Mobility and Migration during COVID-19
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Using research to design COVID-19 policies in developing countries

**High Frequency Data Collection**
- Symptom prevalence
- Public health behavior & knowledge
- Income shock, food insecurity
- Risk Exposure - migrants

**Info Campaigns & Social Influence**
- Personal appeals - social networks
- Community leaders (imams, teachers)
- A/B testing – incentives, identity, messaging content.
- Scale effective strategies via govt, telcos

**Migration Data to Identify Hotspots**
- Migrants as Disease Vectors
- Identify districts and upazilas at risk
- Losses in remittance revenues
- International transmission risk

**Econ-Epi Modeling**
- Add economic and behavioral factors to epidemiological models
- Discipline with country data
- Provide specific policy guidance for LMICs

**Specific Sectors & Interventions**
- RMG Sector - Survey managers
- Produce and distribute masks
- Effects of cash distribution
- Encouraging harvest workers

**Targeting of Social Protection**
- How should we target cash transfers?
- How do we identify beneficiaries?
- Combine telecom records with detailed survey data
- Use machine learning

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[http://yrise.yale.edu/covid-19/](http://yrise.yale.edu/covid-19/)
Executive Summary

- Remittances of migrant workers are an important source of income for households in South Asia
- Migrant sending households have experienced a sharp decline in income
- Return migration is associated with COVID-19 symptoms
- Returning migrants face stigma but the impact cannot be systematically evaluated

Policy Implication

WB estimates a 22% drop in remittances in South Asia
Bangladesh only collected 1.08 billion USD in April 2020, a 25% drop from last year
Households with return migrants worst hit by the pandemic
Ensuring that households that rely on remittances meet their basic need should be a priority

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Policy Implication

Households with return migrants are among the worst hit by pandemic
Ensuring they meet their basic need should be a priority
Samples studied:

**Government to Government (G2G) Visa Lottery**
- Sample of households that participated in a visa lottery which awarded visas for Bangladeshis to work in Malaysia

**Cox’s Bazar Panel Survey**
- Representative sample of both refugees and Bangladeshis living in the refugee affected Cox's Bazar district of southern Bangladesh.

**Nepal Seasonal Migration**
- Poor households in Western Nepal, both in the terai and in the hills
Dramatic drop in labor income in the Rohingya refugee camps and surrounding host communities in Cox’s Bazar, Bangladesh

Observed trends:

Refugees
- In 2019, 45% of men and 4% of women were employed past 7 days
- As of April 9% of men and <1% of women were employed

Hosts
- In 2019, 74% of men and 26% of women were employed past 7 days
- As of April 22% of men and 4% of women were employed

Economic impact of COVID on refugee and host communities
Remittance income has declined for migrant sending households

**Observed trends:**

**Nepal**
- Households in Western Terai received an average of 4900 NPR in late 2019
- This fell to 1,700 NPR last month

**Bangladesh**
- Winners of visa lottery, indicative of high migration, experienced a 31% drop in income

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Observed trends:

- Because many migrants were forced to return
- Both from India and from cities in Nepal
...and also because those still away are sending less money back

**Observed trends:**

- Migrants still away are also sending less money back home
- Drops from ~Rs. 3900 to Rs. 1200

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Incomes of international migrants families have dropped more than incomes of non-migrant families

<table>
<thead>
<tr>
<th>Group</th>
<th>2019 Log Income</th>
<th>2020 Log Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 Malaysia Visa</td>
<td>10.22</td>
<td>8.88</td>
</tr>
<tr>
<td>Lottery Winners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lottery Losers</td>
<td>10.04</td>
<td>9.25</td>
</tr>
</tbody>
</table>

Replace this graph if possible – no axis label
Returnee Presence is associated with COVID-19 symptoms

- Strong correlation between returning migrants and self-reported common COVID-19 symptoms
- In both Cox’s Bazar and visa lottery samples, likelihood of reporting symptoms at least doubles for households reporting a returning migrant

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EXECUTIVE SUMMARY

Inadequate COVID-19 testing capabilities is producing testing data that cannot be reliably compared across countries or across jurisdictions within low- and middle-income countries (LMICs). This is hampering the ability of LMICs to devise timely and effective policy responses, such as identifying hotspots and spatially targeting public health responses or economic relief. Data deficiencies also hamper global resource allocation. International bodies such as the World Health Organization need comparative information on disease risk across countries, to be able to direct support to regions at greater risk.

We develop a methodology to make indirect inferences about the spatial distribution of COVID-19 risk using the migration destination. We construct an index of COVID-19 risk exposure for every country, using the number of emigrants from that country to COVID-affected destinations to infer the likelihood that return migrants are now bringing back the disease to each 'home' country.

2. We validate this COVID-19 exposure index by comparing it to the number of confirmed COVID-19 cases through testing, as well as to the number of COVID-deaths (given the aforementioned limitation of testing data). There are strong positive correlations between our index and both confirmed cases and deaths, in the order of $10.66$ to $10.72$. The strong correlation across all our index and exposure.
Bangladesh COVID-19 Risk Exposure (by cases), Distress Calls, and Total Quarantines by District

Legend

Exposure Index (Log-CAAB) Distress Call Total Quarantines

- 1.000 - 1.550 11 - 430 165 - 782
- 1.260 - 2.419 400 - 860 760 - 1406
- 2.419 - 3.077 801 - 1290 1410 - 2036
- 3.077 - 4.735 1291 - 1730 2037 - 2663
- 4.735 - 5.854 1731 - 2184 2664 - 3306
- 5.854 - 7.053 2195 - 2659 3251 - 4296

N.B. CAAB Data is used for calculating the COVID-19 Risk Exposure Index at the District Level.

Bangladesh COVID-19 Risk Exposure (by cases), Distress Calls, and Total Quarantines by Sub-District

Legend

Exposure Index (Log-BMET) Distress Calls

- 0.0000 - 0.079 1 - 114
- 0.079 - 0.419 115 - 238
- 0.419 - 0.945 229 - 330
- 0.945 - 1.380 340 - 421
- 1.380 - 1.831 450 - 504
- 1.831 - 1.831 550 - 676

N.B. BMET Data is used for calculating the COVID-19 Risk Exposure Index at the Sub-District Level. No data is available on sub-districts which are white. Sub-district names only provided for highest risk category.
THE PHILIPPINES COVID-19 RISK EXPOSURE (BY CASES), BY MUNICIPALITY

LEGEND
Exposure (Log-Cases)
-11.128 - 6.947
-4.946 - -3.121
-4.150 - -3.440
-3.439 - 0.340

COMPARING FILIPINO INDEX WITH CONFIRMED CASES (PROVINCE LEVEL)

N.B. Administrative Data is used for calculating the COVID-19 Risk Exposure Index at the Municipality Level. Names are provided only for the highest risk category.
Validation with International Case Data
Research Team: Reshad Ahsan (Melbourne) Kazi Iqbal (BIDS), Mahreen Khan (MIT), Mushfiq Mobarak (Yale), Abu Shonchoy (FIU)

Figure 2: COVID-19 exposure and actual confirmed cases

(a) No controls
(b) Social-distancing Controls