Adult mortality & household characteristics in rural South Africa: Implications for natural resource use & development*

Wayne Twine
University of the Witwatersrand, South Africa

Lori Hunter
University of Colorado at Boulder, USA

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Study area

- South Africa
  - Mpumalanga Province
  - Bushbuckridge district
  - Agincourt Demographic Surveillance Site
  - 21 rural villages
Introduction

• Two important population and environment trends in rural sub-Saharan Africa:
  – HIV/AIDS
  – Environmental change
• Adult mortality due to AIDS is becoming an increasingly important household shock
• Natural resources are important in rural livelihoods and serve as a buffer against household shocks (e.g. meeting energy & dietary needs or providing opportunity for generating income)
• Adult mortality in the era of HIV/AIDS:
  – AIDS is leading cause of mortality in prime-age adults (15-49 years) in Sub-Saharan Africa

  – Southern Africa: “epicentre” of the pandemic (27.9% prevalence in antenatal clinic attendees in 2003)
Methods

Research Questions

1) Associations between household use of natural resources and household characteristics?

2) Association between prime-age adult mortality and household use of key natural resources?

3) Implications for development in the context of rising AIDS mortality among poor rural communities?
Research design

• Three data sources:
  1) Agincourt Health & Population Unit DSS: sample selection & modelling

  2) Survey (n=248; stratified by mortality experience: 124 prime-age adult mortality in last 2 years, 124 no adult mortality in last 2 years)

  3) Interviews (n = 30; all mortality)
Survey questionnaire

• For fuelwood and water:
  – Availability, proximity
  – Collection strategies
  – Time allocation
  – Level of use, types of use

Interviews

• Impact of the loss of an adult member on general use natural resources in coping strategies
Results

1. Quantitative models: household characteristics, adult mortality & household use of fuelwood & water

2. Qualitative descriptions: impacts of adult mortality on household resource use
Model coefficients for fuelwood (*p<0.05; **p<0.01; - ns)

<table>
<thead>
<tr>
<th></th>
<th>HH size</th>
<th>Sex ratio</th>
<th>Old age structure</th>
<th>SES</th>
<th>Adult mortality</th>
<th>Adult mort. X SES</th>
<th>Years since mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use fuelwood</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.39*</td>
<td>-0.83*</td>
<td>-</td>
</tr>
<tr>
<td>Kg wood/day (summer)</td>
<td>-</td>
<td>1.92**</td>
<td>2.64*</td>
<td>0.99*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kg wood/day (winter)</td>
<td>-</td>
<td>1.93**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male head harvests</td>
<td>0.18**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.84*</td>
<td>-</td>
<td>-0.89**</td>
</tr>
<tr>
<td>Female head/ wife harvests</td>
<td>-</td>
<td>-1.42*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Use electricity (cooking)</td>
<td>-0.10*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>
### Model coefficients for water

(*p<0.05; **p<0.01; - ns)

<table>
<thead>
<tr>
<th></th>
<th>HH size</th>
<th>Sex ratio</th>
<th>SES</th>
<th>Years since adult mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily consumption</strong></td>
<td></td>
<td></td>
<td>-6.24**</td>
<td>-</td>
</tr>
<tr>
<td>(litres winter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Time to collect</strong></td>
<td></td>
<td></td>
<td>-11.28*</td>
<td>-</td>
</tr>
<tr>
<td>(minutes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Male head collects</strong></td>
<td>-0.13*</td>
<td>0.53**</td>
<td>-</td>
<td>-0.70*</td>
</tr>
<tr>
<td><strong>Female head/ wife</strong></td>
<td></td>
<td>-0.37**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>collects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Daughter collects</strong></td>
<td></td>
<td></td>
<td>-0.26*</td>
<td>-</td>
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</tbody>
</table>
From interviews

- Shifts in household resource use strategies varied by role of the deceased in the household economy.
  - Loss of resource collector
  - Loss of wage earner
Loss of Resource Collector

- Impacts primarily on time allocation
- Children often bear increased burden

"instead of studying the child would have to collect fuelwood after school."
Loss of Wage Earner

• Collection often substituted for previously purchased goods: Fuelwood, cultivated & wild foods

“I used to buy some wood, but now I must do that with my own hands”

 “[we have] stopped purchasing [food] because you only do that when you have money…sometimes we buy [food] but most of the time we rely on the garden”

 “there is a big change now because we no longer have food, we just get assisted by the relatives… and we depend more now in the field [for collecting wild vegetables]”

 “Locusts are now our beef”
Policy implications

1. Natural resource management
   - HIV/AIDS: ↓ population growth BUT ↑ in household use of resources
   - Natural resources: important “buffers” for households impacted by AIDS, particularly for poorer households
   - Biomass energy will remain primary energy source in an era of HIV/AIDS
   - Support needed for local management of natural resources
   - Interventions needed to ↑ resource supply & ↑ resource use efficiency
2. Rural development
   - Rural energy: address economic barriers to affordable electricity for cooking
   - Food security: support for low-input agriculture and use of wild foods

3. Public health
   - Declining resource stocks: health consequences, especially for immuno-compromised household members e.g.
     • Loss of nutritional benefits of wild foods
     • Increased smoke inhalation from use of “green” wood
Conclusion

- HIV/AIDS & environment interact in complex ways via changes in household structure, livelihoods & coping strategies
- Environment needs to be integrated into HIV/AIDS scholarship & interventions