COVID-19, household resilience, and rural food systems in low-income countries

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Motivation & Background

- COVID-19: a ‘new’ shock, but sadly familiar mechanisms of impact on the rural food system and household food security
- Development resilience is a useful (and increasingly common) lens for examining these mechanisms and impacts
- Food system framing is also highly pertinent
  - Interconnected ecosystems => multiple entry points for shocks
  - Feedback over space – ‘telecoupling’ (Liu et al. 2021) as policy responses have far-reaching effects
  - Feedback across scales – household, market, community, national, etc.
  - Indirect impacts can exceed direct impacts
- Clear evidence that food security has suffered over the course of the pandemic, across contexts; though pathways diverse and complex
Motivation & Background

• We harness high-frequency household panel data from rural areas in Malawi, Madagascar and Kenya to examine food security resilience over the course of the pandemic, and the underlying mechanisms.

• While not causal, we show how a seemingly unique, shock like COVID-19 has played out in distressingly familiar ways.

• Reinforce the need to improve our understanding of resilience to a wide variety of shocks.
Conceptual Framework

• Resilience studies tend to focus on specific shocks; however, often the mechanisms are common across different types of exogenous shocks
  – E.g., multiple exogenous shocks cause food price hikes

• We frame COVID-19 – and associated global to local policy responses – in terms of the most pertinent shock mechanisms

• For “resilience,” simplify with a focus on food security and its stability over time (following Upton et al. 2018)
  – Four dimensions: Availability, Access, Use, Stability – all subject to shared or separate impacts
Conceptual Framework
## Contexts and Data: Sample Sizes & Locations

<table>
<thead>
<tr>
<th>Country</th>
<th>Start Date</th>
<th>Region</th>
<th>District</th>
<th>Households Sampled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malawi</td>
<td>September 2017</td>
<td>Southern</td>
<td>Chikwawa</td>
<td>750</td>
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<td>Nsanje</td>
<td>750</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Blantyre Rural</td>
<td>750</td>
</tr>
<tr>
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<td></td>
<td>2250</td>
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<tr>
<td>Madagascar</td>
<td>July 2018</td>
<td>Androy</td>
<td>Tsihombe</td>
<td>364</td>
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<td></td>
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<td>Beloha</td>
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<td></td>
<td>601</td>
</tr>
<tr>
<td>Kenya</td>
<td>March 2020</td>
<td>Western</td>
<td>Homa Bay and</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kisumu Counties</td>
<td>90</td>
</tr>
</tbody>
</table>

- Data collected monthly; in Madagascar and Malawi with community-based enumerators, in Kenya by phone
- Data from Malawi and Madagascar collected by Catholic Relief Services as part of the Measurement Indicators for Resilience Analysis (MIRA) project, supported in large part by USAID
- Kenya data collection supported by the Cornell Atkinson Center for Sustainability (COVID-19 Rapid Response Fund)
Contexts and Data: COVID-19 & Policy Response

COVID-19: Stringency Index
This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.

OurWorldInData.org/coronavirus • CC BY
Food Security: Availability, Access, Use, Stability

**Malawi**

- Appeared if anything better than prior years (due to good harvest);
- But causal analysis (Upton et al., under development) reveals coping strategies worse than should have been, especially for the previously worst off.

**Madagascar**

- Very difficult year (failed harvest); dietary diversity in particular extraordinarily poor, with timing suggestive that COVID-19-related mechanisms exacerbated impacts of the poor harvest;
- Coping strategies similar to prior years, though as in Malawi, made “more worse” for the previously worst off.

**Kenya**

- Situation less grave over all; but, increased coping strategies from March to June, then returning to pre-pandemic norm (confounded by harvest timing and flooding);
- Reduced movement restrictions, while increasing illness rates/concerns, also associated with stabilizing coping strategies.
Meso-level Mechanism 1: Health Shocks

• Direct concerns: COVID-related morbidity and mortality, and health system capacity constraints
  – Health system capacity constraints leading to excess morbidity / mortality from other causes

• Less direct: concern / fear of infection (real or perceived) can influence behavior, and lead to damaging effects
  – Changes in health-seeking behavior could likewise diminish health access, lower vaccination rates for other diseases, etc.
Meso-level Mechanism 1: Health Shocks

• Comparisons over 2-3 years in Madagascar and Malawi reveal no change in reported incidence of illness
  – Suggest little direct COVID-19 infection (to date); but, evaluating direct effects could / would be confounded by already high and heterogeneous burden of disease

• Evidence indeed that *fear* has had important (health and economic) impacts across countries
  – In Kenya, 25-50% of households express fear of COVID-19 infection and/or control measures

• Data insufficient to assess excess non-COVID morbidity / mortality; but, many reports in Malawi of *decreased* over-all use of health facilities for routine and other non-COVID needs
  – State fears of infection, and more recently hesitancy regarding the COVID-19 vaccine
Meso-level Mechanism 2: Mobility Restrictions

• Natural disasters often disrupt mobility for extended periods (Hallegatte et al. 2016)
  – Dominant implications are market disruption, price shocks, and human capital reductions due to disruptions to schooling (Béné et al. 2021)

• In conflict settings, fear leads to similar effects; for example, disruptions to livestock trade in N. Kenya, Somalia, Darfur; disruption to schooling (Gates et al. 2012); change in crop profiles / economic behavior (Rockmore 2020)
Meso-level Mechanism 2: Mobility Restrictions

- Madagascar, formal internal restrictions limited, but a combination of economic depression and fear led to a spiraling effect
  - Policy uncertainty + fear of diseases + restricted opportunity = > transit unavailable
  - MORE households reporting this long after the formal restrictions ceased

Reported impacts of the pandemic, April 2020 – March 2021, Madagascar
Meso-level Mechanism 3: Employment Disruptions

• While large covariate shocks do limit individual earning capacity (e.g. de Waal & Whiteside 2003), indirect labor-market effects are often more widespread (Devereux 2007, and others).

• Initial focus in COVID-19 was on direct income effects for wage earners / businesses affected, such as in the service industry (e.g. Adjognon et al. 2021).

• However, wage earners and piece-workers – in many cases employed by those with affected businesses – make up more of the poorest populations (Egger et al. 2021).
Meso-level Mechanism 3: Employment Disruptions

- In Kenya, notable trend to work less to avoid infection, with peaks coinciding with COVID-19 infection waves.
- Malawi, the vast majority (~80%) report income reduced “due to the pandemic”; some from business closures, the majority from unavailability of low-wage/piece work jobs.

![Graph showing worked/earned less to avoid infection (%) with COVID-19 infection/death peaks indicated.](image-url)
Meso-level Mechanism 4: Price Shocks

• Globally, food price implications are ambiguous

• Transit shocks likewise are likely to depress prices in high production areas, but inflate them for imports

• Madagascar: COVID-19 acted as a conflict situation, on top of a poor harvest
  – Imported rice most impacted
  – Livestock prices, meanwhile, dropped; pinching households from both sides
Conclusions

• Examining *mechanisms* behind the COVID-19 shocks highlights the recurring theme of structural deprivation in low-income, rural communities

• Intermediate pathways have dominated their experience of the shock for many households
  – Health shock has not dominated for many households (but this could change)
  – Food insecurity indicators fluctuate significantly over time in these communities; things haven't gotten uniformly worse, underscoring that the pandemic is not the only important factor at hand

• Governments face challenge of redressing and rebalancing exposure to shocks in real time – involves complex trade-offs for which shocks affect whom and where (rural, urban)
  – Need to monitor both households and system-level indicators, watching for any of a wide range of shocks or new stressors that might disrupt the delicate equilibria
  – Shoring up meso-level mechanisms that intermediate between covariate shocks and households' food security status is crucial not just to pandemic response but to building household- and systems-level resilience broadly
Thank you!

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