

Inequalities in Burundi's Primary Schools: Evidence from test scores

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Beyond enrolment

- A lot of research on enrolment, grade attainment and drop-out in schools in Africa
- Much less on the question what children actually learn in the schools they are attending
- This question all the more relevant as enrolment numbers have increased strongly (a result of a.o. abolishment of fees) and children are confronted with class sizes of 60+ pupils

Case of Burundi

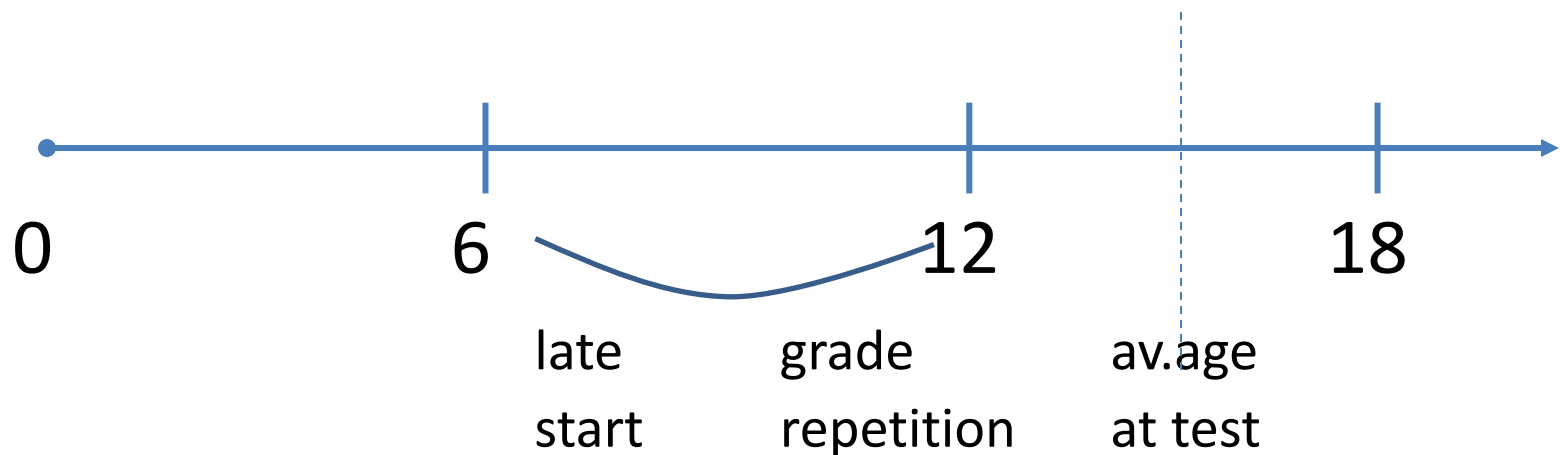
- Long-lasting civil war 1993-2005
- Deprived of contacts with the west
- Very slow recovery, hampered by poor governance
- A population desperate to get educated
- Competitive system in place to access secondary school via nationwide test after primary school

Case of Burundi (ii)

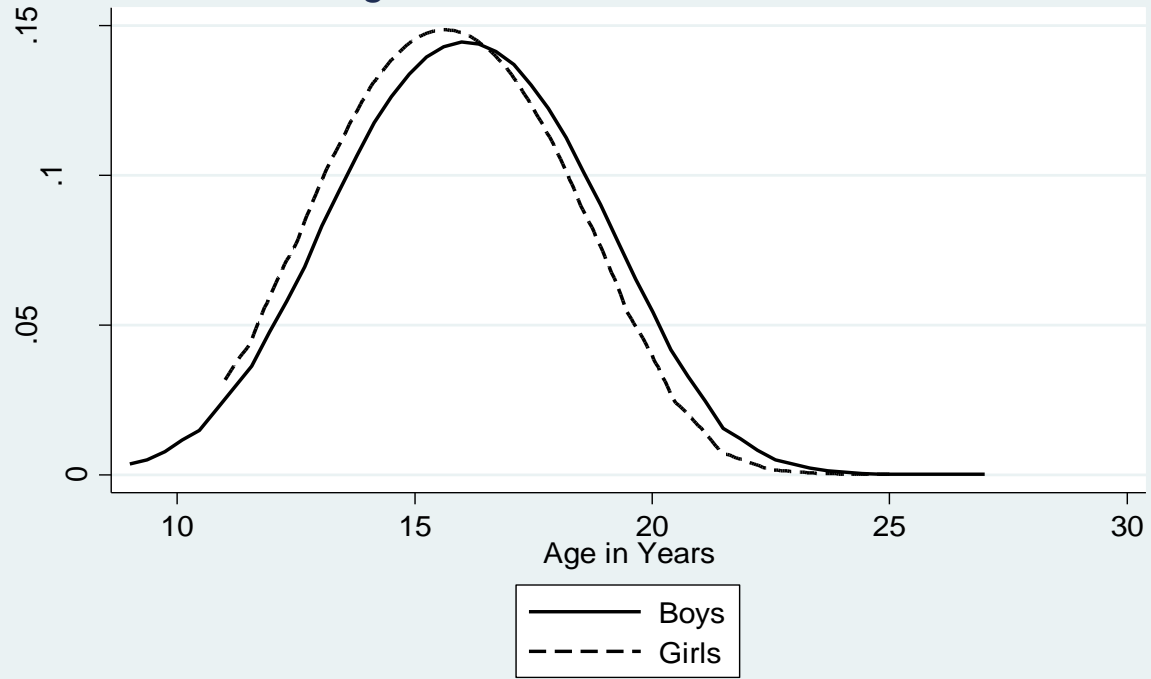
- No fees in primary school anymore since 2005, new president abolished them
- Massive increases in enrolment
- No measures to accompany this increase from the supply side in terms of teachers, class rooms or teaching material
- overcrowded classes

Burundi's education system

- Primary, secondary, higher (until 2013)
- Late start
- A lot of grade repetition
- Drop-out
- Average age at test 16

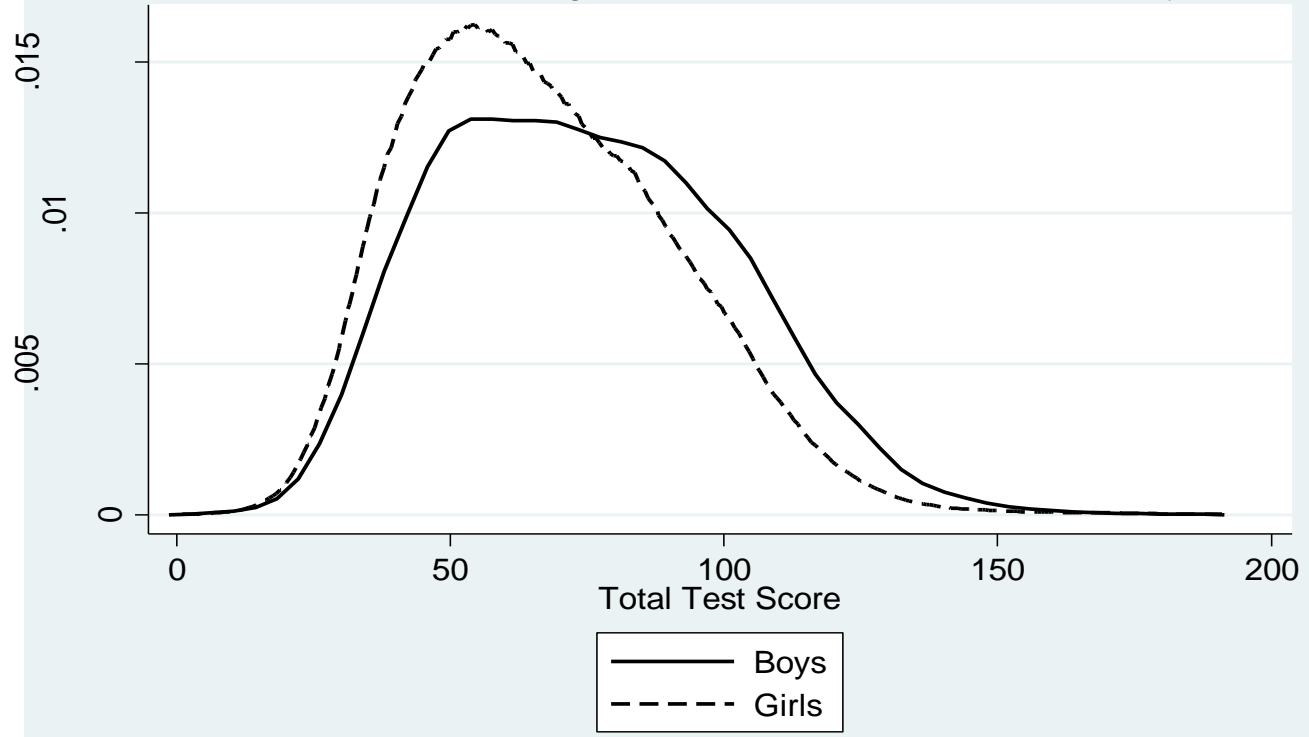


Age at the time of the 2010 Test



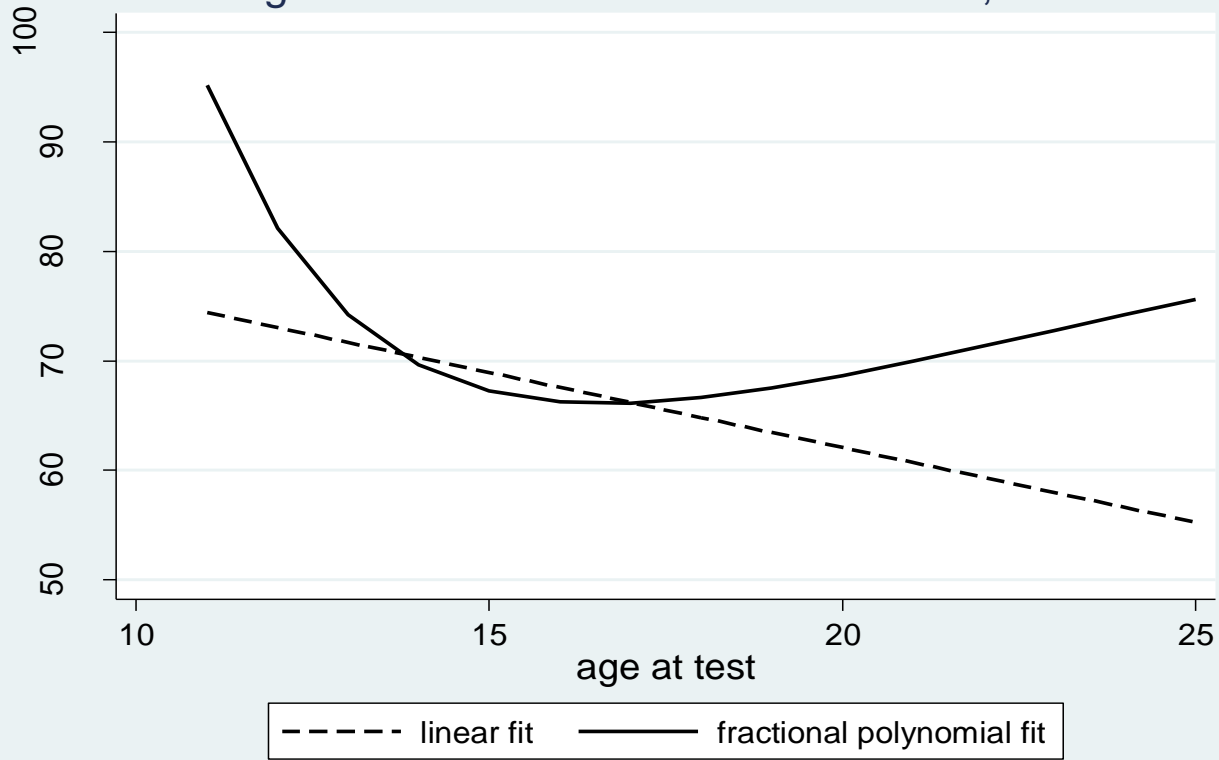
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Test Scores of Pupils taking the 2010 National Test after Primary School



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Age at time of the test and test scores, 2010



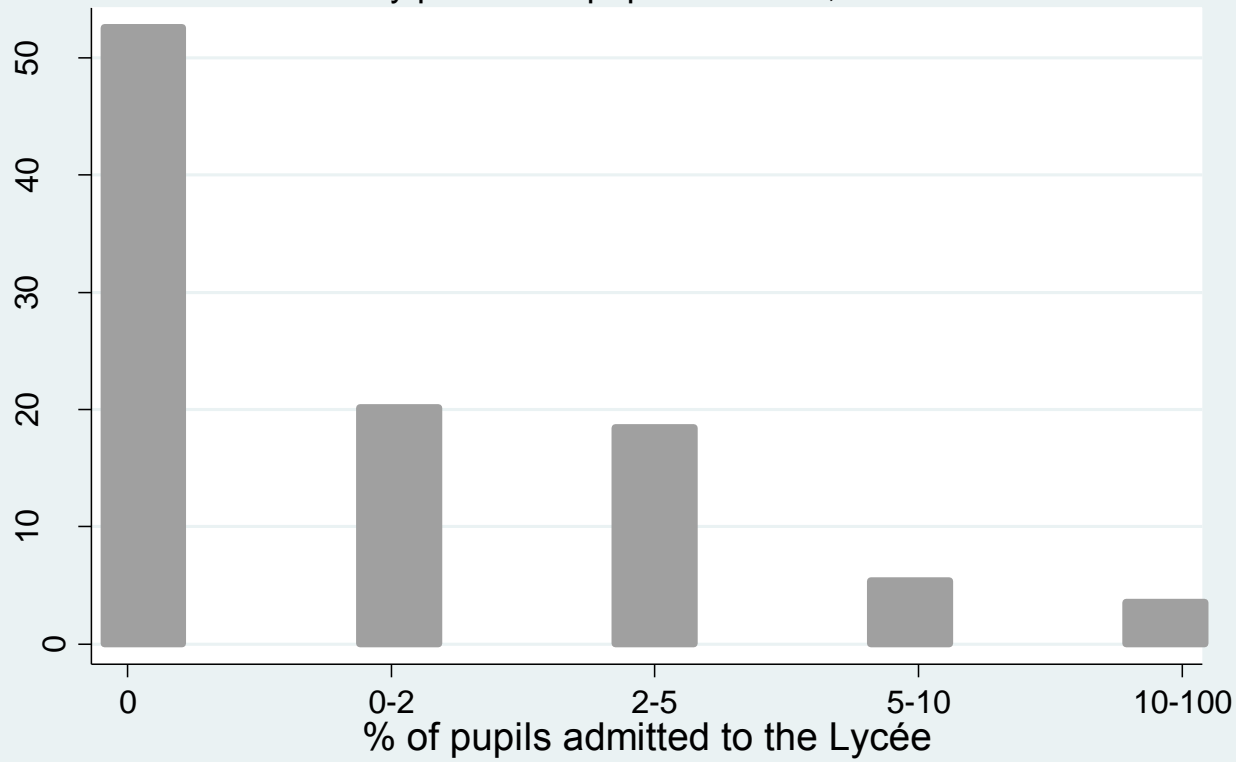
Age at time of the exam	Average score
11	93.7
12	86.7
13	72.0
14	69.2
15	67.6
16	66.3
17	66.1
18	66.9
18+	67.2

Ranking of pupils in the Concours National

- Nationwide test in June of each year for all who finished primary school and want to continue to secondary school
- Four subjects/topics
- On a total of 200 points, with the maths test on 70, French on 80, Kirundi on 20 and Environmental Science on 30
- Every year two thresholds are set to make sure that a certain number of available seats are filled in the two-tier secondary school system
- 200,000 pupils take part every year
- 3,500 seats in the top schools (Lycée), 35,000 more seats in the second tier schools (municipal colleges)
- First threshold in 2010: 128/200, 2% made it
- Second threshold in 2010: 81/200, 25% made in

Percent of Primary Schools with pupils admitted to Lycée

By percent of pupils admitted, 2010



Age and test scores, province level

Province	Average Age at exam	Average score
Bubanza	15.8	68.6
Bujumbura Rural	15.8	68.5
Bururi	15.4	72.0
Cankuzo	16.2	68.3
Cibitoke	15.7	61.5
Gitega	16.1	66.8
Karuzi	16.1	61.9
Kayanza	15.9	64.3
Kirundo	16.3	70.0
Makamba	15.6	74.5
Muramvya	16.5	64.8
Muyinga	15.8	69.8
Mwaro	16.4	66.9
Ngozi	16.0	68.3
Ruyigi	15.7	67.0
Rutana	16.1	65.9
Bujumbura Capital	14.5	71.2

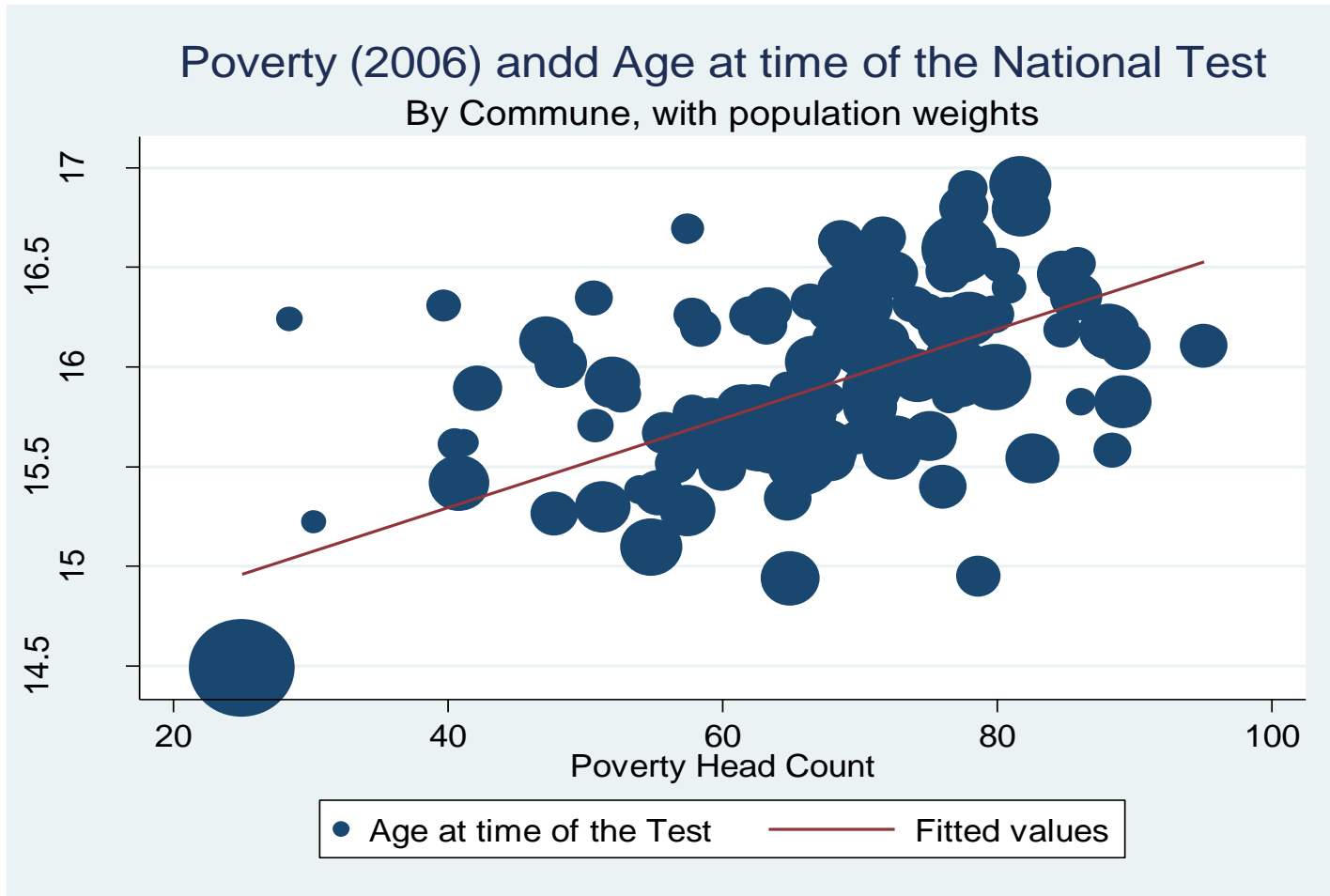
Allocation Correction Mechanism

Province of Residence	Participants in the nationwide exam		admitted to the Lycée in 2010 contest			New allocation Rule	Admitted under new rule	
	N	In % of total	N	In % of part in prov	In % of total admitted	seats as a % of total seats 3307	N	% change
BUJUMBURA Capital	11654	6,18	844	7,2	25,52	6,18	204	-75,82
MUYINGA	9395	4,98	220	2,3	6,65	4,98	165	-25
MAKAMBA	9886	5,24	195	2,0	5,89	5,24	173	-11,28
CANKUZO	4934	2,61	90	1,8	2,72	2,61	86	-4,44
GITEGA	19595	10,39	347	1,8	10,49	10,39	344	-0,86
RUTANA	8294	4,39	138	1,7	4,17	4,39	145	5,07
BURURI	10380	5,50	166	1,6	5,01	5,50	182	9,63
BUBANZA	7268	3,85	114	1,6	3,44	3,85	127	11,4
BUJUMBURA Rural	16246	8,61	248	1,5	7,49	8,61	285	14,91
RUYIGI	7791	4,13	106	1,4	3,20	4,13	136	28,3
NGOZI	10579	5,61	140	1,3	4,23	5,61	185	32,14
RUMONGE	7986	4,23	98	1,2	2,96	4,23	140	42,85
MWARO	9189	4,87	110	1,2	3,32	4,87	161	46,36
MURAMVYA	9915	5,25	115	1,2	3,47	5,25	174	51,3
CIBITOKÉ	10200	5,40	94	0,9	2,84	5,40	178	89,36
KARUSI	11116	5,89	102	0,9	3,08	5,89	195	91,17
KIRUNDO	9938	5,27	89	0,9	2,69	5,27	174	95,5
KAYANZA	14201	7,53	91	0,6	2,75	7,53	249	173,62

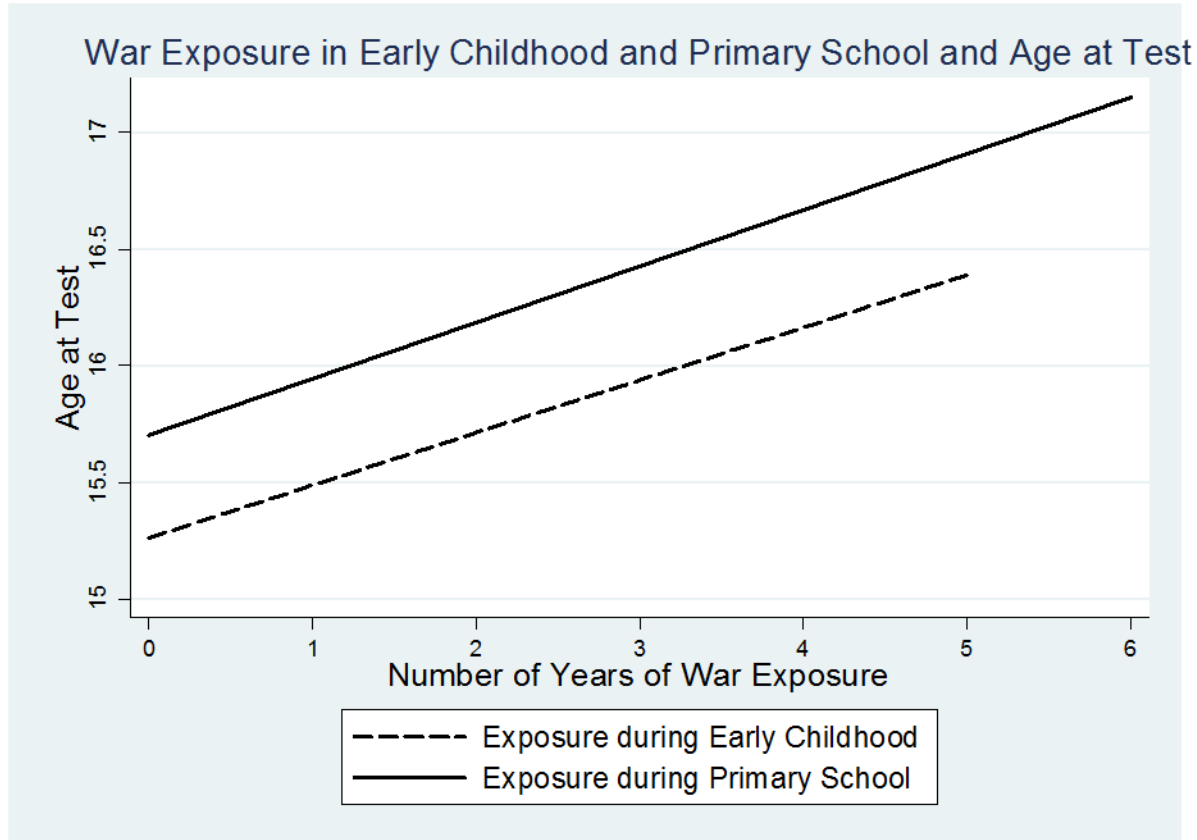
Mechanisms driving inequality

- Household wealth
 - Household socialisation
 - Commune level poverty
 - Civil war
- Early childhood deprivation

Commune Poverty

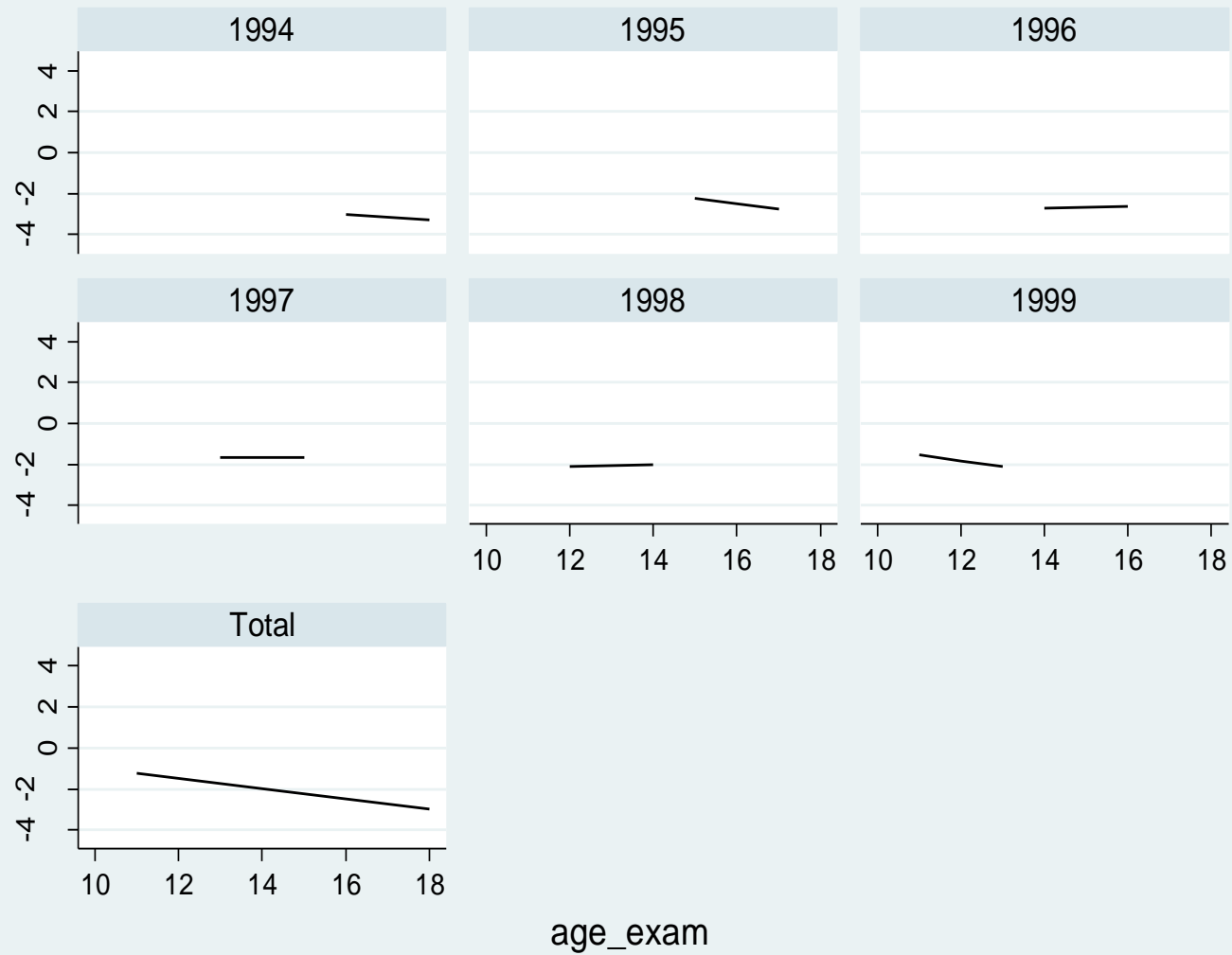


War exposure



Height-for-Age Z-score

- Height-for-age z-score regarded as long-term indicator of child health and well-being
- Undernutrition linked to impaired development of the brain
- Several recent studies using HAZ to predict outcomes in adult life
- Available in surveys in developing countries
- Not free of measurement issues
- I use the number of months exposed to civil war at the time of the survey as an instrument for HAZ



Graphs by year_birth_a

age_exam

School examination results in the 2010-2012 nationwide Concours National and Height-for-Age z-score in 2000, using probability matching of two datasets with at least 95% matching score, N=941 (497) and N=1768 (621)

<i>2SLS</i>	<i>First name missing included</i>		<i>First name missing excluded</i>	
	<i>Age at Exam OLS</i>	<i>Total Score IV</i>	<i>Total Score IV</i>	<i>Total Score IV</i>
Height-for-age z-score in 2000 (HAZ)		7.11***(1.21)	3.77** (1.74)	3.74**(1.7)
Haz_age_0	0.79***(0.14)			
Haz_age_1	0.38***(0.04)			
Haz_age_2	0.17***(0.05)			
Haz_age_3	-0.07** (0.03)			
Haz_age_4	-0.28***(0.03)			
Child is female	0.03 (0.05)	-5.94*** (0.99)	-1.40 (1.17)	-1.51 (1.15)
Mother educated				3.42**(1.50)
Constant	14.15***(0.07)	102.76***(4.09)	73.80***(2.73)	70.53***(3.01)
Year of Exam FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
<i>First stage (b°)</i>		<i>HAZ</i>	<i>HAZ</i>	<i>HAZ</i>
M_expo_age 0		-0.15** (0.07)	0.06 (0.08)	0.06 (0.08)
M_expo_age 1		-0.10*** (0.02)	-0.08**(0.03)	-0.08**(0.03)
M_expo_age 2		-0.07*** (0.03)	-0.11***(0.03)	-0.11***(0.03)
M_expo_age 3		-0.03** (0.02)	-0.02 (0.01)	-0.02 (0.01)
M_expo_age 4		-0.04*** (0.00)	-0.03** (0.01)	-0.03** (0.01)
Constant		0.27 (0.41)	-0.27 (0.61)	0.25 (0.50)
N. of matches		1768	621	621
N. of cases	941	941	497	497
Underidentification		97.69***	30.90***	30.90***
Weakidentification		20.40	6.25	6.24
Overidentification		2.3	2.57	2.85

Conclusion

- I showed that age at exam drives test scores in Burundi
- Older students do worse because their age is a proxy of a difficult primary school career
- The fact that the competition for seats in secondary schools is nationwide, creates inequality between good and poor schools
- In 2010, 50% of the primary schools did not have one pupil going to the Lycée
- The capital of Bujumbura, which represents 6% of the total number of pupils participation in the test in the country , gets 25% of the available seats in the Lycées
- I showed how the allocation rule can be altered to make it fairer
- I showed the drivers of inequality in test scores, among which poor health and nutrition in early childhood

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