Myanmar Subnational Phone Surveys (MSPS) of the World Bank: Coverage, Reliability and Representativeness

Myanmar Subnational Phone Surveys (MSPS) are designed to monitor household wellbeing at the state and regional level. The first round of MSPS interviews were conducted between November 2022 to March 2023 and collected detailed information regarding labor market participation, education levels, consumption, migration, exposure to economic shocks and coping strategies. This note validates the representative properties of MSPS at the subnational level and addresses potential concerns about survey bias in phone surveys. The note also examines MSPS' compatibility with other benchmark household surveys and provides evidence that vulnerable households that are generally overlooked in other telephonic surveys (low-educated, poorer, female-headed, migrant households), are proportionately represented in the MSPS' survey sample. Overall, MSPS covers about 306 of 330 townships in Myanmar, reflecting approximately 98 percent of the country's population. Shares of demographic indicators at the state and regional levels – such as female population, female headed households, urban population, and age-distribution – in MSPS correspond closely with MLCS-2017 survey. Moreover, the share of displaced populations in MSPS match closely with displacement estimates from UNHCR for the same period. In addition, MSPS has significant representation of population belonging to different religious and linguistic groups. Finally, MSPS yields consistent estimates of education, asset ownership, consumption and labor market indicators when compared to IFPRI's MHWS surveys. Overall, these result underscore the unbiased properties of MSPS surveys and show that the surveys provide reliable estimates of household wellbeing at the subnational level.

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Introduction

Risks to Myanmar's economy have been compounding since the start of the pandemic. GDP growth after contracting by 18 percent in 2021, was estimated to be 3 percent in 2022. In July 2022, the local currency kyat, depreciated by 30 percent relative to the dollar while inflation was at 19.5 percent. GDP per capita in 2022 had fallen by 17 percent since the start of the pandemic (2022-2020). The World Bank has been monitoring the welfare effects of Myanmar's rising macroeconomic instability through eight rounds of household telephonic surveys. These surveys revealed considerable effects of macroeconomic instability on wellbeing with large reductions to incomes, rising threat of food insecurity, work stoppages and households struggling to cope with a series of internal and external shocks over the past two years.

The intensity of these shocks however vastly varies across Myanmar. For instance, households in Rakhine have encountered 10 percent higher price of rice in December 2022 compared to a national inflation rate of -3.0 percent (m-o-m; WFP, 2023). Data from the armed conflict location and event data project (ACLED) shows that households in the Northwest (Sagaing, Magway, Chin and Kachin), and the Southeast (Kayah, Kayi, and Tanintharyi) of Myanmar have been exposed to considerably more conflict in 2022 than other areas. Similarly, levels of hunger reported by households in Kachin state are much higher than the rest of the country (MAPSA, 2022).

This unevenness in the intensity of shocks has not been captured in past surveys of the World Bank. These surveys were initiated immediately in the aftermath of the pandemic to monitor wellbeing at the national level and therefore not designed to detect subnational trends.

A new series of surveys by the World Bank, called the Myanmar Subnational Phone Surveys (MSPS), are intended to fill this gap. The objective of MSPS is to periodically monitor regionally disaggregated shocks in Myanmar and quantify their impacts on households based on their location and other characteristics. The first round of MSPS, conducted during November 2022 to March 2023, collected household demographics, education, employment, exposure to adversity, coping strategies, consumption, and prices information. MSPS is comparable with other sub-nationally representative surveys in Myanmar, such as, the Myanmar Living Conditions Survey (MLCS) – conducted in 2017 and Myanmar Household Welfare Survey (MHWS) conducted by IFPRI since 2022. This allows MSPS to detect subnational changes in wellbeing overtime[1].

This note contains a detailed description of the first round of MSPS survey, sampling, and weighting design and is intended to be a technical reference for potential users of MSPS. Section 1 of this note provides an overview of the sampling and stratification protocols. The stratification strategy is based on socio-economic indicators of households that were collected prior to the pandemic. Therefore, households are assigned into strata using data that is not yet up to date. Moreover, the sampling frame is not a representative draw of the population. Both issues are addressed through reweighting, described in Section 2 of this report. Section 3 compares results from MSPS' survey to benchmark survey and census information to demonstrate subnational representativeness.

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[1] Two reports have recently used MSPS to track changes in education access (Bhatta, et al. 2023) and changes in employment indicators (Sinha Roy, 2023) in Myanmar since 2017.

Section 1: Sampling and Stratification

The first round of MSPS was conducted in partnership with a local survey firm. Baseline socio-economic data and last known state and township of residence for 15 states and regions and 321 townships[2]. This dataset serves as the sampling frame for MSPS. Location names and codes in the sampling frame were first harmonized to geospatial datasets of Myanmar Information Management Unit (MIMU). The sampling frame was then stratified using baseline education, income and urban characteristics of the main respondent of the household. The education strata consist of three levels: (i) illiterate, no education or up to elementary school, (ii) more than elementary but only upto high school level of education and (iii) higher than high school level of education, including graduates, post-graduates and others. The income stratum classified households into groups earning more or less than 300,000 kyats per year. As a result, all households in the sampling frame were assigned to one of 12 potential socio-economic strata: 3 levels of education, 2 levels of income; and, either urban or rural locations. Note the assignment of households into strata are based on indicators that date to pre-pandemic years (exact year of data collection is not available). The sampling frame will be updated using data from the first round of MSPS for future rounds of data collection.

The first round of MSPS also sought to capture household opinions regarding the role of the public sector in education, trade, and infrastructure policies. Based on past literature (Lyall, Blair and Imai, 2013; Porter, et al 2021), this information is elicited by assigning households to either a treatment or a control group. Households in MSPS are offered slightly different versions of similarly worded questions based on their treatment or control status, such that differences in responses reveal perceptions about the role of the public sector. All households within a township and each of the twelve socio-economic strata[3] are randomly assigned to treatment/control groups (see appendix 1 for additional details on balance of household characteristics and minimum detectable effects). As a result, MSPS uses 24 socio-economic strata (12 socio-economic strata interacted with treatment and control status) in addition to over 300 geographic stratums (one corresponding to each township) -- to sample households from the overall frame. Figure 1 shows near universal coverage of townships in the sampling frame. The database has the highest concentration of phone contacts in the central areas of Mandalay, Magwe, Bago and Yangon. In comparison, fewer contact details are available in Shan, Chin and parts of Kachin.

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[2] Myanmar has a total of 330 townships. Townships are the third level of administrative units in Myanmar. They comprise of both rural and urban units.

[3] Refer to WB-MSPS round 1 instrument for more details on list elicitation module.
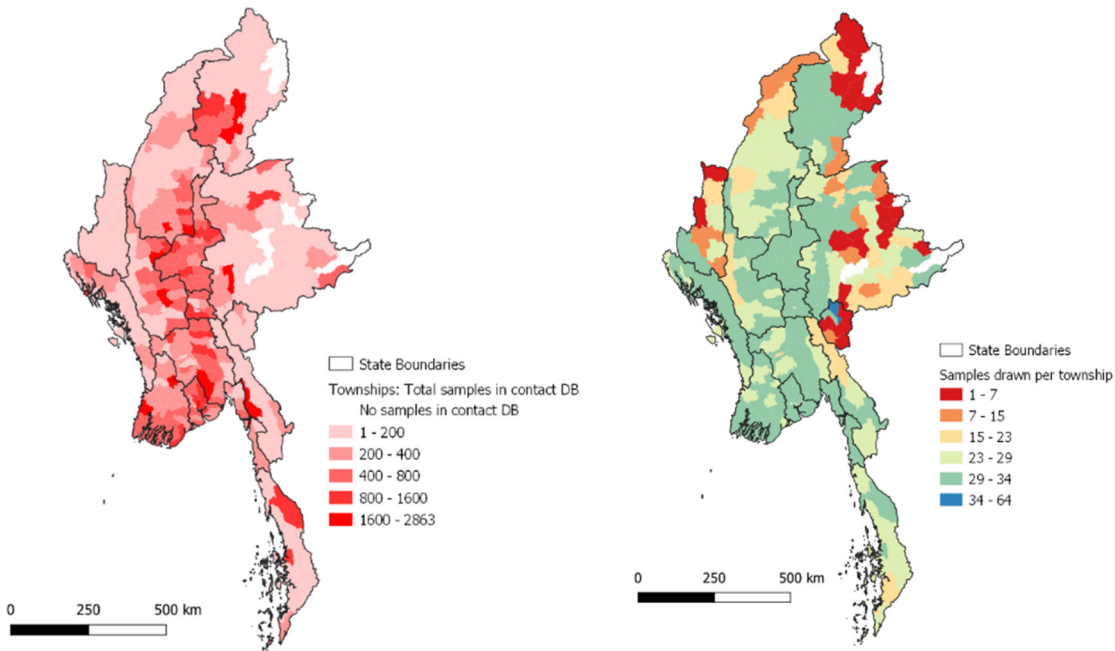
Figure 1: Number of contact details available in the sampling frame per township
Source: Shapefiles – MIMU. Data – Sampling frame.

Map 2: Number of households selected for surveys per Township
Source: Shapefiles – MIMU. Data – Sampling frame.

A sample size of approximately 8,500 households across Myanmar was targeted in the first round of MSPS. The target sample size was achieved by allocating township-stratum level quotas as follows. For each township, two households from the lowest education stratum (illiterate, no education or up to elementary school) and 1 household from all other strata were selected for interviews. The protocol therefore implicitly oversampled households with low education with a maximum of 32 households per township. Oversampling of low educated households mitigates the risk of underrepresenting such households in telephonic surveys (as these households are less likely to possess a phone -- Gourlay et al. 2021; Hoogeveen and Pape, 2020). Overall, the selection protocol yielded a sample size of 8,521 households from 321 townships but only 100 samples in Chin and Kayah. This can affect the reliability of MSPS estimates for the two locations. The sampling procedure was therefore modified to draw 4 households from the lowest education stratum and 2 households from all other strata in the two locations. The modified protocol resulted in the final sample size of 8,606 households in the first round of MSPS.

Compared to their population shares, the final sample contains fewer households from Ayeyawady and Mandalay and more units in Shan and Rakhine (Appendix A2.1). Given the latter two are poorer, remote and prone to conflict than others, more samples from these two areas mitigates the risk of under sampling vulnerable and conflict affected households. Telephonic surveys are often known to under sample poorer households from areas that are harder to reach and in locations where access to public services is limited. Figures A2.4 and A2.6 confirms that sample selection is not affected by road accessibility or proximity to schools. Similarly, figures A2.3 and A2.4 show sufficient representation of rural and low educated households in the final selected sample.

1.1 Replacement Strategy

Non-response rates in past rounds of World Bank household surveys have been as high as 40%, likely due to the adverse political and socio-economic conditions in the country. A long list of replacement households was therefore produced in advance of survey implementation. Replacement households were drawn from the same sampling frame as the primarily sample. Figure 2 shows the density of replacement options available within the same township and stratum for non-responsive households. The figure shows that for most non-responsive households, replacements can be selected simply by choosing another household within the same township and stratum– provided such a choice exists in the sampling frame. Once replacement is carried, the non-responsive household and its replaced unit are removed from the sampling frame – so that no further attempts are made to interview the household in this round (although further attempts to reconnect with the household could be made in future rounds of MSPS).
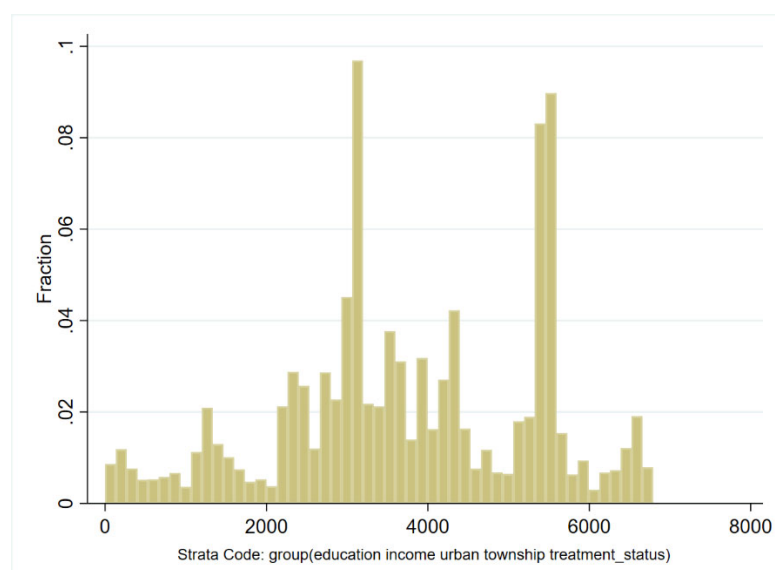
Figure 2: Number of replacement households available per stratum in the sampling frame.

However, it is likely that there may not be sufficient samples in the frame to replace non-responsive units. This could occur if (1) there were few replacement households in the strata to begin with (note that some strata in Figure 2 have limited replacement options available) or (2) replacement households within a stratum were fully used in the course of survey implementation.

In such cases, the sample quotas per stratum were relaxed one-step at a time until a replacement household is found. The income strata requirement is relaxed first, and replacement occurs if a household within the same township, education category, rural/urban and treatment status -- but not the same income status -- as the originally non-responsive household is found in the sampling frame. However, if no replacement occurs despite relaxing the income requirement, the urban quota restriction followed by the education quota restrictions are then relaxed sequentially. If the replacement process continues to fail due to limited samples, the township requirement is further relaxed and another household from the same state with the same treatment status as the original non-responsive households is used as a replacement unit.

Non-response rates were expected to be significantly higher in Chin and Kayah due to the ongoing political situation in the two areas. Replacement in these two areas based on the above protocol is

therefore likely to be more challenging than others. This risk was mitigated by supplementing Sampling frame's sampling frame by an additional set of 600 phone numbers from each of the two areas. However, no information about baseline household characteristics is available for these 1200 supplementary contacts. Thus, replacement in such cases were undertaken through simple random selection. In such cases, the replaced units were assigned the same treatment as the original non-compliant households.

Section 2: Sampling weights and Reweighting

Survey sampling weights are required to produce sub-nationally representative estimates from MSPS. Since the sampling protocol assigned fixed quotas to all townships, the number of samples drawn per state in MSPS are not in proportion to their state-level population shares. Sampling weights correct for disproportionate sampling probabilities caused due to the quota-based protocol, high non-response rates, relaxation of stratum quotas due to insufficient replacement units in the sampling frame, and operational challenges preventing enumeration of all planned geographic units. The construction of sampling weights requires Censuses, surveys and administrative data sources that provide reliable estimates of key indicators at the subnational level. A broad list of such data sources are available in Myanmar: (1) household aggregates from population census of 2014 at the township level; (2) the intercensal survey (ICS) of 2019 containing select household indicators at the district level; (3) MLCS survey of 2017 with detailed education, labor, asset and education information representative at the state and regional levels; (4) administrative data of townships collected by GAD in 2019; and (5) IFPRI's MHWS round 1 survey from 2022 containing select asset indicators at the state and regional levels. The sampling weights in MSPS use a combination of these data sources at different spatial levels to achieve sub-national representativeness.

2.1 Constructing household weights to reflect population shares by district, rural/urban, gender and age-group

The probability of selecting a household h in township i of district j for an interview is given by the following formula:

$$P_{hij} = a_j * \frac{\sigma_{hi,2014}}{\sum_1^n \sigma_{hi,2014}} * \frac{n_{hi}}{N_{hi,GAD-2019}}$$

where:

a_j : Number of townships from district j covered in MSPS

$\sigma_{hi,2014}$: is the total population in township i from the 2014 population census

$\sum_1^n \sigma_{hi,2014}$: is the population of district j in 2014 population census – which is a summation of all members in households h located in townships $i = [1 .. n]$ located in district j

n_{hi} : are the total number of people interviewed across households h in township i in MSPS

$N_{hi,GAD-2019}$: is the population of township i from GAD's 2019 township profile

The term $a_j * \frac{\sigma_{i,2014}}{\sum_1^n \sigma_{i,2014}}$ denotes the probability of selecting a township i based on its 2014 population share in district j. The probability of selecting a household within the township is $\frac{n_{hi}}{N_{hi,GAD-2019}}$. The

probabilities are calculated separately for the rural and urban sectors. The household sampling weight (hwt) is the inverse of its probability of selection ($\frac{1}{P_{hij}}$).

At this point, all households within a township have the same probability of selection based on 2019 population distribution. The intercensal survey conducted in the same year, however, provides additional information about how population is distributed according to age-categories, gender and rural/urban across districts. This information is used to calculate the share of Myanmar population observed within a township-gender-age group-rural/urban category in ICS-2019. The shares are then multiplied with household weights hwt, such that rural/urban, gender and age composition from MSPS is updated to population characteristics observed in ICS-2019

2.2 Maxentropy weight readjustment to mitigate risk of under sampling vulnerable households

In the final step, household weights at the state and regional level are adjusted to mitigate the risk of under-sampling households that are at risk of typically being under-represented in telephonic surveys. Households with fewer assets and low education levels are vulnerable to such exclusion. Additionally, past studies have shown that female headed households possess fewer assets than other households (Rajaram, 2009) and are at a higher risk of underrepresentation in telephonic surveys (Hersh, et al 2021).

While household asset ownership indicators and share of population below 15 years at the state-level were obtained from IFPRI's MHWS 2022 survey, representative estimates of educational attainment amongst adults, female population shares and proportion of population living in female headed households were derived using MLCS 2017. This information was then used to adjust MSPS' sampling weights using the maximum entropy approach described in Wittenberg (2010) and Hainmueller (2021)[4]. A cross-entropy algorithm devised by Paul Corral is used to implement the reweighting procedure[5] (based on Golan, 1996). The algorithm adjusts household weights in a way such that means of specific indicators are simultaneously matched to averages obtained from representative data sources. Asset indicators include binary values indicating ownership of television, ownership status of respondent's current residence and whether the household lives in an apartment, house or a condominium. Two education variables were considered for reweighting: share of adult population (above the 20 years old) that have either pre-primary education or primary education up to grade 5 level. The pre-primary education group comprises of adults with highest educational attainment below grade 1 or education received from a monastic/religious institution, NFE classes, home-based tutoring or other non-school based learning[6]. Share of population livening in female headed households and female population ratios were derived for each state using MLCS 2017 and entered separately into the maxentropy reweighting algorithm.

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[4] Other papers such as Sinha Roy and van der Weide (2022) have used this reweighting procedure to restore representativeness in biased survey samples from India.

[5] https://github.com/pcorralrodas/wentropy

[6] Inclusion of educational variables in the maxentropy approach is underpinned by the plausible assumption that the educational attainment shares among adults over 20 years of age is likely unchanged between 2017 and 2022.

Section 3: Performance Assessment: comparing MSPS weighted estimates to representative survey estimates

This section examines whether key indicators from MSPS are consistent with MLCS-2017 and IFPRI's MHWS. National level estimates are reported in figures and tables below while detailed subnational estimates can be found in appendix 3 of this note. Most comparisons are made with respect to MLCS 2017 because only a handful of variables from this dataset were used in the sampling weight calculations. Compatibility of MSPS with MLCS 2017 is therefore evidence of minimal bias in subnational estimates.

3.1 Geographic and demographic coverage

The table below shows the extent of geographic coverage in the first round of MSPS. Overall MSPS managed to reach about 306 (93%) of the 330 townships in Myanmar. 14 of the 24 townships that were not covered under MSPS were from the state of Shan. Overall, townships covered under MSPS represented 97.8% of the country's population. In terms of state/region-wise populations, most areas had more than 85% of their populations represented in MSPS – with the exception of Shan. MSPS coverage represents about 84% of the population for this unit.

	Townships not covered	Total townships covered	Share of townships covered within MSPS		Population in townships not covered	Total 2014 population covered	Share of population covered within MSPS
Ayeyarwady		26	**100.0%**			6053594	**100.0%**
Bago		28	**100.0%**			4743808	**100.0%**
Chin	1	8	**88.9%**		49949	419160	**89.4%**
Kachin	5	13	**72.2%**		30838	1339910	**97.8%**
Kayah	3	4	**57.1%**		34981	237749	**87.2%**
Kayin		7	**100.0%**			1454264	**100.0%**
Magway		25	**100.0%**			3786538	**100.0%**
Mandalay		28	**100.0%**			5843424	**100.0%**
Mon		10	**100.0%**			1949821	**100.0%**
Nay Pyi Taw		8	**100.0%**			1072833	**100.0%**
Rakhine		17	**100.0%**			2034148	**100.0%**
Sagaing	1	36	**97.3%**		49820	5026506	**99.0%**
Shan	14	41	**74.5%**		911410	4589523	**83.4%**
Tanintharyi		10	**100.0%**			1352283	**100.0%**
Yangon		45	**100.0%**			6949440	**100.0%**
Myanmar	**24**	**306**	**92.7%**		**1076998**	**46853001**	**97.8%**

Table 1: Number of townships covered under MSPS, and their population coverage based on 2014 population census.

In comparison to MSPS, MLCS 2017 and MHWS surveys conducted by IFPRI had a geographical spread of 296 and 310 townships respectively (MHWS, 2022). Biases due to the exclusion of the 24 townships in MSPS are likely minimal as these locations represent only 2.2 percent of Myanmar's population. Overall, there are many similarities in the geographical spread of MSPS and MHWS. Coverage ratios for both surveys are lowest in Shan while all townships in of Rakhine were included in the two surveys, despite the challenging conflict situation in the state. The latter represents a considerable improvement over earlier face-to-face data collection exercises, as the prevailing situation in Rakhine

has prevented population census of 2014, MLCS 2017 and the ICS 2019 from achieving 100% township coverage in the state (MHWS, 2022).

Figures 3 compares the state population shares from MSPS to MHWS and MLCS. Except for a small population growth in Yangon observed in MSPS, the state-wide population shares across the three surveys are almost the same. Share of urban population within states and regions is also similar across the three surveys (Figure 4). Table A3.1 in Appendix 3 shows that the rate of urbanization since 2017 has been highest in Shan and slowest in Bago. MHWS further corroborates this trend.

| **Figure 3:** State's population share | **Figure 4:** Share of urban population within state |
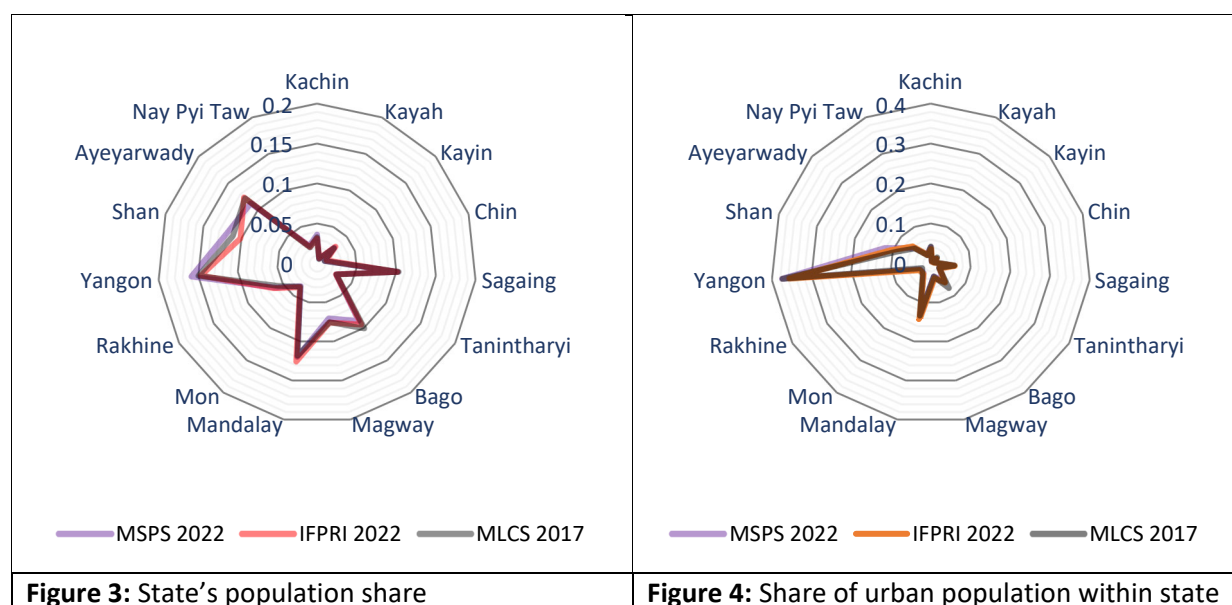
Table 2 compares demographic characteristics between MSPS and MLCS. Since most demographic indicators from MLCS were used to reweigh MSPS (other than education), the small differences between the two surveys reported in the table below underscores the representative nature of MSPS surveys. Overall, the reweighted MSPS sample comprises of slightly lower share of children below the age of 15 years.

	MSPS 2022	MLCS 2017	Difference
Share of female population (rural)	53%	52%	1.1 pp
Share of female population (urban)	52%	53%	-1.1 pp
Share of population in female headed households (rural)	4%	6%	-1.6 pp
Share of population in female headed households (urban)	7%	7%	-0.6 pp
Mean Household size (rural)	5.06	5.16	-1.9 percent
Mean Household size (urban)	5.37	5.19	3.6 percent
Share of population: ages below 15 years	23%	28%	-5.2 pp
Share of population: ages between 16 to 65	69%	65%	4.3 pp
Share of population: ages between 66 and above	8%	7%	1 pp

Table 2: Comparing weighted means of demographic indicators from MSPS to MLCS. pp denotes percentage points.

Table A3.2, A3.3, A3.4 and A3.5 in appendix 3 show the distribution of household size, female population shares, share of population living in female headed households and distribution of age-groups across states and regions, respectively. These demographic indicators tend to progress slowly overtime. The broad consistency of indicators between MSPS and MLCS surveys observed in these tables is therefore reassuring. Only a few notable exceptions are observed: Mon, where MSPS picked up 7 percentage points more urban women than MLCS; Kayin and Nay Pyi Taw , where the share of MSPS population living in urban female headed households exceeds MLCS by 10 percentage points; and Kayah, Kayin, Tanintharyi and Nay Pyi Taw, where the difference between the share of children below 15 in the two surveys are more than 8 percentage points. Comparing MSPS to MHWS however indicates that shares of below 15 populations are comparable across two surveys– suggesting underlying changes in age distributions since 2017 in select states and regions that are detected in both MHWS and MSPS are unlikely due to measurement problems.

Ages: 0-15

Ages: 15-65

Ages: 65+
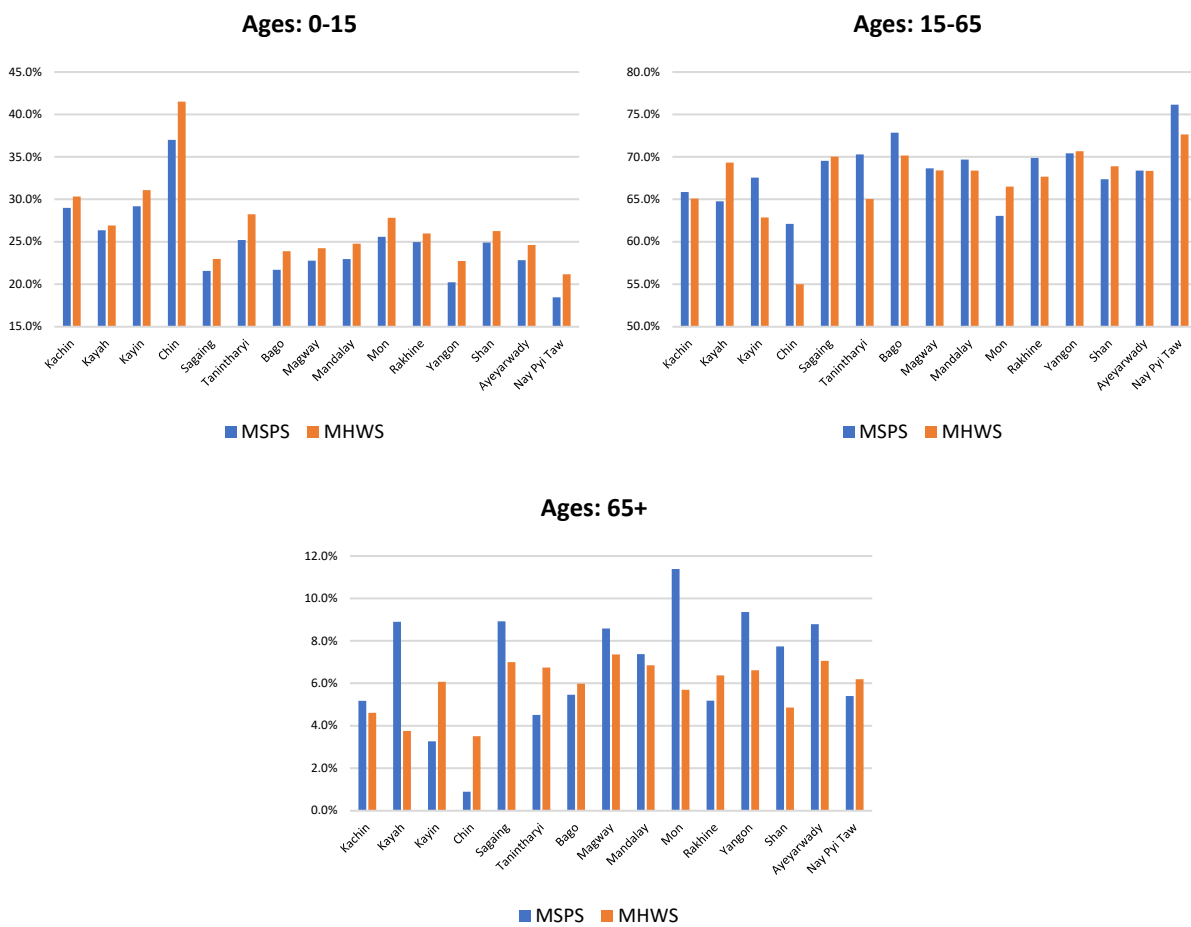
Figure 5: Share of age groups in MSPS compared to MHWS

Table 3 reviews the religious and linguistic composition of households in MSPS. Although the representation of Buddhist and Burmese speaking population is MSPS is slightly higher than the other groups, all groups are sufficiently represented in the survey sample. The share of population that speaks Burmese as the most common language with other members of households is about 10 percentage points higher than independent estimates of Burmese languages speakers in Myanmar. However, these independent estimates of the share of Burmese speakers are dated as language information was not collected in the last census.

	MSPS 2022 (percent)	Independent sources (percent)
Buddhist households	92.3	88
Christian	3.7	6
Muslim	3.3	4
Animist	0.4	0.8
Hindu	0.02	0.5
Other religions	0.01	0.2
No religion	0.3	0.1
Share of Burmese speakers	80	~ 70
Share of other languages	20	~ 30

Table 3: Religious and linguistic composition of population in MSPS

Note: Shares of household religions obtained from CIA factbook. Share of language speakers obtained from Center for Language Technology, Indiana University[7].

Figure 6 compares estimates of households whose state of residence has changed in the past two years based on MSPS and MHWS. According to UNHCR, 1.376 million people have been internally displaced between February 2021 and March 2023[8]. This represents 2.6 percent of Myanmar's population and includes interstate as well intra-state IDPs. In comparison, the share of people who have relocated from their original state of residence in the past 2 years from MSPS and MHWS are 2.5 (~1.4 million) and 0.85 percent, respectively. The differences in estimates are pronounced in Yangon, Rakhine, Mon, Mandalay and Kachin. In these areas, MSPS reflects a much higher share of population migrating (which likely includes IDPs) across subnational units than MHWS over the past two years. Unfortunately, state and regional level data on IDPs is not available from UNHCR to further corroborate these trends.
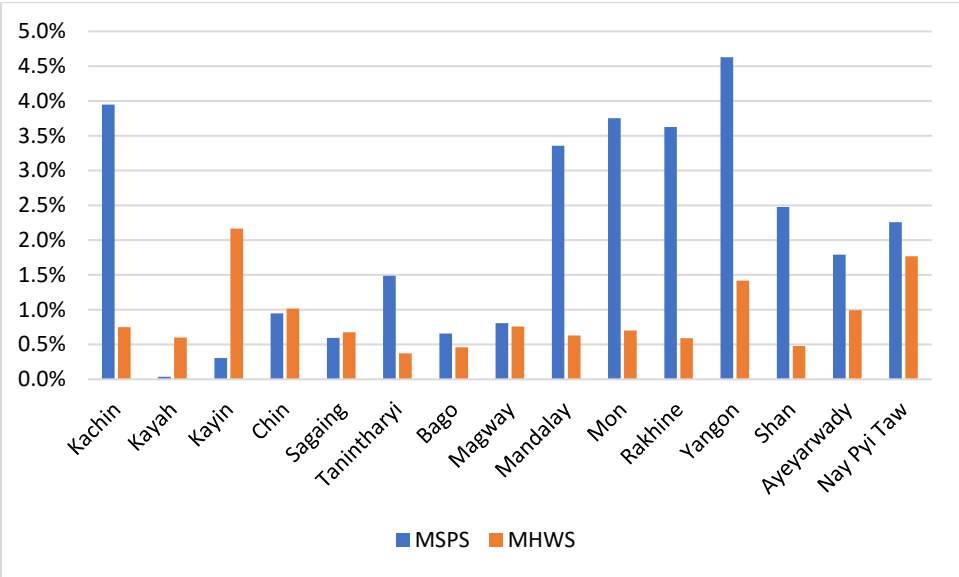
Figure 6: Share of population that has migrated across states and regions in the past two years of survey

[7] https://celt.indiana.edu/portal/Burmese/index.html
[8] https://reporting.unhcr.org/document/4475

3.2 Education levels, asset ownership and access to services

Table 3 compares education levels in reweighted MSPS to MLCS-2017. Differences in pre-primary and primary education are expected to be small as means of these two variables from MLCS was used in the reweighting algorithm. Table 3 confirm this to be the case. However, the small differences observed in the share of middle school, high school and college level of attainment, provides further confidence in the representative nature of MSPS surveys. Table A3.6 in appendix 3 shows shares from MSPS are also largely consistent with MLCS for almost all state-education levels.

	MSPS 2022	MLCS 2017	Difference
Share of pre-primary education	23%	24%	-1.4 pp
Share of primary school education	36%	37%	-1.4 pp
Share of middle school education	19%	21%	-1.8 pp
Share high school education	15%	12%	2.2 pp
Share of college education	8%	5%	2.5 pp

Table 3: Comparing weighted means of education from MSPS to MLCS. pp denotes percentage points.

Table 4 examines household asset ownership shares in MSPS. Some difference in asset ownership between MSPS and MLCS is expected given the 5-year gap between the two surveys. However, unreasonable discrepancies in asset ownership between the two surveys could point to non-representative properties. For further confirmation, household asset ownership shares are also compared to MHWS surveys. Since television and ownership of a house from MHWS 2022 are included in the maxentropy procedure, we expect shares derived from MSPS and MHWS to be similar by design. For all other assets, compatibility in asset ownership shares is further indication of MSPS' representative attributes.

Overall, the table shows that asset ownership and access to services reported in MSPS are broadly in line with MLCS. Notable exceptions are rice cookers, refrigerator, wardrobe and share of individuals connected to the electric grid or self-generated electricity and with access to spring water, rainwater or tube wells. Comparisons with MHWS however suggest that direction of change detected by MSPS could indeed be in the right direction. Despite television and house ownership being the only target reweighting variables, differences in shares of asset ownership and access to public services in MSPS and MHWS are almost minimal. For instance, MSPS suggests a 15 percent point increase in ownership of refrigerators between 2017 and 2022. MHWS 2022 independently confirms that the household ownership of rice cookers has indeed risen during this time and the estimates between MLCS and MHWS differ only by 4 percentage points.

Agricultural land ownership patterns in MSPS also share similarities with other datasets. Forty-five percent of individuals in MSPS belong to households that own agricultural land. In MLCS 2017 and MHWS- 2022, this share is 40 and 39 percent, respectively.

Indicator	MSPS 2022	MLCS 2017	MHWS 2022	Difference: MSPS - MLCS	Difference: MSPS - MHWS
rice cooker	61%	38%	61%	24%	0%
refrigerator	34%	19%	30%	15%	4%
television	65%	58%	64%	7%	1%
wardrobe	62%	51%	58%	11%	4%

car and other vehicles	72%	73%	68%	-1%	4%
own house	84%	89%	85%	-4%	-1%
piped water to residence	5%	11%	7%	-5%	-2%
spring, rainwater and tube well	54%	63%	45%	-9%	9%
water from inferior sources	15%	17%	22%	-2%	-7%
purchasing water	26%	19%	25%	7%	1%
electrical grid connection	65%	43%	66%	23%	-1%
electrical community connection	1%	6%	3%	-5%	-2%
electricity self-generated	30%	42%	28%	-12%	2%
ownership of agricultural land	45%	40%	39%	5%	6%

Table 4: Comparing weighted means of asset and household access to services

Notes: Piped water to residence include piped into dwelling/ yard and public tap/standpipe. Spring, rainwater and tube well include tube well or borehole, protected well or spring or pond and rainwater. Water from inferior sources include unprotected well or spring or pond and surface water. Purchasing water include bottled water / sachets and tanker truck or cart with small tank. Electrical grid connection includes Government/national grid and Border country grid. Electrical community connection includes electricity obtained through a transformer/generator purchased by the community and mini grid/micro-grid solar that are community based. Electricity self-generated include household owned transformer or generator, solar home system, rechargeable battery system and water mill. Estimates are weighted by individual level weights.

3.3 Labor force indicators and household consumption patterns

Table 5 compares key labor market indicators from MSPS to MLCS. Given the existing macroeconomic situation in the country, the labor market is expected to be weaker in 2022 than in 2017. However, large unexplained differences in indicators during this period can point to underlying measurement issues. Table 5 confirms that this is not the case with MSPS 2022. The worker population rate for adults above 15 year of age is 7.8 percentage points lower in 2022 than 2017, while labor force participation rate has fallen by 5.4 percentage points during the same period. Share of rural working population has reduced by 9.6 percentage point while urban areas experienced about 3.7 percentage point fall in this time.

	Rural +Urban			Rural			Urban		
	MSPS 2022	MLCS 2017	Difference	MSPS 2022	MLCS 2017	Difference	MSPS 2022	MLCS 2017	Difference
Worker population ratio	54.8%	62.6%	-7.8 pp	55.3%	64.9%	-9.6 pp	53.7%	57.5%	-3.7 pp
Labor force participation rate	58.7%	64.2%	-5.4 pp	58.8%	66.1%	-7.3 pp	58.5%	59.6%	-1.1 pp
Unemployment rate	3.9%	1.5%	2.4 pp	3.6%	1.3%	2.3 pp	4.8%	2.1%	2.6 pp

Table 5: Comparing labor force indicators in MSPS and MLCS

Finally, the three panels of figure 7 indicate shares of households that consumed specific items in MLCS-2017, eight rounds of World Bank's high frequency phone surveys conducted between May 2020 and 2022 and MSPS 2022. Three trends are common across all commodities. First, the fraction of

households that report having consumed an item during the week prior to the survey has steadily risen since 2017, resulting in an inverted U-shaped curve. Second, the fraction of household reporting consumption of items is higher in 2022 than 2017 for all commodities. This is potentially indicative of rising diversity in consumption or an improvement in welfare levels in 2022 relative to 2017. However, changes in quantity or quality of consumption are not captured in telephonic surveys, which would indicate a decline in overall wellbeing since the start of the pandemic. Third, the downward trend of the inverted U-shape curve begins approximately around the beginning of the military coup (February 2021). This points to rising adversity across households as the security environment changed in the country.
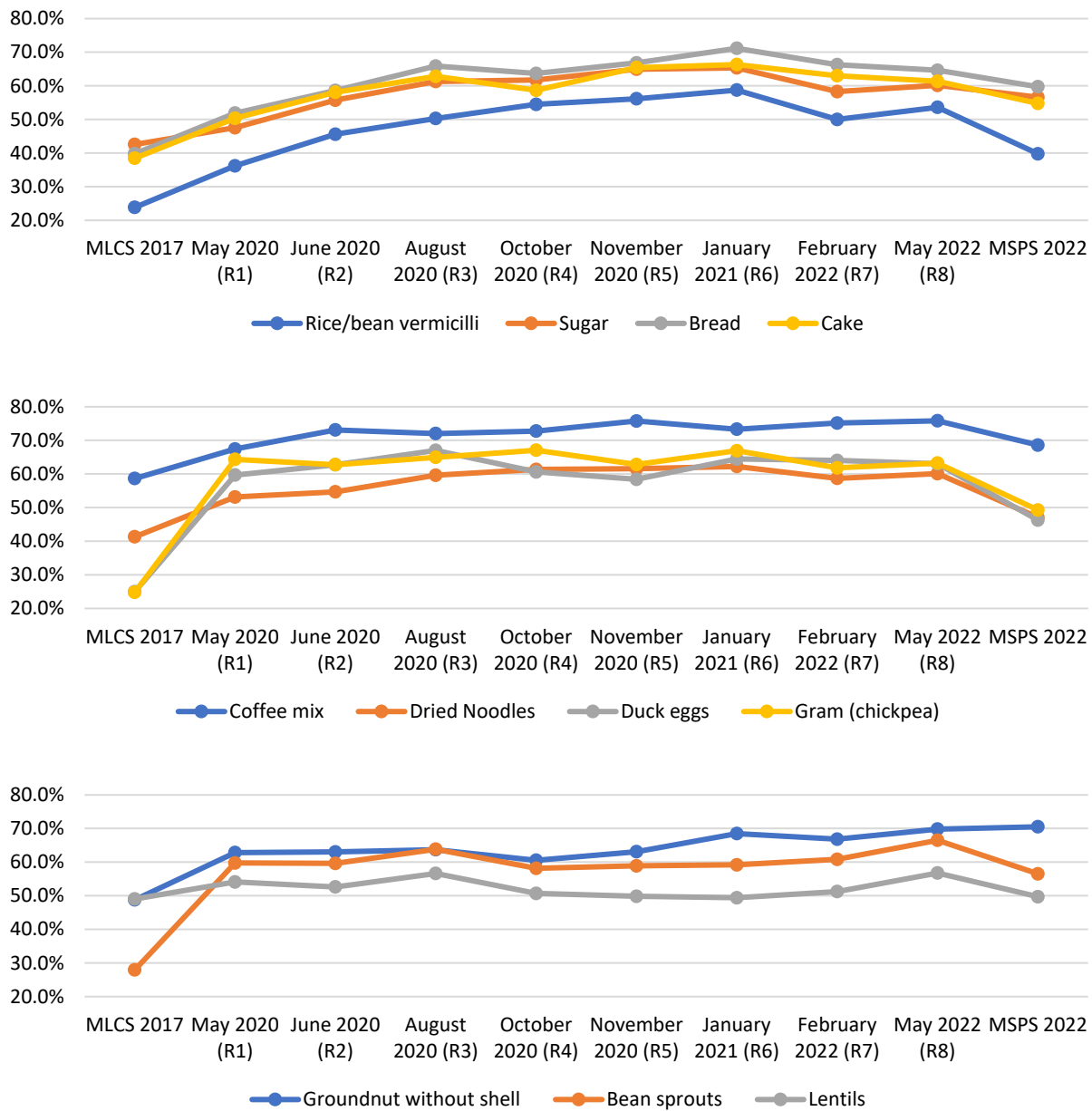
Figure 7: Share of households consuming specific items in MSPS, MLCS and past rounds of high frequency household surveys in Myanmar

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Appendix 1: Allocation of treatment status to households

A1.1: Balance in household characteristics (national)

	Control observations		Treatment observations		T-test of differences in means	T-test of differences in means, conditional on strata
	Control N	Mean/sd	Treated N	Mean/sd	Treated-Control	Treated-Control
number of household members	4298	5.053	4308	5.034	-0.019	-0.018
		0.033		0.033	0.047	0.046
telephone line	4298	0.089	4308	0.092	0.003	0.003
		0.004		0.004	0.006	0.006
tv	4298	0.797	4308	0.803	0.006	0.005
		0.006		0.006	0.009	0.008
dvd video player	4298	0.727	4308	0.724	-0.003	-0.004
		0.007		0.007	0.01	0.009
satellite cable tv	4298	0.333	4308	0.328	-0.005	-0.006
		0.007		0.007	0.01	0.01
fan	4298	0.44	4308	0.447	0.008	0.006
		0.008		0.008	0.011	0.01
refrigerator	4298	0.328	4308	0.33	0.002	0.001
		0.007		0.007	0.01	0.009
framed bed	4298	0.638	4308	0.627	-0.01	-0.012
		0.007		0.007	0.01	0.01
mosquito net	4298	0.991	4308	0.99	0	0
		0.001		0.001	0.002	0.002
blanket	4298	0.991	4308	0.99	-0.001	-0.001
		0.001		0.002	0.002	0.002
mattress	4298	0.381	4308	0.384	0.004	0.003
		0.007		0.007	0.01	0.01
high quality mattress	4298	0.248	4308	0.24	-0.008	-0.009
		0.007		0.007	0.009	0.009
iron	4298	0.63	4308	0.642	0.013	0.011
		0.007		0.007	0.01	0.01
radio	4298	0.379	4308	0.383	0.004	0.003
		0.007		0.007	0.01	0.01
gas cooker	4298	0.182	4308	0.183	0.001	0
		0.006		0.006	0.008	0.008
mixer grinder beaters	4298	0.167	4308	0.154	-0.013	-0.014
		0.006		0.005	0.008	0.007
sofa setti	4298	0.135	4308	0.129	-0.005	-0.006
		0.005		0.005	0.007	0.007
camera camcorder	4298	0.082	4308	0.081	0	-0.001

		0.004		0.004	0.006	0.006
car	4298	0.088	4308	0.08	-0.009	-0.009
		0.004		0.004	0.006	0.006
computer laptop	4298	0.151	4308	0.148	-0.004	-0.005
		0.005		0.005	0.008	0.007
washing machine	4298	0.097	4308	0.104	0.007	0.006
		0.005		0.005	0.006	0.006
dryer tumbler	4298	0.024	4308	0.026	0.002	0.002
		0.002		0.002	0.003	0.003
aircon	4298	0.071	4308	0.074	0.003	0.002
		0.004		0.004	0.006	0.005
watercooler	4298	0.052	4308	0.049	-0.003	-0.003
		0.003		0.003	0.005	0.005
oven	4298	0.031	4308	0.035	0.004	0.004

Table A1.1: Balance of observable household characteristics based on treatment status (national)

Notes: Treatment status is allocated to about 50 percent of households both at the national and state and regional levels. We use baseline household information data contained in the sampling frame to test balance after treatment allocation. Baseline characteristics are insignificantly different between the two groups at 10% confidence. Balance tables at the subnational levels in Table A1.2 show similar results. The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

A1.1: Balance in household characteristics (sub-national)

	Ayeyarwady	Bago	Chin	Kachin	Kayah	Kayin	Magway	Mandalay
education	4.49e-18	0.00676	-0.0315	0.0603	0.0415	-0.00605	0.0279	0.00172
	(0.059)	(0.058)	(0.111)	(0.092)	(0.147)	(0.121)	(0.062)	(0.056)
low income	1.12e-18	-0.00459	-0.000519	-0.0158	-0.0237	0.0155	-0.00417	0.00114
	(0.036)	(0.035)	(0.082)	(0.056)	(0.092)	(0.073)	(0.037)	(0.034)
urban	0	-0.00766	0.0377	0.00366	0.00565	0.00672	-0.00203	-0.00114
	(0.036)	(0.035)	(0.081)	(0.056)	(0.092)	(0.073)	(0.037)	(0.034)
age	0.725	1.288	0.311	-2.051	1.257	0.345	-0.477	0.945
	(0.947)	(0.925)	(1.836)	(1.403)	(2.305)	(1.749)	(0.904)	(0.820)
number of household members	-0.273	-0.0702	-0.0255	-0.422	-0.548	0.363	0.165	-0.0337
	(0.156)	(0.136)	(0.436)	(0.264)	(0.385)	(0.310)	(0.166)	(0.129)
telephone line	-0.00758	-0.0371	0.101	0.00434	0.0215	0.0400	-0.00676	0.00919
	(0.017)	(0.020)	(0.057)	(0.034)	(0.054)	(0.038)	(0.024)	(0.017)
tv	-0.00758	-0.0122	0.0606	0.0176	-0.0938	0.0390	0.0411	0.00411
	(0.027)	(0.027)	(0.075)	(0.050)	(0.073)	(0.061)	(0.032)	(0.026)
dvd video player	-0.0404	-0.0471	0.129	0.0123	-0.0972	0.0323	0.0459	0.0107
	(0.031)	(0.031)	(0.079)	(0.053)	(0.081)	(0.070)	(0.034)	(0.030)
satellite cable tv	-0.0354	-0.0285	0.0570	0.0248	-0.0961	-0.000336	0.0487	0.000669
	(0.032)	(0.033)	(0.077)	(0.054)	(0.091)	(0.069)	(0.035)	(0.031)
fan	0.0303	-0.0244	-0.0175	0.0369	0.0178	-0.0477	0.0107	-0.0283
	(0.035)	(0.035)	(0.061)	(0.055)	(0.088)	(0.073)	(0.036)	(0.034)
refrigerator	0.00758	-0.0144	-0.0835	-0.0181	0.151	-0.0225	0.0149	0.0121

	(0.031)	(0.033)	(0.061)	(0.051)	(0.085)	(0.071)	(0.033)	(0.033)
framed bed	-0.0556	-0.0101	0.0346	0.102	0.0503	0.0460	0.00112	-0.000664
	(0.035)	(0.033)	(0.076)	(0.054)	(0.087)	(0.073)	(0.035)	(0.031)
mosquito net	-0.00505	0.00473	-0.0130	-0.00625	0	0.000336	-0.00563	0.00451
	(0.005)	(0.005)	(0.013)	(0.006)	(.)	(0.015)	(0.006)	(0.005)
blanket	-0.00253	-0.00490	-0.0130	-0.0250*	0	-0.0104	0.00551	0.00224
	(0.006)	(0.006)	(0.013)	(0.012)	(.)	(0.011)	(0.004)	(0.006)
mattress	-0.00505	-0.00825	-0.0107	0.0234	0.0531	0.00806	0.0576	0.00298
	(0.034)	(0.034)	(0.080)	(0.056)	(0.090)	(0.072)	(0.036)	(0.031)
high quality mattress	-0.0152	-0.0253	0.00433	0.0520	0.0808	-0.0706	-0.00339	-0.00627
	(0.029)	(0.030)	(0.077)	(0.049)	(0.082)	(0.061)	(0.027)	(0.028)
iron	0.0253	0.00262	-0.0412	0.0272	0.0141	0.0974	0.0106	0.0308
	(0.034)	(0.032)	(0.081)	(0.056)	(0.090)	(0.071)	(0.037)	(0.033)
radio	0.0177	-0.00904	-0.00866	0.0252	0.0687	-0.105	0.0134	0.0145
	(0.035)	(0.034)	(0.077)	(0.053)	(0.089)	(0.067)	(0.036)	(0.033)
gas cooker	-0.00253	0.0310	0.127*	0.00928	-0.108	-0.123*	0.0350	0.0184
	(0.025)	(0.025)	(0.059)	(0.043)	(0.072)	(0.059)	(0.025)	(0.024)
mixer grinder beaters	0.00758	-0.0482*	0.0218	0.0285	0.0896	-0.0474	0.0100	0.00939
	(0.021)	(0.025)	(0.061)	(0.041)	(0.057)	(0.053)	(0.025)	(0.024)
sofa setti	0.0177	-0.0246	-0.00485	0.0479	0.0560	-0.0124	0.00158	0.0184
	(0.020)	(0.023)	(0.063)	(0.039)	(0.057)	(0.034)	(0.024)	(0.023)
camera camcorder	0.0177	-0.0136	0.102	0.0239	0.00424	-0.0339	0.00915	0.0205
	(0.016)	(0.016)	(0.055)	(0.029)	(0.051)	(0.037)	(0.018)	(0.017)
car	0.0202	-0.0208	-0.0677	0.0102	0.0741	-0.0675	-0.00990	0.00472
	(0.013)	(0.015)	(0.042)	(0.037)	(0.063)	(0.048)	(0.021)	(0.019)
computer laptop	0.0126	-0.0127	0.0741	0.142***	-0.00961	-0.0161	-0.0429	-0.0178
	(0.022)	(0.022)	(0.063)	(0.041)	(0.065)	(0.056)	(0.023)	(0.022)
washing machine	-0.00505	-0.0227	-0.0558	0.0429	0.0904	0.0181	0.0341	0.00470
	(0.019)	(0.019)	(0.053)	(0.028)	(0.061)	(0.043)	(0.017)	(0.018)
dryer tumbler	-0.00758	-0.00928	-0.0277	0.00601	0.0345	0.00974	0.00842	0.0181
	(0.009)	(0.010)	(0.036)	(0.014)	(0.024)	(0.023)	(0.006)	(0.010)
aircon	-0.0177	-0.0135	-0.0277	0.0118	0.0871*	-0.0121	0.0202	0.00924
	(0.015)	(0.017)	(0.036)	(0.023)	(0.043)	(0.031)	(0.017)	(0.019)
watercooler	7.01e-19	-0.0112	-0.0144	0.00529	0.0526	-0.0118	0.0117	0.000143
	(0.011)	(0.015)	(0.034)	(0.025)	(0.037)	(0.028)	(0.015)	(0.016)
oven	-0.00505	-0.00925	-0.0274	0.0183	0.000848	-0.000336	0.0141	0.00687
	(0.010)	(0.011)	(0.032)	(0.021)	(0.024)	(0.015)	(0.010)	(0.013)
N	792	834	152	317	119	189	721	885
	Mon	Nay Pyi Taw	Rakhine	Sagaing	Shan	Tanintharyi	Yangon	
education	0.00472	0.00629	-0.00656	-0.00181	0.0138	0.0194	0.0110	
	(0.093)	(0.106)	(0.076)	(0.053)	(0.050)	(0.099)	(0.047)	
low income	-0.00314	0.00413	0.00825	-0.00494	-0.00759	0.000101	0.00492	
	(0.056)	(0.064)	(0.046)	(0.032)	(0.031)	(0.060)	(0.029)	
urban	-0.00314	-0.00413	0.0125	0.00802	-0.00189	-0.00589	-0.00356	

	(0.056)	(0.064)	(0.046)	(0.032)	(0.031)	(0.060)	(0.029)
age	0.861	2.253	0.505	0.0764	0.225	-0.418	0.586
	(1.528)	(1.584)	(1.125)	(0.775)	(0.776)	(1.382)	(0.724)
number of household members	-0.620*	0.177	-0.144	0.227	0.235	0.160	-0.123
	(0.244)	(0.230)	(0.170)	(0.147)	(0.146)	(0.248)	(0.120)
telephone line	-0.0310	-0.0238	0.0284	0.0265	0.00157	0.00458	0.00591
	(0.025)	(0.030)	(0.023)	(0.022)	(0.017)	(0.034)	(0.017)
tv	-0.0260	-0.0338	0.0684	-0.00678	-0.0108	0.0546	0.00944
	(0.039)	(0.049)	(0.041)	(0.027)	(0.022)	(0.045)	(0.023)
dvd video player	-0.0137	-0.0103	0.0442	-0.0202	-0.0105	0.0348	-0.00638
	(0.044)	(0.057)	(0.043)	(0.029)	(0.025)	(0.050)	(0.026)
satellite cable tv	-0.0792	0.0764	0.0596	-0.0210	-0.0223	-0.0169	-0.00183
	(0.054)	(0.063)	(0.041)	(0.030)	(0.030)	(0.057)	(0.026)
fan	0.0410	0.158*	0.0179	0.0486	-0.0110	0.0377	-0.0250
	(0.056)	(0.063)	(0.043)	(0.031)	(0.030)	(0.059)	(0.028)
refrigerator	-0.0351	0.125*	-0.0428	0.0379	-0.00317	-0.00684	-0.0159
	(0.055)	(0.063)	(0.034)	(0.030)	(0.029)	(0.051)	(0.028)
framed bed	-0.0344	0.0136	0.0156	-0.0226	-0.00833	0.0480	-0.0574*
	(0.056)	(0.059)	(0.044)	(0.028)	(0.028)	(0.059)	(0.029)
mosquito net	-0.0126	-0.00820	0.0124	0.000115	-0.00183	0.0148	0.000107
	(0.012)	(0.014)	(0.007)	(0.006)	(0.008)	(0.017)	(0.007)
blanket	-0.0126	-0.0325*	0.00833	0.00221	0.00193	0.00780	0.00171
	(0.012)	(0.016)	(0.008)	(0.007)	(0.006)	(0.019)	(0.006)
mattress	0.00896	0.0193	-0.000120	0.00716	0.00414	0.0165	-0.0333
	(0.056)	(0.062)	(0.046)	(0.030)	(0.030)	(0.059)	(0.027)
high quality mattress	-0.0733	-0.00590	0.0228	-0.0272	-0.0203	0.0295	0.00993
	(0.051)	(0.057)	(0.039)	(0.026)	(0.030)	(0.049)	(0.024)
iron	-0.0393	0.0705	-0.0460	0.0506	0.0223	0.00906	-0.0229
	(0.049)	(0.058)	(0.045)	(0.031)	(0.030)	(0.056)	(0.025)
radio	-0.0472	0.0597	-0.0319	0.0224	0.0136	0.0179	-0.0138
	(0.056)	(0.062)	(0.044)	(0.031)	(0.030)	(0.058)	(0.027)
gas cooker	-0.0611	-0.0469	0.0279	0.0139	-0.0103	-0.0856	-0.00490
	(0.049)	(0.052)	(0.030)	(0.024)	(0.025)	(0.053)	(0.025)
mixer grinder beaters	-0.112**	-0.0387	-0.0380	-0.0142	-0.0424	0.00277	0.0131
	(0.042)	(0.053)	(0.027)	(0.022)	(0.024)	(0.043)	(0.025)
sofa setti	-0.0619	-0.0230	0.00758	-0.00788	-0.0253	0.0190	-0.0209
	(0.037)	(0.047)	(0.025)	(0.021)	(0.023)	(0.033)	(0.022)
camera camcorder	-0.0684*	-0.0315	-0.0128	0.00494	-0.00609	-0.0166	-0.00573
	(0.031)	(0.040)	(0.020)	(0.017)	(0.019)	(0.033)	(0.019)
car	-0.0871**	-0.0313	0.0161	0.0233	-0.0231	-0.0298	-0.0171
	(0.033)	(0.043)	(0.021)	(0.016)	(0.019)	(0.026)	(0.018)
computer laptop	-0.0681	-0.00649	-0.0135	-0.000172	0.00311	0.0106	-0.0112
	(0.039)	(0.051)	(0.031)	(0.023)	(0.024)	(0.040)	(0.023)
washing machine	-0.0369	-0.0231	0.00377	0.00529	0.0204	0.0408	0.00683

	(0.035)	(0.046)	(0.019)	(0.015)	(0.020)	(0.029)	(0.023)
dryer tumbler	-0.0250	-0.0239	-0.00833	-0.000230	0.00557	-0.00760	0.0144
	(0.015)	(0.028)	(0.008)	(0.008)	(0.010)	(0.016)	(0.012)
aircon	-0.00594	0.00905	0.00398	-0.00506	0.0131	0.0410	-0.00263
	(0.025)	(0.041)	(0.012)	(0.016)	(0.013)	(0.028)	(0.021)
watercooler	-0.0185	0.00859	-0.000239	-0.00276	0.00551	0.0134	-0.0234
	(0.024)	(0.031)	(0.015)	(0.014)	(0.013)	(0.020)	(0.016)
oven	-0.00609	0.000459	0.00394	0.0118	0.0112	0.00659	0.00450
	(0.019)	(0.030)	(0.014)	(0.010)	(0.011)	(0.016)	(0.014)
N	**319**	**247**	**484**	**987**	**1056**	**282**	**1222**

Table A1.2: Balance of observable household characteristics based on treatment status (sub-national)

The tables below present the minimum detectable difference between the treated and control group means that can be computed at five different levels of power: 20%, 50%, 70%, 80%, and 90%. The calculations are estimated with the assigned sample sizes of treated and control observations, a significance level of 5%, and a standard deviation of the outcome variable equal to one. This means that the measurable detectable differences are scalers of the standard deviation. For the national sample, with a power of 80% a difference of more than 0.06 standard deviations in the outcome can be measured with 95% confidence.

National:

	Power				
	0.2	0.5	0.7	0.8	0.9
Minimum detectable effect	0.024	0.042	0.054	0.06	0.07

Table A1.3: Minimum detectable effects in prior to survey implementation (national)

Notes: Minimum detectable effects are measured as standard deviations. Each column assumes a statistical significance of 5% and the power level shown in the column header. The sample size used for the calculation is the number of observations in the initial treatment assignment sample.

Sub-national:

	Power level				
State	0.2	0.5	0.7	0.8	0.9
Ayeyarwady	0.079	0.139	0.177	0.199	0.231
Bago	0.077	0.136	0.172	0.194	0.225
Chin	0.182	0.32	0.406	0.457	0.529
Kachin	0.126	0.221	0.28	0.316	0.365
Kayah	0.206	0.362	0.459	0.518	0.599
Kayin	0.163	0.287	0.363	0.41	0.474
Magway	0.083	0.146	0.185	0.209	0.242
Mandalay	0.075	0.132	0.167	0.189	0.218
Mon	0.125	0.22	0.279	0.315	0.364
Nay Pyi Taw	0.142	0.25	0.317	0.358	0.414
Rakhine	0.102	0.179	0.226	0.255	0.295
Sagaing	0.071	0.125	0.158	0.179	0.207
Shan	0.069	0.121	0.153	0.173	0.2
Tanintharyi	0.133	0.234	0.297	0.335	0.387
Yangon	0.064	0.112	0.142	0.16	0.186

Table A1.4: Minimum detectable effects in prior to survey implementation (sub-national)

Notes: Minimum detectable effects are measured as standard deviations. Each column assumes a statistical significance of 5% and the power level shown in the column header. For each state, the sample size used for the calculation is the number of observations in the initial treatment assignment sample belonging to the respective state.

Appendix 2: Sample characteristics prior to survey implementation

A2.1 Comparing MSPS quotas to a simple probability proportional to size

State	Samples based on simple probability proportional to size	Samples based on MSPS quotas per stratum	Difference
Ayeyawady	1068	792	-276
Bago	812	834	22
Chin	150	152	-2
Kachin	268	317	49
Kayah	150	119	-74
Kayin	246	189	-57
Magway	669	721	52
Mandalay	1030	885	-145
Mon	333	319	-14
Nay Pyi Taw	201	247	46
Rakhine	365	484	119
Sagaing	912	987	75
Shan	803	1056	253
Tanintharyi	228	282	54
Yangon	1268	1222	-46
Total	8503	8606	103

Table A2.1: Comparison of size of samples based on MSPS based draw

Notes: The table below compares sample sizes from the MSPS quota-based sample draws to simple probability proportional to size (PPS) across states and regions.

A2.2 Urban share and elementary education shares of MSPS sample
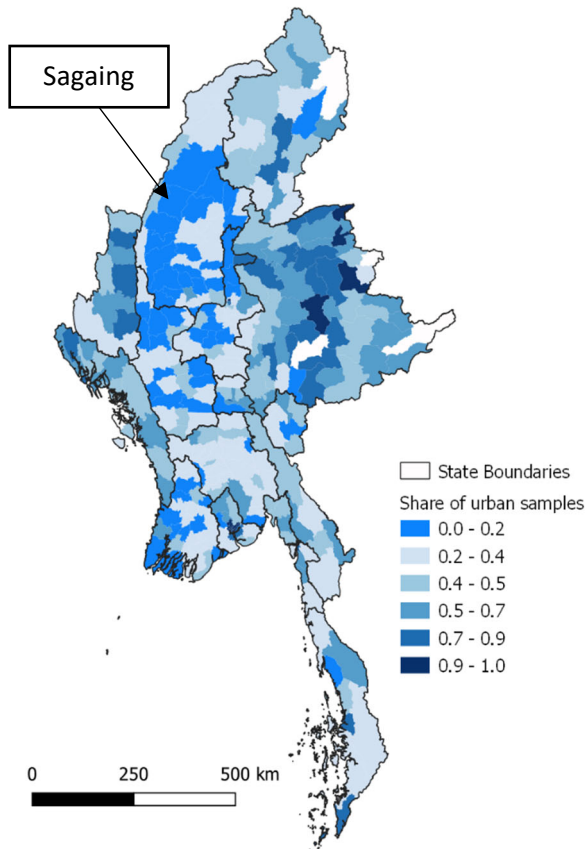
Figure A2.2: Share of households from the urban sector in sampling frame
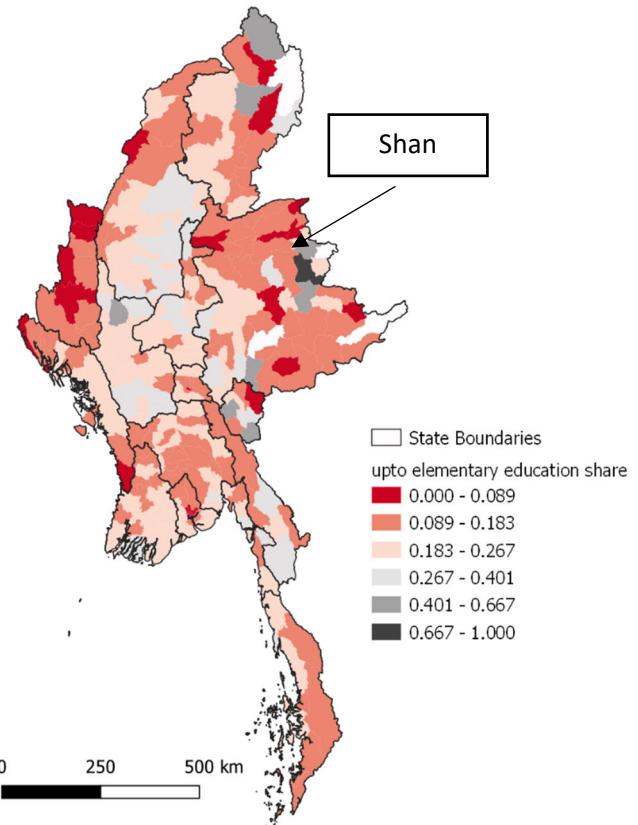
Figure A2.3: Share of main respondents with upto elementary level of education in sampling frame

Notes: Figures A2.2 and A2.3 respectively show the fraction of households from urban sector and share of main respondents who have up to primary level of education (includes those that are illiterate and have no education). Although the sampling frame has fewer contacts in locations like Shan (see Map 1), the households are more likely to be in the urban sector and have a primary respondent with up to elementary levels of education. In comparison, samples in Sagaing are mostly rural but have a wider range of education across respondents.

Source: Shapefiles – MIMU. Data – Sampling frame.

A2.3 Concentration of samples based on remoteness of townships in MSPS

Figure A2.4: Share of sampled households per township overlaid with road and railway transportation network

Figure A2.5: Location of formal schools in Myanmar

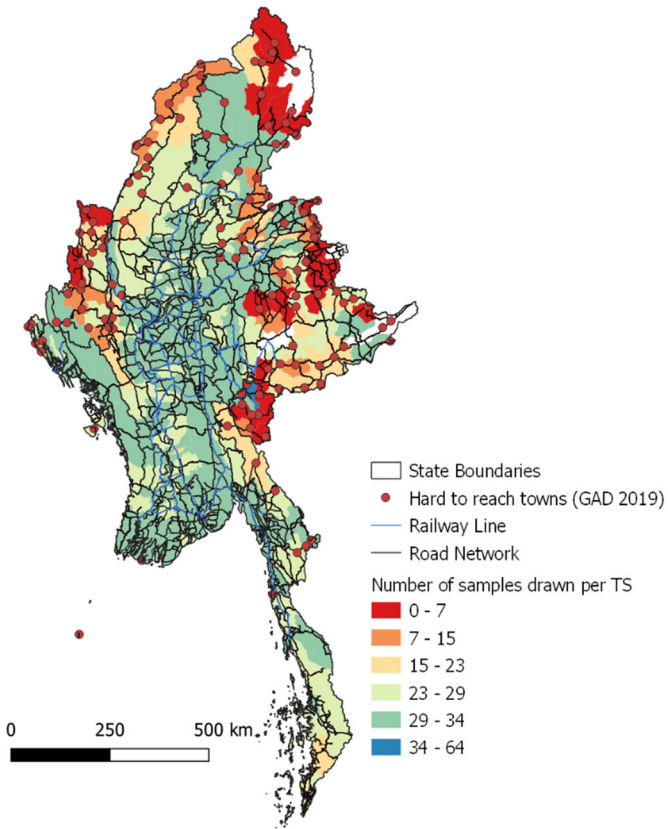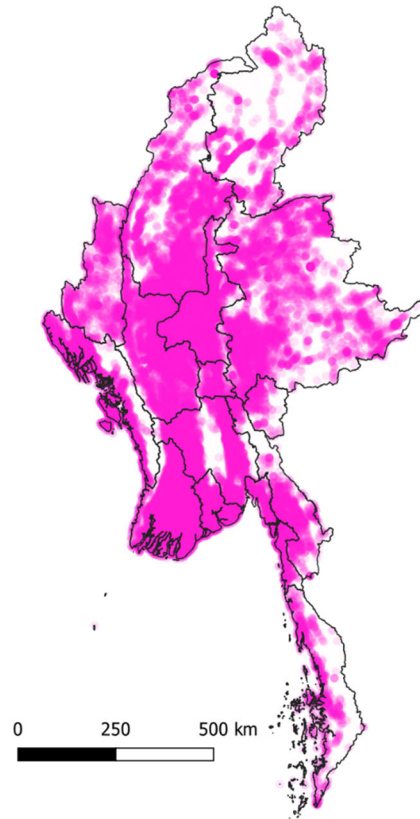Source: Shapefiles – MIMU. Data – Sampling frame.

Appendix 3: Sample sub-national level characteristics after reweighting

A3.1 Share of urban population by state

State	MSPS 2022	IFPRI 2022	MLCS 2017	Changes in urbanization 2022-2017 (MSPS, pp)	Changes in urbanization 2022-2017 (MHWS, pp)
Kachin	4.0%	3.6%	4.1%	-0.1 pp	-0.5 pp
Kayah	0.4%	0.4%	0.5%	-0.1 pp	-0.1 pp
Kayin	1.6%	1.8%	2.1%	-0.5 pp	-0.3 pp
Chin	0.5%	0.7%	0.7%	-0.2 pp	0.0 pp
Sagaing	5.7%	5.9%	5.9%	-0.2 pp	0.0 pp
Tanintharyi	2.3%	2.4%	2.4%	0.0 pp	0.0 pp
Bago	5.3%	5.8%	7.7%	-2.4 pp	-1.8 pp
Magway	3.4%	3.7%	3.4%	0.0 pp	0.3 pp
Mandalay	13.2%	14.3%	13.3%	-0.1 pp	1.0 pp
Mon	3.1%	3.3%	3.5%	-0.5 pp	-0.2 pp
Rakhine	3.1%	3.3%	2.5%	0.6 pp	0.8 pp
Yangon	37.4%	35.7%	37.3%	0.1 pp	-1.6 pp
Shan	12.1%	10.5%	9.1%	3.0 pp	1.5 pp
Ayeyarwady	5.5%	6.2%	5.4%	0.1 pp	0.8 pp
Nay Pyi Taw	2.4%	2.3%	2.1%	0.3 pp	0.2 pp

Table A3.1: Share of urban population by state; differences based on MSPS, 2022 and MLCS, 2017.

A3.2 Household size distribution by state

State	MSPS – 2022				Difference between MSPS 2022 and MLCS 2017			
	1 to 2 members	3 to 5 members	5 to 9 members	9 + members	1 to 2 members	3 to 5 members	5 to 9 members	9 + members
Kachin	0.1%	1.0%	2.1%	0.4%	0.0 pp	0.4 pp	0.3 pp	-0.2 pp
Kayah	0.0%	0.2%	0.3%	0.1%	0.0 pp	0.0 pp	-0.1 pp	0.0 pp
Kayin	0.0%	1.1%	1.6%	0.1%	0.0 pp	0.3 pp	-0.3 pp	-0.2 pp
Chin	0.0%	0.3%	0.6%	0.0%	0.0 pp	0.2 pp	0.1 pp	-0.5 pp
Sagaing	0.3%	3.1%	5.8%	0.9%	0.0 pp	0.0 pp	0.2 pp	-0.1 pp
Tanintharyi	0.1%	0.7%	1.7%	0.2%	0.0 pp	0.0 pp	0.3 pp	-0.2 pp
Bago	0.3%	3.4%	4.8%	0.4%	-0.3 pp	-0.6 pp	0.5 pp	-0.1 pp
Magway	0.4%	2.7%	3.9%	0.1%	0.0 pp	-0.1 pp	-0.1 pp	-0.4 pp
Mandalay	0.7%	4.5%	6.0%	0.9%	0.2 pp	0.3 pp	-0.7 pp	-0.4 pp
Mon	0.2%	1.3%	1.9%	0.2%	0.0 pp	0.2 pp	0.0 pp	-0.4 pp
Rakhine	0.3%	2.7%	2.4%	0.6%	0.1 pp	1.0 pp	-1.2 pp	-0.1 pp
Yangon	0.9%	6.5%	7.7%	0.8%	0.1 pp	1.0 pp	0.8 pp	-0.6 pp
Shan	0.5%	4.0%	6.1%	1.3%	0.2 pp	1.1 pp	0.7 pp	-0.1 pp
Ayeyarwady	0.9%	4.8%	5.0%	0.5%	0.3 pp	-0.3 pp	-0.8 pp	-0.3 pp
Nay Pyi Taw	0.1%	1.1%	1.1%	0.0%	0.0 pp	0.2 pp	0.0 pp	-0.1 pp

Table A3.2: Distribution of household sizes across states and regions; differences based on MSPS, 2022 and MLCS, 2017.

A3.3 Female population distribution by state

State	MSPS – 2022		Difference between MSPS 2022 and MLCS 2017	
	Rural	Urban	Rural	Urban
Kachin	50.6%	50.8%	0.5 pp	0.2 pp
Kayah	46.2%	55.3%	-3.7 pp	3.8 pp
Kayin	54.5%	58.2%	1.5 pp	6.0 pp
Chin	52.3%	56.6%	0.2 pp	3.5 pp
Sagaing	54.7%	51.7%	2.3 pp	-0.6 pp
Tanintharyi	54.6%	50.8%	5.5 pp	-2.1 pp
Bago	54.5%	51.1%	3.2 pp	-2.5 pp
Magway	55.0%	56.0%	-0.4 pp	0.5 pp
Mandalay	54.5%	52.9%	1.8 pp	-1.3 pp
Mon	50.1%	60.0%	-3.5 pp	7.1 pp
Rakhine	52.0%	53.2%	-0.5 pp	-0.1 pp
Yangon	55.2%	51.4%	3.4 pp	-1.6 pp
Shan	51.1%	49.8%	-0.5 pp	-1.9 pp
Ayeyarwady	53.1%	51.2%	0.5 pp	-2.5 pp
Nay Pyi Taw	53.7%	52.2%	0.6 pp	-1.4 pp

Table A3.3: Distribution of female population across states and regions; differences based on MSPS, 2022 and MLCS, 2017.

A3.4 Distribution of population living in female headed households

State	MSPS – 2022		Difference between MSPS 2022 and MLCS 2017	
	Rural	Urban	Rural	Urban
Kachin	0.6%	5.2%	-2.2 pp	1.0 pp
Kayah	4.8%	7.5%	0.9 pp	1.4 pp
Kayin	1.8%	31.1%	-3.4 pp	21.0 pp
Chin	0.4%	4.8%	-4.5 pp	-1.0 pp
Sagaing	4.0%	2.9%	-1.1 pp	-2.9 pp
Tanintharyi	1.4%	0.1%	-2.7 pp	-4.6 pp
Bago	2.7%	9.3%	-4.2 pp	1.0 pp
Magway	5.8%	7.3%	-2.5 pp	-1.4 pp
Mandalay	4.9%	7.8%	-1.9 pp	-0.6 pp
Mon	8.4%	6.7%	0.8 pp	0.2 pp
Rakhine	6.5%	3.4%	1.8 pp	-1.9 pp
Yangon	5.4%	7.2%	0.1 pp	-0.3 pp
Shan	3.7%	2.3%	-2.1 pp	-4.3 pp
Ayeyarwady	3.7%	4.5%	-1.3 pp	-2.6 pp
Nay Pyi Taw	8.0%	16.5%	2.2 pp	9.1 pp

Table A3.4: Distribution of population living in female headed households across states and regions; differences based on MSPS, 2022 and MLCS, 2017.

A3.5 Distribution of age-groups

State	MSPS – 2022			Difference between MSPS 2022 and MLCS 2017		
	Less than 15 years	15 to 65 years	Over 65 years	Less than 15 years	15 to 65 years	Over 65 years
Kachin	29.0%	65.9%	5.2%	-4.7 pp	3.6 pp	1.1 pp
Kayah	26.3%	64.8%	8.9%	-9.0 pp	3.7 pp	5.3 pp
Kayin	29.2%	67.6%	3.3%	-8.2 pp	10.6 pp	-2.4 pp
Chin	37.0%	62.1%	0.9%	-4.1 pp	7.9 pp	-3.8 pp
Sagaing	21.6%	69.5%	8.9%	-5.3 pp	3.5 pp	1.8 pp
Tanintharyi	25.2%	70.3%	4.5%	-9.8 pp	10.6 pp	-0.7 pp
Bago	21.7%	72.8%	5.5%	-7.3 pp	8.4 pp	-1.1 pp
Magway	22.8%	68.6%	8.6%	-3.7 pp	3.2 pp	0.5 pp
Mandalay	23.0%	69.7%	7.4%	-1.0 pp	2.4 pp	-1.4 pp
Mon	25.6%	63.0%	11.4%	-5.7 pp	2.6 pp	3.1 pp
Rakhine	25.0%	69.9%	5.2%	-7.0 pp	8.4 pp	-1.4 pp
Yangon	20.2%	70.4%	9.4%	-3.6 pp	1.1 pp	2.5 pp
Shan	24.9%	67.4%	7.7%	-6.2 pp	3.8 pp	2.5 pp
Ayeyarwady	22.8%	68.4%	8.8%	-6.0 pp	2.7 pp	3.3 pp
Nay Pyi Taw	18.5%	76.1%	5.4%	-11.4 pp	11.1 pp	0.3 pp

Table A3.5: Distribution of age-groups by state; differences based on MSPS, 2022 and MLCS, 2017.

A3.6 Share of educational attainment

State	MSPS – 2022					Difference between MSPS 2022 and MLCS 2017				
	below primary school	Primary school	Middle school	High School	College or above	below primary school	Primary school	Middle school	High School	College or above
Kachin	21.5%	33.7%	18.7%	16.2%	10.0%	-0.3 pp	-0.3 pp	-6.1 pp	2.1 pp	4.7 pp
Kayah	22.7%	33.5%	20.8%	13.6%	9.4%	-4.5 pp	1.5 pp	-3.0 pp	0.7 pp	5.3 pp
Kayin	33.7%	34.8%	15.8%	11.0%	4.7%	-1.7 pp	-0.4 pp	-2.1 pp	2.4 pp	1.8 pp
Chin	29.0%	28.2%	25.6%	10.4%	6.8%	-0.8 pp	-2.8 pp	4.8 pp	-4.7 pp	3.5 pp
Sagaing	21.5%	39.1%	20.8%	13.3%	5.3%	-2.7 pp	0.1 pp	-0.5 pp	2.7 pp	0.5 pp
Tanintharyi	18.4%	39.3%	22.0%	14.2%	6.2%	-4.6 pp	-3.9 pp	0.0 pp	5.1 pp	3.4 pp
Bago	16.2%	43.3%	20.3%	14.5%	5.7%	-3.8 pp	-1.8 pp	-0.8 pp	4.1 pp	2.4 pp
Magway	25.8%	38.8%	17.2%	11.3%	6.9%	2.2 pp	-2.2 pp	-4.1 pp	1.0 pp	3.1 pp
Mandalay	21.4%	34.7%	19.5%	14.9%	9.6%	0.9 pp	-0.6 pp	-2.1 pp	-1.4 pp	3.3 pp
Mon	19.9%	41.6%	16.2%	12.7%	9.7%	-5.8 pp	3.4 pp	-3.6 pp	1.8 pp	4.2 pp
Rakhine	22.7%	45.2%	15.8%	11.8%	4.5%	-3.0 pp	-0.4 pp	-2.3 pp	3.9 pp	1.8 pp
Yangon	16.6%	24.7%	22.3%	22.6%	13.9%	0.4 pp	-0.6 pp	-2.7 pp	1.1 pp	2.0 pp

Shan	39.8%	29.5%	15.4%	11.0%	4.3%	-2.1 pp	-2.1 pp	-0.5 pp	3.1 pp	1.6 pp
Ayeyarwady	19.5%	44.0%	19.5%	11.9%	5.1%	-2.3 pp	-1.5 pp	-0.4 pp	2.3 pp	1.9 pp
Nay Pyi Taw	15.3%	36.3%	19.0%	19.3%	10.1%	-5.7 pp	-2.9 pp	-2.5 pp	6.5 pp	4.6 pp

Table A3.6: Distribution of educational attainment across states and regions; differences based on MSPS, 2022 and MLCS, 2017.