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HIV/AIDS epidemic and Agriculture in sub-Saharan Africa

• Epidemic will have large effects on agriculture and rural welfare
• Role for Ag Economists
  – Anticipate micro and macro-level consequences
  – Anticipate implications for mitigation strategies and rural development
• Need for empirical information
  – Which individuals and HHs suffer from morbidity and mortality
  – How affected HHs respond
Current Understanding of HIV/AIDS’ Effects on Rural Households:

Theoretical literature

- Prime-age adult mortality leads to reduction in available HH ag labor:
  - HH reduces area cultivated
  - HH shifts toward less labor-intensive crops, away from higher-value crops
- HH loses non-farm income sources
- Depletion of assets; loss of knowledge and land rights
- IMPLICATION:
  - Severe income and asset poverty among affected HHs
  - Respond with labor-saving ag technology and food aid

Micro-level empirical literature

- Case studies & regional sample surveys
  - Often not quantitative or representative
  - Targeting high HIV prevalence areas limits extrapolation
  - Little attention to non-affected population or to counterfactuals
  - Limited for measurement of characteristics of affected individuals or HHs and effects of HIV-mortality
Literature which predicts/finds heterogeneous effects

- Effects on rural households predicted/found to vary depending upon:
  - Labor requirements of cropping system, population density, local labor market size (Barnett)
  - % change in HH labor (Dorward)
  - Household position and gender of the deceased individual (Yamano & Jayne)
  - Initial HH income/asset level (Yamano & Jayne; Drimie; Dorward)

Paper Objectives

1. Use large sample representative household survey to develop better micro-level understanding of affected individuals and households
2. Identify implications for design of HIV/AIDS mitigation and rural development policies
Methods

- Add demographic and mortality component to ongoing nationally representative rural HH surveys
  - Ask HHs about individuals who died over past 3-4 years; cause of death (illness), symptoms, etc.
  - Use death of prime-age adult (age 15-49) by illness as rough proxy of HIV/AIDS death
- Cross-sectional data, longitudinal data where possible
- Undertaken with agricultural sector funding

Countries studied

- Malawi (1990, 2002)
- Mozambique (2002)
- Zambia (2000)
Methods

• Compare ex post HH composition, land use, and income
  – affected vs non-affected HHs
• Relate findings to results from analysis of impacts of adult mortality
  – Rwanda: Donovan and Bailey (2005)

Methods: Challenges/Caveats

• Household dissolution due to AIDS-related mortality could bias results
  – Low household attrition rates
    • 5.6% (Kenya 1997-2000)
    • 14% (Malawi 1990-2002)
• Results here are short-run
  – Prime-age death occurred one to four years prior
  – Longer-term effects could be worse, especially for HHs headed by widows/widowers
• Inter-household effects not captured
Finding #1: Majority of deceased prime-age adults are not heads/spouses

- % of prime-age deaths due to illness which are household heads/spouses:
  - 54% Malawi, 49% Rwanda, 46% Zambia, 44% Kenya, 27% Mozambique

- Magnitude of effect of prime-age death on rural HH income conditioned by:
  - gender & household position of deceased individual (Yamano & Jayne)
  - initial HH income/assets (Yamano & Jayne; Drimie)

Finding #2: Affected HHs do not uniformly have less ex post PA labor than non-affected HHs

- Mean ex post no. of PA adults similar. Why?
  - Some affected HHs attract new PA members
    - more likely in the case of female death
  - Some affected HHs have more PA members ex ante
    - more likely in case of non-head/spouse death

- Yet HHs with ‘head/spouse’ death have lower ex post mean no. of PA adults than non-affected HHs
Finding #3: Average affected HH has similar ex post land/labor ratios and total income to non-affected HHs

- Yet ex post income/capita is lower among HHs with a head/spouse death
- IMPLICATIONS:
  - Questions usefulness of homogeneous conceptualization of ‘affected households’
  - Targeting of food aid or other assistance should be based on which affected HHs are most in need
    - those with head/spouse death, especially male

Cropping systems

- Is HIV/AIDS causing shifts from high-value crops to roots/tubers?
- Macro evidence shows aggregate shifts
  - Decline in area cultivated to maize & increase in roots/tubers in eastern and southern Africa
  - Related to recent crop and input policy changes which have affected relative profitability of grains vs other crops
  - Also related to HIV/AIDS?
Finding #4: Mixed evidence on effect of adult mortality on cropping systems

- **Ex post comparison**
  - Similar *ex post* % of area cultivated to roots & tubers between affected and non-affected HHs
  - Yet higher *ex post* % among HHs with head/spouse death

- **Impact analysis**
  - Death of male head/spouse -- reduction in cash crop area (Kenya)
  - Death of female head/spouse -- reduction in cereal crop area (Kenya)
  - Illness or death of PA adult -- reduction in coffee production, increase in sweet potato production (Rwanda)

**IMPLICATION #1**: Where gender is a main determinant in activity/crop participation, loss of participating adult (male) may leave HH without access
  - Need to address gender bias in ag production and marketing knowledge

**IMPLICATION #2**: Questions blanket recommendations of prioritizing labor-saving ag technologies (LSTs) for ‘affected households’
  - Ag labor may not necessarily become the limiting constraint to ag production
  - Higher returns to investing in LSTs for domestic tasks (water/fuel gathering, cereal processing)
Conclusion-1

• Mitigation strategies:
  – heterogeneity of affected HH ex post assets and income demonstrates need to improve understanding of which HHs are hardest-hit
  – Social safety nets needed to protect hardest-hit

• Resources are limited -- What is appropriate balance between:
  – Investing in Long-Term Productivity (e.g. education, ag. technology, market infrastructure)
    vs.
  – Investing in targeted assistance and technologies to AIDS-affected households and communities

Conclusion-2

• ‘Good development practice’ could improve welfare of both affected and poor non-affected households (Rural development / Mitigation):
  – Improved land tenure
  – LSTs for water/fuel, food processing
  – Redressing gender bias in crop marketing & education
  – Development/dissemination of improved food crop varieties
Recommendations for Future Empirical Research

- Insights possible by combining demographic, mortality, production, income and related data from representative sample and comparing affected and non-affected hhs

- Time-use studies of rural adults and children
  - vital for cost-benefit assessment of alternative LSTs

- Investigate linkages between affected HHs and communities
  - Financial/in-kind support from social network
  - indirect effects of HIV/AIDS
  - how HIV/AIDS affects social support networks

Finding #1: Head/Spouse deaths represent a minority of overall prime-age deaths
Finding #1b: Support for Method Used: Panel Data Show Low Household Dissolution Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Panel Survey Time Period</th>
<th>Attrition Rate (%)</th>
<th>% attrition HH that dissolved due to death (%)</th>
<th>% total sample HH that dissolved (%)</th>
<th>% total sample HH with PA death (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>1997-2000 (4 years)</td>
<td>5.6</td>
<td>11</td>
<td>0.6</td>
<td>5.8</td>
</tr>
<tr>
<td>Malawi</td>
<td>1990-2002 (13 years)</td>
<td>14</td>
<td>13</td>
<td>1.8</td>
<td>17.1</td>
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<tr>
<td></td>
<td>2000-2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rwanda</td>
<td>2000-2002 (3 years)</td>
<td>4</td>
<td>12.5</td>
<td>0.5</td>
<td>6.0</td>
</tr>
</tbody>
</table>

* Kenya HH dissolution includes all causes