Local context and fertility in Burkina Faso
A multilevel longitudinal analysis

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Objectives

- **Empirical**
  - **Identify individual and community determinants of fertility using multilevel longitudinal data**
    - Age at first birth & transition to higher-order births
   - Effects of schools, health services, income-generating activities

- **Methodological**
  - **Comparison of community effects on fertility with different types of data**
    - No retrospective community data
    - Retrospective community data on current place of residence
    - Retrospective community data on current and previous places of residence

Burkina Faso

- TFR : 6.2 children
  - 3.7 in urban areas
- Contraceptive use (modern) : 5.1 %
  - 28.2 % in urban areas
- Age at first birth : 19.4 years
  - 20.1 in urban areas
- Birth intervals : 36 months
  - 40 months in urban areas

- Urban population : 20 %
- 80 % of women 15-49 have never been to school
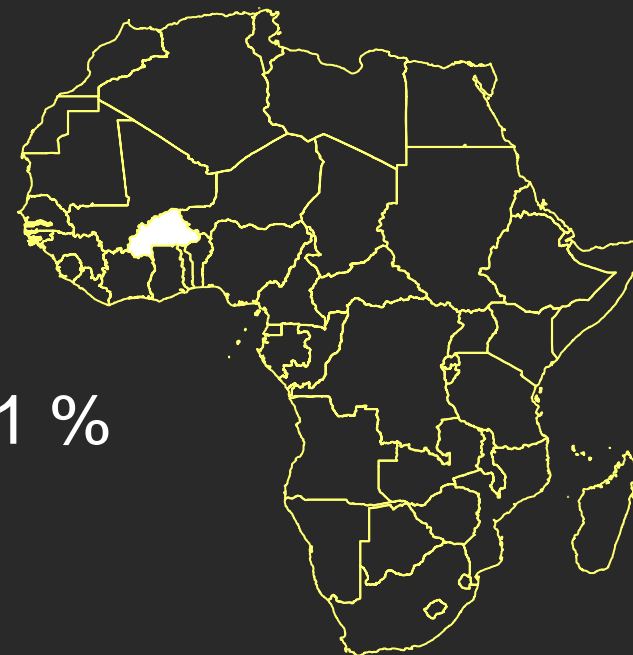
Data issues in multilevel longitudinal analyses

- **Individual-level**
  - Retrospective dependant variables often available (birth histories)
  - Backdated explanatory variables less frequent

- **Community-level**
  - Time-varying (retrospective) community data rarely available in demographic surveys
    - e.g. No or very little retrospective data in DHS service availability modules
  - Interference of migration
    - Some women were not living in the sampled community in the past
    - No community data for women before last migration

Age 12

Age 23

Age 25

Age 27

1977

1988
First birth

1990
Migration

1992
2nd birth

2000
survey
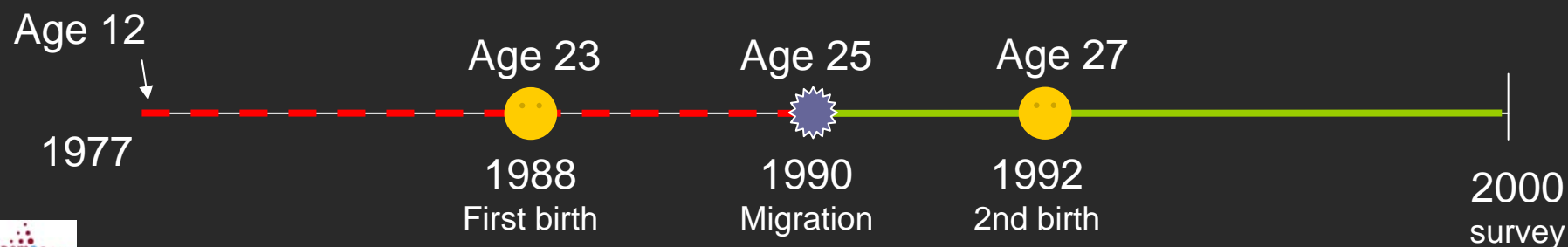
Missing data at community level

% of women living in a village/town different from their place of residence at the time of the survey

% of missing values at community level
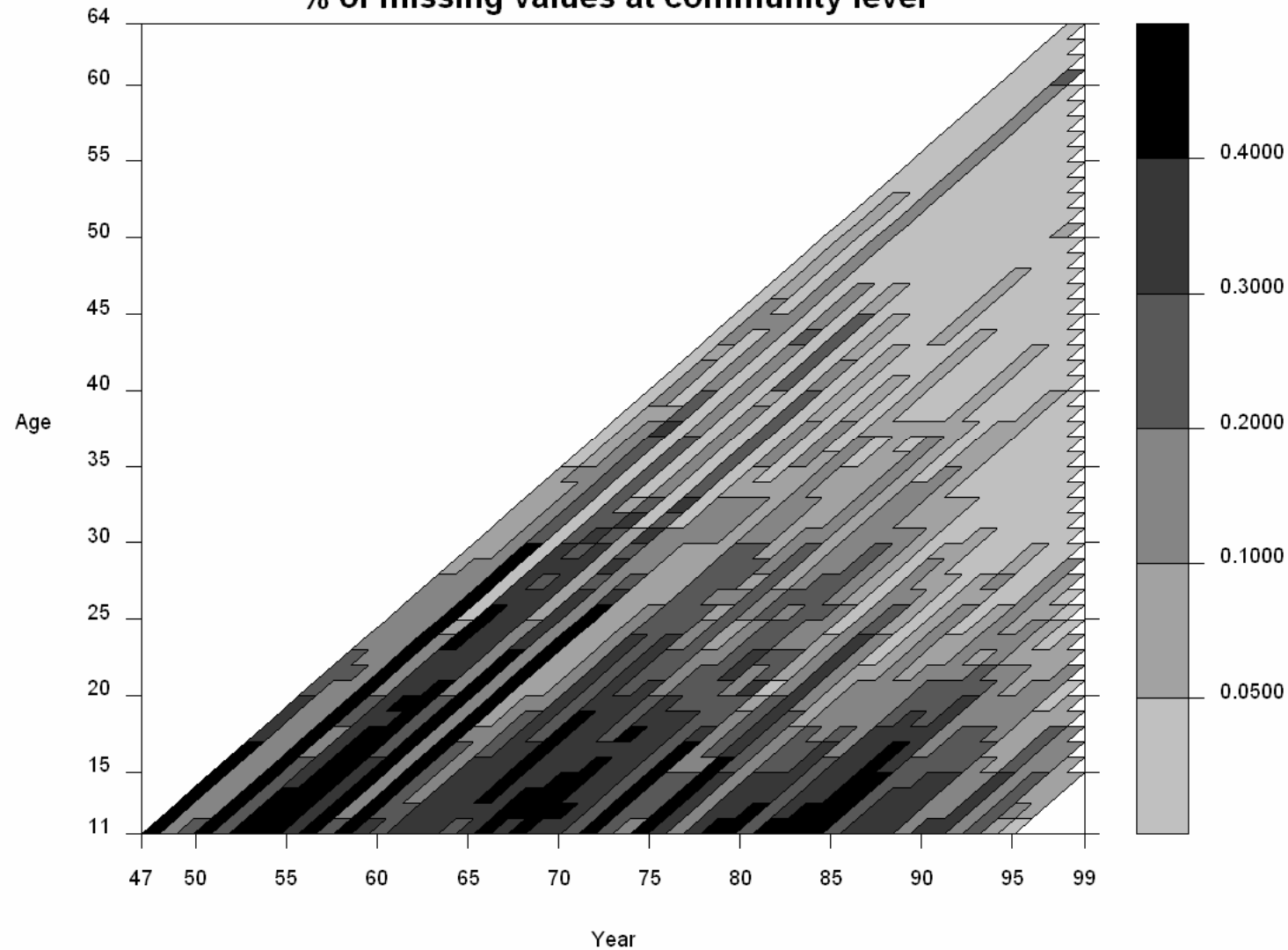
Possible approaches

- Modification of the analysis sample
  - Migrants removed from the analysis sample
  - Person-periods before migration dropped from the analysis sample

- Imputation of community data
  - No retrospective community data
    - Use community characteristics measured at the time of the survey in the current place of residence
      - Restrict analyses to a few years before the survey

  - Retrospective community data available
    - Attribute retrospective characteristics of current place of residence to previous places of residence
    - Or use national average for periods before last migration

- Collect retrospective community data on previous places of residence
    - Use retrospective community data collected at the right place

Multilevel longitudinal data

- **Individual and community retrospective surveys**
  - Conducted by the University of Montreal, University of Ouagadougou and CERPOD

- **Individual data (2000)**
  - Survey on "Migration, urban integration and environment"
  - Nationally representative sample of 8647 male and female respondents
  - Retrospective life histories
    - Birth histories
    - Employment histories
    - Marital histories
    - Migration histories since the age of 6
      - Identification of all previous places of residence

Multilevel longitudinal data
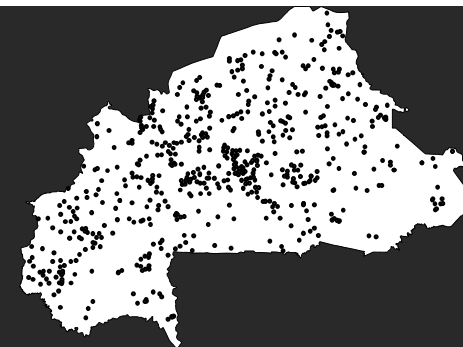
- **Community-level survey (2002)**
  - Designed to be linked with the individual survey
  - 600 villages and towns
    - Out of 1800 places identified in the migration histories
    - All settlements in which at least 3 respondents spent at least 3 months
  - Retrospective data collected since 1960 on:
    - schools, health centres, roads, employment opportunities, conflicts, development projects,…

Methods and variables

- Event-history models
  - Piecewise constant exponential models
    - person-periods data file, 3-month periods
  - Correction for clustering at community-level

- Dependant variables / analysis samples
  - Age at first birth
    - First birth from age 11 (1970-1999) : 3 785 women
    - 24 % of time at risk spent out of current place of residence
  - Length of birth intervals
    - Higher-order births (1970-1999) : 3 748 women
    - 16 % of time at risk spent out of current place of residence

Methods and variables

- **Explanatory variables**
  - Control : age, duration, parity, period
  - Individual : education, activity, ethnic group

  - Community-level
    - Schools : no, primary, secondary
    - Health centres: no, primary health care, higher
    - Income-generating activities : no, 1, 2 and +
    - Place of residence : rural, secondary towns, city

  - Comparison of community effects with three types of data
    - (1) right time & right place
    - (2) right time & wrong place
    - (3) wrong time & wrong place

Results

Age at first birth

Individual effects

Community effects

Education
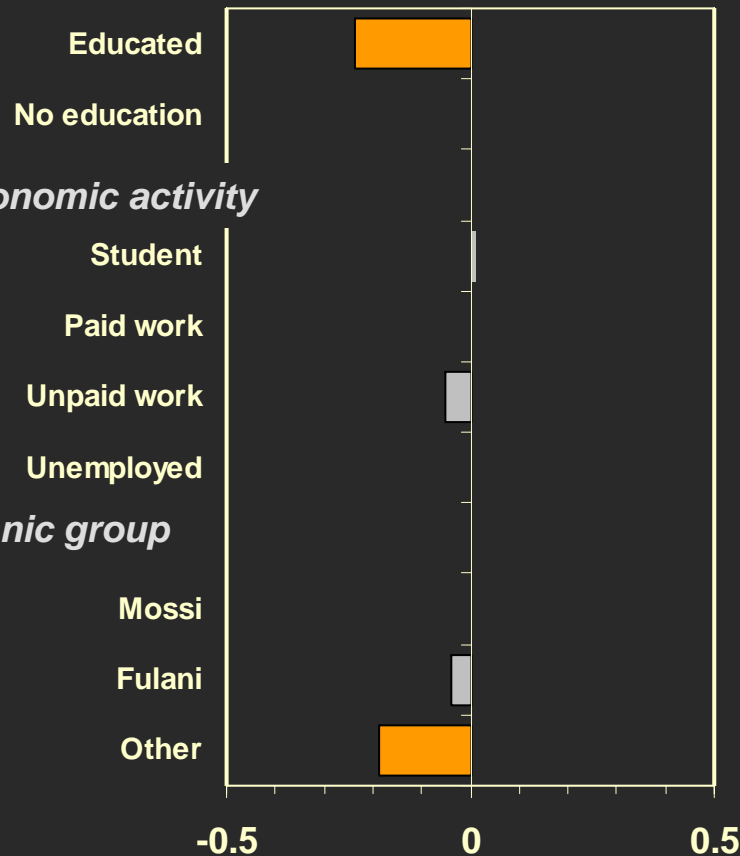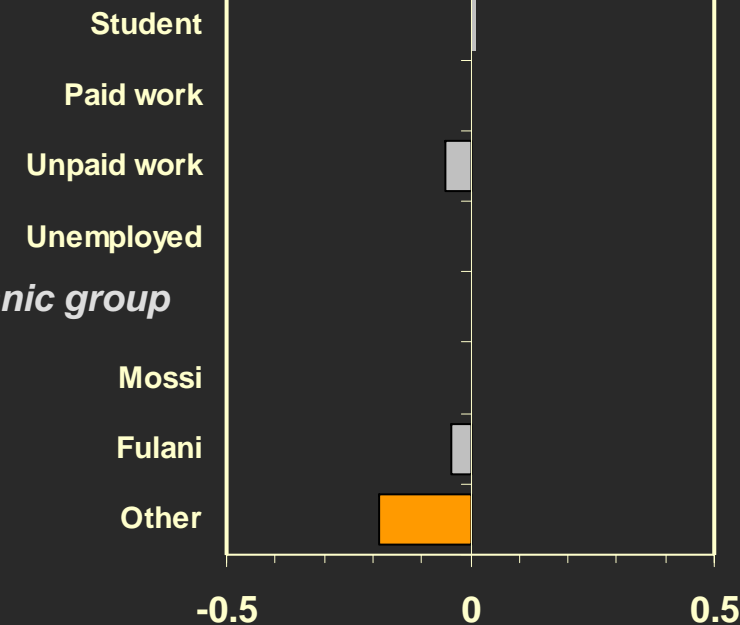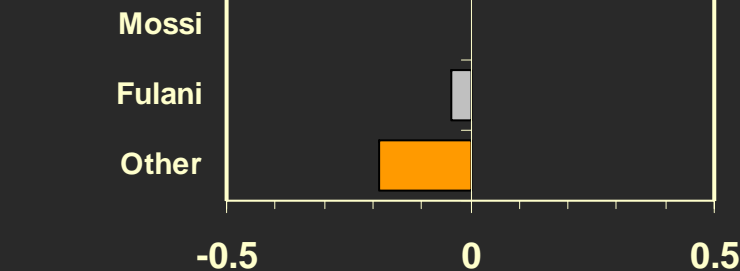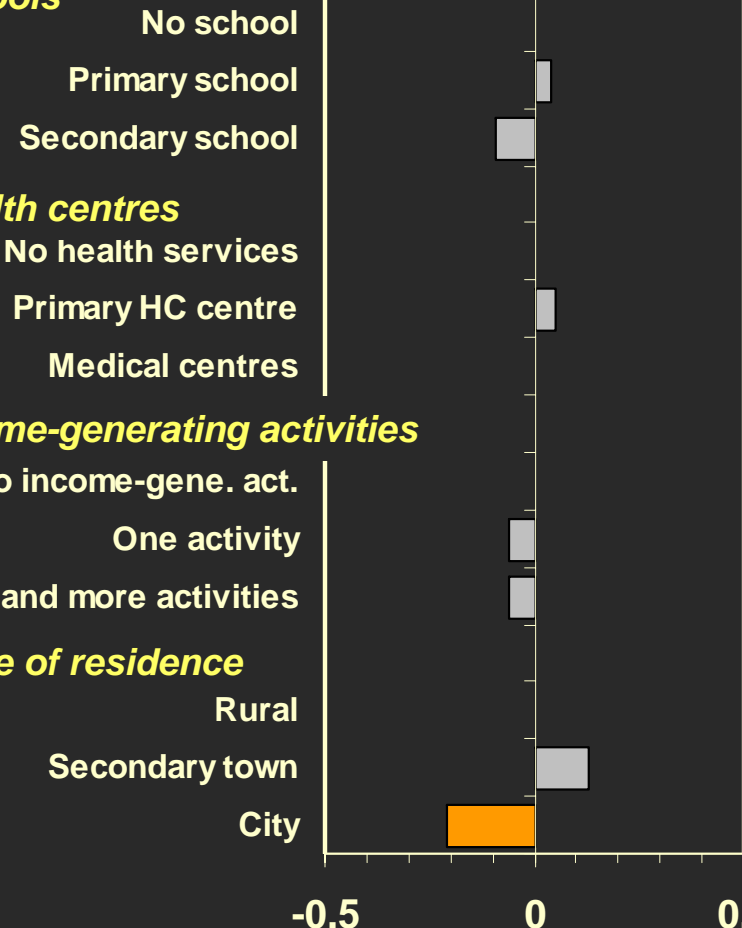
Schools

Educated

No school

No education

Primary school

Economic activity

Secondary school

Student

Health centres

Paid work

No health services

Unpaid work

Primary HC centre

Unemployed

Medical centres

Ethnic group

Income-generating activities

No income-gene. act.

Mossi

One activity

Fulani

2 and more activities

Other

Place of residence

Rural

Secondary town

City

-1   **-0.5**   **0**   **0.5**

log (rate ratio)

-0.5   **0**   **0.5**

log (rate ratio)

Transition to higher-order births

Individual effects
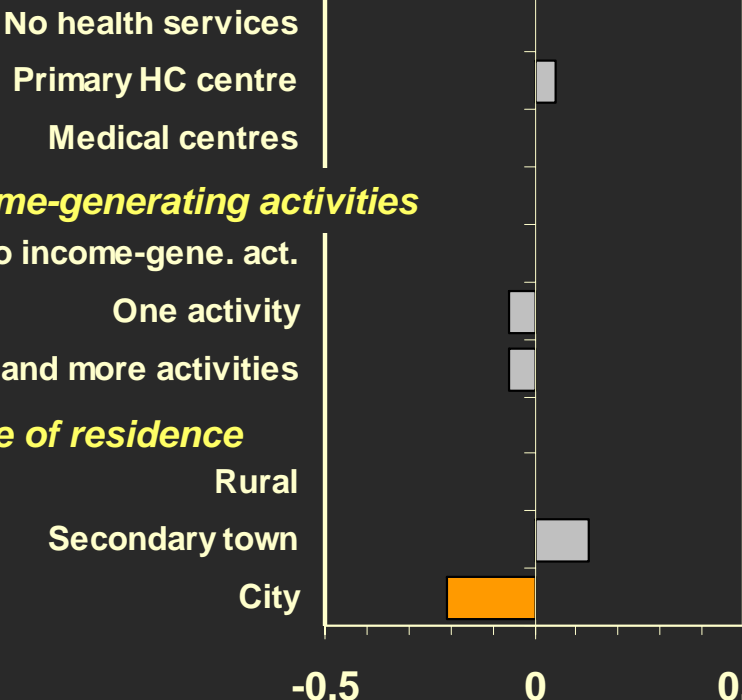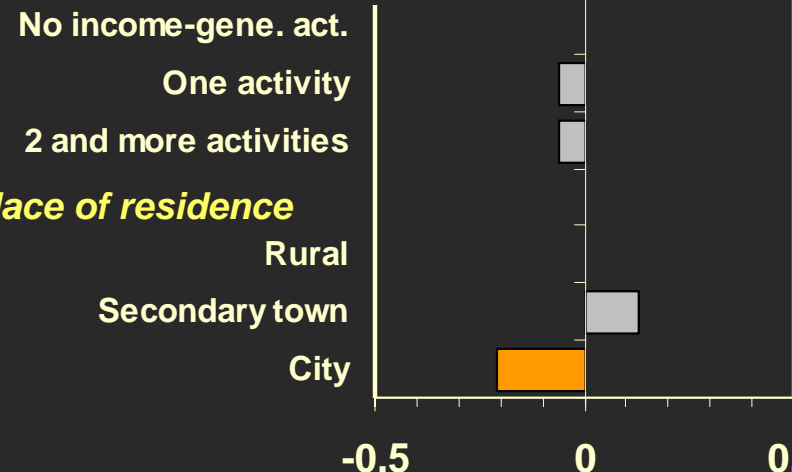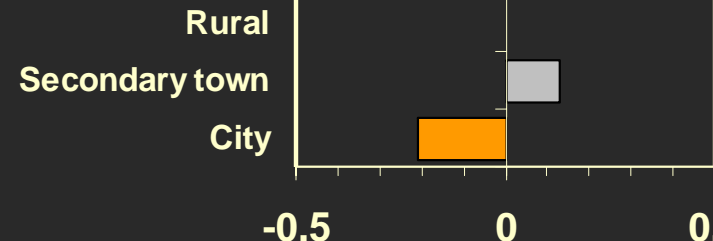
Community effects

Comparison of community effects

- Age at first birth

log (rate ratio)

Comparison of community effects

- Transition to higher order births

Right time & Right place — Right time & Wrong place — Wrong time & Wrong place

No school
Primary school
Secondary school

No health services
Primary HC centre
Medical centres

No income-gene. act.
One activity
2 and more activities

Rural
Secondary town
City

-0.5   0   0.5   log (rate ratio)
-0.5   0   0.5   log (rate ratio)
-0.5   0   0.5   log (rate ratio)
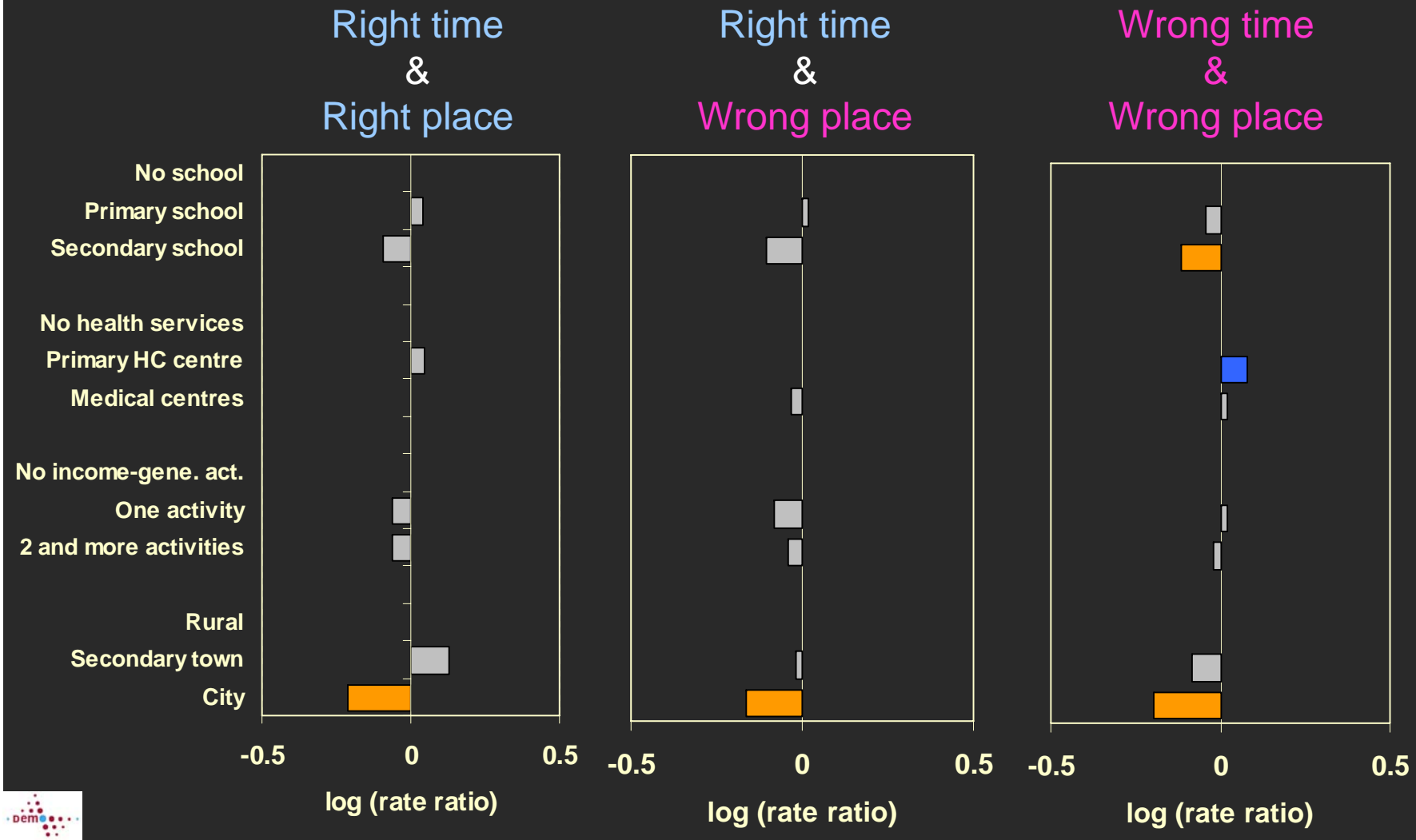
Conclusion

- **Significant community effects**
  - Greater for age at first birth than for higher-order births
    - age at first birth
      - Income-generating activities (-)
      - *Secondary schools (+)*
      - City (-)
    - Transition to higher order births
      - City (-)
- **Results vary with type of community data**
  - Differences larger between extreme situations
    - Due to larger differences in values of community variables
  - Differences more pronounced for first births than for higher-order births
    - Due to higher % of missing community data for first births than for higher-order births