



# The short-term impact of a malaria elimination campaign on school performance: preliminary evidence from Southern Mozambique

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Nandito

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## Context

- Mozambique is among the **10 countries with the greatest malaria burden**
- Prevalence as high as **40%** in some regions  
45% of all outpatient cases  
56% of all inpatient cases  
26% of all hospital deaths
- **100 deaths daily**
- Bordering countries in elimination phase

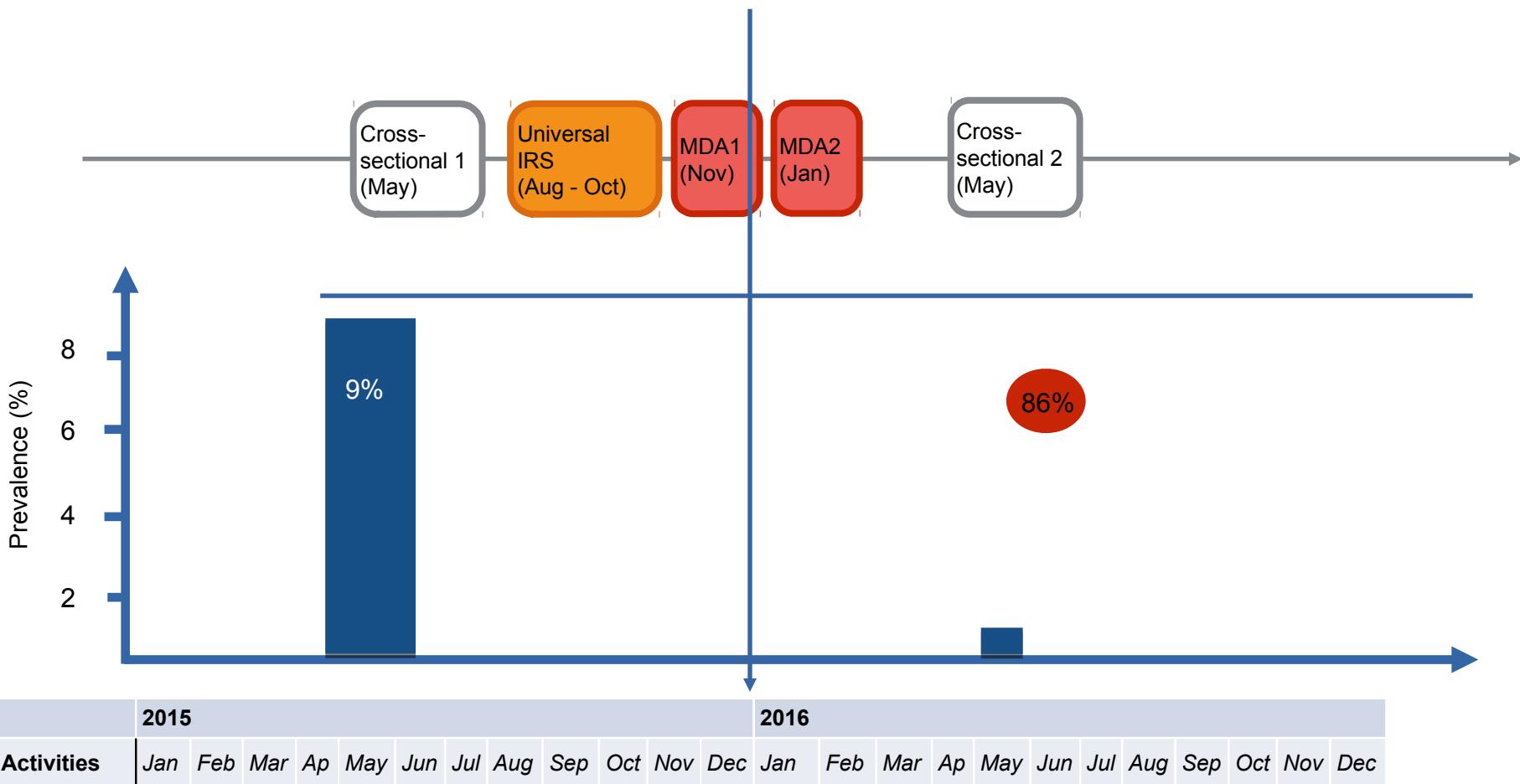


# Mozambican Alliance Towards the Elimination of Malaria



- Creation of MALTEM alliance in 2014 (funded by BMGF)
- Aims at assisting MoH in Mozambique in designing interventions towards malaria elimination
- By generating evidence on interventions that work towards malaria elimination
  - Pilot malaria elimination effort in Magude district since 2015

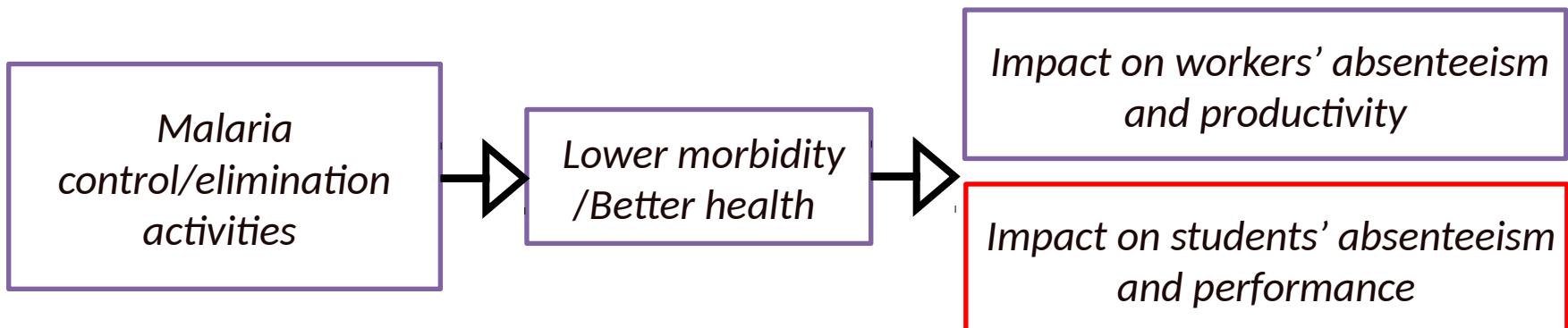
# Impact of malaria elimination interventions in Magude



# Research objectives

**Provide evidence on the economic benefits of malaria elimination**

1. Impact on labour force (absenteeism and productivity)
2. **Impact on school age children (absenteeism and performance)**



## Literature

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- **Early childhood health shocks – long term economic outcomes** (Smith 2009, Case et al 2002 & 2005, Currie and Stabile 2003)
- Malaria shown to have **lifelong effects on economic outcomes and economic growth** (Sachs and Malaney 2002)
- **Within the context of malaria elimination:**
  - **Evidence from Uganda (Barofsky et al, 2012)**
    - Increased years of schooling (half year)
    - Increased primary school completion
    - Increased likelihood of wage work (40%)
  - **Evidence from India (Cutler et al, 2010) shown to**
    - Increased household consumption (as proxy for income)

## Contribution to the field

- Uniqueness of data collected
  - Previous studies are ecological, retrospective, long-term
  - Ours is person-level, real-time, short-term
- Potential impact
  - Relevant in terms of informing policy making
  - Short-term trumps the long- term for most policy-makers

## Identification strategy

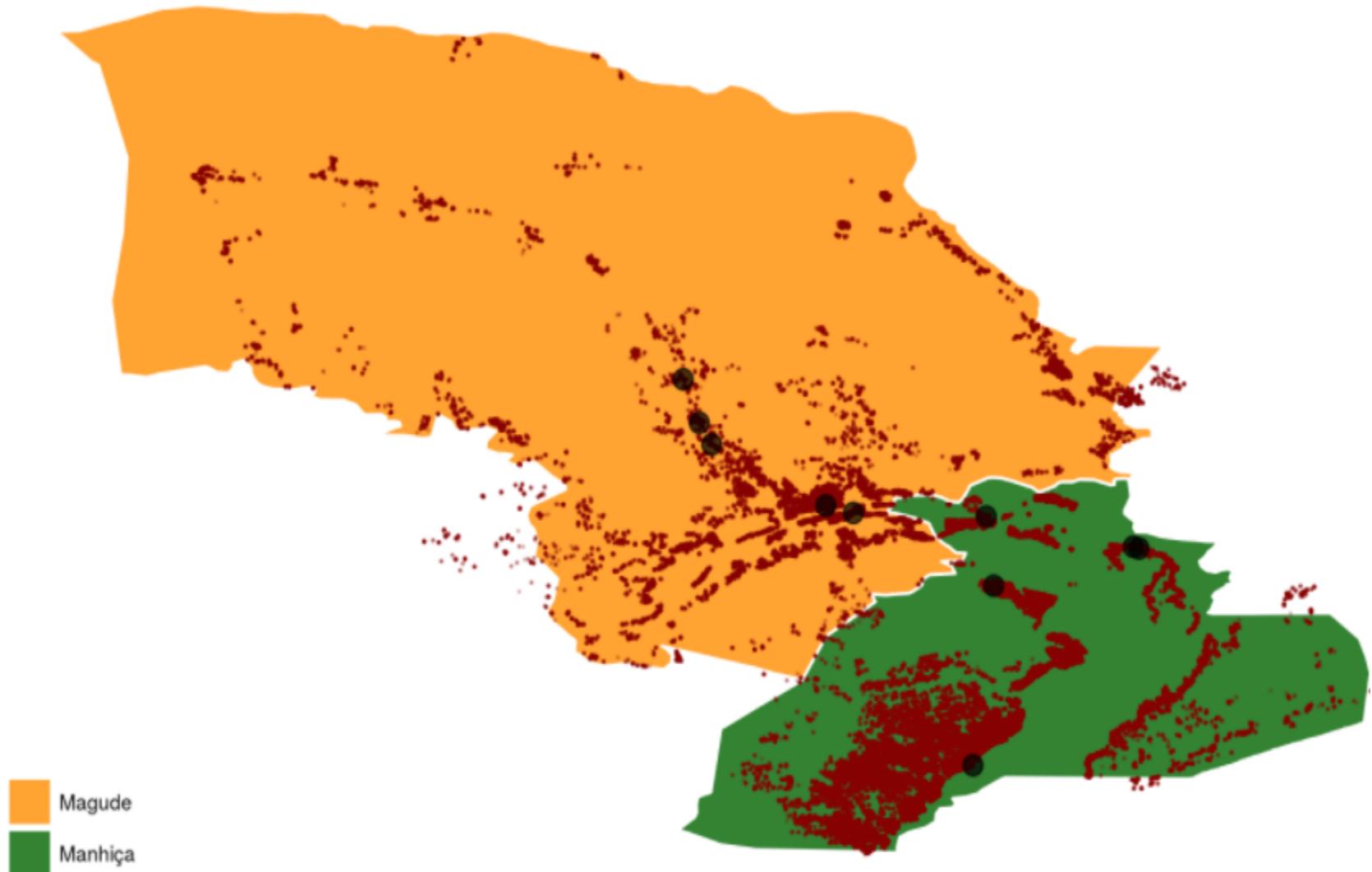
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- We compare grades of students from selected schools in Intervention (Magude district) and Control (Manhiça district) areas
- For both intervention and control we collected data for the year before the intervention started (year 2015) and for the year after the intervention started (year 2016).
- We apply **difference in difference analysis** to identify and measure the short term impact of the elimination campaign

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## Schools

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## Similarity across districts

<b>characteristics</b>	<b>Manhiça</b>	<b>Magude</b>
% females	49%	51%
number siblings	4.5 (sd = 2.5)	4.4 (sd = 2.8)
parents' education level	2.4 (sd = 1.2)	2.5 (sd = 1.4)
age	9.4 (sd = 2.7)	9.2 (sd = 2.8)
<b>SES by assets</b>	<b>6,972 (sd = 962)</b>	<b>6,770 (sd = 852)</b>

## Data collection

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

PAUTA DE FREQUÊNCIA												PAUTA DE FREQUÊNCIA											
ANO LECTIVO DE 200...												ANO LECTIVO DE 200...											
CLASSIFICAÇÃO												CLASSIFICAÇÃO											
Nº	NOME DO ALUNO	PORTUGUÉS	MATEMÁTICA	E. VISUAL	E. FÍSICA	OFÍCIOS	C. SOCIAIS	E. MORAL/EM.	C. NATURAIS	E. MUSICAL	INGLÉS	COMPORT.	OB. MATERIAIS	CASEPACIÃO	INSTRUÇÕES								
		FALTAS	FALTAS	FALTAS	FALTAS	FALTAS	FALTAS	FALTAS	FALTAS	FALTAS	FALTAS	COMPORT.	OB. MATERIAIS	CASEPACIÃO	INSTRUÇÕES								
01	Abrahão C. Maceno	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
02	Aderito Mahalelo	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
03	Amélia C.F. Melas	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
04	Ana M. Chilengue	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
05	Antivaldo Nhambilo	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
06	Belchica Chiburro	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
07	Bernardino Mulungu	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
08	Chalcia Alberto	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
09	Shelton Mujuco	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
10	Cláudio H. Dzimba	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
11	Cléiton Mazivilo	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
12	Clérice C. Manhica	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
13	Cristóvão Hungula	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
14	Dumisane Chongo	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
15	Edmene C. Cubai	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
16	Edvania Sergio	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
17	Eusébio J. Job	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
18	Eulálio F. Joice	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
19	Eulálio G. Maholo	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
20	Elton Tivans	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
21	Erica B. Coque	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
22	Eduardo N. Guedes	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
23	Feliciano Chovore	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
24	Francliso Ubisa	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
25	Graça L. Nhamo	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
26	Jocana L. Hamza	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
27	José A. Vize	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
28	Juliánio Alberto	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
29	Leticio Costa	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
30	Malumuna Suleiman	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
31	Miro R. Massinga	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
32	Milton C. Ndzuva	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
33	Portuguesa	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
34	Priscila da Costa	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
35	Pablo Alberno	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
36	Patrícia Magude	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
37	Sulaiman Abdul	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	15/16/16	
38	Tomas Mazivale	15/16/16																					

## Data collection

## Mapa das faltas dos alunos

# Econometric models

## 1) Diff-diff

$$Y_{it} = \alpha + \beta_1 Intervention + \beta_2 Year 2016 + \beta_3 Intervention * Year 2016 + \delta SchoolFE + \sigma TrimesterFE$$

Main assumption: **parallel trends (in the outcome variable) in treatment and control groups before the introduction of the intervention**

In order to check this crucial assumption,

## 2) we estimate an **event study model**:

$$Y_{it} = \alpha + \beta_1 Intervention + \delta SchoolFE + \sigma_1 Tr2\_2015 + \sigma_2 Tr3\_2015 + \sigma_3 Tr1\_2016 + \sigma_4 Tr2\_2016 + \sigma_5 Tr3\_2016 + \sigma_6 Tr2\_2015 * Inter + \sigma_7 Tr3\_2015 * Inter + \sigma_8 Tr1\_2016 * Inter + \sigma_9 Tr2\_2016 * Inter + \sigma_{10} Tr3\_2016 * Inter$$

The coefficients  $\sigma_6 - \sigma_{10}$  identify the differential trends in the outcome variable over time between the treated and control regions.

As the policy is implemented in 2016 trim1,  $\sigma_6 & \sigma_7$  identify any differential pre-trends in the outcome variable between treated and control regions (the crucial assumption for diff-diff models)

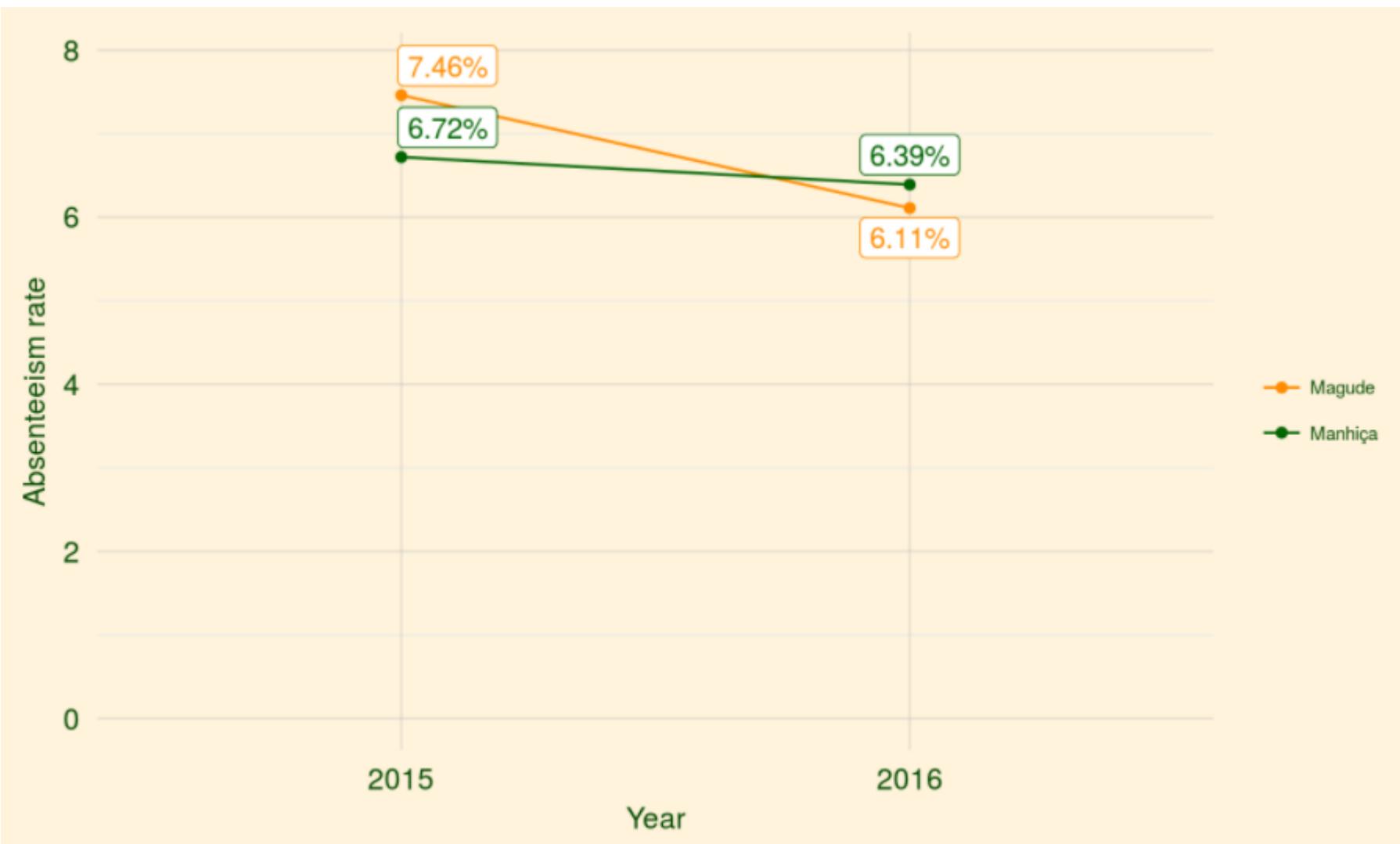
## Descriptive data

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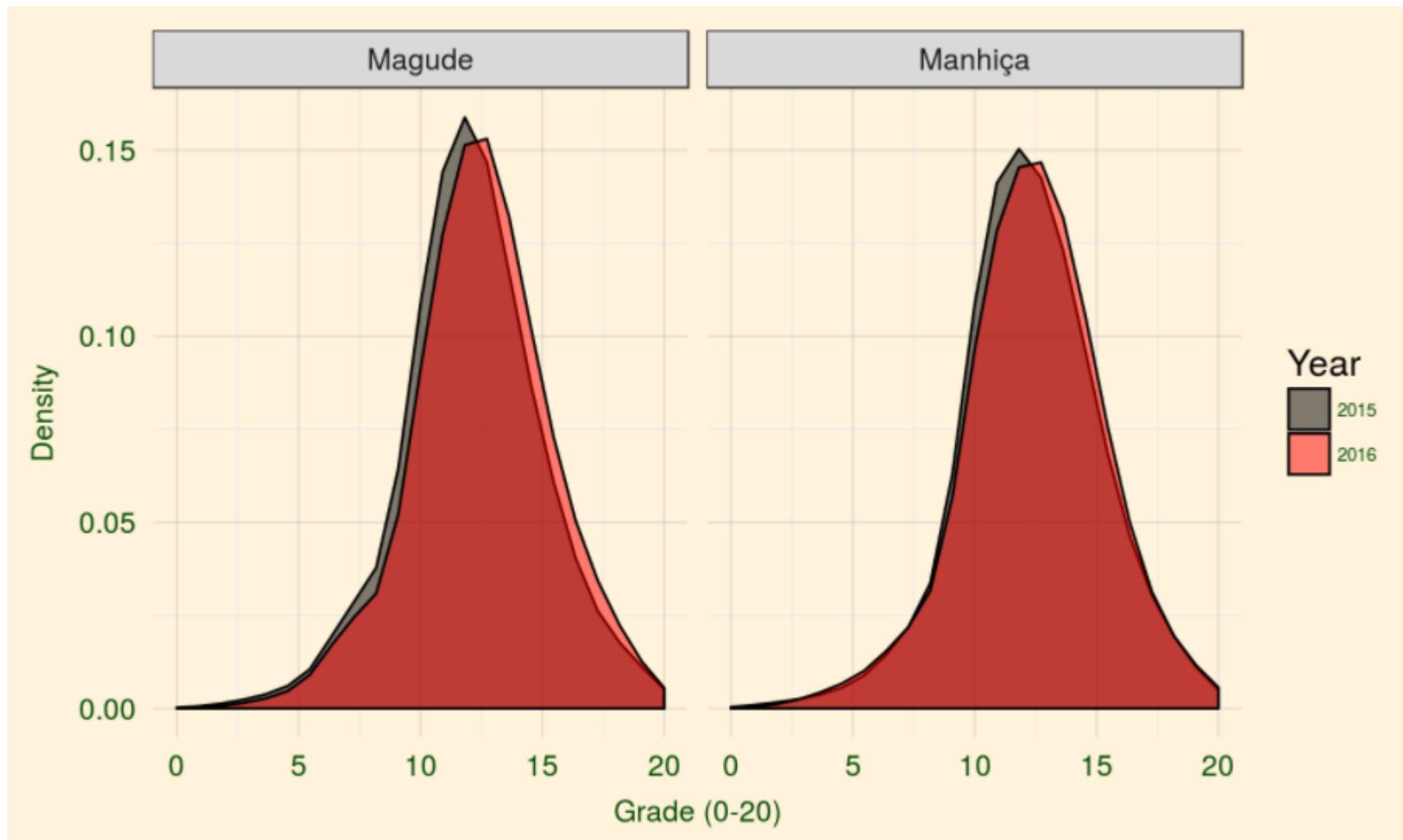
- 9 schools (5 intervention, 4 control)
- 140 classes (across the 2 years observation)
- 8,832 students
- 222,503 observations (on trimester examination)
- 860,927 observations (on daily absenteeism)
- Unbalanced panel

	Average grade		Absenteeism rate	
	2015	2016	2015	2016
Manhiça	12.29	12.43	6.72	6.39
<b>Magude</b>	12.11	12.51	7.46	<b>6.11</b>

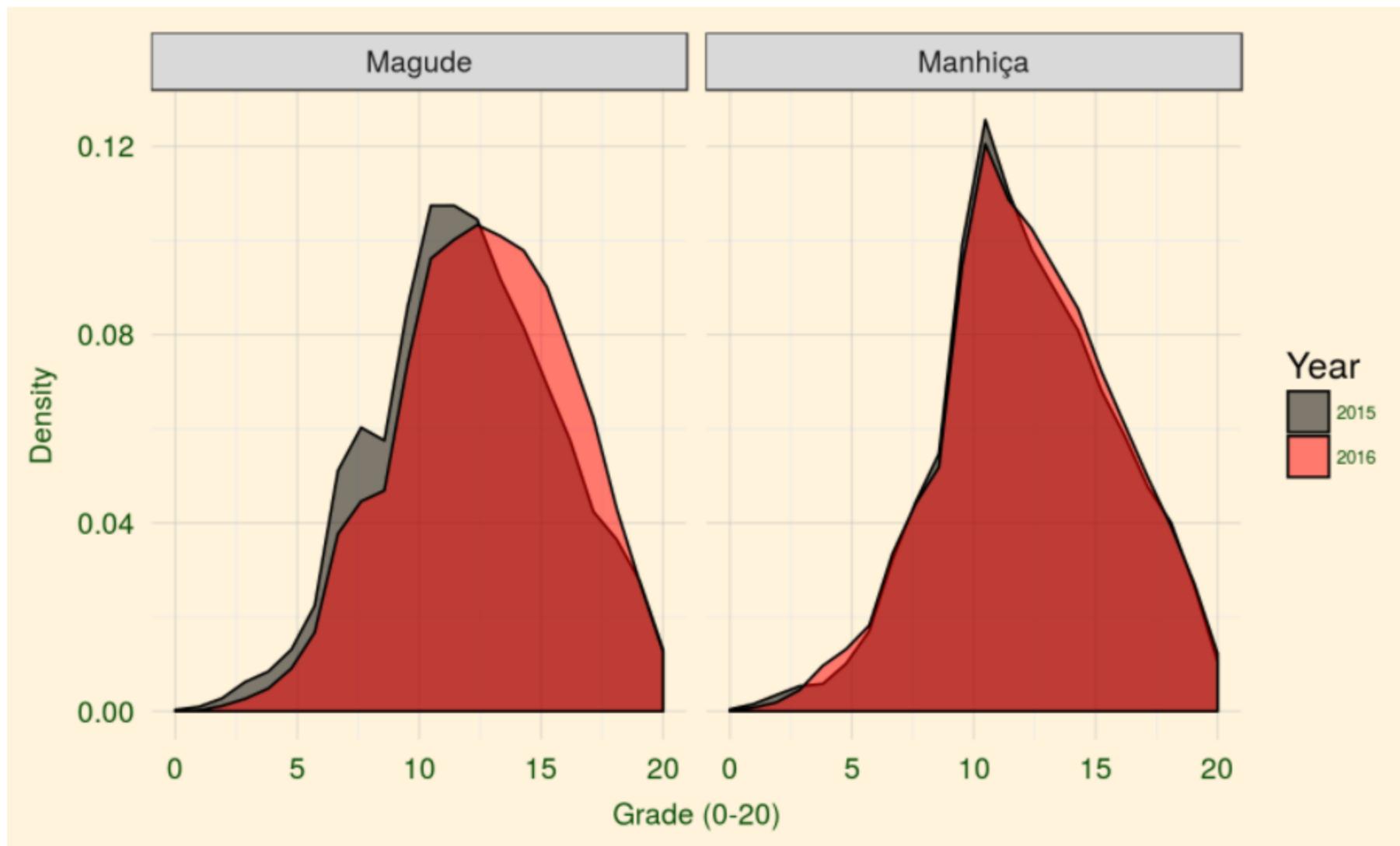
## Absenteeism rate



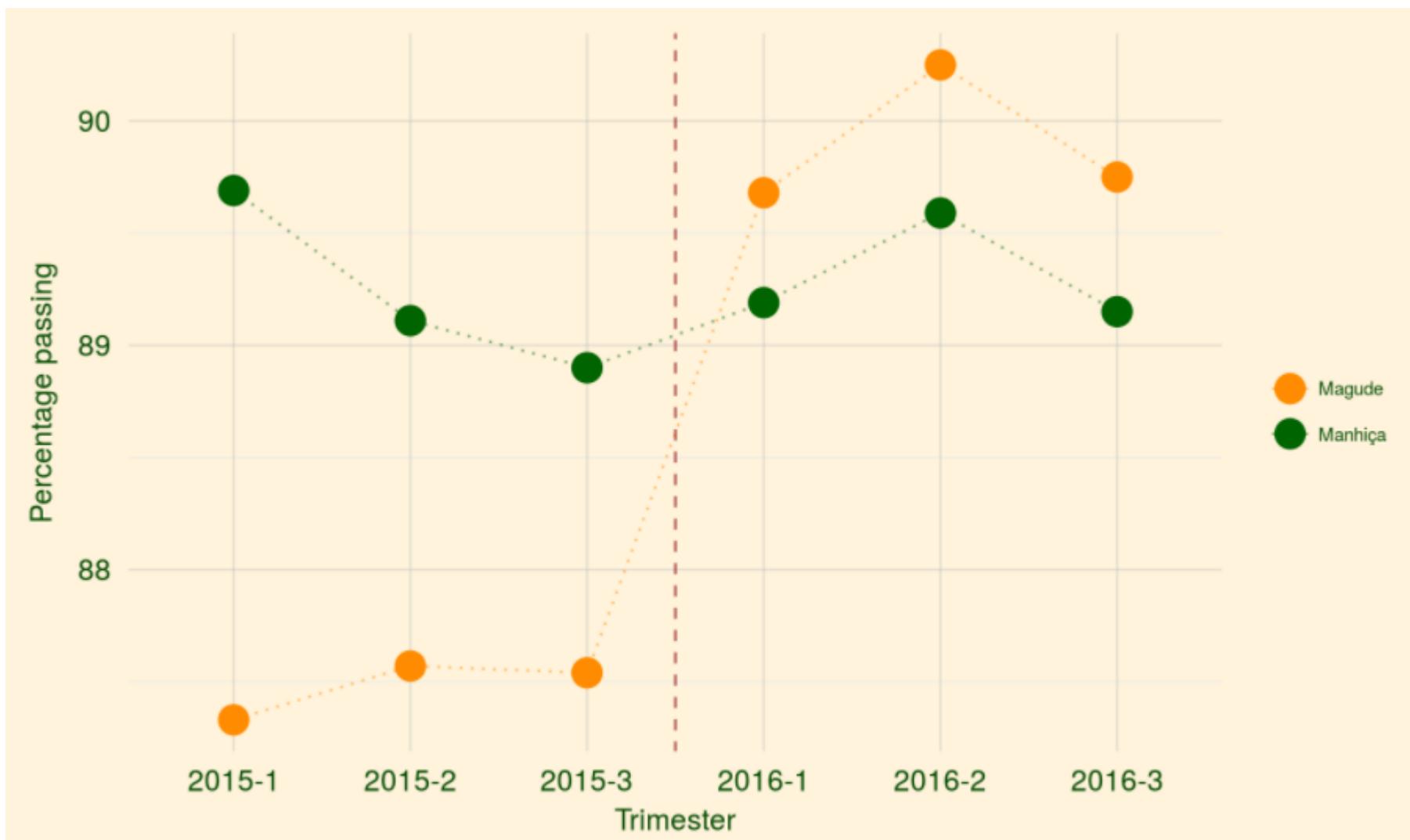
# Distribution of grades, all subjects



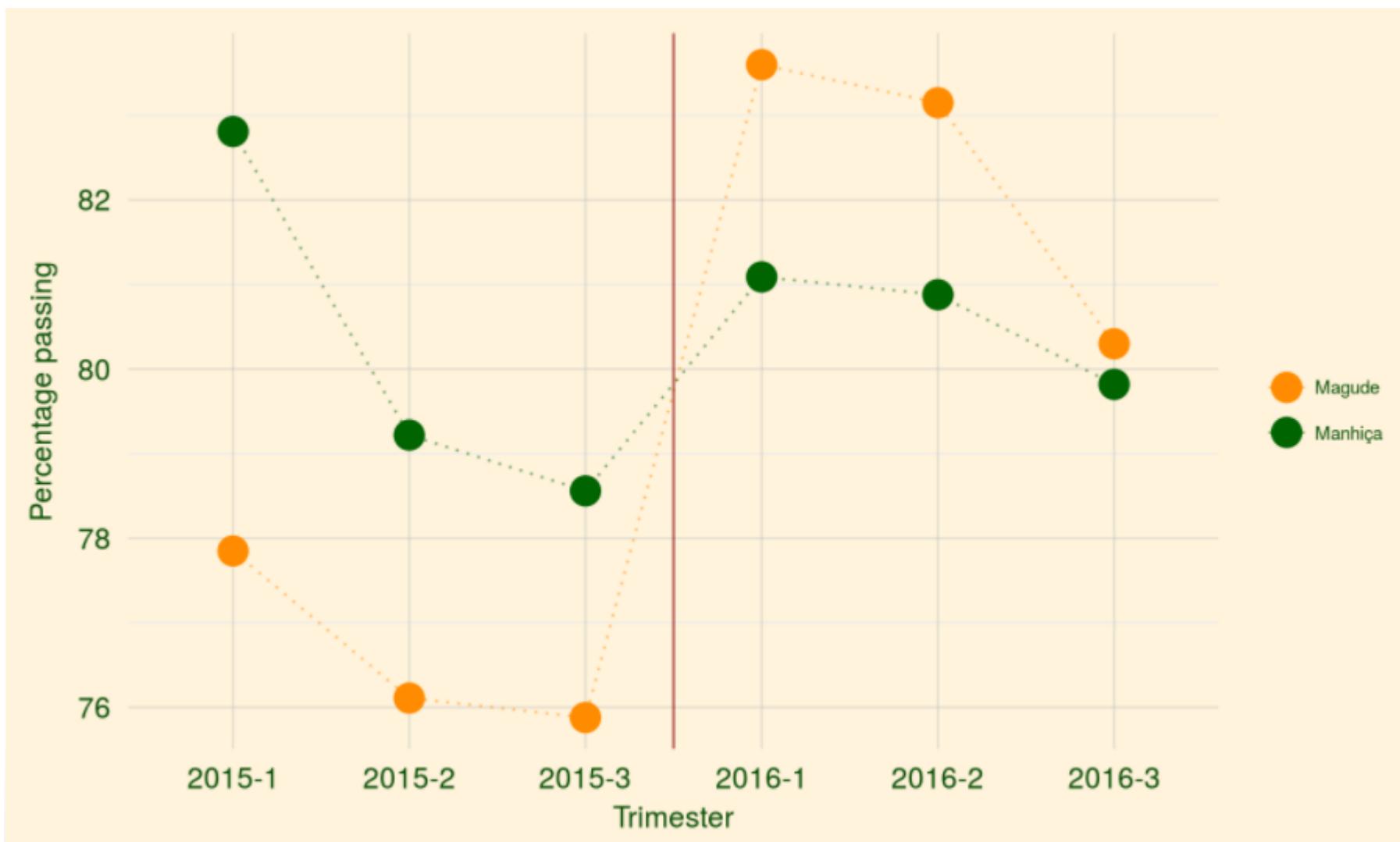
# Distribution of Maths grades



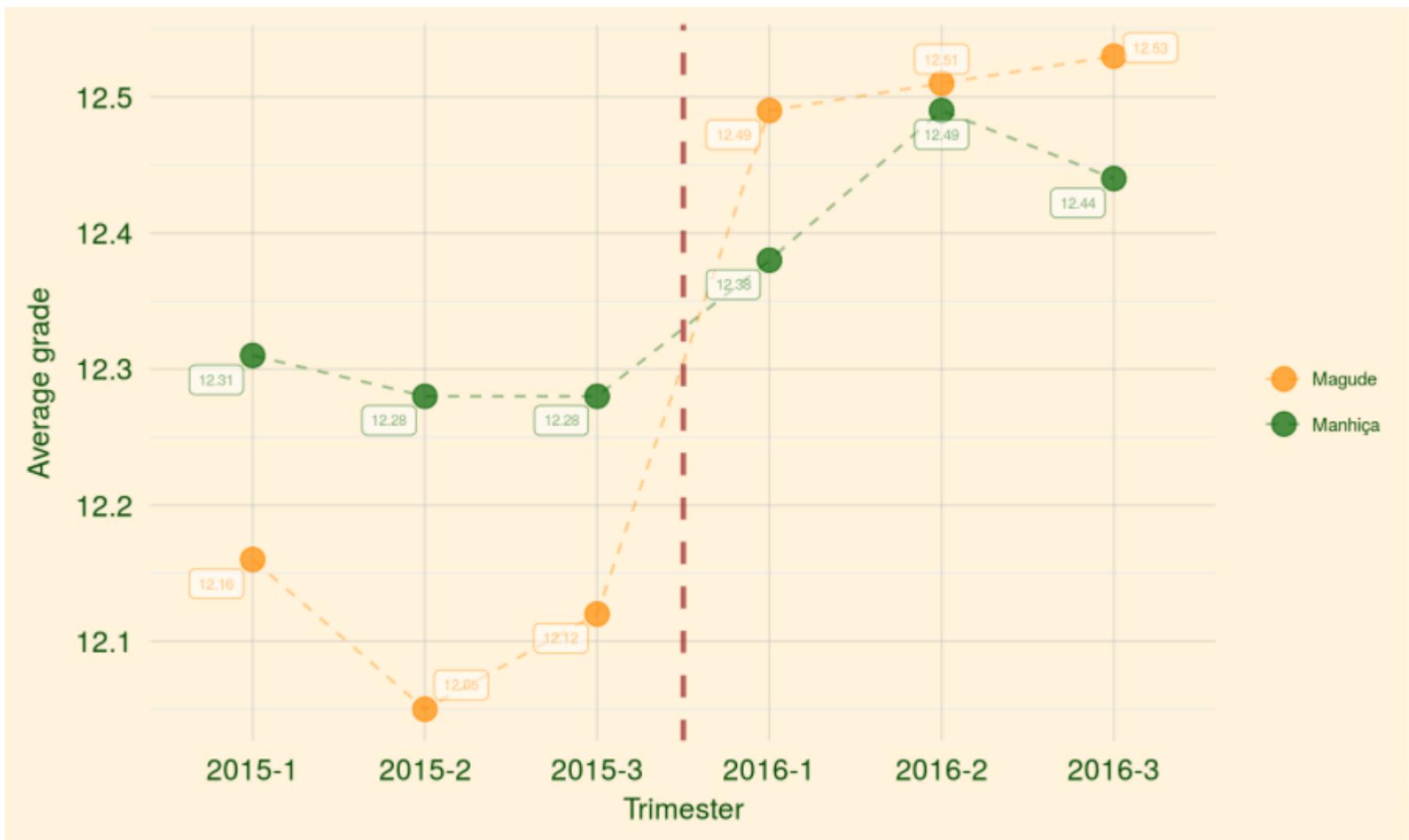
— Proportion of those passing exams (grade $\geq$ 10), all subjects —



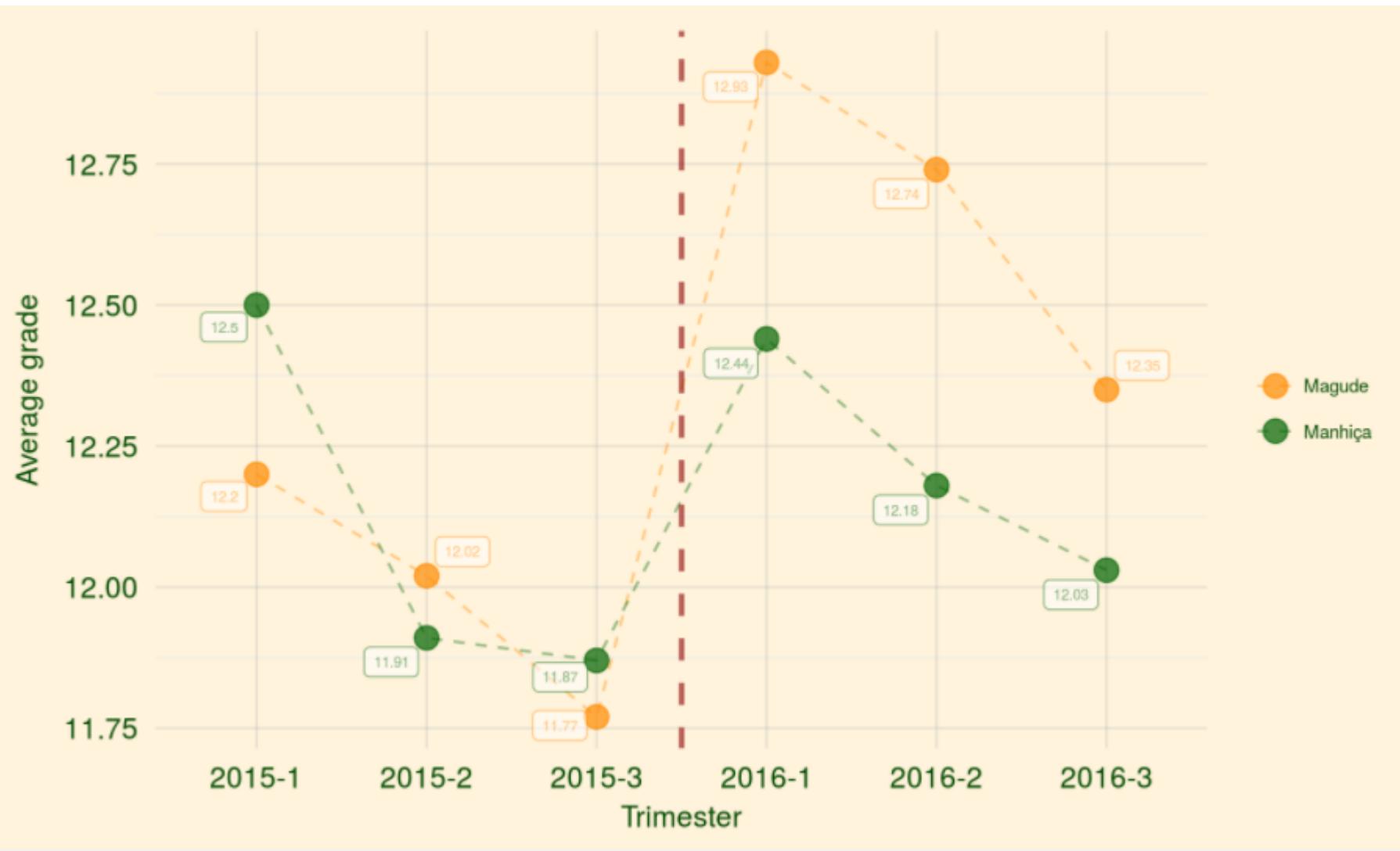
## Proportion of those passing Maths exams (grade $\geq$ 10)



## Mean grade obtained, all subjects



## Mean grade obtained in Maths



## Passed trimester examination?

	I	II	III
intervention	0.04 (0.005)**	0.04 (0.005)**	0.04 (0.005)**
after	0.0024 (0.002)	0.0034 (0.001)*	0.0034 (0.001)**
<b>interv*after</b>	<b>0.02</b> <b>(0.003)**</b>	<b>0.02</b> <b>(0.003)**</b>	<b>0.02</b> <b>(0.0003)**</b>
2nd trimester			0.0007 (0.0014)
3rd trimester			-0.002 (0.002)
Constant	0.87 (0.002)**	0.76 (0.026)**	0.76 (0.026)**
R <sup>2</sup>	0.004	0.13	0.13
N	222,503	222,503	222,503

\*p<0.05; \*\* p<0.01; OLS regressions; Robust SE in brackets, clustered by intervention

All regressions controlling for school. Regressions II and III also controlling for subject

The impact of the policy is to increase the probability of passing the exam by 2 percentage points. Given that the proportion of those passing examinations was 87.5% in the intervention area in 2015, the increase due to the intervention is (0.02/0.875\*100) **2.28%**

## Passed trimester examination? (Maths)

intervention	0.03
	(0.018)
after	0.0057
	(0.005)
<b>interv*after</b>	<b>0.05</b>
	<b>(0.01)**</b>
2nd trimester	-0.02
	(0.005)**
3rd trimester	-0.03
	(0.005)**
Constant	0.79
	(0.006)**
R <sup>2</sup>	0.01
N	33,626

The impact of the policy is to increase the probability of passing the exam by 5 percentage points for the case of maths.

Given that the proportion of those passing examinations was 76.69% in the intervention area in 2015, the increase due to the intervention is  
 $(0.05/0.7669 * 100) 6.52\%$

\* $p<0.05$ ; \*\*  $p<0.01$

OLS regression; **regression controlling for school (coeff not shown);**

## Grade trimester examination, all subjects

	I	II	III
intervention	0.02 (0.05)	-0.03 (0.05)	-0.03 (0.05)
after	0.169 (0.014)**	0.174 (0.013)**	0.174 (0.013)**
<b>Interv*after</b>	<b>0.23 (0.026)**</b>	<b>0.23 (0.026)**</b>	<b>0.23 (0.026)**</b>
2nd trimester			0.02 (0.013)
3rd trimester			0.02 (0.014)
Constant	11.99 (0.014)**	12.16 (0.247)**	12.15 (0.247)**
R <sup>2</sup>	0.016	0.048	0.05
N	222,503	222,503	222,503

OLS regression; \*  $p<0.05$ ; \*\*  $p<0.01$ ; Robust SE in brackets, clustered by intervention

The impact of the policy is to increase the grade for all subjects by 0.23 percentage points. Given that the mean grade was 12.11 in the intervention area in 2015, the increase due to the intervention is  $(0.23/12.11 \times 100) 1.9\%$

## Grade trimester examination (Maths)

intervention	-0.45 (0.158)**
after	0.153 (0.046)**
<b>Interv*after</b>	<b>0.53 (0.088)**</b>
2nd trimester	-0.35 (0.05)**
3rd trimester	-0.52 (0.05)**
Constant	12.24 (0.05)**
R <sup>2</sup>	0.01
N	33,626

The impact of the policy is to increase the probability of passing the exam by 0.53 percentage points.

Given that the mean grade was 11.98 in the intervention area in 2015, the increase due to the intervention is  $(0.53/11.98 * 100) 4.42\%$

OLS regression; \*  $p<0.05$ ; \*\*  $p<0.01$ ; Robust SE in brackets, clustered by intervention

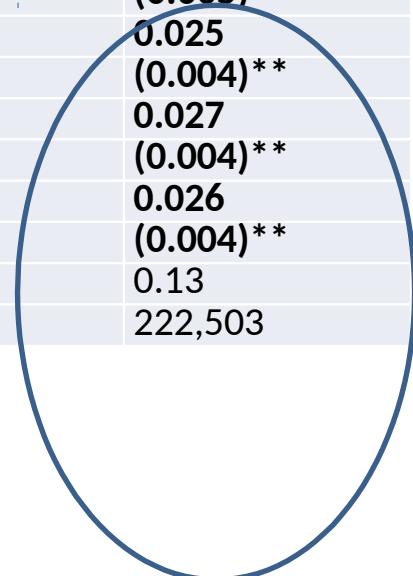
**regression controlling for school (coeff not shown)**

## — Event study, pass examination (all subjects) —

To analytically prove the parallel trend assumption (the crucial assumption for diff-diff models):

- Analyse **differential trends (prior to intervention) in the outcome variable between the treated and control regions.**
- Prior intervention, differential trends very small between treated and control regions
- Parallel trends assumption holds

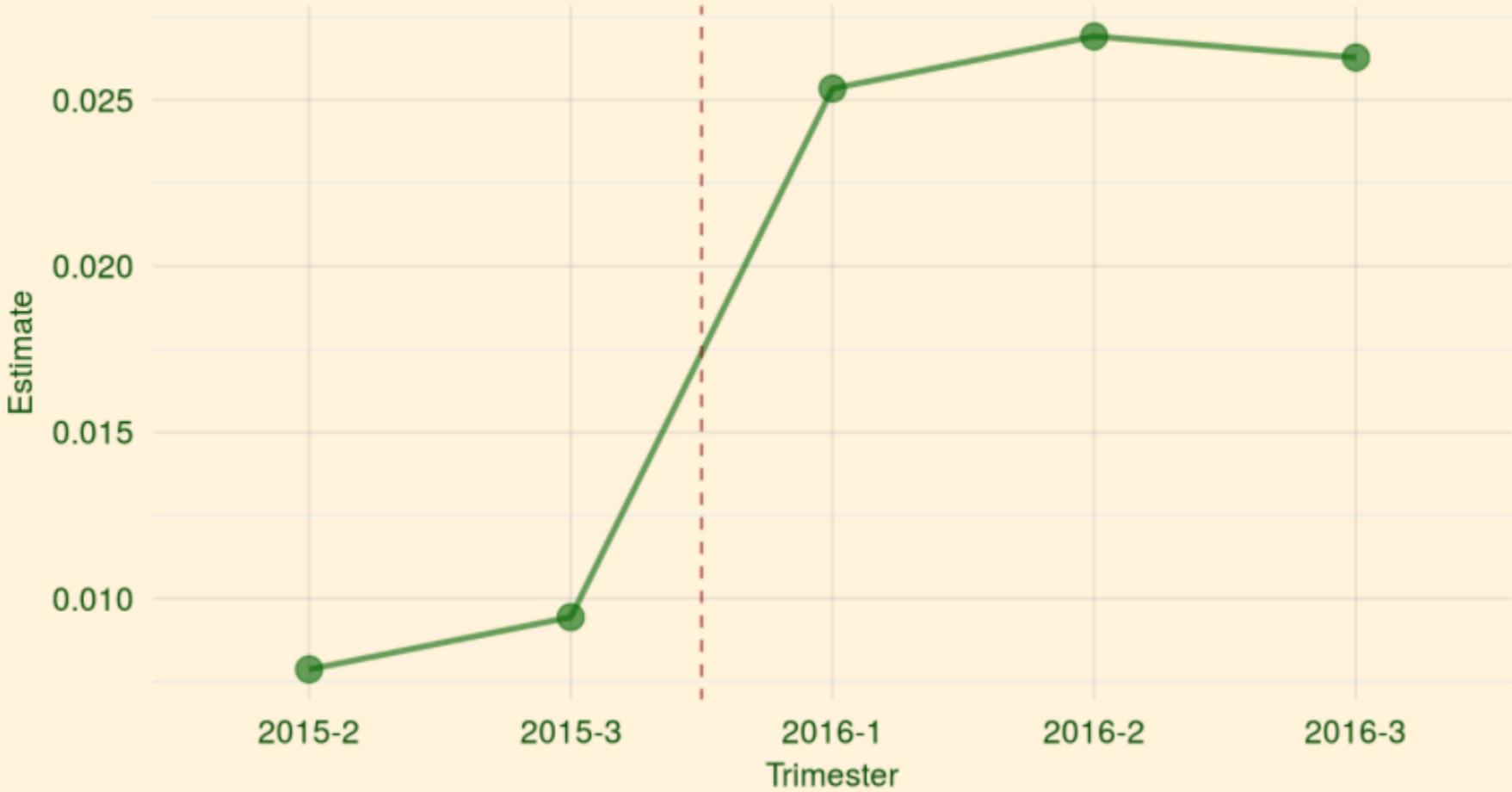
intervention	0.05 (0.005)**
(-2) trimester 2, year 2015	-0.005 (0.003)*
(-1) trimester 3, year 2015	-0.008 (0.003)**
(0) trimester 1, year 2016	-0.002 (0.002)*
(1) trimester 2, year 2016	0.002 (0.002)
(2) trimester 3, year 2016	-0.002 (0.002)
<b>(-2)*intervention</b>	<b>0.008 (0.005)</b>
<b>(-1)*intervention</b>	<b>0.009 (0.005)</b>
<b>(0)* intervention</b>	<b>0.025 (0.004)**</b>
<b>(1)*intervention</b>	<b>0.027 (0.004)**</b>
<b>(2)*intervention</b>	<b>0.026 (0.004)**</b>
R <sup>2</sup>	0.13
N	222,503



## Event study

### Place-time interaction

Clear effect of intervention



## Discussion/Conclusion

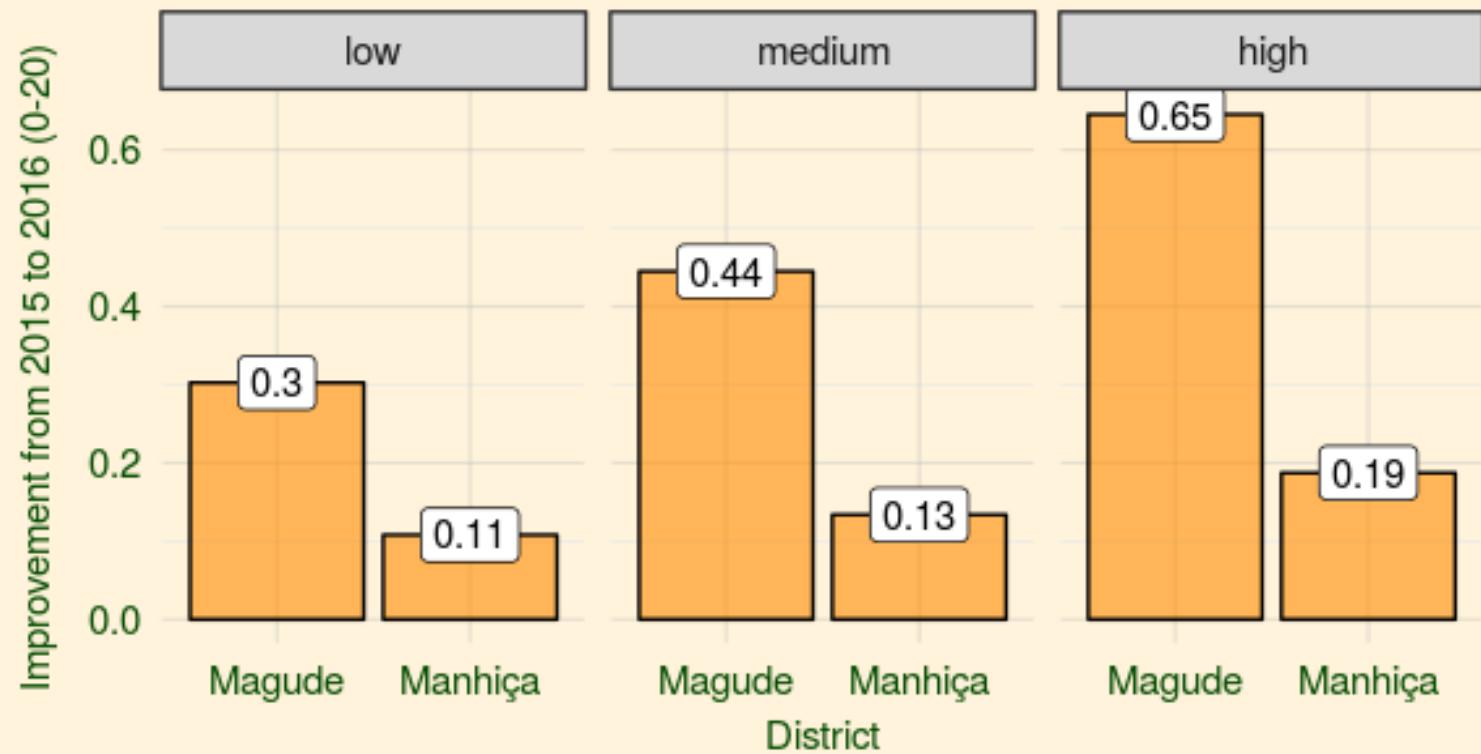
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- Preliminary results:
  - There is a **positive impact of the malaria campaign on school performance**, both in terms of grades as continuous variable and % passing examinations;
- Implications:
  - Malaria elimination has an **impact beyond health**
  - There is an immediate benefit that could lead to a snowball effect
- Next steps:
  - Model improvement
  - Absenteeism reduction as the next outcome to investigate and probable channel through which the campaign had an impact on school performance
  - Rich database to explore further research lines (equity issues...)

## Further research

### Non-equitable effect of malaria intervention

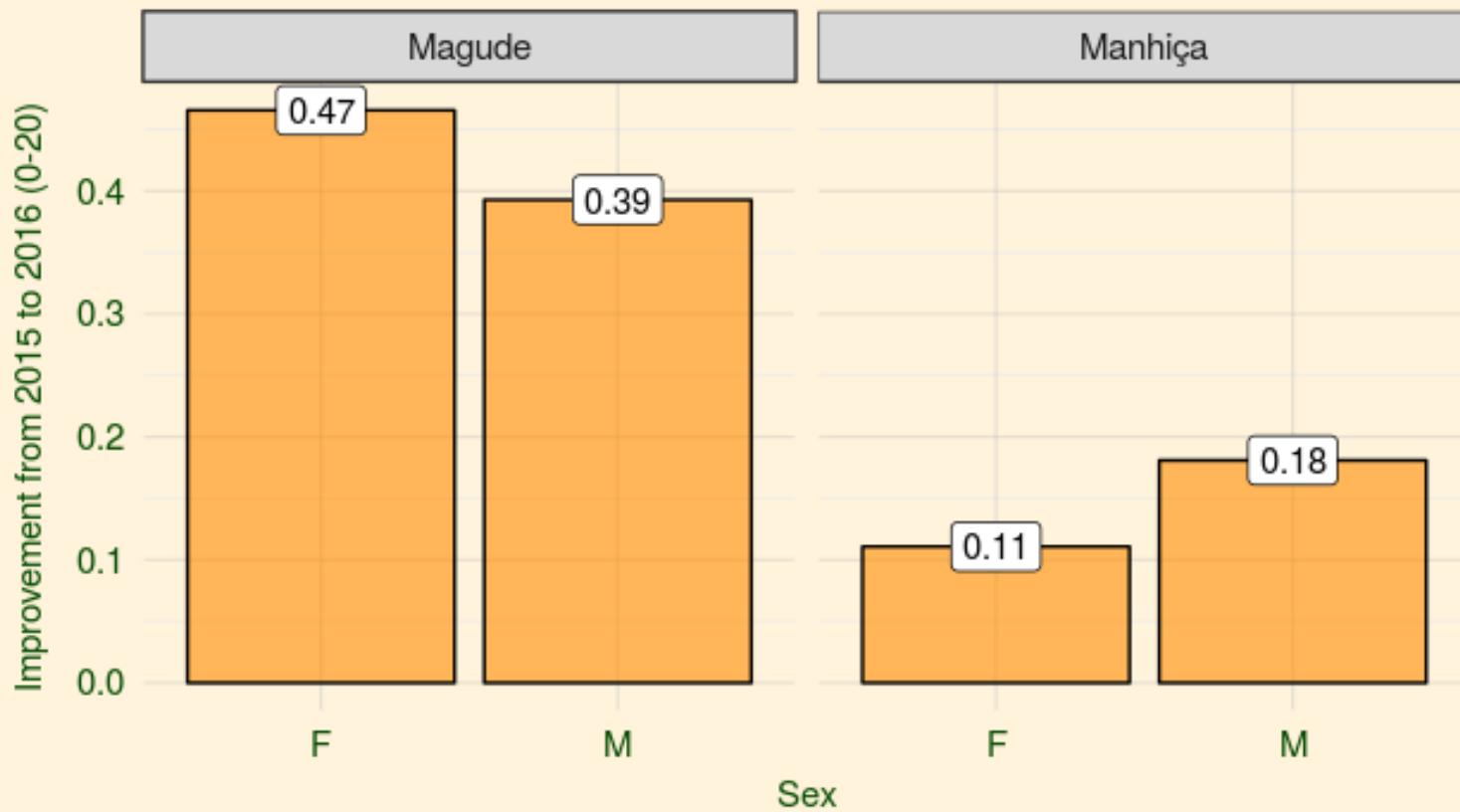
Everyone in Magude benefits, but some more than others



## Further research

### Non-equitable effect of malaria intervention

Everyone in Magude benefits, but some more than others



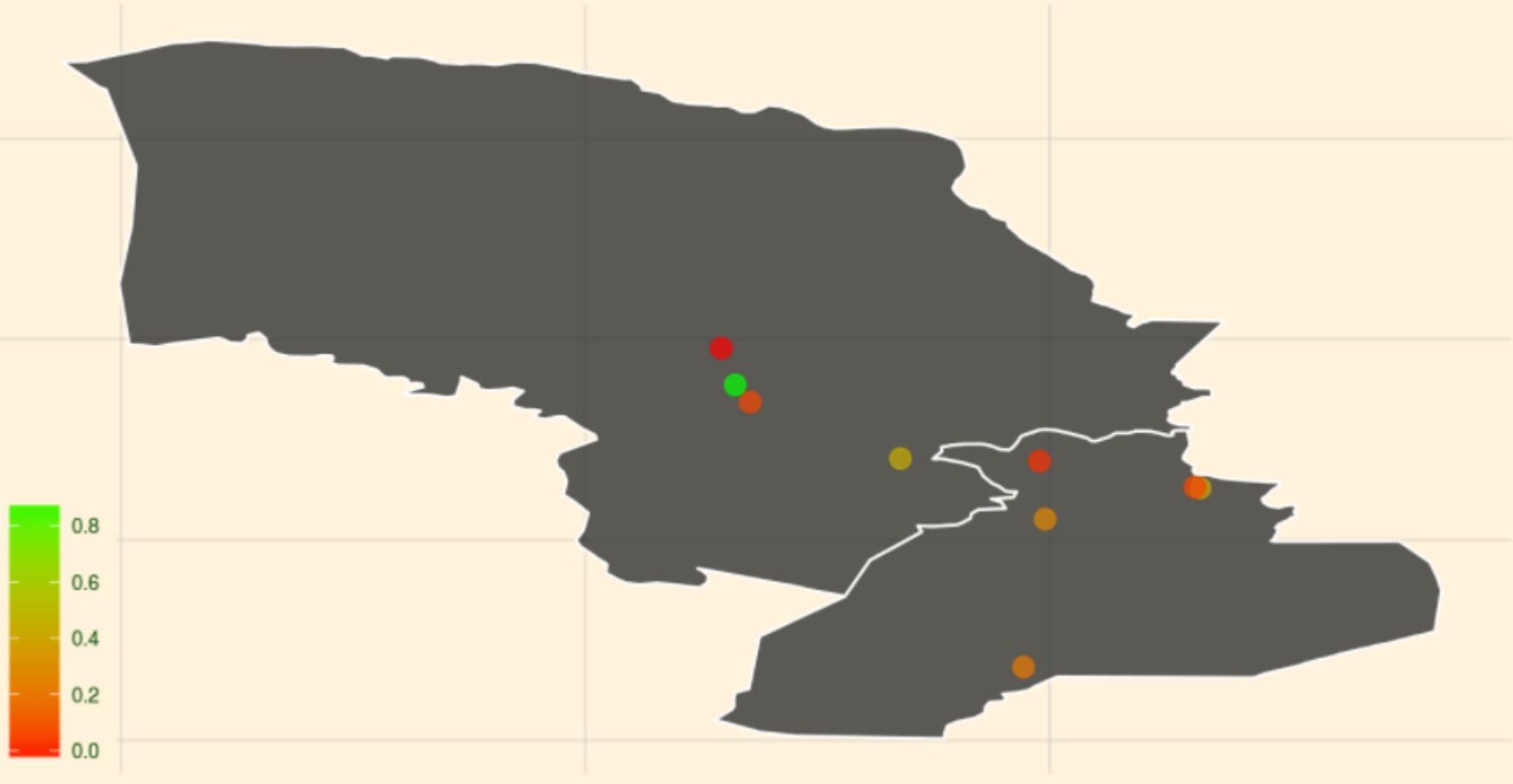


**Thank you!**

# Spillover / contamination?

## Improvement from 2015 to 2016

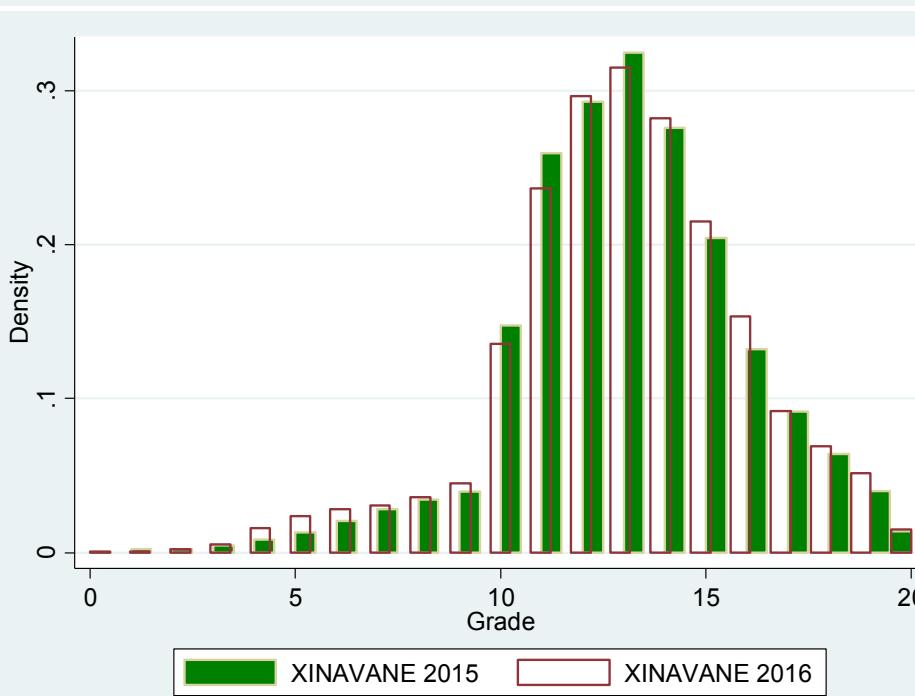
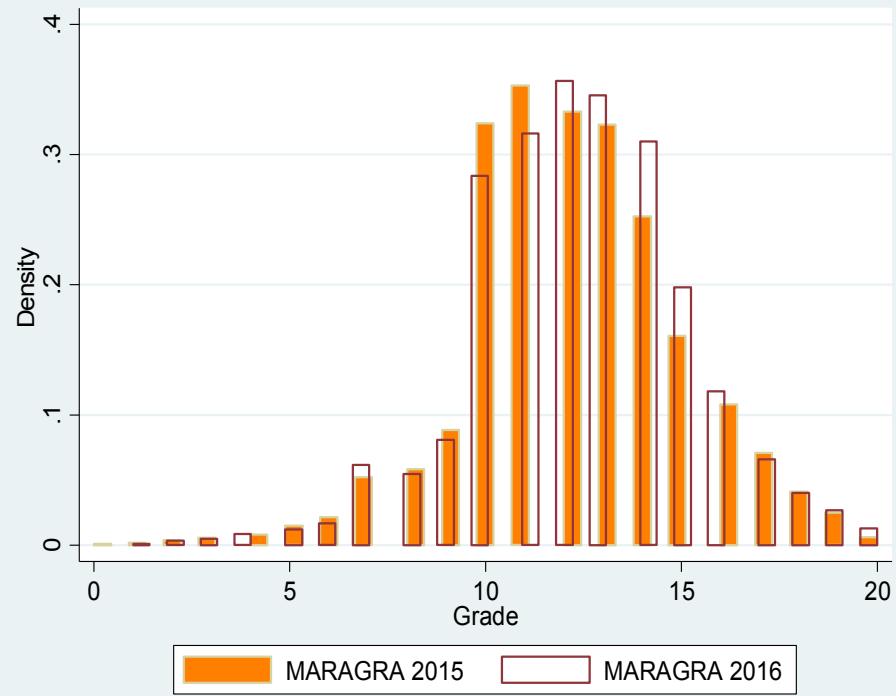
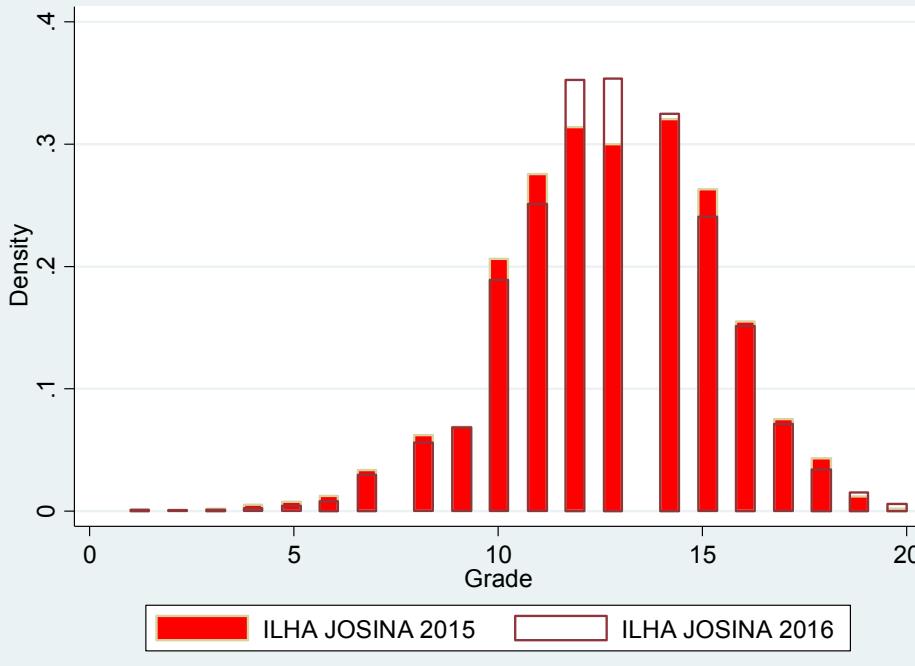
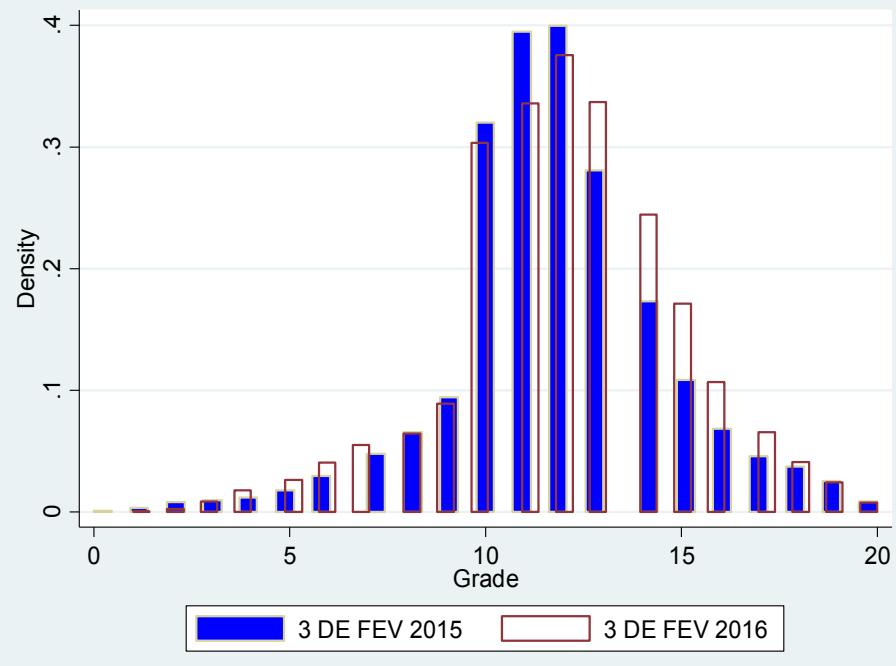
0: no improvement; > 0: improvement



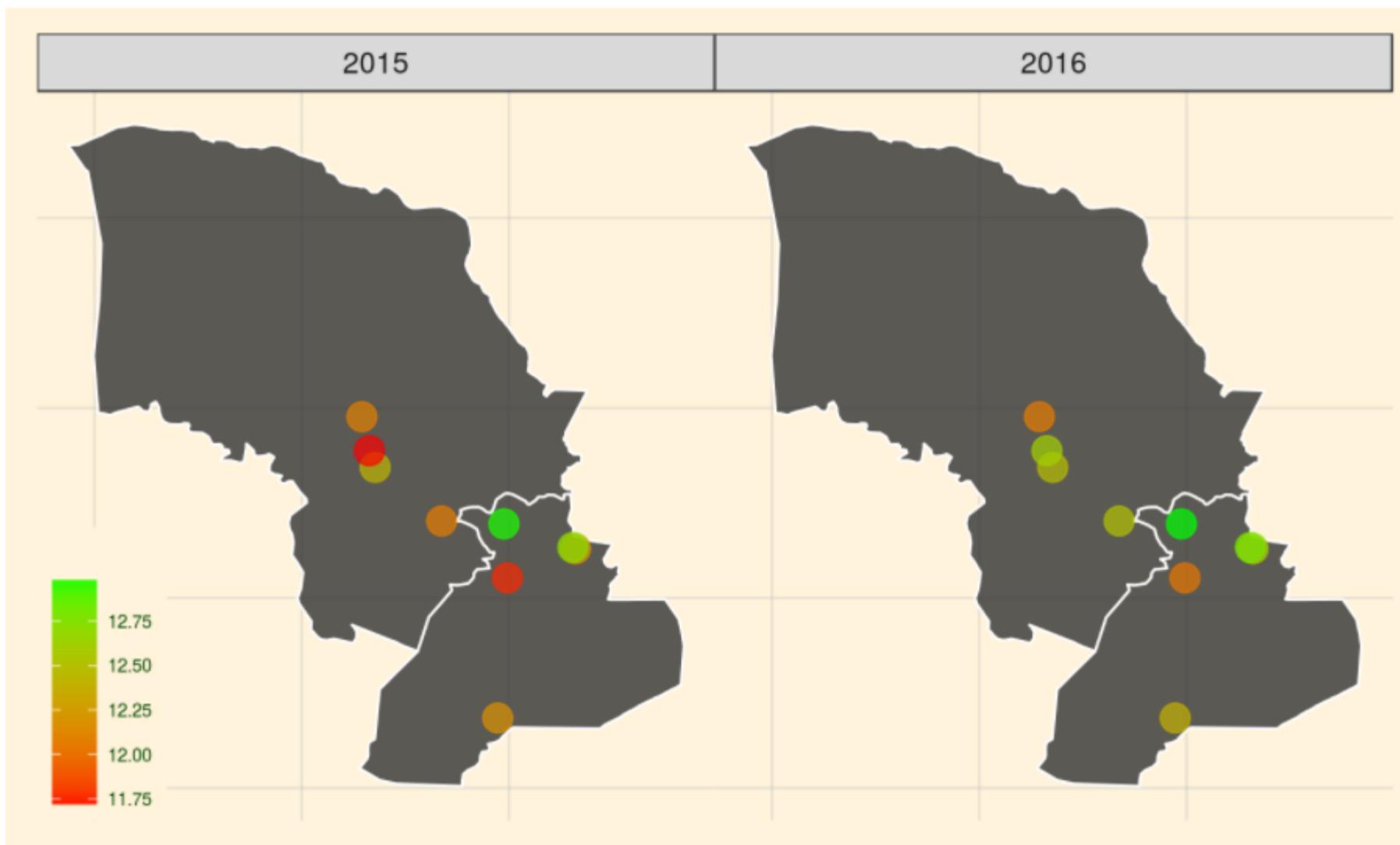
## — Event study, pass examination (Maths) —

intervention	0.087 (0.019)**
(-2) trimester 2, year 2015	-0.036 (0.009)**
(-1) trimester 3, year 2015	-0.042 (0.009)**
(0) trimester 1, year 2016	-0.015 (0.009)
(1) trimester 2, year 2016	-0.017 (0.009)
(2) trimester 3, year 2016	-0.027 (0.009)**
<b>(-2)*intervention</b>	<b>0.018 (0.018)**</b>
<b>(-1)*intervention</b>	<b>0.022 (0.018)**</b>
<b>(0)* intervention</b>	<b>0.073 (0.017)**</b>
<b>(1)*intervention</b>	<b>0.070 (0.017)**</b>
<b>(2)*intervention</b>	<b>0.053 (0.017)**</b>
R <sup>2</sup>	0.01
N	33,626

Regression controlling for  
costant term (coeff not  
shown)

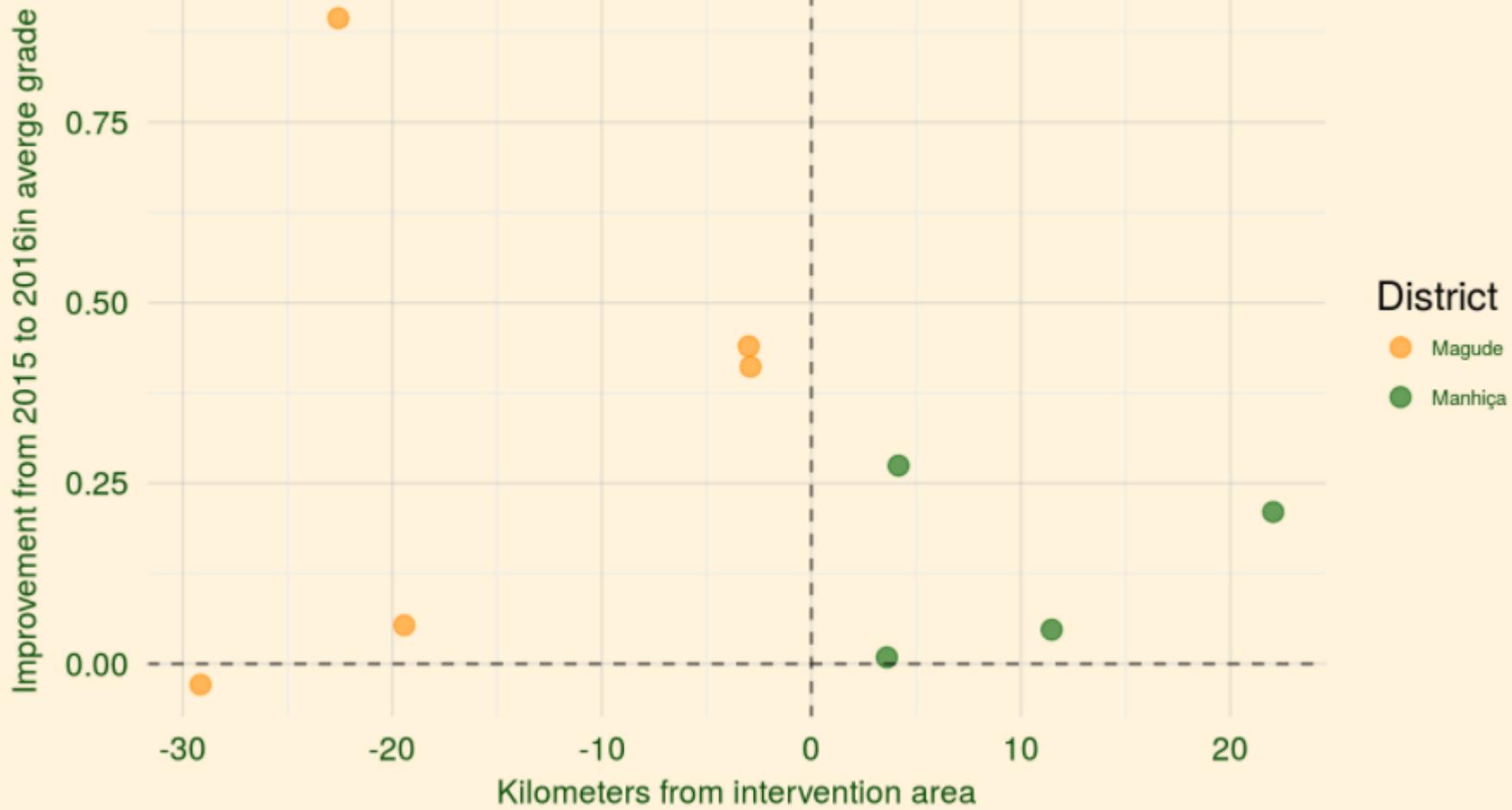


## Additional (support slides)



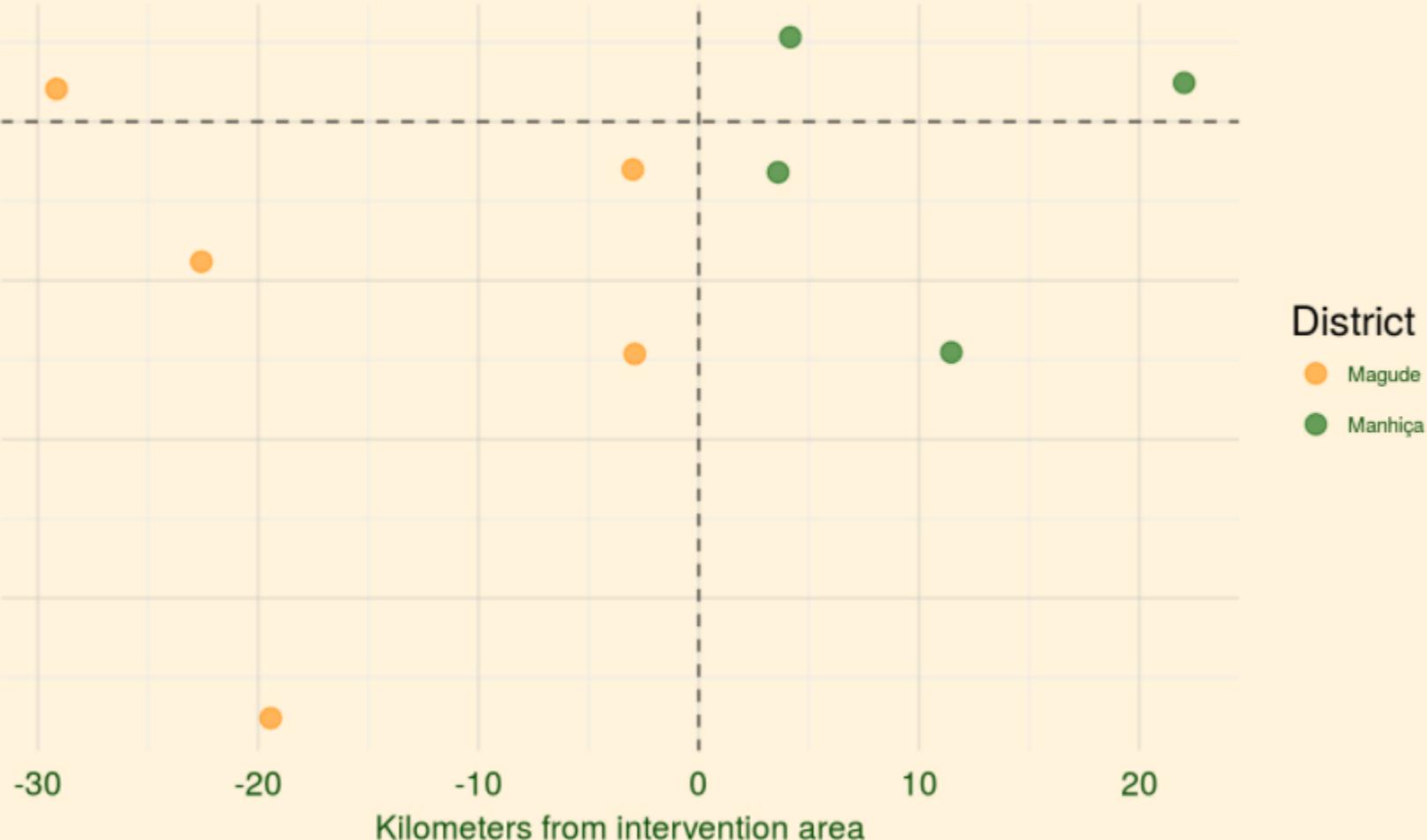
## Additional (support slides)

Spill-over / contamination?



### Spill-over / contamination?

Change from 2015 to 2016 in absenteeism



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## Additional (support slides)

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## Additional (support slides)

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## Additional (support slides)

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