Urbanization, Migration, and Health in a Transition Economy

Insights from South Africa

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# Overview

## Today’s Presentation
- Some Motivation
- Background on Demographic Surveillance
- A Few Empirical Results re from HDSS and pilot study
- Our Next Steps

## Questions [for you!]
- Comparative Value of Health and Demographic Surveillance Systems?
- Insights for Research Design on Migration, Urbanization, and Health?
Motivation: Migration, Urbanization, and Health: Why do we Care?
World Demographic Context

Meanwhile

- The 7 Billion Threshold – Monday 31 Oct 2011 (UN)
  - “At the same time, he [Executive Director of the UN Population Fund (UNFPA) Babatunde Osotimehin] highlighted the need to give ageing populations in many parts of the world a life of dignity, and to **tackle the rapid urbanization and migration** which many countries have to face.”

And at the UN:

**IN THE NEWS**

31 October 2011

As World Passes 7 Billion Milestone, UN Urges Action to Meet Key Challenges

NEW YORK – Top United Nations officials today marked the global population reaching 7 billion with a call to action to world leaders to meet the challenges that a growing population poses, from ensuring adequate food and clean water to guaranteeing equal access to security and justice.

And Yet:

- Data Collection on Migration remains weak:
  - Census prior residence [maybe]
  - DHS ends/reinstates Migration QNs
  - Limited Panel Data
The Urban Transition – a summary
See MR Montgomery *Science* 2008 & also NRC *Cities Transformed* 2003

*African urbanization low, but advancing in parallel to Asia*
Migration, Urbanization, and Health Transition

CAUSES OF NON-COMMUNICABLE DISEASES

UNDERLYING SOCIOECONOMIC, CULTURAL, POLITICAL AND ENVIRONMENTAL DETERMINANTS
- Globalization
- Urbanization
- Population ageing

COMMON MODIFIABLE RISK FACTORS
- Unhealthy diet
- Physical inactivity
- Tobacco use

NON-MODIFIABLE RISK FACTORS
- Age
- Heredity

INTERMEDIATE RISK FACTORS
- Raised blood pressure
- Raised blood glucose
- Abnormal blood lipids
- Overweight/obesity

MAIN CHRONIC DISEASES
- Heart disease
- Stroke
- Cancer
- Chronic respiratory diseases
- Diabetes

Preventing CHRONIC DISEASES
a vital investment
Urbanization Bad for Health?

Are Cities Healthy Places?

- Urban Living and ...
- Increased Stress
- Increased BMI, BP...
- Adverse Exposures

See: Marmot 1984; Madrigal et al. 2011; Goel et al 2004; Fu & VanLandingham 2012

Gibson et al. 2012: “results suggest significant and persistent increases in blood pressure and hypertension, which are likely to have implications for future health budgets given recent increases in developing to developed country migration.”
Urban Good for Health? [Child Survival]

Fig. 1 Urban and rural under-5 mortality rates after controlling for migration status of the mother. Black diamonds denote a significant difference; the black square represents the weighted average for 18 countries; and the dotted line represents equality between urban and rural mortality rates.

Rural Mort > Urban Mort, after controls, 18 DHS LDC countries

Bocquier et al Demography 2011
And South Africa

Migration Urbanization, and Health
South Africa: Steady Increase In Migration Of All Kinds

(Source Reed, Demography 2013)
“South Africa’s per head health burden was the highest of any middle-income country in the world, with the brunt still carried by the poorest families.”

Dual burden of NCDs and IDs “colliding epidemics”


South Africa manifests crucial risk factors in order: alcohol use, high body mass index (BMI), high blood pressure, dietary risks, and smoking

(Healthmetrics 2014; 2015).
Migration and HIV in S Africa: Changing Concerns

**Then**

- Early in epidemic: migrants seen as a “vector” of spread.
  - “the migratory labor system in eastern, central, and southern Africa” “…giving rise to the prevalence of sexually transmitted infections (STIs) and later AIDS.” [Scrimshaw in *Int’l Pub Health Ch 2* (2001)]

- Mechanism: High prevalence and high transmission risk at migration destinations; return home then exposes rural partners
  - Evidence consistent for southern Africa

- Migrant men 2.5 times more likely to have HIV compared to non-migrant men (Lurie et al., 2003a)

**Now**

- **Scale up of ART**
- **In South Africa 2012**
  - Prevalence (15-49) 17.9%
  - New Infections -37% from 2001
  - ART coverage: 81%
  - [Source: *UNAIDS Global Report 2013*]

- **BUT:**
- **Continuity of Care and Treatment Cascade?**
  - How do migrants negotiate access to ART given migration status?

- **And other chronic conditions**
Previous Study Site Work [Wits/Agincourt]

- Links Migration to HIV
  - Prevalence
  - “Returning Home to Die”
- **Agincourt Area Prevalence:** [2010-11 survey]
  - 19.4% among 15+
- Links TEMP migration to HH well-being (+)
  - Both male & female Mig
- **SO: MIG & HIV & OTHER CHRONIC CONDITIONS**
  - And Sociodemographic links

Recent Improvements in Life Expectancy, following a period of decline

![Graph showing trends in life expectancy Agincourt HDSS 1992-2010](image)
Why care about migration in longitudinal health studies?

- **Health Policy concerns**
  - Migration is linked to health and other demographic outcomes
    - Migration changes risk exposure, e.g. urbanisation and lifestyle
    - Migration improves livelihoods (possible health benefits)
  - HDSS provides a window otherwise unavailable

- **Accuracy in measurement**
  - Data accuracy [numerator and denominator]
  - LTFU & attrition bias (via migrant selectivity)
  - HDSS Data managers grapple with migration

- **Determinants and Consequences of Migration**
  - Migration-Development Paradox?
  - Migration and Livelihoods, e.g. via remittances
Empirical windows on migration, urbanization, and health

1. Agincourt (Rural Origin) Demographic Surveillance
2. Migrant Follow-up Pilot
3. Gauteng Province Quality of Life Survey
1. Demographic Surveillance

INDEPTH Centers 2015

http://www.indepth-network.org/index.php?option=com_content&task=view&id=1671&Itemid=1135
Our Approach

- **Agincourt Health and Demographic Surveillance System:** 2001-2011 (N ≈ 110,000)
  - Classifying temporary (circular, seasonal) migrants
    - remain connected to origin HH
    - absent 6 months or more per year
  - Description: Who moves, where?
  - Regression models (w/ various controls)
    - predict temporary migration
    - estimate HH benefit from temporary migration
**Health and Demographic Surveillance Systems**

### What are they?
- “district”-sized area
- Repeated visits to HH [1-4x/yr]
- Oft long duration (20+ yrs)
- Most Rural; Some Urban
- Basic roster
- Modules[?]
- But *not* identical platforms

### Why?
- Lack of high-quality conventional data
- Platform for RCT & intervention
- Intense observation -- rapport
- **AND MIGRATION**
## Migration & Surveillance Systems (HDSS)

### Why?
- Ready-to-Go Population of large N
- Longitudinal info from Origin HH
- Pros & Cons of narrowly defined Origin community

### Issues?
- LTFU – few DSS follow migrants out of area
  - Ouch!
- Migration definition
- Socioeconomic vs health objectives
- Representativeness
- “Feed the beast”
Source: Ginsburg, et al *Demographic Research* (Forthcoming)
Source: Ginsburg, et al *Demographic Research* (Forthcoming)
Our HDSS Work -- Objectives

Exploit HDSS

- Evaluate HDSS as a platform for other studies, e.g. migration
- Migration and LTFU
  - Migrant follow up pilot study
    - Can we find the migrants?
    - Interview method: phone versus in-person
- Lessons for future:
  - For us (migration)
  - For INDEPTH & others

Migration & Health

- Migration implicated in HIV/AIDS
- Urbanization implicated in epi/health transition
- Migrant pros and cons
  - For migrant
  - For origin HH & comm.
Agincourt HDSS
Mpumalanga Province

Villages: 26
Population: 84,000
Households: 15,000
Inaugurated: 1992
Data Analysis with the Existing Agincourt HDSS

Determinants of Temporary/Circular Migration
AHDSS Demographic Surveillance Data structure 1992 onward, with some extensions and modifications

Event Tables

Object Tables

| Individuals in households (e.g. family) - membership episode - |
| At locations (with lat, long) - residence episode - |

**BASELINE**

**CENSUS**

**Time-line**

- Births
- Deaths
- In-Migrations
- Out-Migrations

**BUT**: those leaving the Dem. Surveillance Area (DSA) NOT followed; hence out pilot work
Who moves?
Agincourt Temp Migration Age Profile

- **Agincourt HDSS:**
- **Who is a “Temporary Migrant”?**
  - HH reports “migrant” has HH membership
  - Intermittent visits
- **Percent of adult Person-Years \([15,70)\) with temp migration**
  - Female 27%
  - Male 53%

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**Graphs by male**

- Median females 26.2 yrs
- Median males 24.5 yrs
A multivariate model

Concepts to Examine

- Basic Mig Theory Holds?
  - Age
  - Education
- “NELM” (re HH structure)
  - Who in HH moves
- Mig-Develop [paradox]
  - \( P(mig) = f(\text{assets}) \)

Approach

- Event History
- Dichotomous outcome
  - \( \rightarrow \text{logit} \)
- Modest set of Controls
  - Age, Sex, Mozambican
  - Educ
  - HH relationship
  - HH Asset Index
AHDSS Launching a Migrant?

A poverty trap?

Agincourt HDSS Data: 2003-2011 N PYrs= 31,268 (female) 33,901 (male) 15-24 years of age
Adjusting age, education, HH relationship, prior migration, Mozambican Refugee status.

Odds Ratio for Temporary/Circular Migration

- Female
- Male
AHDSS Who Moves?

Migration Varies Sharply by Relationship to Head

Agincourt HDSS Data: 2003-2011 N Pyrs = 416,616 82,522 indivs
Adjusting age, sex, education, HH relationship, Mozambican Refugee status.
2. Our MHFUS Pilot Study & Preliminary Analysis

Finding Migrants  AND Hints at differentials
Study Design – Migrant Follow-up [MHFUS]

- “Migration and Health Follow-up Survey” MHFUS
- Sample Migrants from the HDSS N=368
  - Varying distance from origin
  - Random split into interview: (a) in-person (b) phone
- Protocol
  - Contact origin Household for permission & contact info
  - Face-to-Face includes anthropometric component
- Analysis
  - Compare two fieldwork outreach methods
Where do they go?

Agincourt & BBR
Pilot study suggests: **migrants more likely to exhibit elevated BP**

Note: Unweighted data: N=200 respondents with personal interviews (BP Measured) Predicted value at sample means for age, sex; Systolic BP results comparable
Pilot study: *suggests that distant migrants access more private clinic health care and less government care*

Private health care utilisation

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<th>Percent</th>
<th>near and mid</th>
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Distance category key:
Near: same district
Mid & Far: 1-4 hours drive + metropolis (Gauteng)

Government health care utilisation

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N=363 migrants from Agincourt
P= p=0.01 Mlogit model (govonly; privonly; both-neither)
When we matched migrant sample to earlier HIV study:

**All Cases (N=363)**
“Far” more likely to be missing

**Non-Missing Cases (N=243)**
“Far” LESS likely to be HIV+

With add’l controls: Odds ratio HIV+/HIV- for “Far” = 0.397
Pilot study: self-reported health: Healthy Migrant Effect?

Distance category key:
Near: within HDSS district or surrounding
Far: at least 1-2 hrs drive, incl metro (Gauteng)

Note: *asked versus age-sex peers*
Unweighted data: p=0.008
N=356 migrants from Agincourt
And Also from the Pilot Study: Randomization of Contact Method

- **Q:** Is phone contact feasible? **A: Yes.** Many HHs and their migrants keep in touch via mobile phone.
- Re-contact info for 88% of sample
- 93% of these reached
- **Q:** Do response rates (given contact info) vary by interview type and distance? **A: modest for most vars**

*“Send Money” differs by interview method (p=0.059)*
3. A result from a cross-sectional survey in the Destination

Reported Health Status in Gauteng Province
Guateng (Destination Area) Quality of Life Survey: Health Migrant Effect?

Index of Reported Health Problem

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<th>Population Group (Race) &amp; Immigrant Status</th>
<th>Index Value</th>
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<td>NonMig</td>
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<tr>
<td>Internal Mig</td>
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<tr>
<td>International Mig</td>
<td>1.35</td>
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GCRO Quality of Life Survey 2013, Gauteng Province
Response Agreement with “Health Status Disrupts Daily Work” N = 27154,
Ordinal Logistic Regression, adjusting for age, race, sex, household size, education
Conclusions and Next Steps

- Migration Pervasive in this population
- Significant in most transition economies
- Migration as HH Strategy, Much Possible Benefit
  - Remittances
  - Overall SES improvement
  - HH Strategy NELM evident
- But
  - Poverty Trap
  - Healthy Migrant give way to negative adjustment?
- And on methods, we find:
  - Migrant follow-up (via phone) feasible

- Our Next Steps
  - Enroll cohort of ~4,000 (migrants + nonmigrants)
  - Follow up to 5 years with regard to
    - Migration,
    - Socioeconomic Change
    - Treatment Cascade
    - Epi Transition, etc.
  - Companion (smaller) study of destination population

- Understand
  Migration/Urbanization to Understand Health
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