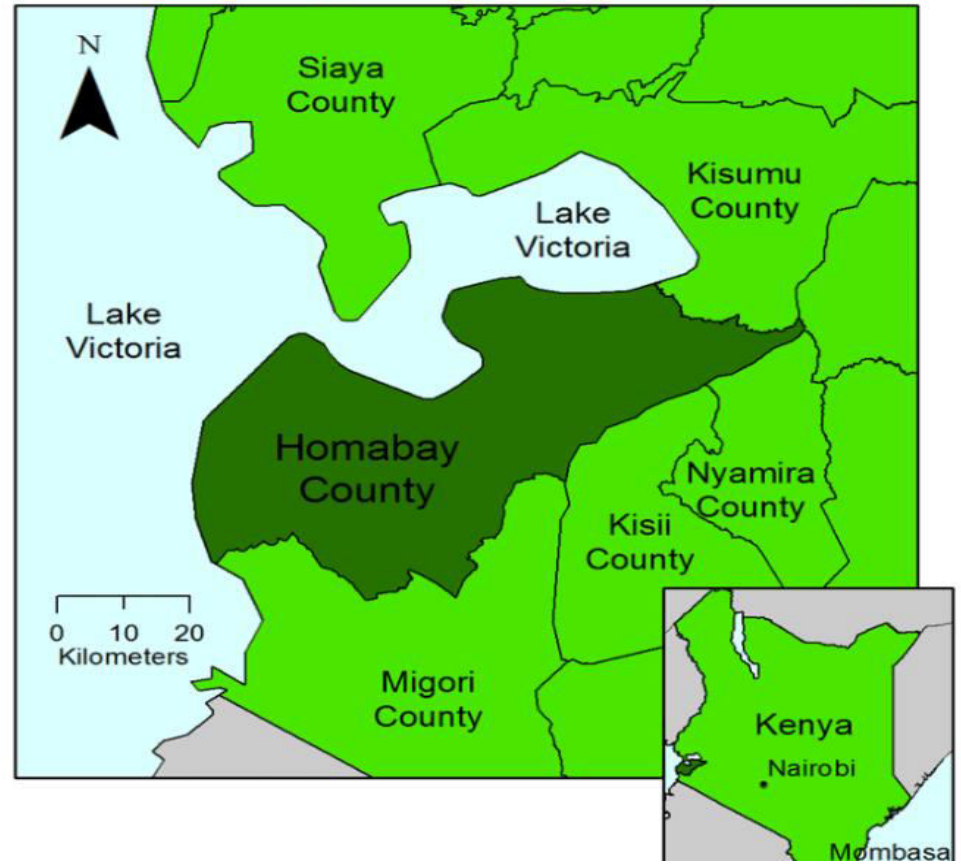




Study design (1): Study sites



Homabay County in Kenya





Study design (1): Study sites





STUDY DESIGN (1): STUDY SITES

1. Homa Bay County (Test County)

297 facilities in all 8 sub-counties and Mfangano island (Mbita sub county)

Government and some faith-based health centres

Levels included in the study (level 4, level 3, and level 2)

2. Migori County (Control County)



STUDY DESIGN (2): METHODOLOGY



Drugs used in the study

- Artemether-lumefantrine (AL)
- Amodiaquine-artesunate (ASAQ)
- Dihydroartemisinin-Piperaquine (DHA-PIP)
- Pyronaridine-Artesunate (PYR-ART)



STUDY DESIGN (2) METHODOLOGY

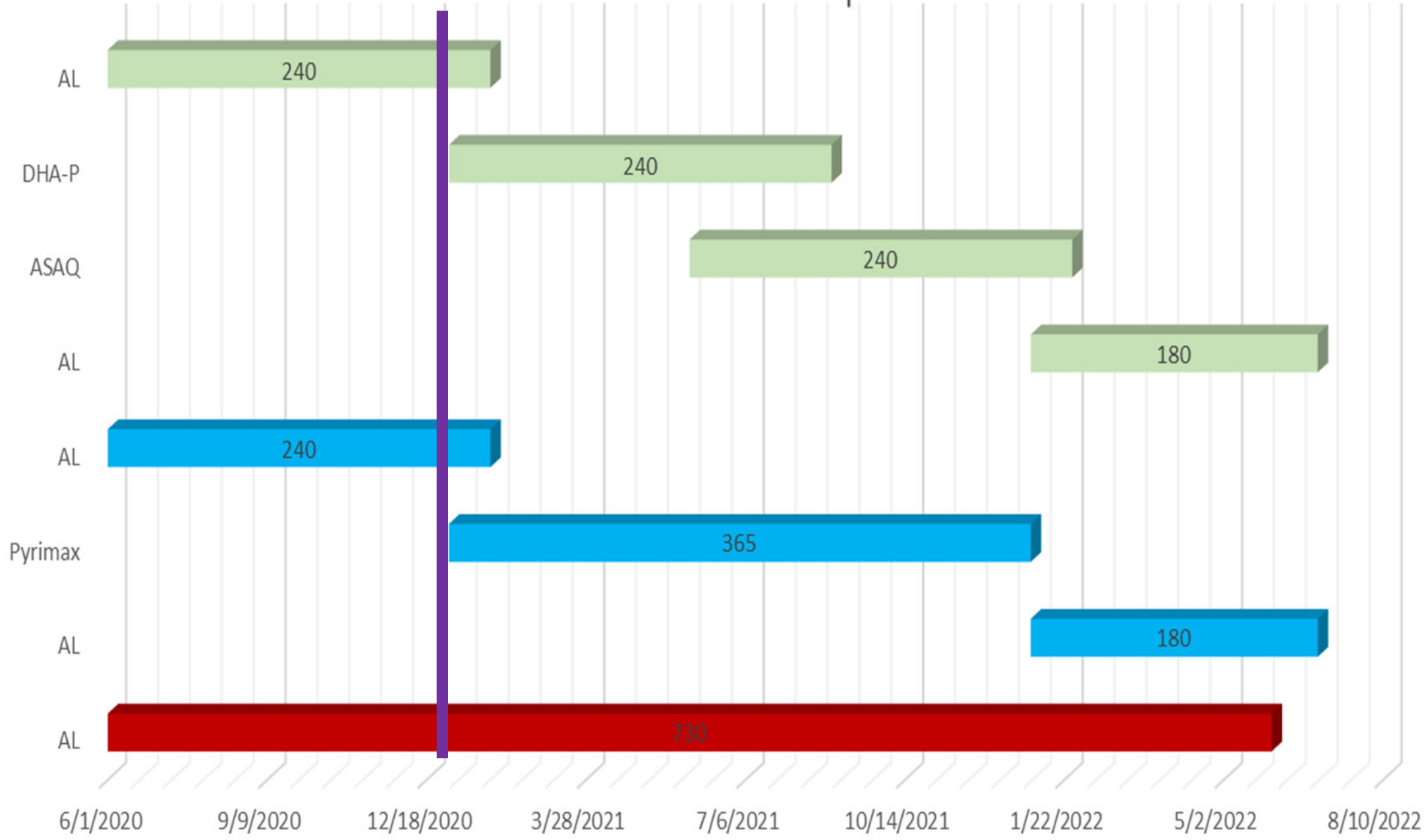
- **Health systems pilot study – 24 month duration**
- **Migori control; Homa Bay Test county**
- **Rotational introduction of new ACT combination therapies with crowding out**
- **Supply ACTs to Government health facilities and private not for profit organisations(Homa Bay) (250 facilities)**
- **Children under 5 years old and expectant mothers – excluded**
- **Data collected from 31 facilities (3 per sub county)**



TIMELINES

- 1. Total: 24 months (originally) , extended to 36 months, comprising:**
 - ❖ 6 months baseline**
 - ❖ 18 months MFT deployment**

MFT Rotation sequence





Why did we choose the rotational approach for MFT deployment?

- Supply chain logistics easier (seamless alignment with national procurement schedule- KEMSA)
- Training and facilities preparations easier
- Monitoring for malaria parasite resistance can be done after deployment of each drug in a sequential way. Predictive modeling for emergence of resistance easier



PRE- MFT DEPLOYMENT ACTIVITIES

- 1. Training of Healthcare workers (ToTs first, followed by other cadres): Covered Malaria epidemiology, microscopy, use of new drugs (MFTs), monitoring for adverse drug reactions**
- 2. Community sensitization about MFTs**
- 3. Quantification, Procurement and distribution of study drugs**
- 4. Adjustment of reporting tools to accommodate new molecules**
- 5. Printing and distribution of Job Aids and Posters to health facilities**



TRAININGS





MANAGEMENT OF MFTs SUPPLY CHAIN



Supply Chain Process Map





TYPICAL HEALTH WORKERS TRAINING SESSION



- **18 ToTs trained (Homa bay and Migori counties)**
- **All 8 sub county health management teams (sCHMT) sensitized**
- **280 health workers trained from all health facilities**
- **Community Health Volunteers (CHVs) trained**
- **Trained on parasitological diagnosis and management of malaria, commodity management, pharmacovigilance and MFT study roll out**





EXAMPLE OF POSTERS DISPLAYED AT A HEALTH FACILITY





DATA COLLECTION



- **Surveys (policy makers, service providers, patients)**
- **Interviews (policy makers, service providers, patients)**
- **Expenditure records and informant interviews (program costs)**



RESULTS : HEALTH SYSTEM ISSUES



Rotational MFT feasible. However, challenges with:

- **Procurement logistics (quantification, timely procurement and distribution)**
- **Stock out of malaria Rapid Diagnostic Tests in some facilities**



RESULTS (I) : PROVIDERS AND PATIENTS EXPERIENCES

- **Both health service and patients found the simplified dosing regimens for DHA-PIP, PYR-ART and ASAQ an advantage compared to the regimen for AL**
- **A few side effects (mainly committing by some children) were reported with these new medicines, but none were serious.**
- **Some healthcare workers initially had some challenges with determining the correct doses of the new drugs based on weight or age ranges**



RESULTS (II) : COST OF DEPLOYMENT OF MFTs

- **The estimated total economic costs of the implementing MFTs pilot study for uncomplicated malaria were USD 356,335, with the start-up phase accounting for 46%, while implementation phase 54%.**
- **Costs of drugs comprised the largest share of total economic costs (60%), followed by salaries (staff time) (22%), and allowances (9%).**
- **In terms of individual activities, procuring and distribution of antimalaria drugs for MFT accounted for the highest share of costs (62%), followed by training (29%)**



RESULTS : COST OF DEPLOYMENT OF MFTs

Table 4. Economic costs of MFTs for uncomplicated malaria pilot by Activity Phase (2022 USD)

Phase	Activity	Cost (USD)	% Of phase	% Of total
Startup Phase	Official launch of MFT	-	2%	1%
	County stakeholder meeting	14,940	11%	4%
	TOT training	20,976	17%	6%
	Health Workers (HWs) training (ToTs)	42,909	34%	12%
	Other HW Training - Health Facilities CMEs	38,260	30%	11%
	Revision & design of reporting tools	4,976	4%	1%
	Designing & printing of IEC materials	1,954	1%	1%
	Updating of KHIS2	78	0.06%	0.02%
	Total Start-up Phase		125,967	100%



RESULTS : COST OF DEPLOYMENT OF MFTs



Phase	Activity	Cost (USD)	% Of phase	% Of total
Implementation phase	Procuring and availing of antimalarial drugs to facilities in study area			
	Printing of reporting tools	23	0%	0%
	Quantification & Ordering of commodities	2,099	1%	1%
	Warehousing and storage	838	0%	0%
	Preparation of distribution list	299	0%	0%
	Generation of commodity delivery notes	1,380	1%	0%
	Preparation of distribution plan	299	0%	0%
	Commodities distribution- last mile	2,257	1%	1%
	Total Implementation phase			100%
		229,205		
Grand Total Costs		356,335	-	100%



CONCLUSIONS AND RECOMMENDATIONS



Deployment of MFTs is feasible provided the following are done:

- **Accurate estimation of drug requirements, timely procurement and distribution**
- **Procurement of adequate RDTs**
- **There is political good will**
- **Training of service providers on use of new medicines.**
- **Availability of Job aids, posters and reporting tools at health facilities**
- **Involvement of Private Sector**
- **Community sensitization activities regarding MFTs is undertaken**



WAY FORWARD: MATHEMATICAL MODELING AS ENABLER OF FUTURE MFT DEPLOYMENT



- **Future deployment of MFTs could benefit from mathematical modelling that has been undertaken by other groups and our group**
- **Our group, for example, is currently refining a mathematical model that will help generate dashboards on potential emergence of resistance to MFTs under different deployment contexts**
- **These dashboards will help policy makers to take appropriate timely decisions on the changes in deployment strategy under different operational contexts**

THANK YOU!!