

# REINTEGRATING REBELS INTO CIVILIAN LIFE: QUASI-EXPERIMENTAL EVIDENCE FROM BURUNDI



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# MOTIVATION

- Why we need reintegration programs:
  - Prevent crime, war-recurrence, grievance
- Why we need to evaluate them:
  - Improve their effectiveness
  - Assess impact relative to opportunity costs
- What we want to know:
  - Working as intended?
  - Distributional consequences?
  - Downstream effects?



# EVALUATION CHALLENGES

- Challenge: “emergency” programs.
- Attempts to study reintegration programs:
  - Descriptive studies of ex-combatants.
    - **Problem: no comparison group.**  
(Muggah; Pugel; Verwimp & Verpoorten; Uvin)
  - Comparing those who take up the program to those who don't.
    - **Problem: high take-up suggests major self-selection biases.**  
(Humphreys & Weinstein SL study)
- Short of random assignment, we need within-country **shocks to *program access***. This is what we use in Burundi.

# ARMED FORCES IN BURUNDI AT WAR'S END

Table 1: Estimated Sizes of Armed Forces as of January 2004

Name of Force	Estimated Size
Forces Armées Burundaises (national army)	45,000
CNDD-FDD I (Nkurunziza faction)	25,000
CNDD-FDD II (Ndayikengurukiye faction)	3,000
FNL-PALIPEHUTU I (Rwasa faction)*	3,000
CNDD (Nyangoma faction)	1,000
FNL-PALIPEHUTU II (Mugabarabona faction)	1,000
FROLINA (Kalumba faction)	1,000
PALIPEHUTU (Karatasi faction)	1,000
Total	80,000

*Source: World Bank (2004), p. 17.*

*\*Not a party to the peace process until September 2008.*

# BURUNDI REINTEGRATION

- MDRP-sponsored DDR program after 1993-2004 war.
- Caseload 23,000 in total, including 14,000 ex-rebels.
- Program benefits:
  - 18 months of reinsertion allowances (based on rank).
  - Counseling, including psychological counseling.
  - “Socio-economic reintegration package”:
    - Formal school
    - Vocational training
    - “Income generating activities”: 600,000 FBu in in-kind benefits to start business.

# STATUS OF COMBATANTS

## JUNE 2007

Table 2: Military Status of Surviving Civil War Combatants as of June 2007

Status	Number	Of which from rebel forces
In Forces de Defense Nationale (new national army)	28,390	approx. 9,000
In Police Nationale	approx. 20,000	approx. 8,000
Demobilized	23,185	approx. 14,000*
In FNL-PALIPEHUTU (active factions)	approx. 6,500**	approx. 6,500**
Totals	approx. 78,075	approx. 37,500



# SHOCK TO ACCESS

**Table 3: Program Access in Africare and Non-Africare Regions, Before and After NGO transition in Fall 2006 and as of the Time of Fieldwork in July 2007**

Region	Pre-transition cases completed by 12/06	Remaining caseload...	...% subject to disruption	Overall disruption rate
Africare provinces	1,982	2,257	100%	.53
Non-Africare provinces	3,213	5,925	0%	0

- Shock allows us to avoid self-selection problems.
- But, it occurred at a high level of aggregation.
- Need to remove incidental imbalances between Africare and non-Africare excoms & communities.



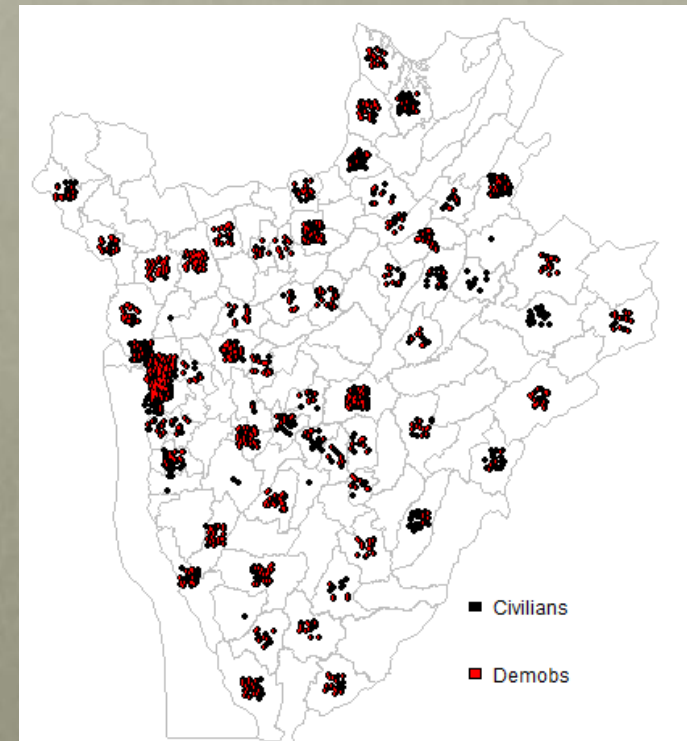
# STUDY DESIGN

Summer 2006:  
NGO contracts

Winter 2006/7:  
Programming starts in non-Africare regions

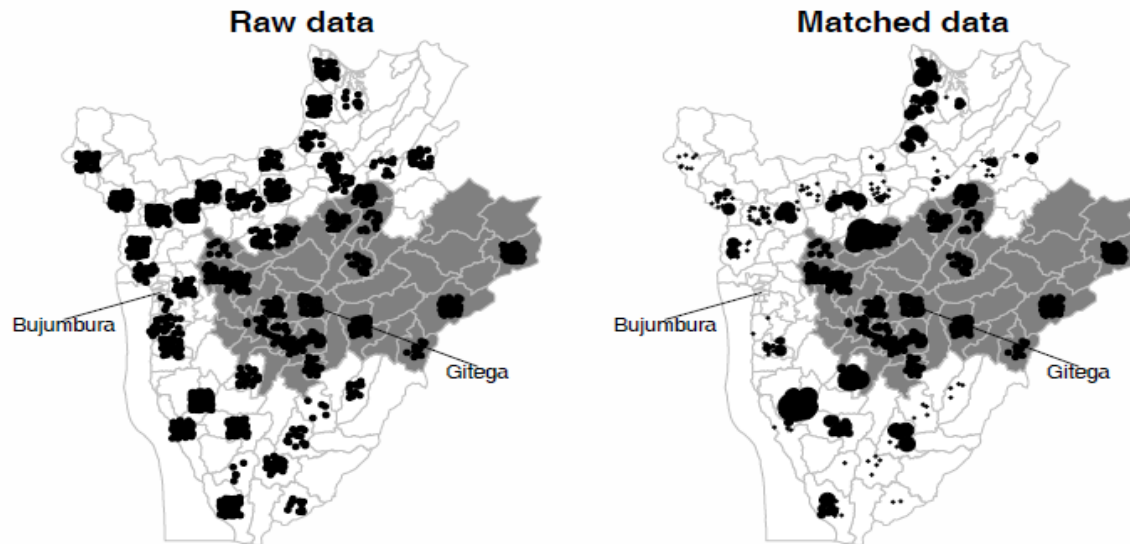
Summer 2007:  
survey

- Random sample of ex-rebels.
- Outcomes:
  - Income & occupation
  - Well-being & political attitudes
- Matched on 17 individual and community characteristics



# SUBJECT LOCATIONS IN RAW AND MATCHED DATA

Figure 1: Subject locations



# BALANCE STATISTICS

	Variable	Before matching					After matching					% Improvement	
		Means treated	Means control	Var. Ratio	t-test p-value	KS test p-value	Means treated	Means control	Var. Ratio	t-test p-value	KS test p-value	Mean Diff.	eQQ Mean
<b>Imputation 1</b>	Age	34.37	33.31	1.20	0.34	0.20	34.37	33.20	1.58	0.39	0.27	-10.39	-60.92
<b>Sample sizes:</b>	Hutu	0.95	0.96	1.08	0.89		0.95	0.96	1.23	0.77		-174.74	0.00
<i>Africare</i>	Father in agriculture, prewar	0.82	0.69	0.70	0.01		0.82	0.82	0.99	1.00		100.00	53.09
n=110	Prewar education	4.75	5.10	0.85	0.24	0.42	4.75	4.93	1.24	0.62	0.60	48.10	-37.45
<i>Non-Africare</i>	Prewar wealth	-0.05	0.10	1.18	0.03	0.00	-0.05	-0.02	1.07	0.80	0.81	84.37	62.11
Before matching	Non-comm. officer	0.72	0.66	0.91	0.26		0.72	0.72	0.99	1.00		100.00	76.55
n = 261	Comm. officer	0.11	0.18	0.65	0.05		0.11	0.14	0.82	0.60		63.55	17.91
After matching	Unit death rate	0.09	0.13	0.59	0.00	0.11	0.09	0.08	1.46	0.48	0.79	73.18	67.38
n = 67	Years in faction	9.60	10.71	0.62	0.00	0.00	9.60	9.88	1.81	0.46	0.07	74.50	20.56
	Family death rate	0.15	0.18	1.05	0.13	0.17	0.15	0.13	1.76	0.46	0.17	43.58	27.42
	Non-CNDD-FDD	0.09	0.22	0.48	0.00		0.09	0.09	0.99	1.00		100.00	64.82
	Demob. Date (std.)	-0.05	0.04	0.08	0.27	0.87	-0.05	-0.08	1.13	0.57	0.51	67.83	67.34
	War violence index	5.17	9.31	0.32	0.00	0.00	5.17	5.16	1.96	0.99	0.00	99.88	54.07
	Log(pop. density)	5.63	5.76	1.20	0.01	0.00	5.63	5.72	1.21	0.14	0.03	30.97	12.49
	Ruling party province	0.65	0.59	0.94	0.21		0.65	0.65	0.98	0.90		86.70	-2.61
	Propensity score	0.40	0.25	1.53	0.00	0.00	0.40	0.38	1.54	0.50	0.11	88.75	57.29

# RESULTS: INCOMES (OLS)

	No adjustment			Matching & regression			Matching, regression, & het. exposure adjustment		
	coef.	s.e.	<i>p</i> -val.	coef.	s.e.	<i>p</i> -val.	coef.	s.e.	<i>p</i> -val.
Africare	-0.67	0.33	0.04	-0.59	0.53	0.26	-1.12	1.00	0.26
Age				-0.06	0.04	0.14	-0.06	0.04	0.14
Hutu				3.31	2.10	0.12	3.31	2.10	0.12
Father in agriculture, prewar				-1.18	0.74	0.11	-1.18	0.74	0.11
Prewar education				0.17	0.13	0.22	0.17	0.13	0.22
Prewar wealth index				0.52	0.50	0.30	0.52	0.50	0.30
Non-comm. officer				-0.19	0.51	0.71	-0.19	0.51	0.71
Comm. officer				0.07	0.88	0.93	0.07	0.88	0.93
Unit death rate				6.30	3.40	0.07	6.30	3.40	0.07
Years in faction				0.09	0.17	0.62	0.09	0.17	0.62
Family death rate				1.84	1.25	0.14	1.84	1.25	0.14
Non-CNDD-FDD				0.60	1.07	0.58	0.60	1.07	0.58
Demob. Date (std.)				-0.83	0.63	0.19	-0.83	0.63	0.19
War violence index				0.16	0.09	0.09	0.16	0.09	0.09
Log(pop. density)				-0.14	0.68	0.84	-0.14	0.68	0.84
Ruling party province				-1.19	0.59	0.04	-1.19	0.59	0.04
Propensity score				8.67	5.34	0.11	8.67	5.34	0.11
Constant	9.37	0.20	0.00	4.15	6.61	0.53	4.15	6.61	0.53
N from imputed datasets	371, 371, 371, 371, 371			177, 177, 181, 178, 177			177, 177, 181, 178, 177		

# RESULTS: INCOMES

## QUANTILE REGRESSION

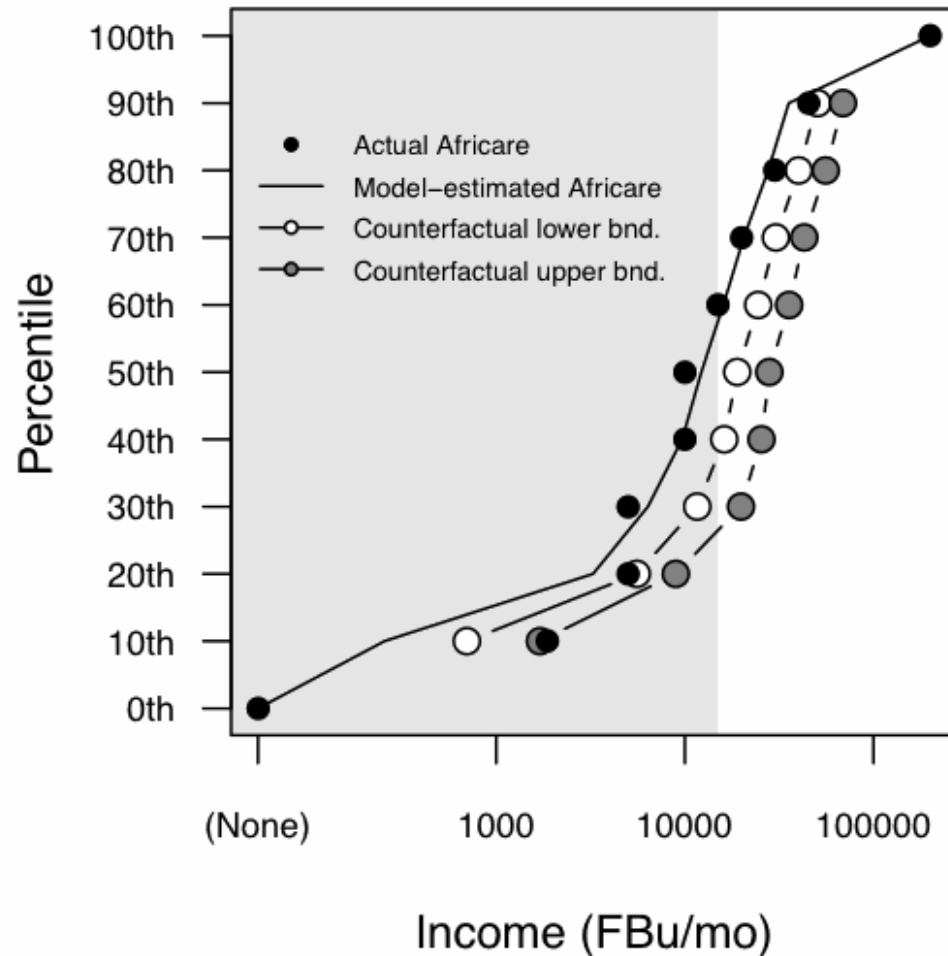
Table 6: Estimates from quantile regressions on  $\log(\text{income}/\text{month}+1)$

	No adjustment			Matching & regression			Matching, regression, & het. exposure adjustment		
	coef.	s.e.	p-val.	coef.	s.e.	p-val.	coef.	s.e.	p-val.
Decile 1	-0.92	2.89	0.75	-1.01	2.24	0.65	-1.90	4.22	0.65
Decile 2	-0.69	0.24	0.00	-0.54	0.98	0.59	-1.01	1.85	0.59
Decile 3	-0.69	0.16	0.00	-0.60	0.31	0.06	-1.14	0.58	0.06
Decile 4	-0.41	0.17	0.02	-0.51	0.28	0.07	-0.97	0.52	0.07
Decile 5	-0.64	0.17	0.00	-0.44	0.24	0.07	-0.83	0.45	0.07
Decile 6	-0.60	0.21	0.01	-0.43	0.18	0.02	-0.80	0.34	0.02
Decile 7	-0.41	0.14	0.00	-0.39	0.18	0.03	-0.74	0.33	0.03
Decile 8	-0.51	0.18	0.00	-0.37	0.22	0.11	-0.70	0.42	0.11
Decile 9	-0.25	0.17	0.14	-0.35	0.21	0.10	-0.66	0.40	0.10
N from imputed datasets	371,371,371,371,371			177,177,181,178,177			177,177,181,178,177		

*Standard errors computed using robust inverted rank test intervals. Regressions on matched data include the covariates in Table 5. The coefficients on these covariates are not displayed to save space.*

# RESULTS: INCOME

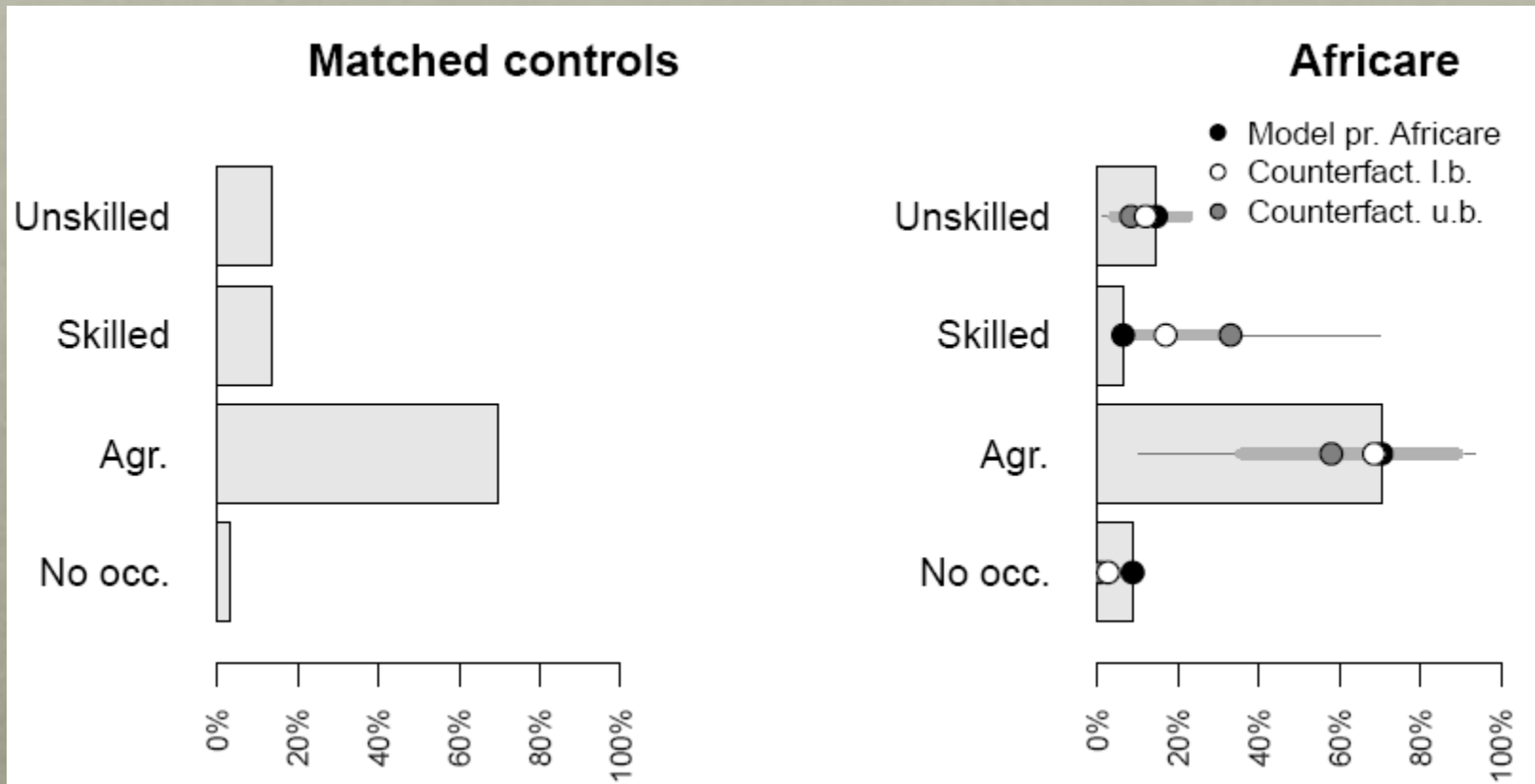
- 20-35% reduction in poverty incidence
- From logit estimates:(  
p-val .02).



# RESULTS: LIVELIHOODS (MULTINOMIAL LOGIT)

	No adjustment				Matching & regression				Matching, regression, & het. exposure adjustment			
Unordered outcomes (multinomial logit)	coef.	RRR	s.e.	<i>p</i> -val.	coef.	RRR	s.e.	<i>p</i> -val.	coef.	RRR	s.e.	<i>p</i> -val.
No occ. vs. agr.	-0.57	0.56	0.43	0.18	1.02	2.78	1.22	0.42	1.93	6.86	2.30	0.42
Skilled occ. vs. agr.	-1.00	0.37	0.46	0.03	-0.94	0.39	0.78	0.23	-1.78	0.17	1.46	0.23
Unskilled occ. vs. agr.	-0.33	0.72	0.47	0.48	-0.52	0.59	0.56	0.35	-0.99	0.37	1.06	0.35
Ordered outcomes (ordered logit)	coef.	OR	s.e.	<i>p</i> -val.	coef.	OR	s.e.	<i>p</i> -val.	coef.	OR	s.e.	<i>p</i> -val.
1=no job, 2=agriculture or unskilled, 3=skilled	-0.23	0.80	0.20	0.25	-0.77	0.46	0.50	0.13	-1.46	0.23	0.95	0.13
N from imputed datasets	371, 371, 371, 371, 371				177, 177, 177, 181, 178, 177				177, 177, 177, 181, 178, 177			

# RESULTS: LIVELIHOODS



- Likelihood of being in the skilled sector 63% lower for Africare beneficiaries (p-val .03)



# RESULTS: POLITICAL ATTITUDES

Table 8: Estimates from logistic regressions on political attitudes outcomes

Outcome	No adjustment				Matching & regression				Matching, regression, & het. exposure adjustment			
	coef.	OR	s.e.	p-val.	coef.	OR	s.e.	p-val.	coef.	OR	s.e.	p-val.
i. "Life better as civilian than combatant"	-0.06	0.94	0.29	0.83	-0.72	0.49	0.51	0.17	-1.36	0.26	0.96	0.17
ii. "Very satisfied with peace accords"	0.05	1.05	0.23	0.83	-0.02	0.99	0.39	0.97	-0.03	0.97	0.74	0.97
iii. "Government should have more time to solve problems"	0.19	1.21	0.35	0.60	0.74	2.11	0.68	0.29	1.41	4.08	1.29	0.29
N from imputed datasets	371, 371, 371, 371, 371				177, 177, 181, 178, 177				177, 177, 181, 178, 177			

# RESULTS: POLITICAL REINTEGRATION ATTITUDES

- Maximum effect: 18 -34 percentage point difference in likelihood of saying that “life is better as a civilian than combatant” (p-val .17).
- Zero difference in “satisfaction with peace accords”.
- Coefficient on “we should be patient with the government as it tries to solve problems” is the wrong sign (and not significant).

# DISCUSSION

- Pros of this study: no self-selection biases.
- Introduces a way to evaluate programs ex post—there must be a lot more administrative snafus out there!
- Results differ from Humphreys & Weinstein
  - They estimate *all* effects to be essentially zero.
  - But their findings consistent with self-selection bias.
  - Our evidence is less pessimistic.
- Cons of this study:
  - Still far from proper random assignment.
  - Could only estimate short-run effects.
  - Low power (especially after matching).
  - Self-reports are noisy.

# DISCUSSION

- Let's address these weaknesses!
  - Prospective evaluation.
  - Behavioral measurement.
  - More refined hypotheses.

