

Are there Gender Differences in Access to and Demand for East Coast Fever Vaccine? Empirical Evidence from Rural Smallholder Dairy Farmers in Kenya

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Introduction

- East Coast fever (ECF) is cattle disease of great economic significance in Eastern and Southern Africa.
- ECF results in high economic losses mainly through cattle mortality and morbidity, and high cost of cattle treatment and vector control.
- The economic losses due to ECF are more ravaging for rural poor, particularly women, since they are resource-constrained.
- Although cattle keepers are using acaricide to control ECF-vectors, this method is not effective, hence a need to shift to a better alternative- ECF vaccination (Fig 1).
- Infection and Treatment Method (ITM) is considered a safe and effective approach to control ECF; however, its uptake and factors influencing uptake by men and women cattle keepers in Kenya remain unclear.
- Therefore, using survey data from rural Kenya, this study aims to address the following research questions:

1. How big are the differences in ITM vaccine awareness and adoption between smallholder dairy farming households headed by men and by women?
2. What are the factors contributing to these differences?

Findings from this study aim to guide policymakers and researchers in designing effective strategies for disseminating and further scaling the ITM vaccine among smallholder men and women cattle keepers.

Results

- Considerable gender difference were reported in terms of awareness and adoption of ITM (Table 2):
 - 53% of the pooled sample was aware of the ITM vaccine.
 - There was a high level of awareness among MHHs than FHHs- 57% and 46 %of MHHs and FHHs, respectively.
 - Greater ITM adoption rates were reported in MHHs (41%) than in FHHs (19%).
 - The results project a potential adoption gaps of 21% for MHHs but only 12% for FHHs.
- These results imply that not all the cattle keepers who had ITM knowledge adopted it and that the difference was especially pronounced in FHHs.
- We run a logistic regression to determine factors influencing uptake of ITM vaccine after control for lack of awareness (see Table 2).
- Considering the pooled and the separate models, most of the variables were significant and had the expected signs.

Table 1: ITM adoption rates by Gender

Adoption estimator	MHHs		FHHs		Pooled sample	
	Parameters	S.E.	Parameters	S.E.	parameters	S.E
ATE	0.616***	0.032	0.314***	0.044	0.528***	0.025
ATE1	0.720***	0.026	0.422***	0.031	0.635***	0.022
ATE0	0.478***	0.042	0.223***	0.064	0.406***	0.031
JEA	0.411***	0.015	0.194***	0.014	0.339***	0.012
GAP	-0.205***	0.018	-0.120***	0.034	-0.190***	0.014
PSB	0.103***	0.010	0.107***	0.029	0.106***	0.008
Observation	298		150		448	
Aware of ITM	170		69		239	
Adopted ITM	123		29		152	



Figure 1: A shift from use of acaricides to vaccination against ECF.

Key Messages

- Women lag in the adoption of ITM vaccine mainly due to gender inequalities in access to resources and lack of awareness about ITM vaccine.
- ITM adoption in both household headships was mainly determined by education, extension interventions, access to financial services, and social capital. Besides, in FHHs ITM was more likely to be adopted by older women, those who had larger land size and the ones who actively participated in social groups.
- To realize adoption beyond the current potential and to reduce inequities at the scale-up stage, gender-specific interventions targeting resource-poor women cattle keepers would be effective, in addition to ensuring that women have access to extension and financial services.

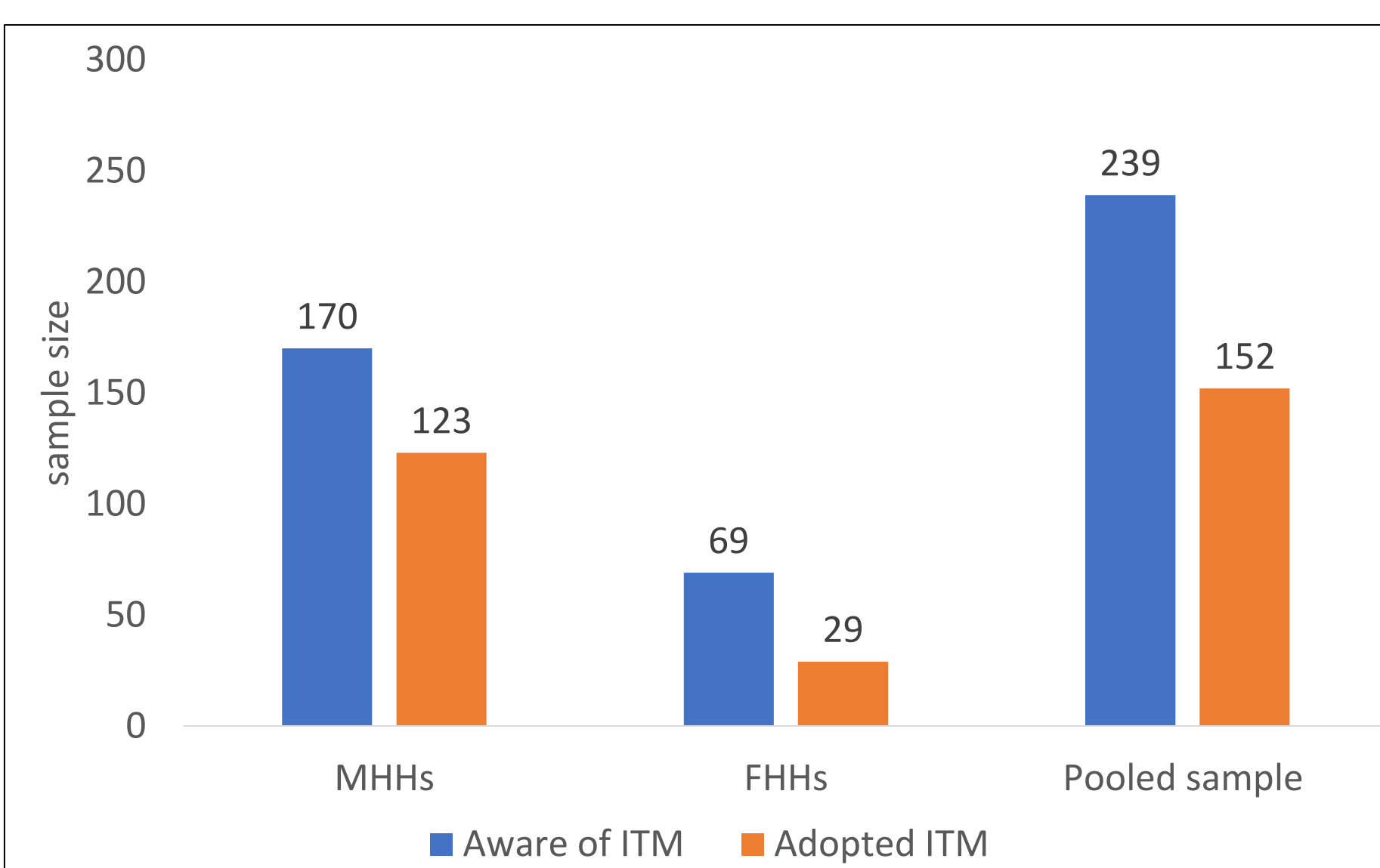


Figure 2: Gender perspective in awareness and adoption of ITM

Results

- Education, social group membership, and access to financial services strongly influenced the likelihood of adopting the ITM vaccine in both household headships and for the pooled sample.
- Interestingly, age had a negative influence for the pooled model but a positive effect for FHHs, indicating that elderly women had higher likelihood of adopting ITM than young ones.
- Farm size and active labor force (adult equivalent) increased likelihood of ITM adoption for FHHs only.
- We further assessed the contribution of the significant factors to ITM adoption identified in the gender-specific models by introducing interaction terms of the most relevant factors in the pooled sample model.
- As expected, the factors representing resource endowment showed a significant interaction with gender, indicating that the effect of resource constraints differs significantly between the two headships.
- These results imply that adoption of ITM is significantly affected by resource constraints in FHHs, but this does not apply to MHHs.
- While the model shows no interaction of gender with credit access – the effect of credit on adoption does not differ between headships – a significant negative interaction is shown for group membership, indicating that group membership had a stronger effect in FHHs than in MHHs.

Methods

Study area, data, and sampling

- The study was conducted in Uasin-Gishu County in Kenya.
- We conducted household survey between June –August 2016.
- Focused was on smallholder cattle keepers who had vaccinated at least part of their cattle stock against ECF (adopters) and those who were yet to vaccinate (non-adopters).
- We used a multi-stage sampling technique to identify potential respondents -298 male-headed households (MHHs) and 150 female-headed households (FHHs) (Fig 2).

Analysis and empirical framework

- The Average-Treatment-Effect (ATE) framework was used to estimate actual and potential adoption for the ITM vaccine among MHHs and FHHs.
- ATE framework helps control biases due to a non-random distribution of information and self-selection.
- The key parameters estimated using ATE-framework are:
 - Potential adoption rates in the whole population of interest (ATE)
 - Potential adoption rates among ITM aware population (ATE1)
 - Potential adoption rates among ITM non-aware population (ATE0)
 - Observed ITM adoption rates (JEA):
 - Adoption gap (GAP): GAP=ATE-JEA
- STATA was used in data management and analysis.

Table 2: Determinants of ITM adoption among MHHs and FHHs

Variables	MHHs		FHHs		Pooled sample	
	Coef.	S.E	Coef.	S.E	Coef.	S.E
Dependent variable: ITM adoption						
Household characteristics						
Gender HH (1=male)					3.68**	1.11
Age (years)	-0.03*	0.01	0.01**	0.06	-0.01*	0.01
Education (years)	0.21***	0.04	0.04***	0.14	0.18***	0.04
HSZ	0.15	0.07	0.07*	0.03	0.29	0.11
Occupation (1=farming)	1.14**	0.51	0.05*	0.15	0.77**	0.25
Household wealth and farm characteristics						
Land-size (hac)	0.45	0.06	0.02**	0.07	0.36**	0.07
Cattle herd size (TLU)	0.17*	0.08	0.04**	0.04	0.20**	0.08
Breed- type (1=exotic)	0.65	0.34	0.02	0.08	0.52	0.54
zero-grazing (1=yes)	-0.20	0.29	-0.14	0.11	-0.43	0.26
Vector control (1 = acaricides)	0.39	0.05	0.30	0.14	0.37	0.25
Institutional characteristics						
Group membership (1=yes)	0.74**	0.04	0.20***	0.08	1.63***	0.29
Credit access (1=yes)	1.08**	0.03	0.14**	0.08	0.58***	0.35
Access extension (1=yes)	1.63***	0.01	0.05**	0.09	1.62**	0.58
Access water (walking time in minutes)	0.10	0.08	0.02	0.21	0.06	0.07
Interactions of gender with other variables						
Land size and gender HH					-0.34**	0.14
Household size and gender HH					-0.38**	0.17
Credit access and gender HH					0.17	0.39
Group membership and gender HH					-0.83*	0.50

Conclusion

- Despite the potential of ITM in reducing shocks due to ECF, adoption rates are still low overall and especially amongst women.
- This is confirmed by a statistically significant gender difference in ITM adoption, with higher actual and potential adoption rates among MHHs compared to FHHs.
- The ATE estimates also reveal a considerably lower adoption gap FHHs, half the gap in MHHs, implying that improving only awareness in FHHs would not help in increasing adoption rates to levels found in MHHs.
- In both MHHs and FHHs, household heads with higher education and higher social capital regarding active participation in social groups, access to extension services and credit, and having farming as primary occupation resulted in an increased the likelihood of ITM adoption.
- The study is based on small sample; hence the results should be interpreted with caution.

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