Unfolding Epi-Demo Transition in low- and middle-income countries: evidence from health and demographic surveillance data

Ayaga Bawah on behalf of Demo-Transitions team

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Motivation

- That epi-demo transition seems underway in Africa and Asia
- Appears to be different from classical transition theory
- Longitudinal data from INDEPTH member centres might help us characterize the unfolding transition
Key objective

Utilize HDSS data to enhance our understanding of epi-demo transition and examine the implications for the health systems
Data and methods

- We used fertility and mortality data generated from HDSS to examine long-term trends in fertility and mortality.

- Examined structural changes in the age-patterns of mortality and fertility.

- Four HDSS involved in the project – Agincourt and Navrongo (Africa) and Matlab and Filabavi (Asia).
Results

Trends in All-cause mortality
Predicted Probability of Dying by Period

By All Causes

Probability of Dying (per 1,000)

Period


95% CI Matlab Agincourt
Navrongo Filabavi

Stratified logistic regressions by site on sex, age, and time
Predicted Probability of Dying by Age
By All Causes

Stratified logistic regressions by site on sex, age, and time
Age–Specific Mortality Rates, by DSS

(a) Female

(b) Male
(a) Females

(b) Males

(a) Females

(b) Males
Predicted Probability of Dying by SES
By All Causes

Stratified logistic regressions by site on sex, age, time, and SES quintiles
Trends in causes of death by age
Predicted Probability of Dying by Period
by Noncommunicable

Stratified multinomial logistic regressions by site on sex, age, and time
Predicted Probability of Dying by Age Over Time

Malaria in Navrongo

Logistic regressions on sex, age, and time

Predicted Probability of Dying by Age Over Time

Noncommunicable in Navrongo

Logistic regressions on sex, age, and time
Predicted Probability of Dying by Age Over Time
HIV/TB in Agincourt

Predicted Probability of Dying by Age Over Time
Noncommunicable in Agincourt

Logistic regressions on sex, age, and time
Predicted Probability of Dying by Age Over Time
Injuries in Agincourt

Logistic regressions on sex, age, and time
Predicted Probability of Dying by Age Over Time

Injuries in Navrongo

Log Probability of Dying (per 1,000)

Age

95% CI

1995–1999

2000–2004

Multinomial logistic regressions on sex, age, and time
Predicted Probability of Dying by Age Over Time

Injuries in Matlab

Log Probability of Dying (per 1,000)

Age

95% CI
1985–1989
1990–1994
1995–1999
2000–2004
2005–2009

Multinomial logistic regressions on sex, age, and time
Predicted Probability of Birth by Year

Stratified logistic regressions by site on age and time
Predicted Probability of Birth by Age

Stratified logistic regressions by site on age and time.
Predicted Probability of Birth by Age and Time

Matlab

Probability of Birth (per 1,000)

Age

15 20 25 30 35 40 45

95% CI

1985–1989

1990–1994

1995–1999

2000–2004

2005–2009

Stratified logistic regressions by site on age and time
Predicted Probability of Birth by Age and Time

Navrongo

Stratified logistic regressions by site on age and time

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Predicted Probability of Birth by Age and Time

Agincourt

Probability of Birth (per 1,000)

Age


Stratified logistic regressions by site on age and time
Predicted Probability of Birth by Age and Time

Filabavi

Stratified logistic regressions by site on age and time
Integrating fertility, infant mortality and cause-of-death over time

Relation of 0–1 Mortality, TFR, and Cause of Death by Site Over Time

Matlab

Agincourt

Navrongo

ICD

0.1

0.2

0.3

0.4

0.5

0.6

0.7

NCD

0.2

0.3

0.4

0.5

0.6

0.7

0–1 Mortality

TFR

0.12 0.10 0.08 0.06 0.04 0.02

0.12 0.10 0.08 0.06 0.04 0.02
Some Observations

- Epi-demo transition clearly underway
- Different from classical transition - triple burden of disease observed –
  - Non-communicable diseases on the rise while communicable diseases still remain high
  - Injury mortality on the rise
- Compared to Asia sub-Saharan Africa has relatively higher levels of disease burden
- Fertility levels on the decline but levels in sub-Saharan Africa still quite high
Acknowledgments

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