Economics 172
Issues in African Economic Development

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Issues in African Economic Development

Lecture 6 – February 1, 2007

Health and wealth: cause or effect?

- How can we determine whether poor health is the cause of poverty (as Bloom and Sachs assert) or vice versa?
- This is a difficult problem

- More generally how to interpret $Corr(A, B) > 0$?

1. "A causes B": $A \rightarrow B$
2. "B causes A": $B \rightarrow A$
3. $A \rightarrow B$ and $B \rightarrow A$ simultaneously
4. Some other factor C causes both: $C \rightarrow A$ and $C \rightarrow B$
5. The association is purely coincidental (but regression confidence intervals help address this)

Another approach: analysis with “micro-data”

- Both Bloom and Sachs (1998) and AJR (2001) focus on broad country-level historical trends
- But establishing causality and theoretical channels is exceedingly difficult in that setting

- Another approach uses data at the level of individuals, communities, or firms to test theories about the link between health and wealth
- Problem Set #1 features some analysis of this kind

Miguel (2005) / Miguel and Kremer (2004)

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- Education is a possible channel linking health, income

Poor health Lower income

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Education

Poor health   Lower income

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- Worms are among the world's most prevalent diseases:

Parasite	# infections globally
Hookworm	1.3 billion
Roundworm	1.3 billion
Whipworm	900 million
Schistosomiasis	200 million

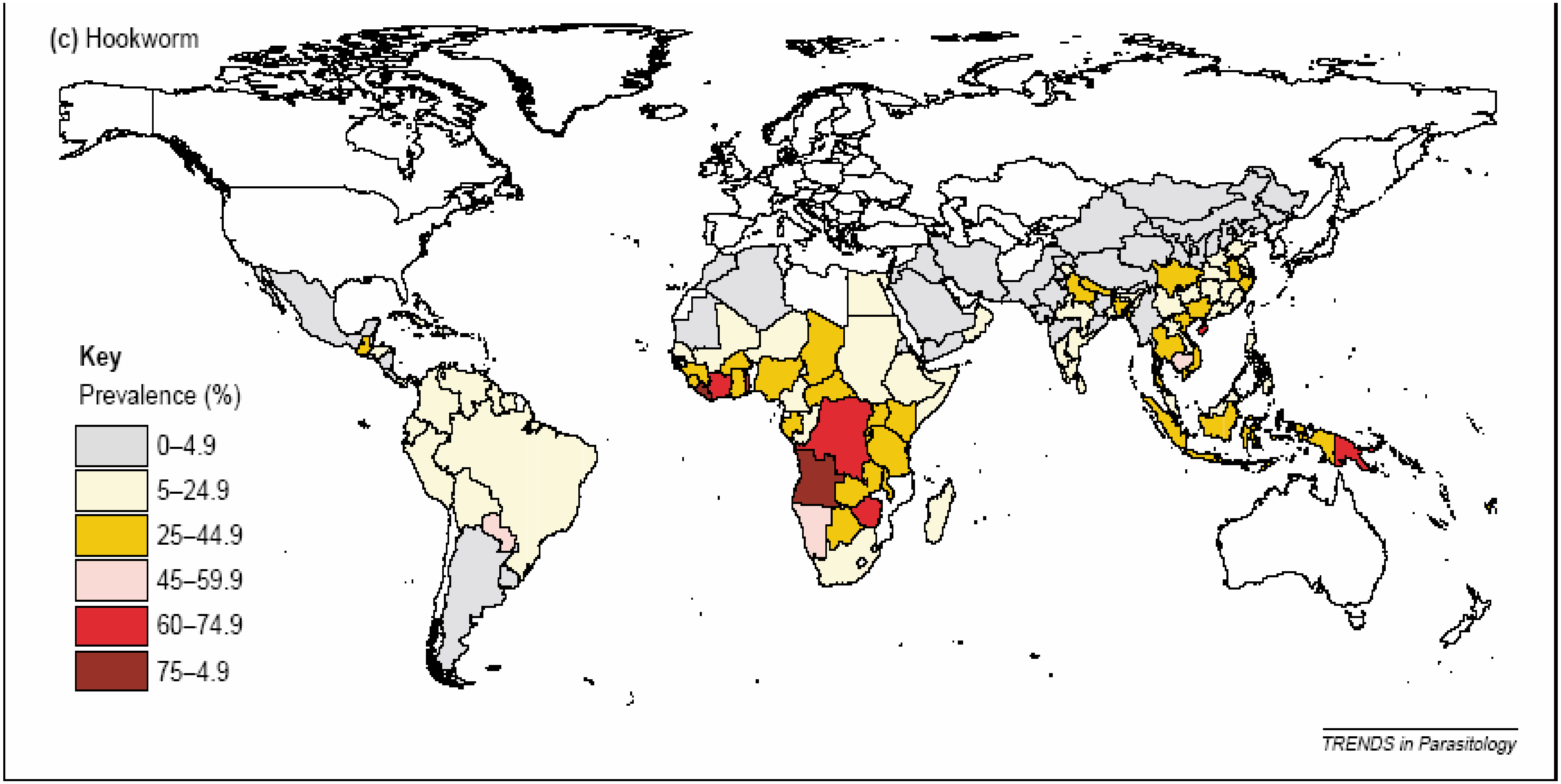

Figure 1. The global distribution of (a) *Ascaris lumbricoides*, (b) *Trichuris trichiura* and (c) hookworm. White areas represent countries not included in the present analysis. Data obtained from http://www.fic.nih.gov/dcpp/dcp2.html

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- Health and nutritional consequences – anemia, weakness, listlessness, stunting, wasting, stomach pain – especially for heavy infections

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- Transmission of worm infections through poor hygiene, sanitation. Eliminating one person’s infection may reduce transmission to others: “externalities” / spillovers
- Treatment is cheap (<US$1 per year)
  - Drugs: albendazole, praziquantel

Health and education: cause or effect?

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W: indicator variable (=0 or 1) for having worms

X: child characteristic (e.g., home socioeconomic status)

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e: white noise "error/disturbance" term, $E(e) = 0$
i: denotes person "i" in the population, i from 1, …, N

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Expectations ("average") of the outcome for different cases:

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  "Experimental" variation in variables of interest

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  "Experimental" variation in variables of interest

- If treatment with deworming drugs is assigned "randomly", and reduces worm infection, then the reduction in worms should be uncorrelated with X

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- Randomized evaluation design: Three steps
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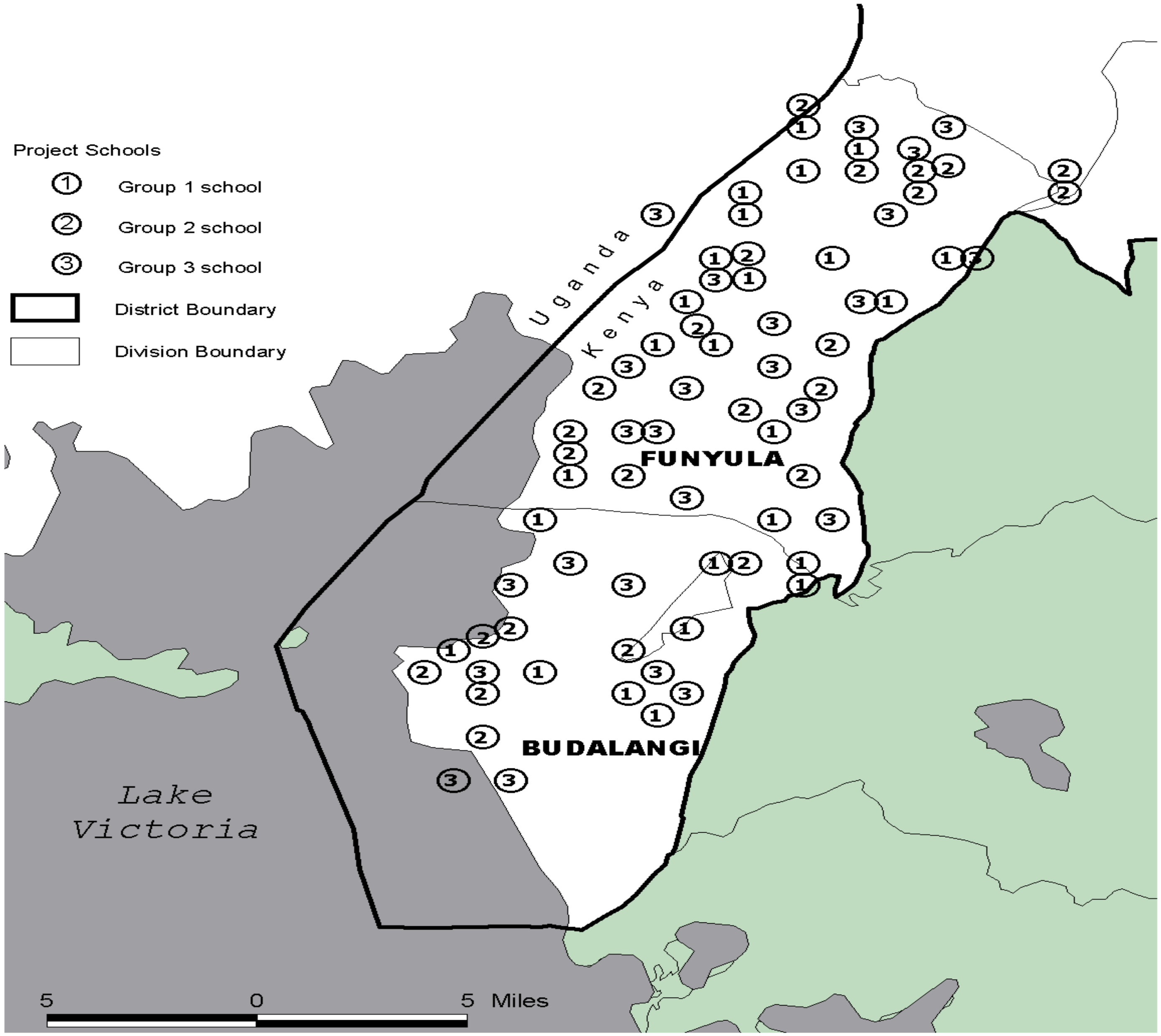
	1998	1999
Group 1 (25 schools)	Treatment	Treatment
Group 2 (25 schools)	Comparison	Treatment
Group 3 (25 schools)	Comparison	Comparison


Project Schools
Group 1 school
Group 2 school
Group 3 school
District Boundary
Division Boundary
Uganda
Kenya
FUNYULA
BUDALANGI
Lake Victoria
5
0
5 Miles

PSDP Baseline differences (1998)

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	Average Group 1 (N=25)	Average Group 2 (N=25)	Average Group 3 (N=25)
Latrine at home	0.82	0.81	0.82
Livestock at home	0.66	0.67	0.66
Child sick often (self-reported)	0.10	0.10	0.08
1996 exam score (normalized mean 0, s.d. 1)	-0.10	0.09	0.01

Program impacts

- Three types of analysis:

  (1) Direct treatment effects: simple difference between treatment and comparison schools

  (2) Within-school externality impacts

  (3) Cross-school externality impacts

Health, nutrition impacts (1999)

	Group 1	Group 2	G1–G2
Rate of moderate-heavy infection	0.27	0.52	-0.25*
Sick in past week	0.41	0.45	-0.04*
Height for age (Z-score)	-1.13	-1.22	0.09*
Hemoglobin (Hb)	124.8	123.2	1.6

Within-school infection externalities (1999)

	Group 1 (Treated)	Group 1 (Untreated)	Group 2
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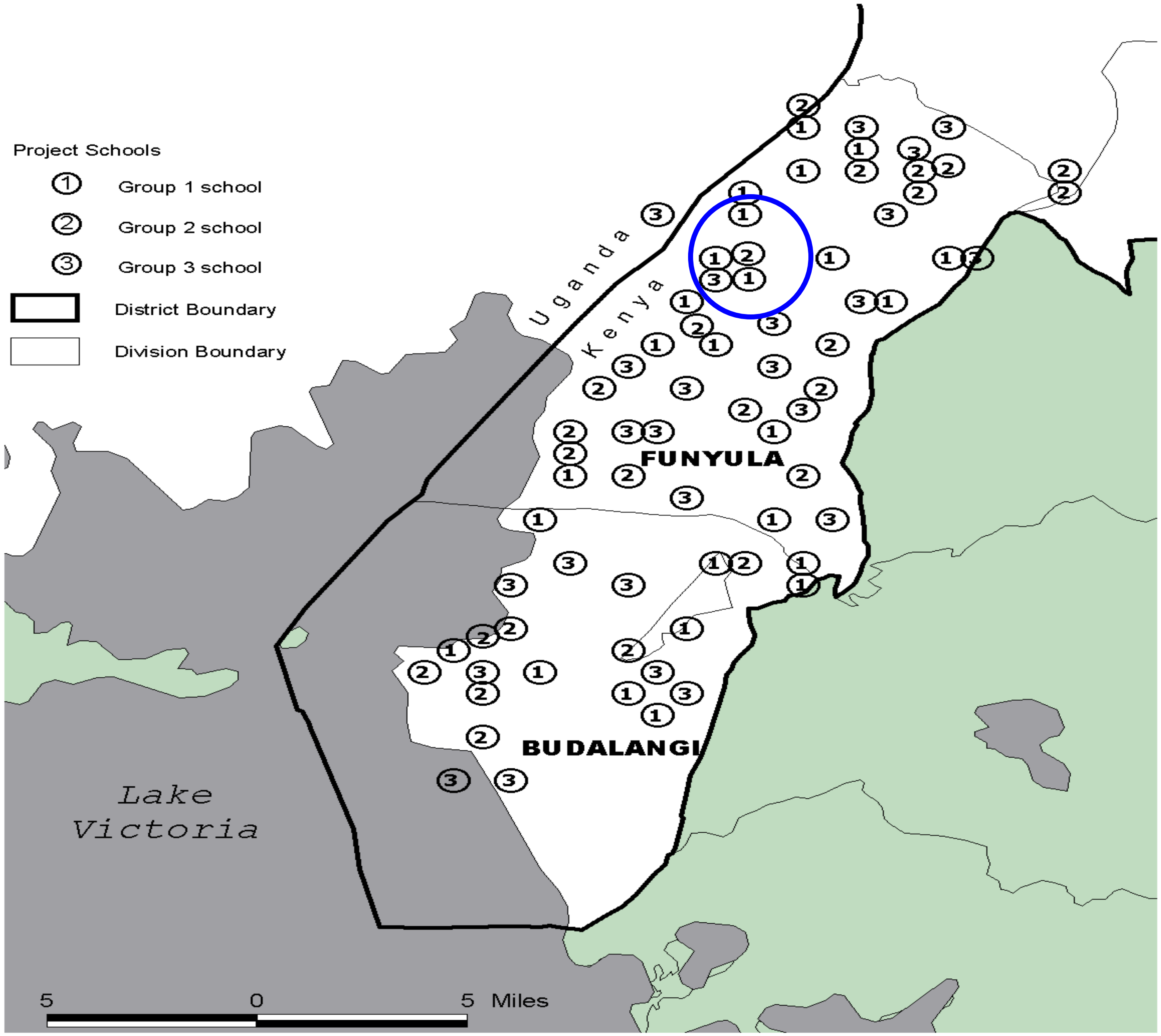
Cross-school infection externalities (1999)

- Large reductions in moderate-heavy infection levels within 6 km of treatment schools in 1999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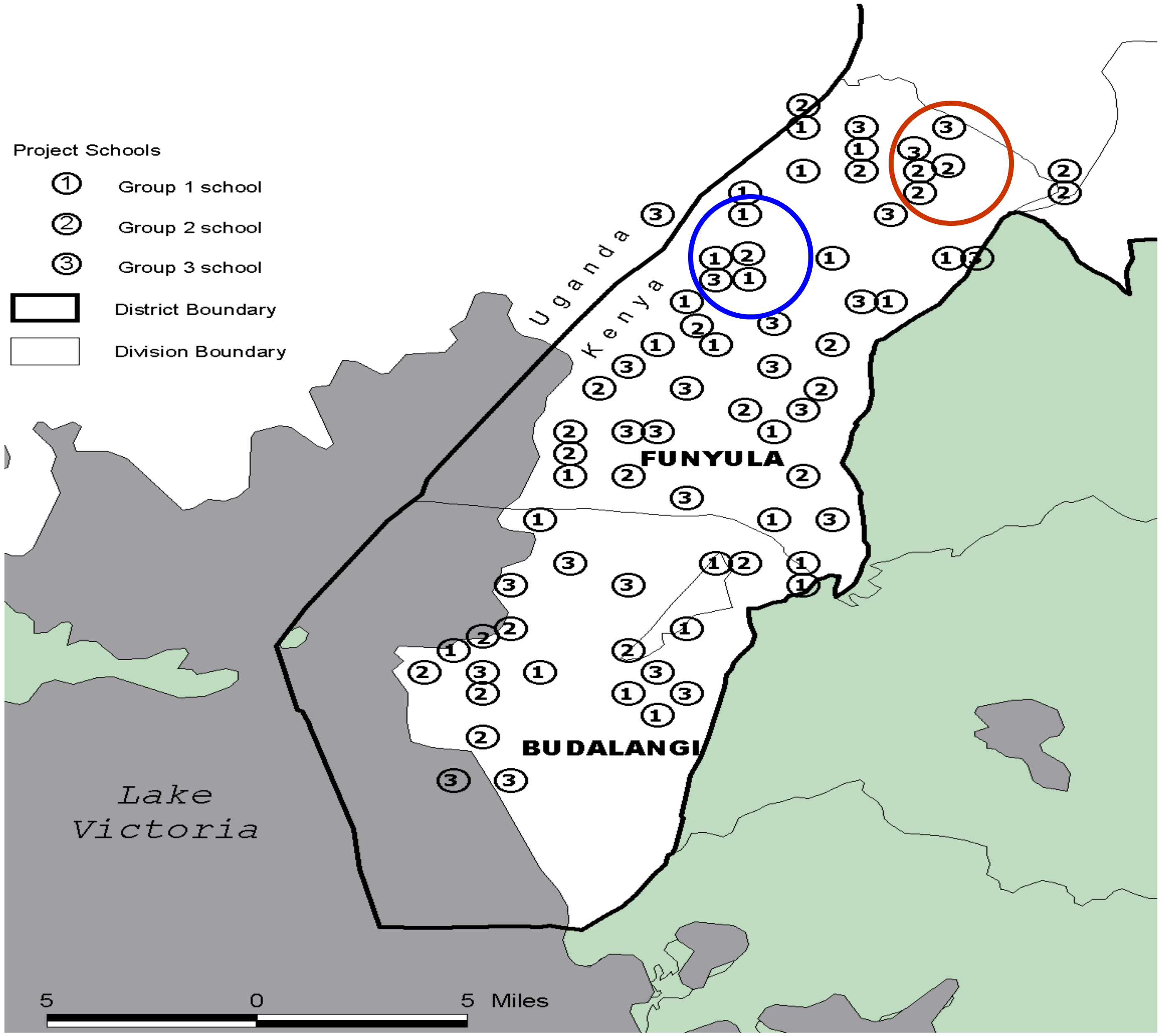
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<u>Cross</u>-school infection externalities (1999)

- Large reductions in moderate-heavy infection levels within 6 km of treatment schools in 1999

- An average reduction in moderate-heavy infections of 23 percentage points in the study area can be attributed to cross-school externalities

Educational impacts – school participation

- “School participation” data collected by enumerators during unannounced primary school visits

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	Group 1 (T)	Group 2 (C)	Group 3 (C)
Younger girls, and all boys	0.84	0.73	0.77
Older girls (≥ 13 years)	0.86	0.80	0.81
Pre-school, Grades 1-2	0.80	0.69	0.70
Grades 6-8	0.93	0.86	0.89

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  - Congestion effects in the classroom
  - Time lags

Cost-benefit calculations

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- Previous study: each year of school → 7% higher wages
- Take these gains in wages (7% x 7%) over 40 years in the workforce, discounted 5% per year

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→ Deworming benefits are at least three times (3x) as large as treatment costs (using the Tanzania costs)

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  (2) Socio-cultural explanations / resistance to new technologies (evidence from anthropology)

The Impact of Higher Drug Costs

- In 1998, 1999, 2000 deworming was given for free
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- 2001 deworming take-up:

  Free-treatment schools: 75%

  Cost-sharing schools: 18%

- For next time: Read Miguel (2005)

Whiteboard #1

Whiteboard #2

Whiteboard #3

Whiteboard #4

Whiteboard #5

Map of Africa

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