



Healthy or Unhealthy Migrants? Identifying Selection, Socialisation and Adaptation Effects in Comparative Analysis of African HDSS

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INDEPTH Network

Background

- Migration, a major demographic event
 - Health status may impede or stimulate migration
 - Migration can influence health outcomes

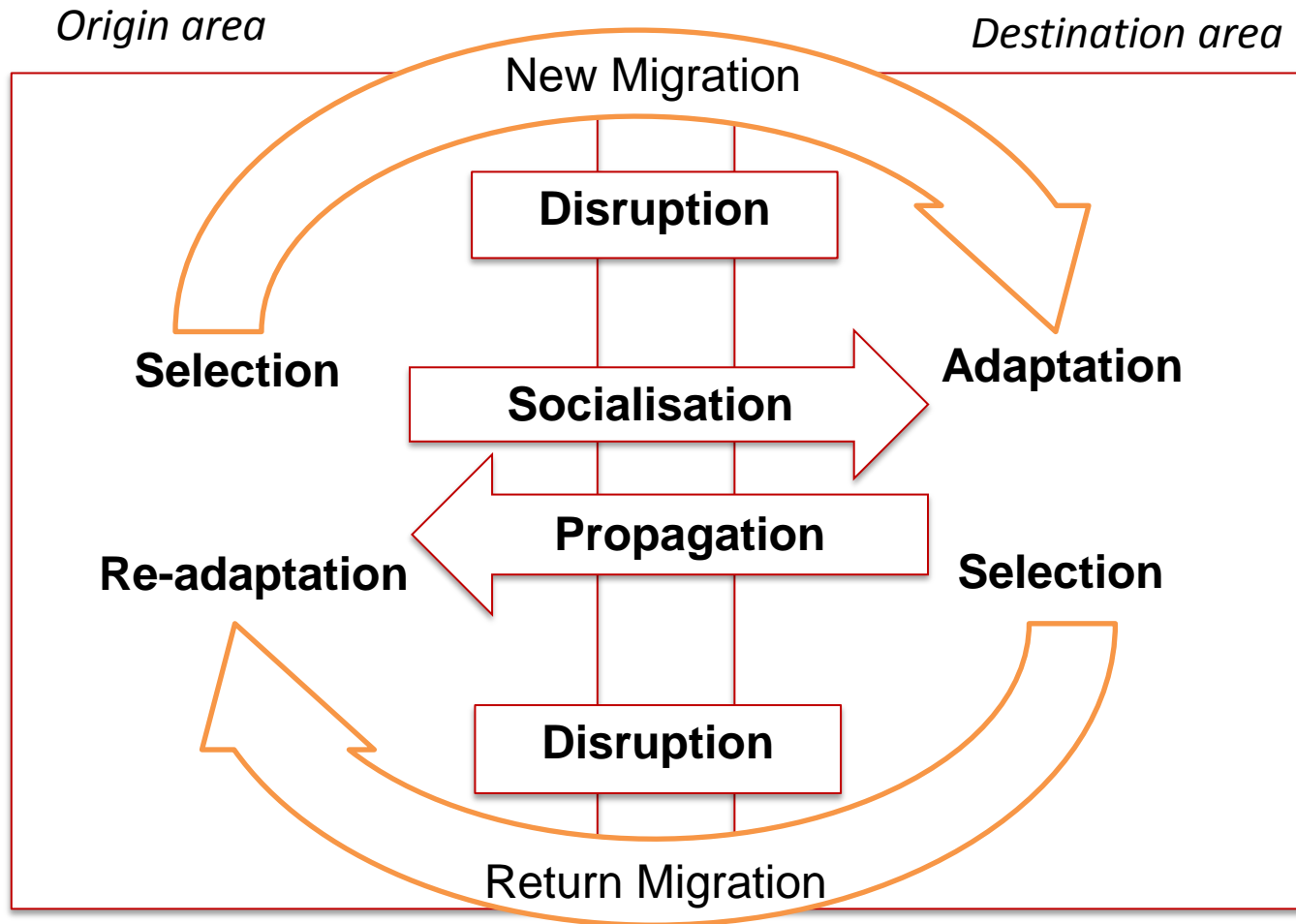
- Net effect of migration on health may be positive, negative, or nil
 - Are migrants positively selected on health?
 - Do migrants propagate diseases and behaviours?
 - Is the impact of migration vanishing with time?

SoSAD hypotheses

on migration and health relationship

	Origin to Destination (new) migration	Destination to Origin (return) migration
Socialisation	Origin behaviour persists	Destination behaviour persists
Selectivity	Selection of migrants in origin areas	Selection of migrants in destination areas
Adaptation	Adaptation to the destination behaviour	Re-adaptation to the origin behaviour
Disruption	Migration disrupts other behaviours	Migration disrupts other behaviours

Migration effects on health before and after new migration or return migration



Objectives

To examine the **relationship between internal migration and mortality** in 9 HDSSs in sub-Saharan Africa

- To confirm the **diversity** of the migration-mortality relationship
- To confirm that this relationship is mainly generated by the **combination** of two processes: **selection and exposure**
- To check whether patterns of mortality conform to the well-known **healthy migrant** and **unhealthy return migrant** hypotheses
- To help local health authorities to identify the categories of migrants for **targeted interventions**

15 different potential combinations of the 3 effects

Socialisation/ propagation	(re-) Adaptation	Negative selection	No selection	Positive selection
Negative	Yes	✓		✓
	No	✓		✓
	Not testable		✓	
None	Yes	✓		✓
	No	✓		✓
	Not testable		✓	
Positive	Yes	✓		✓
	No	✓		✓
	Not testable		✓	

“Healthy migrant”

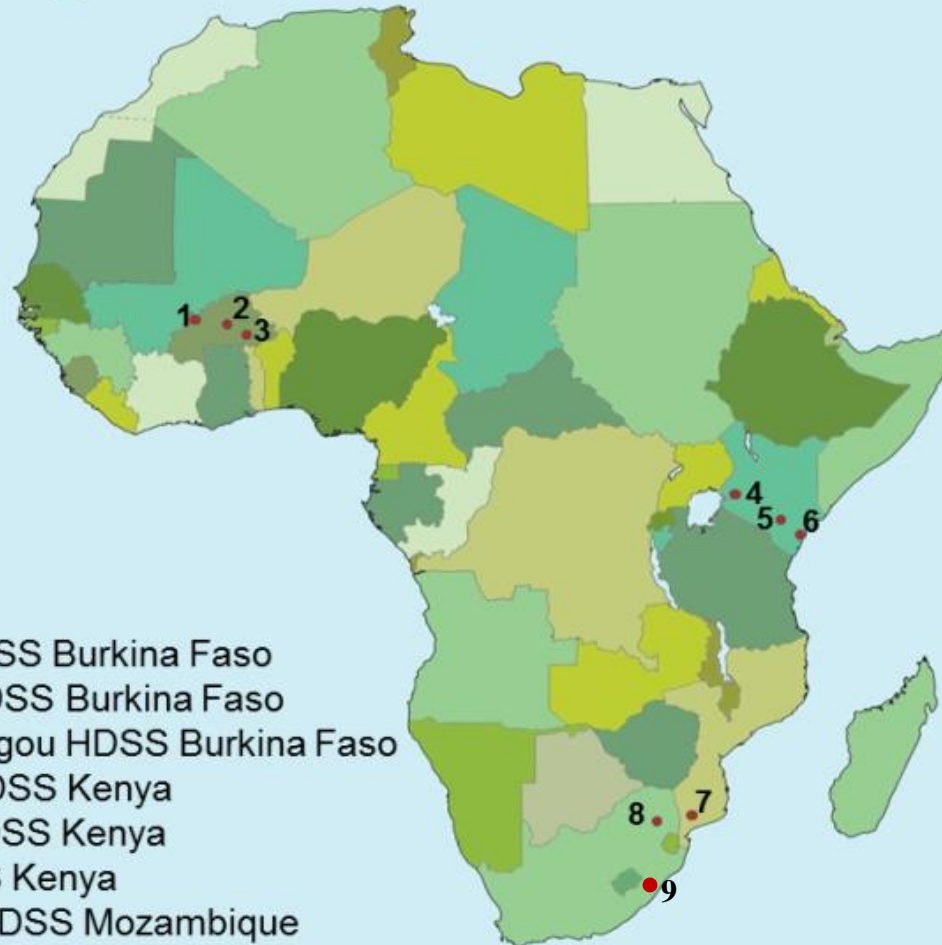
For in-migrants in rural areas (assuming no socialisation)

“Unhealthy return migrant”

MADIMAH

Multi-local dynamics of internal migration and health

Participating HDSSs



1. Nouna HDSS Burkina Faso
2. Nanoro HDSS Burkina Faso
3. Ouagadougou HDSS Burkina Faso
4. Kisumu HDSS Kenya
5. Nairobi HDSS Kenya
6. Kilifi HDSS Kenya
7. Manhica HDSS Mozambique
8. Agincourt HDSS South Africa
9. Africa Centre HDSS South Africa

Migration-Health Empirical Cox Model

Migrant status:

- In-migrant by duration of residence (<2y; 2-5y; 6y+)
- Return migrant by duration of res. & years spent away (<3y; 3y+)
- Permanent resident

Period effect:

1998-2000
2001-2003
2004-2006
2007-2009
2010-2012

Socio-demographic characteristics:

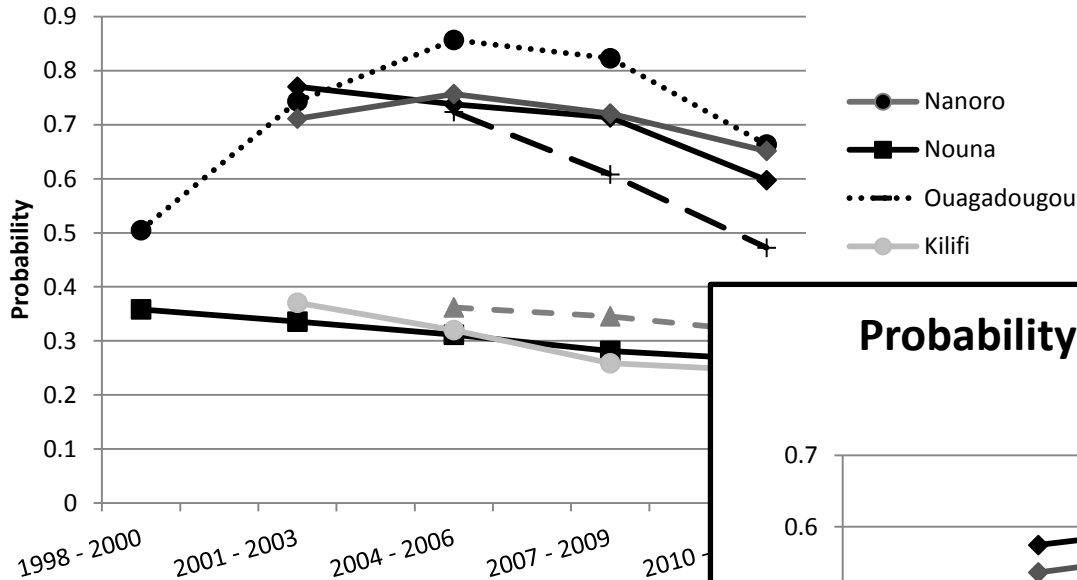
Age (non-parametric)
Sex (stratification)
Education (none; primary; secondary+)



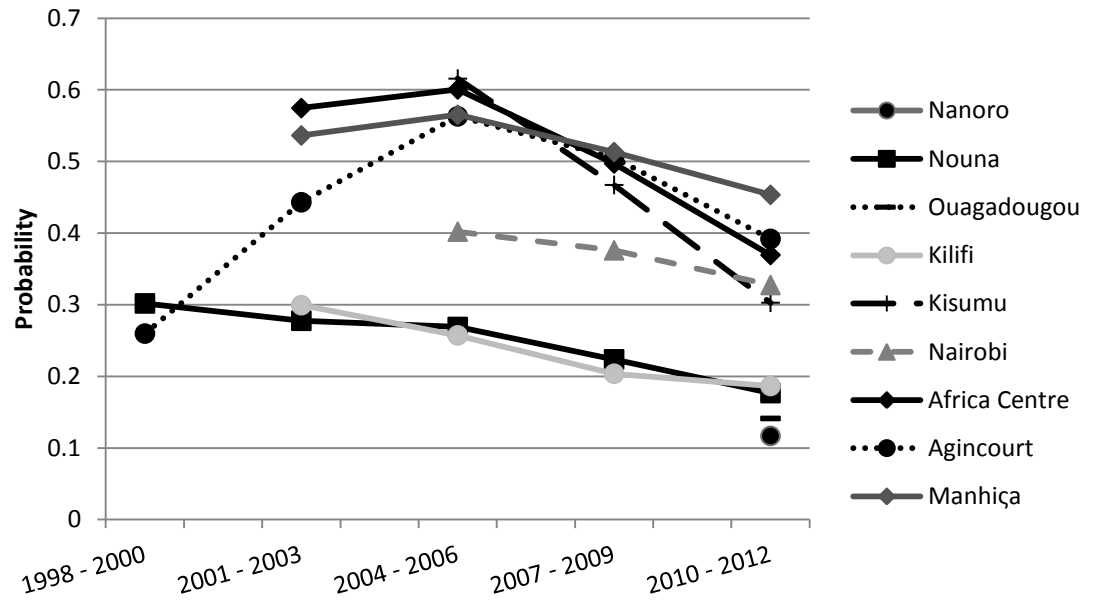
Mortality

Probability of Death

Probability of Death between Ages 15 and 60 - Males



Probability of Death between Ages 15 and 60 - Females



Examples of outputs

(migration variables only)

	Kilifi HDSS		Kisumu HDSS		Nairobi HDSS	
	All Deaths		All Deaths		All Deaths	
	Male	Female	Male	Female	Male	Female
Permanent Resident						
In-Migrant						
6 - 24 months in HDSS	0.59*** (0.53 - 0.65)	0.58*** (0.52 - 0.64)	1.35*** (1.23 - 1.49)	1.80*** (1.64 - 1.97)	0.67*** (0.66 - 0.90)	1.25*** (1.05 - 1.50)
25 - 59 months in HDSS	0.67*** (0.60 - 0.74)	0.74*** (0.67 - 0.82)	1.12** (1.01 - 1.24)	1.26*** (1.13 - 1.40)	0.91 (0.78 - 1.07)	1.01 (0.83 - 1.24)
60+ months in HDSS	0.94 (0.84 - 1.06)	1.11* (0.99 - 1.24)	0.95 (0.81 - 1.12)	1.17* (0.99 - 1.39)	0.83 (0.65 - 1.05)	0.90 (0.67 - 1.22)
Return Migrant						
6 - 24 months in HDSS	0.56*** (0.44 - 0.70)	0.62*** (0.49 - 0.77)	1.36*** (1.17 - 1.57)	1.53*** (1.31 - 1.79)	1.31*** (1.04 - 1.65)	1.16 (0.85 - 1.57)
25 - 59 months in HDSS	0.76** (0.60 - 0.96)	0.86 (0.68 - 1.07)	1.40*** (1.21 - 1.62)	1.13 (0.94 - 1.36)	1.10 (0.86 - 1.41)	0.97 (0.70 - 1.35)
60+ months in HDSS	0.74 (0.49 - 1.12)	0.92 (0.63 - 1.33)	1.15 (0.87 - 1.52)	1.12 (0.79 - 1.60)	1.33 (0.93 - 1.89)	1.39 (0.91 - 2.14)
Return Migrant Exposure >36months						
36+ months away	0.95 (0.71 - 1.29)	1.11 (0.84 - 1.48)	1.04 (0.81 - 1.33)	0.88 (0.64 - 1.23)	1.46* (0.99 - 2.15)	1.36 (0.77 - 2.40)

Selection

Adaptation

Selection

Re-adaptation

Propagation

Summary results for in-migrants in rural areas (assuming no socialisation)

Socialisation	Adaptation	Negative selection	No selection	Positive selection
Negative	Yes			
	No			
	Not testable			
None	Yes	Manhiça M+F Kisumu M+F		Kilifi M+F
	No			Nouna M
	Not testable		Agincourt M+F Africa Centre M Nouna F Nanoro M+F	
Positive	Yes			
	No			
	Not testable			

No suitable combination was found for female in-migrants in Africa Centre
(positive selection + counter-adaptation)

Summary results for return migrants in rural areas

Propagation	Re-adaptation	Negative selection	No selection	Positive selection
Negative	Yes	Agincourt M+F		
	No			
	Not testable			
None	Yes	Africa Centre F Kisumu M+F		Kilifi M+F
	No	Manhiça M		Nouna M
	Not testable		Africa Centre M Nouna F	
Positive	Yes			
	No			
	Not testable			

Not enough female return migrants in Manhiça

Not enough return migrants of both sexes in Nanoro (2010-2012)

Summary results for in-migrants in urban areas

Socialisation	Adaptation	Negative selection	No selection	Positive selection
Negative	Yes			
	No			
	Not testable			
None	Yes	Nairobi F		Ouaga M Nairobi M
	No			
	Not testable		Ouaga F (?)	
Positive	Yes			
	No			
	Not testable			

Several possible combinations were found for female in-migrants in Ouagadougou : no socialisation (as for males) is assumed.

Summary results for return migrants in urban areas

Propagation	Re-adaptation	Negative selection	No selection	Positive selection
Negative	Yes			
	No			
	Not testable			
None	Yes	Nairobi M		
	No			
	Not testable		Nairobi F	
Positive	Yes			
	No			
	Not testable			

Not enough return migrants in Ouagadougou (2010-2012)

Summary Findings

- Confirms the **diversity** of the migration-mortality relationship over a range of settings
- **Theoretical framework** explain all 34 observed situations but 1
- **Selection in-migrants:**
 - Positive: 4 sites for males, 1 for females
 - Negative: 2 sites for males and females
 - No selection: 3 sites for males and females
- **Selection return migrants:**
 - Same pattern as for in-migrants except:
 - Female in Africa Centre (?)
 - Nairobi
- **(re-)Adaptation after selection** in 17/20 situations
- **No socialisation** (in-migrants): **most reasonable assumption**
- **Propagation** (return migrants): always nil, **except in Agincourt (negative)**

Provisional Policy Implications

- **Negative selection on health:**
 - **Manhiça & Kisumu:** a concern whatever migration status and gender
 - **Agincourt:** a concern for **return migrants**, also vector of propagation
 - **Africa Centre:** why **female return migrants'** health deteriorates over time?
 - **Nairobi:** a concern for **male return migrants** and **female in-migrants**
- In all these cases: **target recent migrants**
within the first 2 years of their arrival/return
- **Agincourt:**
target residents who intend to migrate to reduce propagation
through return migration
- **Rural areas: return migrants will not help health policy**
(no propagators of “good” health behaviour)



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