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Crick & Partners Malaria Symposium

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The short-term impact of a malaria elimination project on school outcomes: evidence from Southern Mozambique

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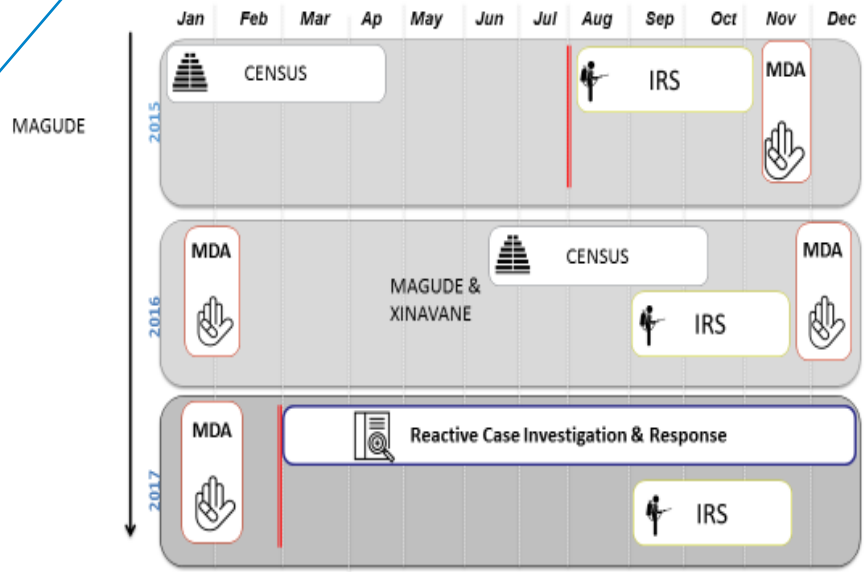
Malaria Elimination Project (MALTEM)

Magude district



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Impact on health

- Epidemiologist: interrupted time-series
- Economists:
  - Synthetic control
  - Difference in difference

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Impact of malaria elimination project on school outcomes

- Improving health, while important in itself, can also lead to higher economic growth and development
- In this work, we focus on short term education outcomes (absenteeism and grades)

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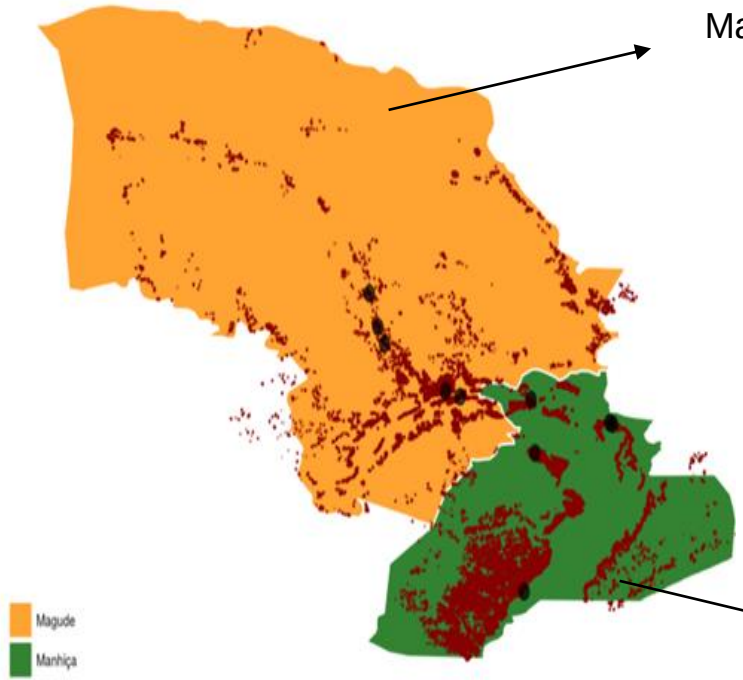
Intervention and control schools



Magude: intervention

Manhiça: control

- 4 Schools in **Magude (Intervention)**; 5 Schools in **Manhiça (Control):** Black dots
- Pre-intervention: year 2015
- Post- intervention: year 2016

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Data collection from schools

PAUTA DE FREQUÊNCIA

ANO LECTIVO DE 200

CLASSIFICAÇÃO

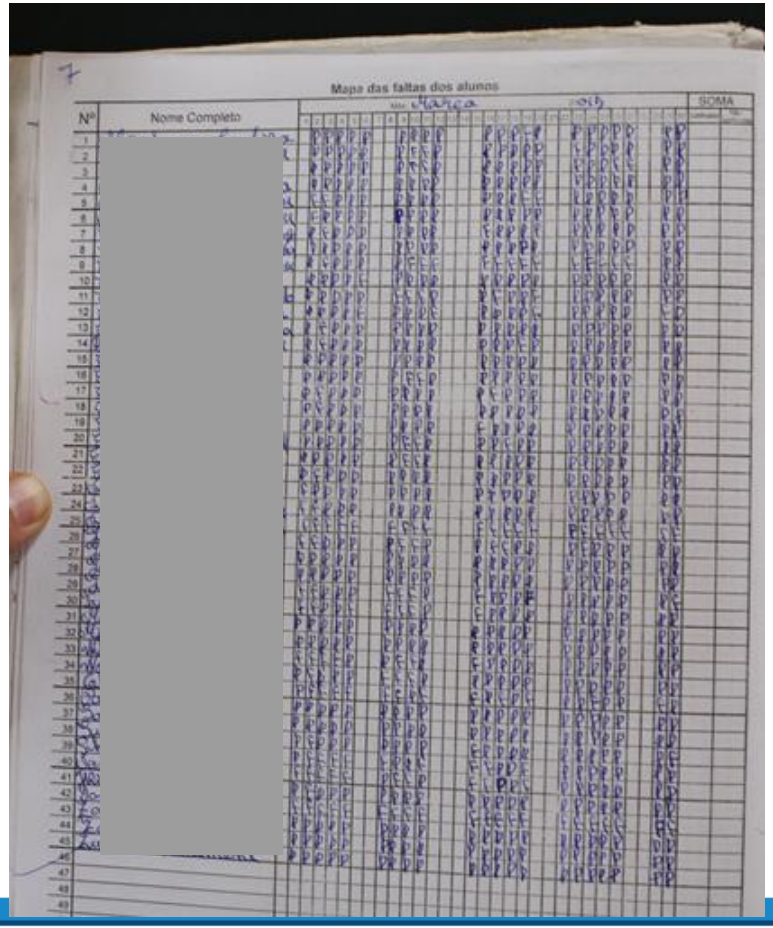
DISTRITO DE Magude

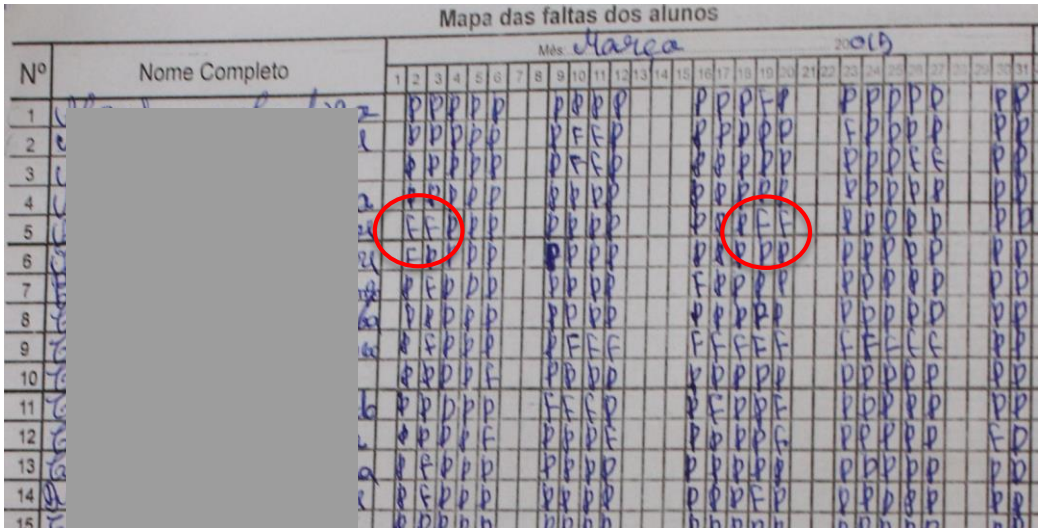
ESCOLA Primária de 1º e 2º Graus Graça Machel

CLASSE 1ª TURMA 3

Maputo

Data collection from schools





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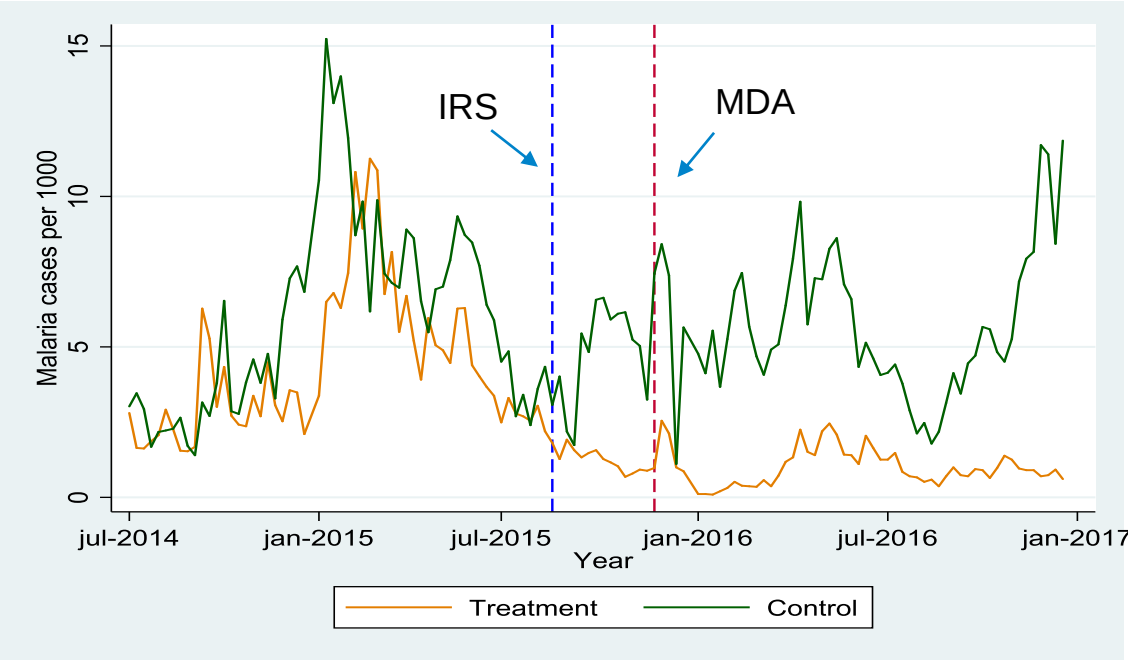
Once more: Health impact



Weekly malaria incidence in treatment (Magude) and control (Manhiça) districts

Routine malaria surveillance - Ministry of Health data

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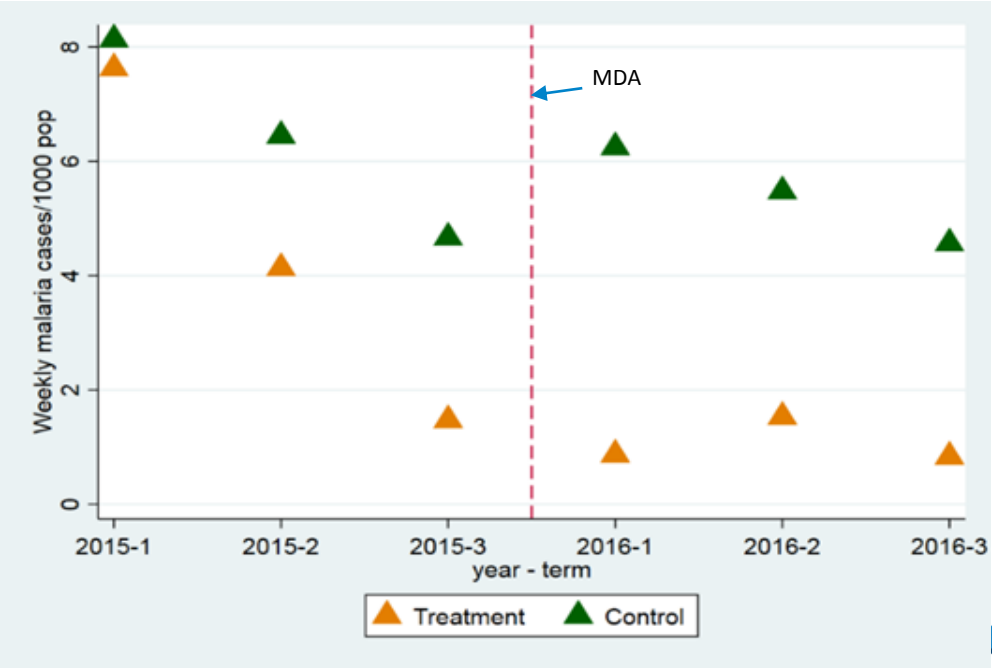
Health impact, model

$$Y_{jt} = \alpha + \beta_1 Treatment_j + \beta_2\, After_t + \boldsymbol{\beta_3 Treatment_j * After_t} +$$
$$+ \beta_4 Precipitation_{jt} + \beta_5 Temperature_{jt} + \beta_6 Month/TrimFE + \varepsilon_{jt}$$

Y_{jt} = weekly incidence in group *j* at time *t*



Abadie et al, Econometric Methods for Program Evaluation, Annual Review of Economics, 2018, 10, 465–503.

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Effect of the campaign on weekly malaria incidence

	(1)	(2)	(3)
Treatment	-2.176***	-2.180***	-2.428***
	(0.371)	(0.349)	(0.311)
After	-0.628*	-0.639*	-0.825**
	(0.374)	(0.352)	(0.321)
Treat*after	**-2.256*** **	**-2.230*** **	**-1.882*** **
	(0.525)	**(0.493)**	**(0.440)**
precipitation	0.027	-0.095	
	(0.102)	(0.101)	
temp_min	-0.013	-0.123	
	(0.060)	(0.082)	
prec_L7			0.258***
			(0.088)
prec_L8			0.173**
			(0.078)
Constant	8.137***	11.538***	10.852***
	(1.329)	(1.818)	(4.054)
Trimester FE	x		
Month FE		x	x
Observations	172	172	160
R^2	0.669	0.721	0.775

OLS with standard errors in parenthesis. * p < 0.10, ** p < 0.05, *** p < 0.01

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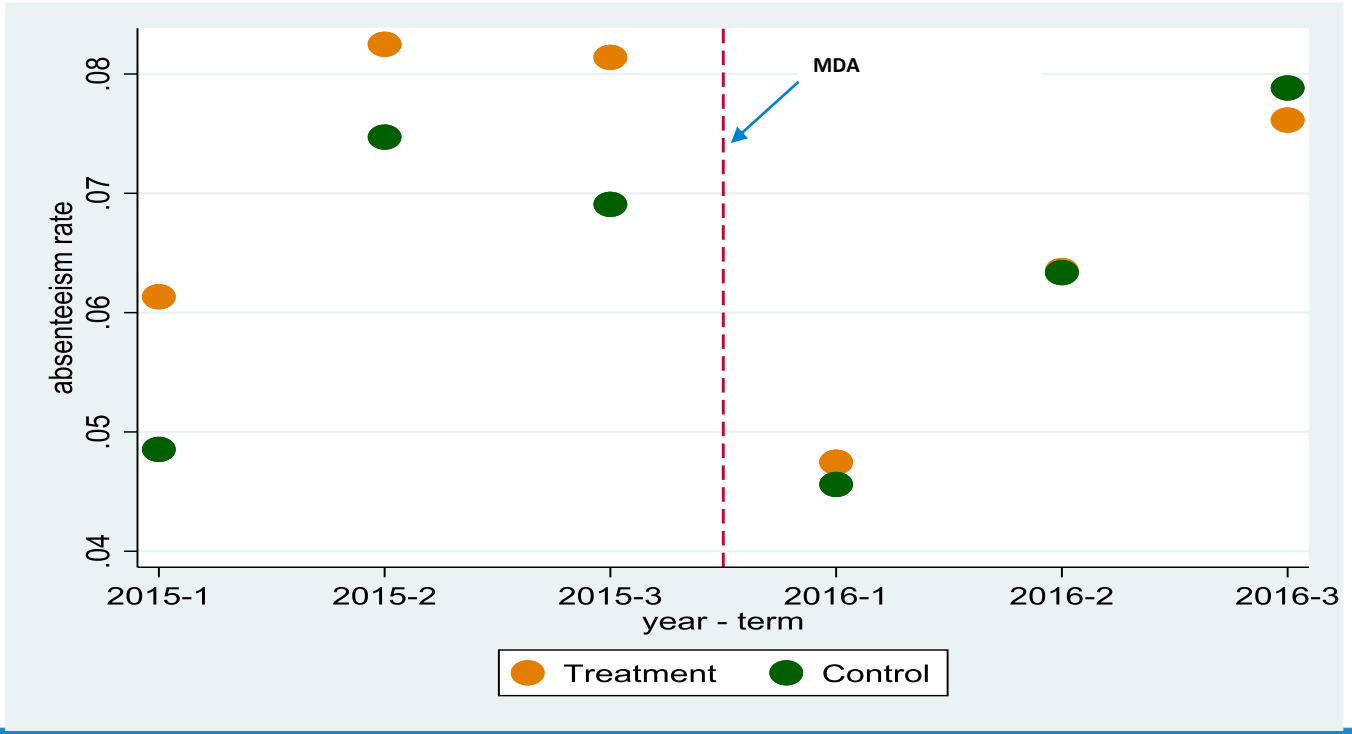
Absenteeism rates in Magude (treatment) and Manhiça (control) districts, 2015 - 2016



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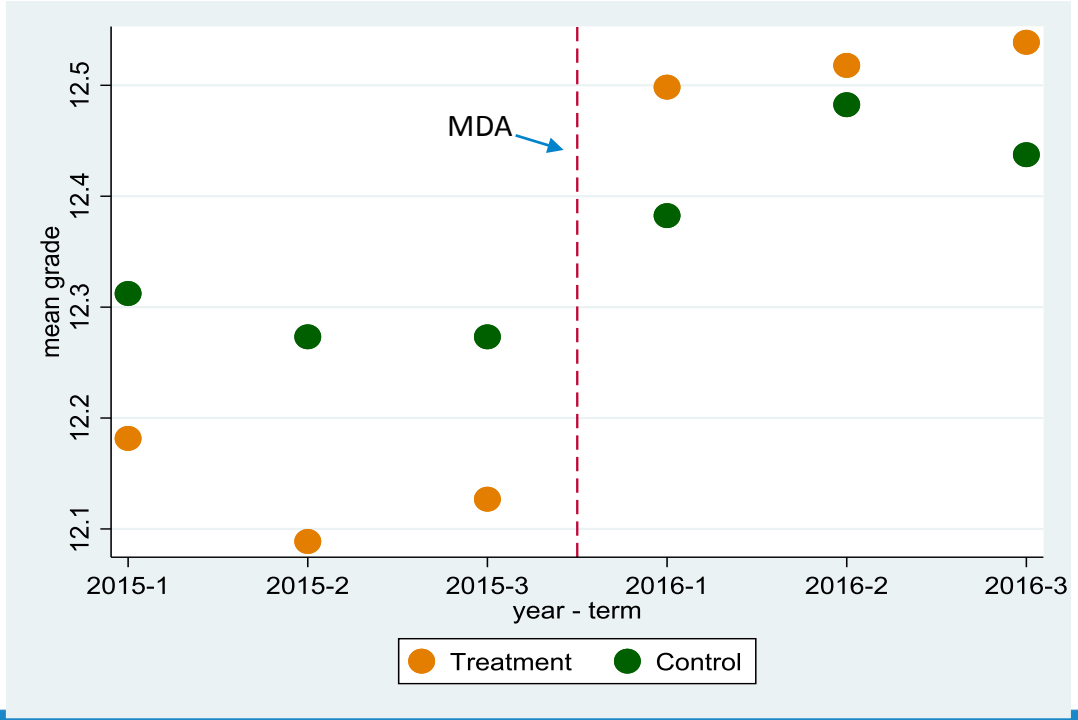
Mean grades in Magude (treatment) and Manhiça (control) districts, 2015 - 2016



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Basic estimated model

- $Y_{ijt} = \alpha + \beta_1 Treatment_j + \beta_2 After_t + \boldsymbol{\beta_3 Treatment_j * After_t} + \beta_4 SchoolFE + \beta_5 TimeFE + \beta_6 IndividualFE + \varepsilon_{ijt}$

- Y_{ijt} is:
  - Probability of student *i* in district *j* at time *t* to be absent from school
  - The trimestral grade of student *i* in district *j* at time *t*
  - The probability of student *i* in district *j* at time *t* to pass the exemination

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Impact of the malaria elimination campaign on school absenteeism

	(1)	(2)	(3)
Treatment	0.006***	0.004***	0.004*
	(0.000)	(0.000)	(0.000)
After	-0.000***	-0.006	0.031*
	(0.000)	(0.012)	(0.003)
Treat*after	**-0.021*** **	**-0.020*** **	**-0.021*** **
	(0.000)	**(0.000)**	**(0.000)**
	[0.005]	[0.005]	[0.005]
Constant	0.054***	0.041	0.039**
	(0.000)	(0.013)	(0.002)
School FE	X	x	x
Month FE		x	x
Trimester FE			x
Observations	996,411	996,411	996,411
R^2	0.017	0.020	0.019

OLS coefficients, with standard errors clustered by district in parentheses. P-values of wild bootstrap clustering procedure presented in brackets for the interaction term (based on 400 repetitions). * p < 0.10, ** p < 0.05, *** p < 0.01

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Impact on grades (all subjects)

Dependent variable	All subjects (1)	(2)	(3)
Mean grade value			
Treatment	0.025***	0.024***	-0.002
	(0.000)	(0.000)	(0.003)
After	0.164***	0.146**	0.152**
	(0.000)	(0.004)	(0.005)
Treat*after	**0.241*** **	**0.241*** **	**0.240*** **
	(0.000)	**(0.000)**	**(0.003)**
	[0.005]	[0.005]	[0.005]
Constant	11.849***	11.877***	12.159**
	(0.000)	(0.010)	(0.848)
School FE	x	x	x
Trimester FE		x	x
Subject FE			x
Observations	229,427	229,427	229,427
R^2	0.015	0.015	0.047

OLS coefficients, with standard errors clustered by school in parentheses. P-values of wild bootstrap clustering procedure presented in brackets for the interaction term (based on 400 repetitions). * p < 0.10, ** p < 0.05, *** p < 0.01

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Discussion (focused on inter-institutional and interdisciplinary collaboration)

- Inter-institutional collaboration *was* key in this study, made the study possible through sharing research platforms and knowledge

- More interdisciplinary collaboration *could* have improved the findings: we could have shown that same/similar findings can result from different approaches

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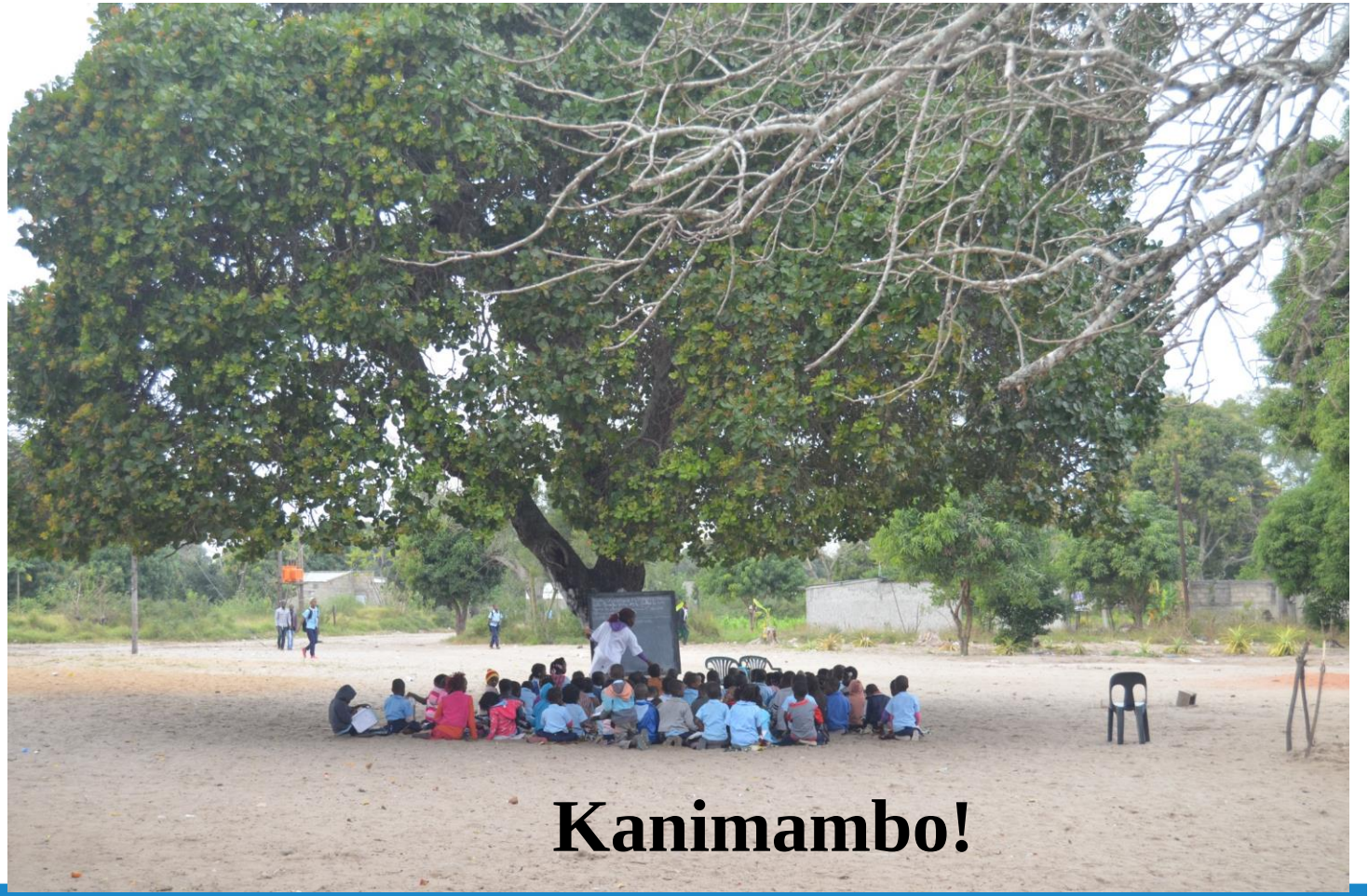

Kanimambo!