

Is poverty in Myanmar on the rise?

Poverty predictions from Google mobility data

The severe economic impacts of COVID-19 on Myanmar's economy have been accentuated by the recent political instability. In this note, we present the most recent evidence on changes in Google consumer mobility data, since these are leading indicators of changes in household income, and use a previous econometric model linking mobility indices to survey-based household poverty to predict what may be happening to poverty in Myanmar in 2021.

Key findings

- Consumer mobility fell sharply during the peak of Myanmar's second COVID-19 wave (September and October 2020) but started to improve from October to the end of January 2021, signaling a gradual economic recovery. However, from February 1 onwards, consumer mobility again declined markedly with retail and workplace mobility falling to their lowest levels at 80 percent below pre-COVID-19 mobility levels.
- Consumer mobility in Myanmar is also far below that of Thailand, suggesting more serious economic impacts in Myanmar. Trends in Yangon and Mandalay are similar.
- The Rural-Urban Food Security Survey (RUFSS) found that income-based poverty in January 2020 was only 7 percent in the Yangon sub-sample and 22 percent in the rural Dry Zone sub-sample. However, the RUFSS panel for June-November 2020 found that poverty rose sharply throughout the year, averaging over 60 percent by October 2020 in both the rural and urban samples.
- The statistical model linking changes in income-based poverty in RUFSS to changes in regional consumer mobility predicts that poverty likely declined from November 2020 (the last RUFSS round) to January 2021 but increased markedly from February. Predicted poverty was 40 percent in Yangon in January but rose to 50 percent by mid-April 2021. In the rural sample, it rose from 53 percent in January to 61 percent by mid-April 2021.
- There are important caveats to these predictions, including use of an income-based poverty measure, sensitivity to the mobility index used, statistical uncertainty, representativeness, disruption to mobile phone services, and widespread migration.

Recommended actions

- It is critical for development partners and civil society organizations to find resources and modalities to deliver social protection to Myanmar's vulnerable populations.
- Given the adverse impacts of political instability on consumer mobility and predicted poverty, a peaceful resolution to the conflict could potentially result in a rapid economic recovery.
- Development partners need to continue investing in ICT-based data collection, including household and firm surveys, to quickly assess the rapidly evolving economic situation.

Introduction

A range of simulation and survey evidence showed that COVID-19 had severe impacts on Myanmar's economy in 2020, the most concerning of which were rising income-based poverty and food insecurity.¹ From June–November 2020, the Myanmar Agriculture Policy Support Activity (MAPSA) implemented the COVID-19 Rural-Urban Food Security Survey (RUFSS) and found that incomes had declined sharply among a sample of households in urban Yangon and the rural Dry Zone. An income-based poverty measure of whether a household earned less than \$1.90 per day in the past month showed worrying trends in both samples. Poverty in the urban sample rose from just 7 percent of households in January 2020 to 60 percent in October and November 2020. In a rural sample more affected by seasonality, income-based poverty was 25 percent in January 2020 and reached 65 percent by October and November 2020. These dire economic trends in the two samples were consistent with microsimulation predictions by another MAPSA study,² as well as with a nationally representative telephone survey implemented in late 2020.³

While the serious second wave of COVID-19 infections from August 2020 onwards signaled a slow economic recovery, the political instability starting from 1 February 2021 has translated into economic instability and uncertainty, with widespread business closures, reduced investment, financial disruptions, major barriers to international and domestic trade, and, most recently, significant migration from urban to rural areas. Although the broad scale of economic turmoil is readily apparent, the impacts of the current political crisis on household poverty remain uncertain in the absence of any recent survey evidence. However, international agencies are deeply concerned about a mounting humanitarian crisis, with the World Food Programme estimating that an additional 1.5 to 3.4 million people could become food insecure in 2021.⁴

Given the critical knowledge gap regarding the economic impacts of the ongoing political instability in Myanmar, this note uses statistical results from a previous analysis that linked changes in income-based poverty from the RUFSS data to changes in Google mobility data for Yangon and Mandalay.⁵ That study showed that high-frequency Google mobility data from 2021 at the municipal level were strongly predictive of household poverty trends in a 2020 household panel, suggesting that the mobility-poverty relationship could be used to make out-of-sample predictions on poverty trends in 2021. In this note, we report trends in various Google mobility indices at the national level as well as separately for Yangon and Mandalay, and provide an international comparison between Myanmar and Thailand, which has also experienced COVID-19-related economic shocks and some degree of political instability in recent months.

Using recent Google mobility data with the statistical model established in the previous analysis, we then estimate trends in income-based poverty using the \$1.90 per day poverty line in the RUFSS urban Yangon and rural Dry Zone sub-samples. The evidence points to sharply rising household

¹ Brancati, E., Minoletti, P., Win, N., Hein, A., Rimbau, G. 2020. *Coping with COVID-19: Protecting lives, employment, and incomes in Myanmar*. Final Report. Yangon: International Growth Center.

Diao, X., Aung, N., Lwin, W.Y., Zone, P.P., Nyunt, K.M., Thurlow, J., 2020. *Assessing the impacts of COVID-19 on Myanmar's economy: A Social Accounting Matrix (SAM) Multiplier approach*. Myanmar SSP Working Paper No 01. Yangon: IFPRI.

Headey, D., Goudet, S., Lambrecht, I., Oo, T.Z., Maffioli, E.M., Field, E., Toth, R., 2020. *Poverty and food insecurity during COVID-19: Phone-survey evidence from rural and urban areas of Myanmar*. Myanmar SSP Working Paper 03. Yangon: IFPRI.

Headey, D., Oo, T.Z., Mahrt, K., Diao, X., Goudet, S., Lambrecht, I., 2020. *Poverty, food insecurity, and social protection during COVID-19 in Myanmar: Combined evidence from a household telephone survey and micro-simulations*. Myanmar SSP Policy Note 35. Washington DC: IFPRI.

² Diao, X., Mahrt, K., 2020. *Assessing the impacts of COVID-19 on household incomes and poverty in Myanmar: A microsimulation approach*. Myanmar SSP Working Paper 02. Washington, DC: IFPRI.

³ CSO (Central Statistical Organization) and UNDP (United Nations Development Program). 2020. *Household Vulnerability Survey Key Findings: Rapid assessment of the economic impact of COVID-19 restrictions on vulnerable households*. Yangon: CSO & UNDP.

⁴ WFP (World Food Programme). 2021. *Myanmar: Analysis of the Economic Fallout & Food Insecurity in Wake of the Takeover*. Yangon: WFP

⁵ Headey, D., Cho, A., Lambrecht, I., Maffioli, E.M., Toth, R., 2021. *Consumer immobility predicts both macroeconomic contractions and household poverty during COVID-19*. IFPRI Discussion Paper 2002. Washington DC: IFPRI.

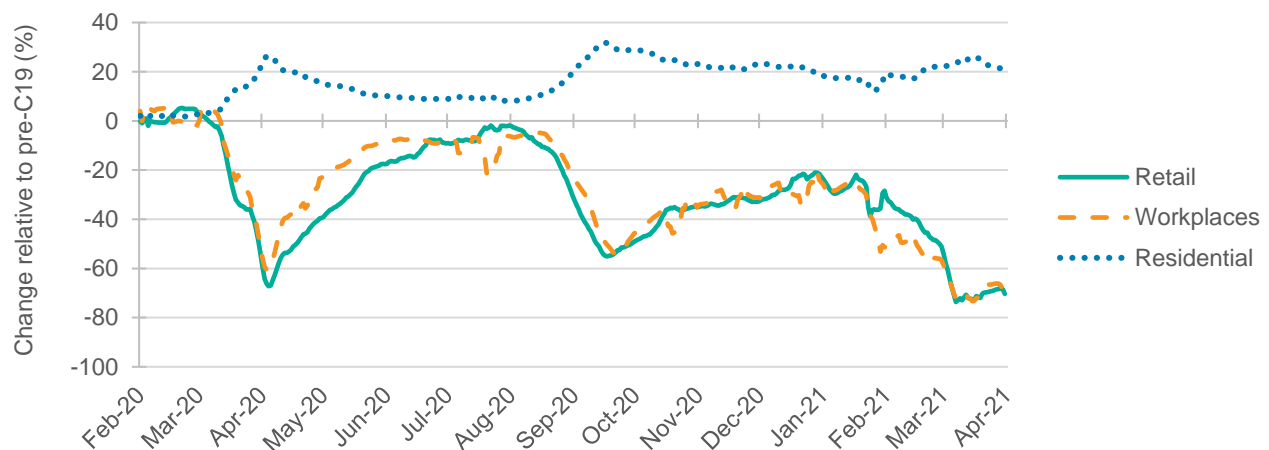
poverty in the wake of recent political instability. Indeed, we estimate that income-based poverty is now higher than it was at the peak of the second wave of COVID-19 infections in September and October 2020. We conclude the note with a series of cautions about the uncertainty and external validity of these poverty predictions, as well as recommended actions in light of these findings.

Trends in Google consumer mobility indices

Since the onset of COVID-19, Google has publicly released various mobility indices based on anonymized smart phone data to measure how much consumer mobility has changed since a pre-COVID-19 baseline (January-February 2020). Google publishes six distinct indices corresponding to different kinds of consumer behavior, though in practice the indices are highly correlated. All indices combine measures of the number and duration of trips made by smart phone users.

Figure 1 present national-level trends in three mobility indices for Myanmar: retail (comprising retail and recreation, as well as grocery and pharmacy), workplace, and residential. The residential mobility index measures the extent to which consumers are staying at home and, therefore, is negatively correlated with the other indices. In our previous study, we referred to this as the stay-at-home index and argued that it was a very relevant composite indicator of the extent to which COVID-19 had suppressed normal economic activities.

Figure 1. Trends in Myanmar's retail, workplace, and residential mobility indices from February 2020 to mid-April 2021



Source: Authors' estimates from Google (2021) mobility indices.

Note: "Retail" refers to the average of two separate Google mobility indices: "Retail and recreation" and "grocery and pharmacy". "Residential" refers to the extent to which consumers are staying at home.

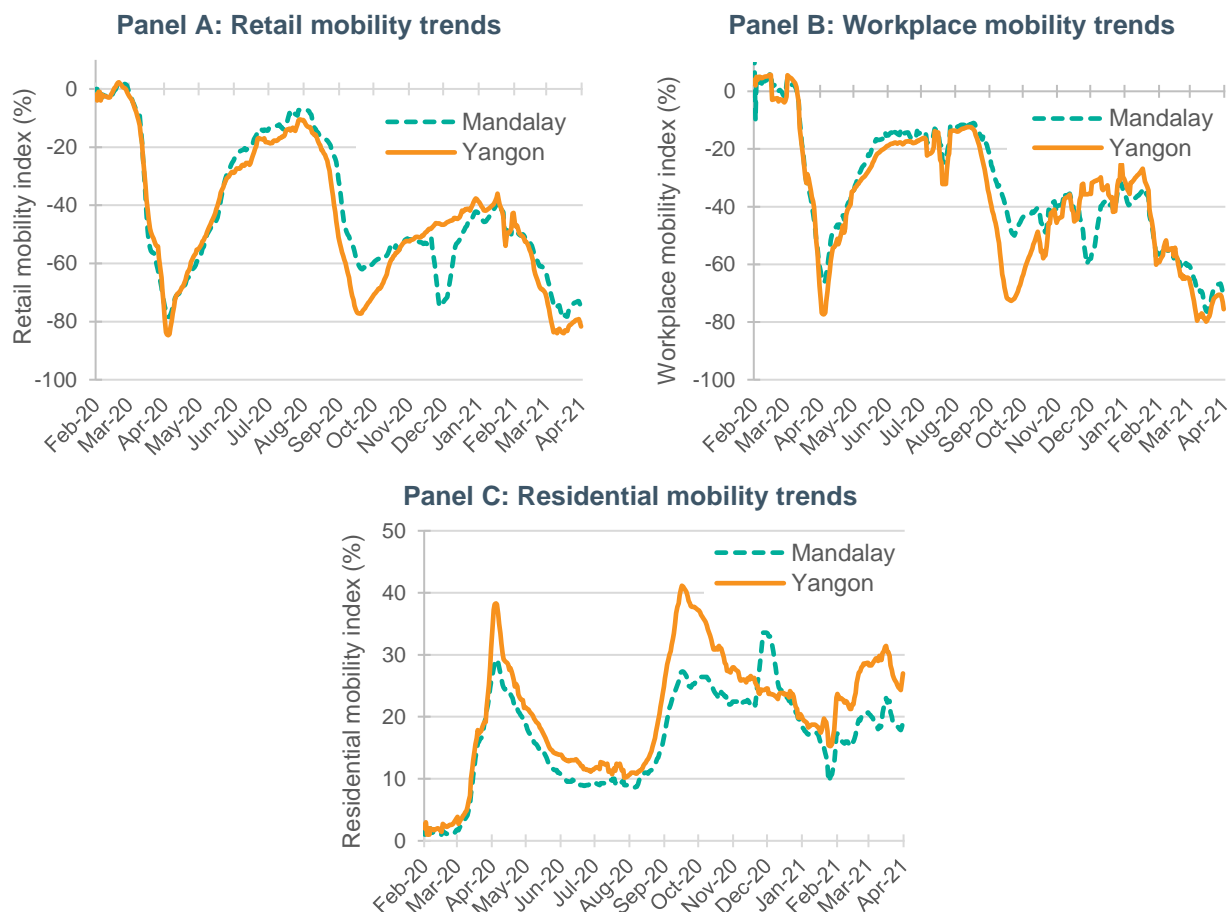
Figure 1 demonstrates three mobility waves in Myanmar. The first wave corresponds to the initial outbreak of COVID-19 in Myanmar and the associated lockdown, starting late-March 2020. Retail and workplace mobility declined by around 60 percent in mid-April, while consumers stayed at home around 30 percent more than usual. However, all three indices converged towards normal mobility patterns relatively quickly; by June 2020, retail mobility was almost back to baseline levels, while workplace mobility was around 10 percent below normal, and the residential stay-at-home index was 10 percent above normal.

The second and far more serious wave of COVID-19 infections that spread from Rakhine to the rest of Myanmar in August 2020 resulted in a second wave of mobility disruptions. Retail and workplace mobility fell 50 percent below the pre-COVID-19 baseline by October, while residential mobility peaked at 30 percent. The larger number of infections in the country during this second wave resulted in a much slower recovery in mobility, with the retail and residential mobility indices declining gradually from -50 percent to around -30 percent by January 2021.

However, the political instability from 1 February 2021 resulted in a third and unfinished wave of reductions in mobility, involving a rapid decline in retail and workplace mobility through February and March to 70 percent below pre-COVID-19 levels. The initially rapid decline in workplace mobility in February likely reflected widespread participation in the protest movement, although the further decline in March may suggest more widespread business closures and unemployment. Likewise, the decline in retail mobility is deeply worrying from an income and consumption perspective given the direct importance of the retail sector for urban employment and its indirect impacts on rural incomes through weaker urban demand for food products produced in rural areas. The increase in the residential stay-at-home index is more modest—about a 5 percent increase from 1 February to mid-April—though this indicator could potentially be underestimating the size of the consumer mobility shocks given that many individuals have engaged in protest movements and, more recently, migrated from major cities to rural areas.

Google provides subnational data only for metropolitan Yangon and Mandalay. In Figure 2, we compare mobility indices for these two cities. Overall, there is close correspondence between trends in the two cities. The only exception in recent months is a larger increase in the residential stay-at-home index in Yangon.

Figure 2. Trends in retail, workplace, and residential mobility indices in Yangon and Mandalay from February 2020 to mid-April 2021



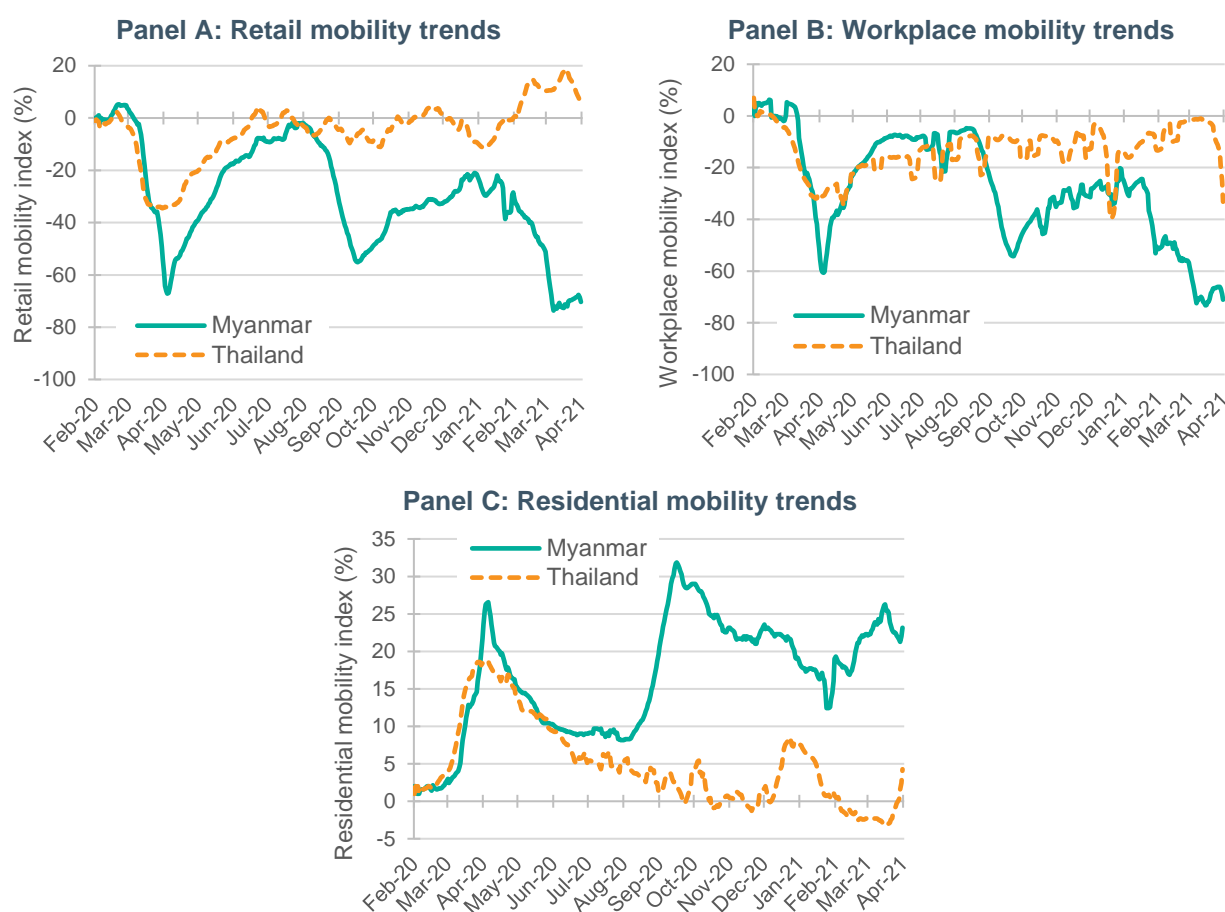
Source: Authors' estimates from Google (2021) mobility indices.

Note: "Retail" refers to the average of two separate Google mobility indices: "Retail and recreation" and "Grocery and pharmacy". "Residential mobility index" refers to the extent to which consumers are staying at home.

Finally, Figure 3 compares Google mobility index trends in Myanmar to neighboring Thailand. Thailand's economy has also faced severe economic shocks due to COVID-19 given its dependence on tourism, as well as several serious infection outbreaks, including in late March and early April

2021, and significant political instability. However, Figure 3 demonstrates dramatically different trends in the Google mobility indices for Myanmar and Thailand. Although retail and workplace mobility declined in Thailand in March and April 2020, these indices quickly returned close to baseline levels (i.e., near zero). Through mid-2020, the indices were comparable between Myanmar and Thailand, but from August onwards the mobility gap between Thailand and Myanmar extended quickly as Myanmar's second wave of infections hit. That gap was slowly closing between November 2020 and January 2021, but the political instability from 1 February 2021 widened it again. Overall, Figure 3 suggests that Myanmar's economy has been much harder hit than Thailand's by both COVID-19 and political instability, despite Thailand's higher dependence on international tourism.

Figure 3. Trends in the retail, workplace, and residential mobility indices in Myanmar and Thailand from February 2020 to mid-April 2021



Source: Authors' estimates from Google (2021) mobility indices.

Note: "Retail" refers to the average of two separate Google mobility indices: "Retail and recreation" and "Grocery and pharmacy". "Residential mobility index" refers to the extent to which consumers are staying at home.

Predicting poverty in urban Yangon and the rural Dry Zone from Google mobility indices

In an earlier research report, we showed that trends in 2020 Google mobility indices were highly predictive of macroeconomic outcomes during the pandemic—such as annual GDP growth in 2020 and quarterly growth in aggregate private household consumption—as well as household poverty trends computed from RUFSS.⁶ Specifically, we matched the Google mobility data for Yangon and Mandalay to the rural RUFSS sub-samples and estimated a simple ordinary least squares regression

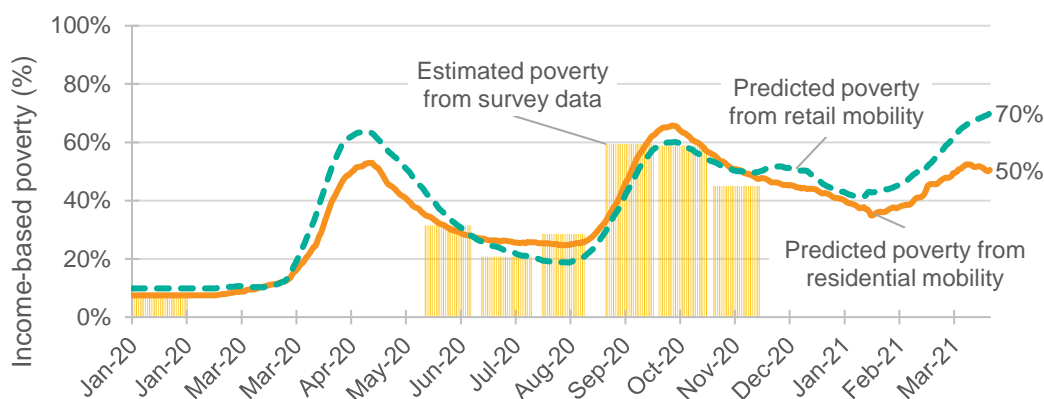
⁶ Headey, D., Cho, A., Lambrecht, I., Maffioli, E.M., Toth, R., 2021. Consumer immobility predicts both macroeconomic contractions and household poverty during COVID-19. IFPRI Discussion Paper 2002. Washington DC: IFPRI.

to understand how well income-based poverty was predicted by changes in mobility. We found that the residential mobility index was the single best indicator of poverty trends, explaining 22 percent of poverty changes in the Yangon sub-sample and 13 percent of changes in the rural Dry Zone sub-sample. Moreover, in both samples, a 10 percent increase in the residential mobility index predicted approximately a 16 percent increase in poverty.

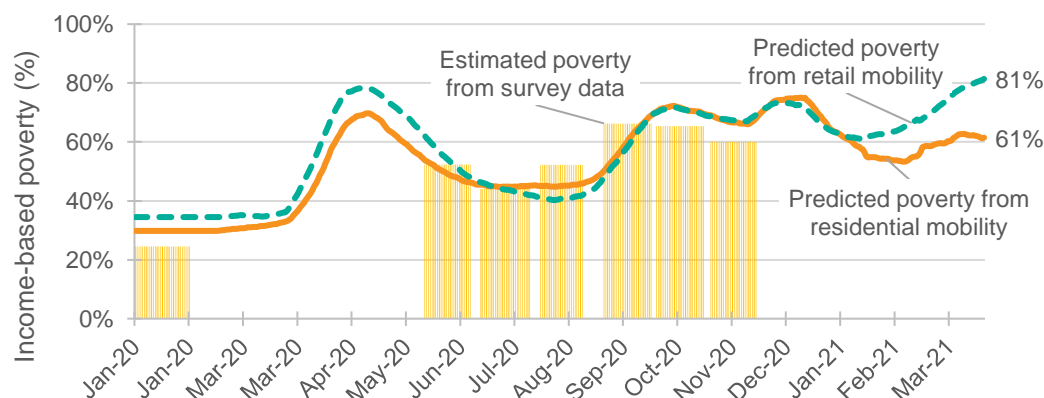
In Figure 4, we use this predictive relationship to forecast changes in income-based poverty in the two samples in 2021. Additionally, we explore the extent to which poverty predictions are sensitive to the choice of mobility indicator by using the retail mobility index to predict poverty.

Figure 4. Predictions of income-based poverty at the \$1.90/day poverty line in urban Yangon and the rural Dry Zone from regression fits of survey-based poverty to changes in the Google residential and retail mobility indices: January 2020–April 2021

Panel A: Urban Yangon sub-sample



Panel B: Rural Dry Zone sub-sample



Source: Survey-based poverty data are from the RUFSS panel. Poverty predictions are from Google (2021) mobility indices.
Note: "Retail" refers to the average of two separate Google mobility indices: "Retail and recreation" and "grocery and pharmacy".

The results strongly suggest that income-based poverty has risen sharply since 1 February 2021. In Panel A of Figure 4, the yellow bars report income-based poverty from the RUFSS panel, while the solid orange line reports poverty predictions from the residential mobility index and the dashed blue line from the retail mobility index. The bars show that income-based poverty in the urban sub-sample of the RUFSS panel was very low in January 2020 at just 7 percent but reached 30 percent in June 2020 after the first COVID-19 economic shock. During the more serious second COVID-19 wave, poverty in the urban sub-sample increased sharply to 60 percent in September and October 2020 before showing signs of recovery in November 2020 as consumers gradually started to become more mobile. The out-of-sample predictions based on residential mobility suggest that income-based poverty continued a steady decline from October onwards, falling below 40 percent by the end of January 2021. However, poverty increased thereafter, reaching 50 percent by the start of April.

Poverty predictions from the retail mobility index are far more dire; poverty was predicted to have fallen from 60 percent in October 2020 to 40 percent in late January 2021, but thereafter increased dramatically upwards to 70 percent by mid-April.

In the rural sub-sample, we see a broadly similar result, though income-based poverty in the RUFSS Dry Zone sub-sample was much higher in January 2020 (22 percent). Survey-based poverty had doubled by June 2020 and then increased again to 66 percent by September, with signs of a slow recovery by November 2020 (60 percent). The residential mobility index also predicted a slow recovery in the rural Dry Zone, with income-based poverty falling only in January 2021. However, this trend was reversed after 1 February 2021. The residential mobility index predicts that rural poverty stopped falling in February 2021 and then began to increase again in March and early April. The retail mobility index suggests that income-based poverty increased dramatically again from 1 February 2021 onwards, from 60 percent on 31 January 2021 to 81 percent by mid-April.

Methodological limitations

It is important to acknowledge some significant limitations to these estimates. First, RUFSS measured income-based poverty, not the preferred expenditure-based poverty more often estimated from in-person surveys, including Myanmar's nationally representative surveys on household living conditions. Many households may have savings and other coping mechanisms that allow them to smooth out their expenditures, so the changes in income-based poverty reported here are likely to be larger than changes in expenditure-based poverty. Because of this, expenditure-based poverty rates are usually lower than income-based poverty rates. Our income-based estimates are therefore not comparable to official expenditure-based poverty estimates from the Government of Myanmar, although these do show the same spatial pattern as in our January 2020 results, with much lower poverty in Yangon (7 percent) than in the rural Dry Zone sample (22 percent).

Second, although the RUFSS phone panel is large, comprising around 1,000 households in each sub-sample in any given round, it is not representative of either urban Yangon or the rural Dry Zone. In particular, the samples were selected from households with young children, so the demographic structure of the households is quite specific. That said, it seems likely that the poverty trends observed in RUFSS are indicative of broader trends in the economy, as suggested by similar results from a nationally representative phone survey conducted in late 2020.⁷

Third, we provided point-estimate poverty predictions. In reality, these predictions come with considerable uncertainty because the Google mobility data can only be disaggregated at the municipal level. In other words, the lack of spatial variation in the mobility indices at any given point in time means that we are relying on inter-temporal variation to assess their predictive power.

Finally, since early February the military government has disrupted internet and telecommunications services on several occasions. In addition, many households have reportedly moved out of major cities to return to smaller urban centers or rural villages. It is not clear how these internet and telecommunications and migration shocks may have altered or biased the Google mobility data or the relationship between mobility indices and poverty. In summary, the predictions in Figure 4 should be treated as uncertain, warranting corroboration from future phone surveys.

Recommended actions

The political instability since 1 February 2021 has resulted in a steep decline in consumer mobility, with more consumers staying at home rather than engaging in normal retail and occupational

⁷ CSO (Central Statistical Organization) and UNDP (United Nations Development Program). 2020. *Household Vulnerability Survey Key Findings: Rapid assessment of the economic impact of COVID-19 restrictions on vulnerable households*. Yangon: CSO & UNDP.

behaviors. Based on previous analysis of the relationship between these indices and income-based poverty, the most recent mobility data suggest that poverty has risen sharply in both the rural and urban sub-samples of the RUFSS panel. We thus provide the following points as recommended actions.

- Rising income-based poverty—and the potential for large-scale humanitarian emergency—suggests an urgent need for social protection for vulnerable groups. Given the scale of people adversely affected by the crisis, a significant challenge will be to identify the most vulnerable groups. Finding modalities to effectively reach these populations will also be challenging given the disruptions to the financial and telecommunications sector, as well as reports of significant migration in the wake of insecurity.
- The impact of political instability on consumer mobility and predicted poverty suggests that a peaceful resolution to the crisis could spur a rapid economic recovery.
- It is critically important for development partners to continue funding and collecting phone-based survey evidence in 2021 and beyond. The poverty predictions reported here come with important caveats, and thus more data is needed on many other aspects of household welfare, including changes in employment, migration, coping mechanisms, trends in food insecurity experiences, changes in maternal, child, and household dietary diversity, and access to formal or informal social protection.

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