Malaria and disease-driven migration: empirical evidence from Malawi, Tanzania and Uganda

Luis Becerra Valbuena[1] Katti Millock[2]

[1]Paris School of Economics & Université Paris 1

[2]Paris School of Economics & CNRS

Migration, Environment and Climate

23rd October, 2018

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Households can adapt on the

intensive margin:
bednets, insecticides, repellents, preventive medical treatment
extensive margin:
migration from affected areas
(Mesnard and Seabright, 2009, 2016)

Research objective

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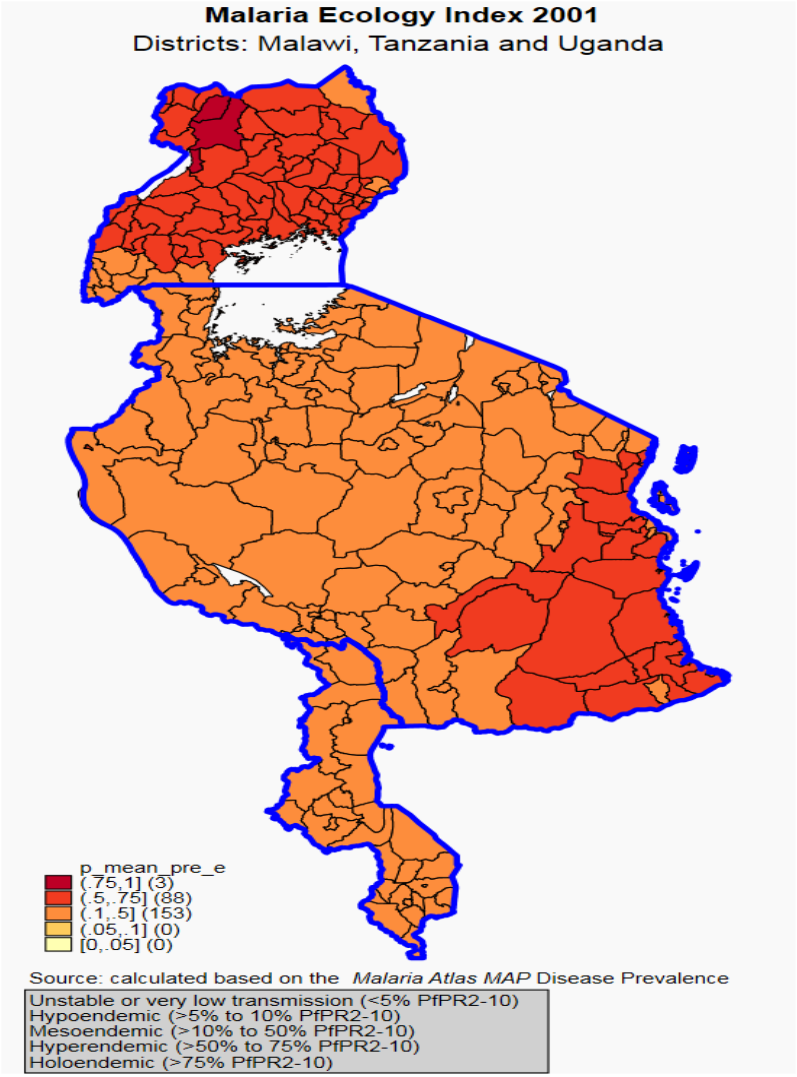
Empirical analysis requires

- migration panel data
- spatial and temporal variation in disease prevalence...
- ...and no other major determinant of displacement (conflict)
- measures of income and other migration determinants

Variation in the Malaria Ecology Index



The challenge of finding good long run data

Migration: LSMS panel data

Disease prevalence:
Malaria Atlas Project (MAP), GIDEON, malaria ecology index

Vulnerability: sickle cell trait data

Income: night-lights data (available from 2000)

Other migration determinants:
distance and road access

Data: Migrants by survey and country

	Total	%	Total	%	Total	%
UGANDA	**2010-2011**		**2011-2012**		**2013-2014**	
No Migrants	12,889	67.2%	15,269	71.1%	11,365	64.9%
Internal Migrants	2,352	12.3%	2,504	11.7%	2,595	14.8%
International Migrants	99	0.5%	83	0.4%	78	0.4%
Inside District Migrants	3,847	20.1%	3,631	16.9%	3,472	19.8%
Total	**19,187**	**100.0%**	**21,487**	**100.0%**	**17,510**	**100.0%**
TANZANIA	**2010-2011**		**2012-2013**			
No Migrants	15,241	74.1%	16,710	65.8%		
Internal Migrants	3,831	18.6%	4,842	19.1%		
International Migrants	-	0.0%	51	0.2%		
Inside District Migrants	1,490	7.2%	3,809	15.0%		
Total	**20,562**	**100.0%**	**25,412**	**100.0%**		
MALAWI	**2010-2011**		**2013**			
No Migrants	40,698	72.1%	12,790	63.3%		
Internal Migrants	8,445	15.0%	3,795	18.8%		
International Migrants	795	1.4%	188	0.9%		
Inside District Migrants	6,471	11.5%	3,447	17.0%		
Total	**56,409**	**100.0%**	**20,220**	**100.0%**		

Source: Own calculations based on LSMS surveys for each country.
LSMS Tanzania 2010-2011 does not provide information of international migrants.

Method

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Migration depends on:
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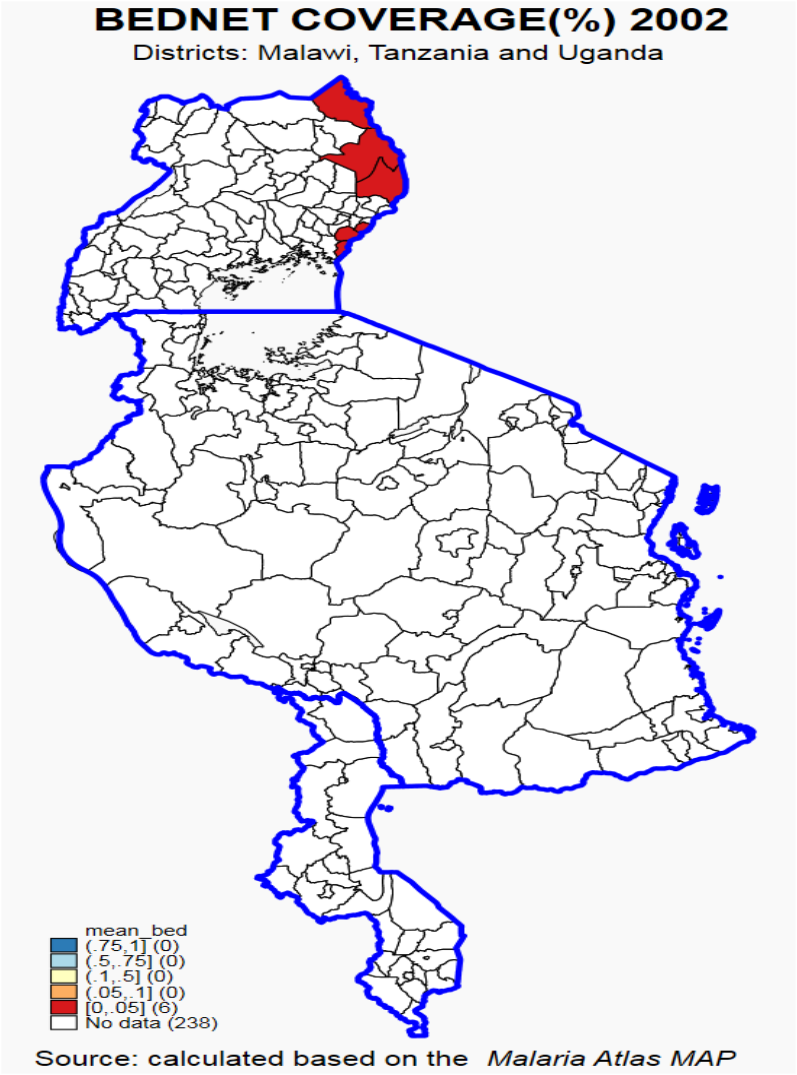
Time-varying fixed effects to control for unobserved destination district characteristics

Variation in bednet coverage



Main results on the choice of destination district

	MAL-TAN-UGA			MAL-TAN-UGA		
	(1)	(2)	(3)	(4)	(5)	(6)
$MEI_{(d-o)}$	-1.969***	-0.805	-1.347**	-0.397	-0.421	-0.407
	(0.723)	(0.638)	(0.671)	(0.710)	(0.704)	(0.709)
$MEI_{(d-o)} * bednet_o$	4.529***	3.870***	3.548**	3.532***	3.465***	3.496***
	(1.596)	(1.473)	(1.504)	(1.333)	(1.336)	(1.332)
$Nightlights_{(d-o)}$ (mean)		0.267***			0.0508	
		(0.0265)			(0.0566)	
$Nightlights_{(d-o)}$ (sum)			0.0920***			0.00932
			(0.0114)			(0.007)
FE-country	Yes	Yes	Yes	Yes	Yes	Yes
FE-country-survey	Yes	Yes	Yes	Yes	Yes	Yes
FE-Individual	Yes	Yes	Yes	Yes	Yes	Yes
FE-District$_d$	No	No	No	Yes	Yes	Yes
Obs.	1,040,980	1,040,980	1,040,980	1,040,980	1,040,980	1,040,980
R^2 *pseudo*	0.179	0.197	0.192	0.257	0.257	0.257
No. clusters	242	242	242	242	242	242

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Standard errors (in parentheses) clustered at the Origin District. Control variables include Destination-Origin distance, and difference in population density (destination-origin) in a linear and quadratic way.

Preliminary results

Some indication of negative response to disease risk (according to a Malaria Ecology Index).

This effect is dampened by the coverage of bednets in the district of origin.

Any effect is less significant when time-varying characteristics of the destination districts are controlled for.

Conclusions

Attempt to analyze the impact of disease prevalence on migration patterns

Limitations in the span of the data (length of time)

Need exogenous shock
(the Roll-Back Malaria program dummy)

Constraints on publicly available data on disease prevalence
(The Malaria Atlas Project is an exception)