Mobile phones, Internet, information and knowledge

Myanmar 2016

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August 2017

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The survey was carried out with financial support from the UK Government's Department for International Development and the International Development Research Centre, Canada.

Acknowledgements

The authors wish to acknowledge all those who provided invaluable input and engaged with LIRNE*asia* on the design, implementation, and analysis of the survey.

Third Eye Co. conducted the fieldwork on this survey. The input of Htun Htun Oo and San Naing in particular are much appreciated.

MIDO's constant support throughout the research, in participating in fieldwork and conducting quality checks, must be acknowledged. Phyu Phyu Thi, Htaike Htaike Aung, Yatanar Htun, Hnin Nu Nu Niang and Myo Min Aung in must be given special mention.

The survey conducted in 2016 was follow up to one carried out in 2015. Mention must be made of those who helped with the design of the initial questionnaire. Our thanks go out to Joshua Blumenstock, Per Helmerson, Saad Gulzar, Jorge Garcia Hombrados, Srignesh Lokanathan and Nilusha Kapugama. The advice given by Rohan Samarajiva, who also spent time reviewing the early part of data analysis, is appreciated.

Special mention must also be made of Piyumi Gamage for assisting in writing the report.

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Executive summary

Myanmar has witnessed tremendous growth in telecom connectivity following the liberalization of the market in 2013; this is reflected in the affordability, access and use indicators. Mobile subscriptions per 100 people reached 80 in 2015, within 18 months of reform. The International Telecommunication Union's 2016 ICT Development Index ranked Myanmar 140th out of 175 countries. This was four places ahead of Lao PDR, ahead of both Bangladesh and Pakistan, and within striking distance of India.

This report presents the findings of LIRNE*asia*'s 2016 nationally representative survey of mobile and ICT access and use in Myanmar. The survey was conducted among 7,204 15-65 year olds across Myanmar between June and August 2016. Stratified Four Stage Probability Proportional to Size (PPS) Cluster sampling was used to ensure representation of the population of Myanmar within a +/-3% margin of error. The sample covered all states and regions, but excluded 32 townships that were deemed unsafe or inaccessible for research. Face-to-face interviews were conducted using electronic data entry. The 2016 survey was a follow-up to a baseline survey conducted in 2015 by LIRNE*asia* on similar topics.

Access to ICT devices had increased considerably between 2015 and 2016. Household ownership of mobile phones stood at 83%, up from 57% in 2015. On average, there were 2.3 mobile phones per household; the corresponding figure for SIM cards per household was even higher at 2.9. Geographically, the increase in the proportion of households with mobile phones and SIMs has taken place largely in the smaller townships.

Teleuse at an individual level was high, and had improved considerably. The proportion of individuals who said they had never used a phone reduced to 31% from 9%. Nearly half the population had used a phone on the day of the survey in 2016, up from 29% in 2015. This increase in the frequency of calling was observed in both urban and rural areas, and among both males and females. Still, males were more likely to have owned the last phone they used. Females, on the other hand, were twice as likely as males to have used a household or common phone. Ninety-four percent of the calls were made on a mobile device.

Mobile ownership increased from 39% in 2015 to 61% in 2016, more than doubling in rural areas. Fifty-eight percent of mobile owners lived in rural areas in 2016. Mobile ownership among females had increased but the gender gap remained, with males being 28% more likely to own a mobile phone than females.

The average expenditure on purchasing a mobile phone was MMK105,198 (USD 87) and the total average monthly spend on top-ups was MMK7,494 (USD 6). Expenditure on top-ups in urban areas was twice as large as rural areas.

Over a quarter of active SIM owners owned more than one SIM card; a third of those between the ages of 15 & 33 owned more than one SIM card, while the corresponding figure for older cohorts was lower. Fifty-six percent of those with more than one SIM said this was to get coverage wherever they went.

Thirty-nine percent of the population

didn't own a mobile phone in 2016. The main reason stated by the respondents for the lack of ownership was that they could not afford a handset (43%), followed closely by the perception that they didn't need one (41%). The proportion of respondents who stated that they didn't need a phone increased since 2015, perhaps in the line with the notion that those who aspired to buy a phone in the past have already got connected.

Computer use was low in Myanmar; only three percent of the population of 15 to 65-year-olds had ever used a computer in 2016. Among these, an already small group of computer users, only 16% had accessed the Internet within the day.

Therefore, smartphones were the primary mode of accessing the Internet. The data showed that 78% of mobile owners used smartphones in 2016. The gender gap in smartphone ownership among mobile owners was a mere one percent. Smartphone ownership penetration in rural areas has increased however, leading to a reduction in the urban-rural gap in smartphone penetration was still highest among the younger cohorts with 93% of mobile owners in the 15-24 age-group owning smartphones, but older cohorts are also catching up. However, only 47% of mobile owners used mobile data services.

Accessing Facebook was a common use of the mobile phone, with 35% of mobile owners claiming they use it; 21% accessed it daily. Significant growth in the use of phones for instant messaging and making Internet calls has been observed since 2015. Community news, weather information and national news were the top three information needs in Myanmar, consistent with the results in 2015. Face-to-face conversations were the most common mode of getting information, followed by calls via mobile phones (15%) and the Internet (9%). A shift from the use of mobile phones to the Internet for this purpose was observed between 2015 and 2016.

The ability to act or contact others in the case of an emergency was the biggest perceived improvement of using mobile phones. Users also saw a comparatively large improvement in social and familial relations with the use of mobile phones. Concerns on mobile access and use remained, particularly regarding the costs associated with mobile phones and the risk of children being exposed to inappropriate content.

Digital skills among mobile handset owners were low. Only a fifth of mobile owners were able to search for information, install applications, create log-in details, locate and adjust settings on an application or post information online by themselves. However, the ability to carry out these tasks improved with the help of another individual.

15-65 POPULATION WHO NEVER MADE A CALL DECREASED

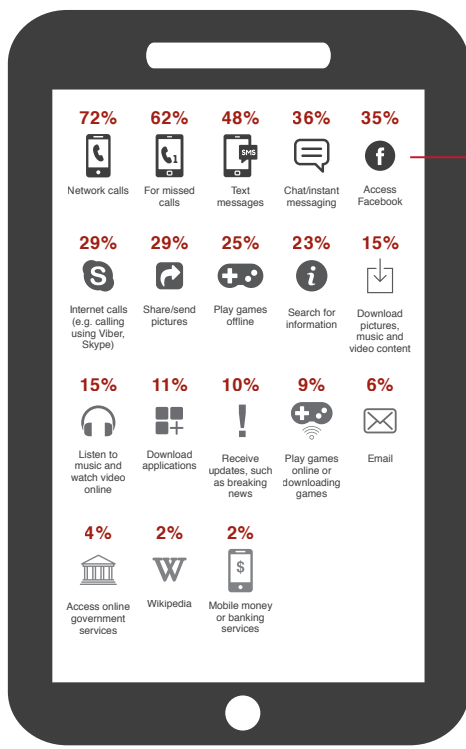
31% 2015 → 9% 2016

MOBILE OWNERSHIP INCREASED

39% 2015 → 61% 2016

78% of mobile owners in Myanmar, **owned a smartphone in 2016**

WHAT DO YOU DO WITH YOUR MOBILE PHONE?



35% of mobile owners use Facebook → **60%** of them use it daily

FREE/ZERO RATED CONTENT

Facebook-flex: **6%** Aware → **71%** Use

Wiki-zero + Other: **3%** Aware → **10%** Use

of them

58% of mobile owners lived in **rural areas in 2016**

DIGITAL SKILLS ARE LOW AMONGST MOBILE OWNERS

	Search for information or other content online	Install an app	Create login details (user name and password)	Locate and adjust settings on an application or service	Post any information online
I can do by myself	**22%**	**21%**	**18%**	**19%**	**21%**
I can do with the help of others	**11%**	**25%**	**21%**	**25%**	**7%**

Figure 1 : Summary of findings: Mobile momentum in Myanmar

Methodology

For a more detailed description of the survey methodology, see Annex 1.

LIRNE*asia* conducted two consecutive nationally representative surveys in 2015 and 2016 to obtain comparable data on ICT use and information needs in Myanmar, post liberalization. The key differences between the two are highlighted in Table 1. Despite the differences in sample size and margins of errors, the results from the two nationally representative surveys are largely comparable.

	2015 survey	2016 survey
Fieldwork dates	February – March 2015	June – August 2016
Sample age group	15-65	15-65
Sample size	8,400	7,204
Margin of error	+/-2.5%	+/-3%

Table 1 : Key differences between 2015 and 2016 surveys

The results can be disaggregated into administrative regions and states, geographic regions, urban versus rural locations, as well as by gender and age groups. The townships were set as Primary Sampling Units (PSU). Thirty-two of the 330 townships (from Kachin State, Kayah State, Kayin State, Chin State, Sagaing Region, Rakhine State and Yangon Region) are excluded from the PSU sampling frame due to inaccessibility and security concerns.

The data is stratified as follows:

Main strata: The country is divided into six geographic areas – Northern Hills, Eastern Hills, Middle Dry Zone, Lower Valley, Ayeyarwady Delta and Long Coast.

First level sub-strata: The population is further subdivided into three sub strata according to the population size of the cities or townships. The three sub strata are big cities, other major cities and smaller townships.

Second level sub-strata: Urban and rural areas were selected within selected sample cities/townships.

Four-stage sampling was carried out to select households. The stages, briefly, are;

Stage 1: Selection of township

Stage 2: Selection of wards in urban areas and village tracts in rural areas in selected townships

Stage 3: Selection of clusters in specified wards/village tracts

Stage 4: Selection of households in selected cluster (segment)

Once a household was selected, a Kish grid was used to select a respondent from each household for the individual-specific component of the questionnaire.

Information was gathered on the following topics;

- Characteristics of household members
- Housing and living status
- Household expenditure and income
- Respondent's characteristics
- ICT use
- Information sources, needs and access
- Perceived impact of ICTs

Gender, age and location distribution in the sample:

The gender, age and location (i.e. urban vs. rural) distributions of the survey sample were verified against the most recent (i.e. 2014) Myanmar census data. It should be noted that although the census was carried out in 2014, it is the best publicly available data source for comparison.

The comparison in Figures 2, 3 and 4, and Table 2 indicate that the sample distributions are comparable.

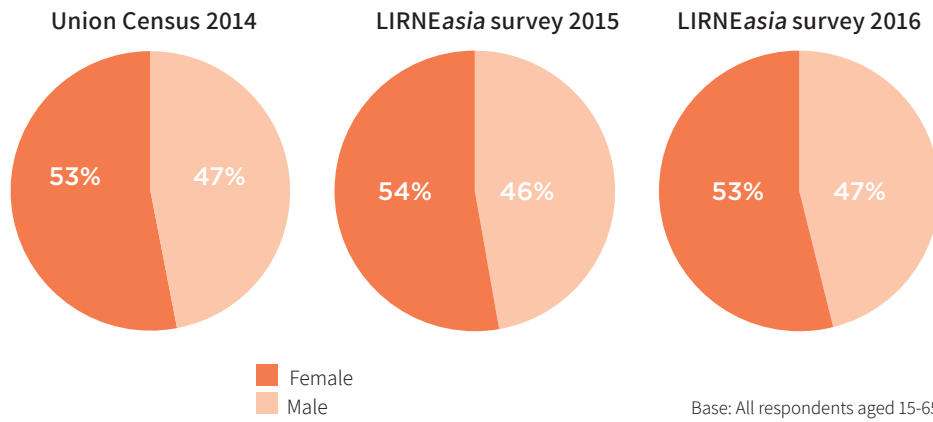


Figure 2 : Sample demographics – gender (% of population aged 15-65)

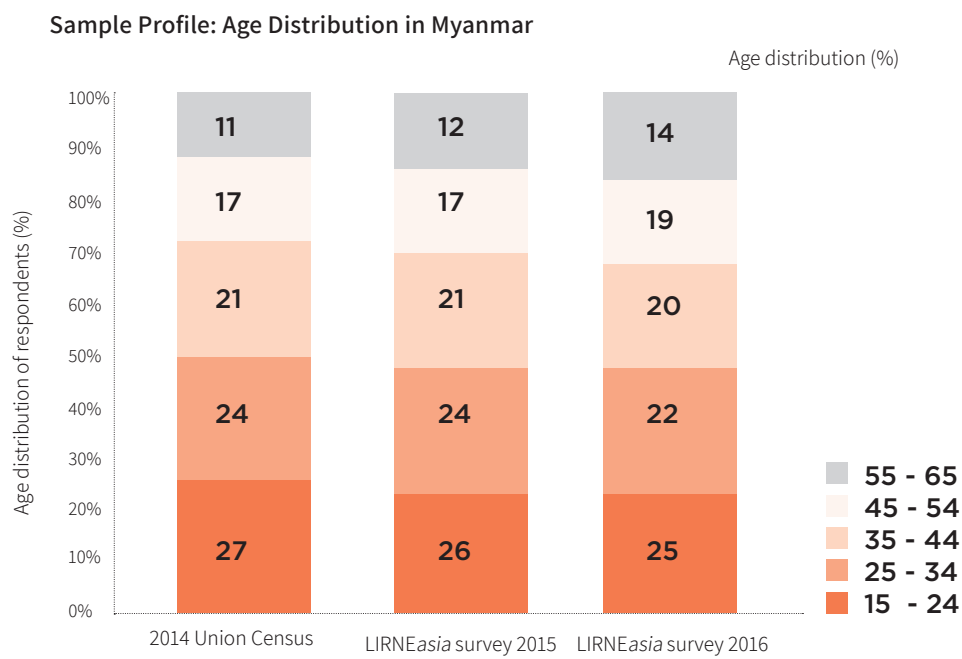


Figure 3 : Sample demographics – age (% of population aged 15-65)

We also compared the economic status of the population aged 15-65, and compared our results with the 2014 census (Table 3). The age bands of the two data sources differ by one year where the upper age limit of consideration for the LIRNEasia survey was 65, while that in the Union census was 64. The numbers are largely comparable. The LIRNE*asia* surveys showed a higher proportion of fulltime housewives, while the proportion of old-aged and unable to work were constant.

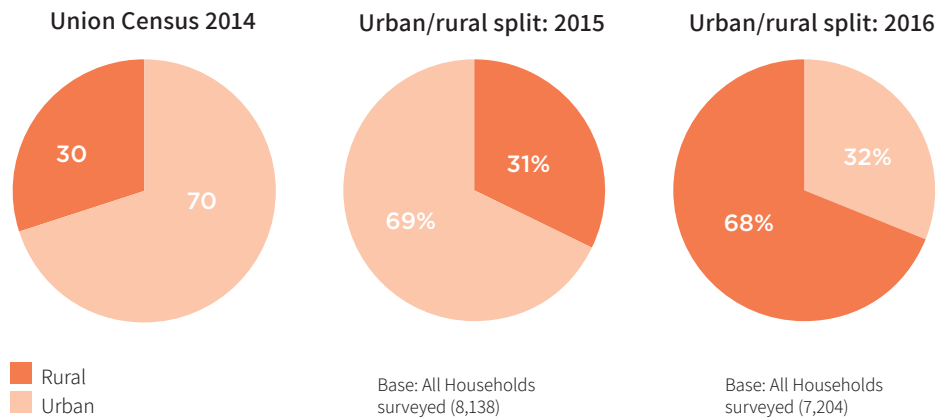


Figure 4 : Sample demographics – urban vs. rural (% of population aged 15-65)

Economic status in the previous six months		2015 LIRNE*asia* survey: % of 15-65 population	2016 LIRNE*asia* survey: % of 15-65 population	2014 Union Census: % of 15-64 population
In the labor force	Employed	59%	61%	64%
Not in the labor force	Unemployed (Sought job, got no job)	3%	1%	3%
	Fulltime housewife	25%	26%	21%
	Full-time student	7%	5%	5%
	Old aged and don't work	2%	2%	2%
	Not able to work (Unhealthy/ Disabled)	1%	1%	1%
	Did not work and didn't seek job	3%	3%	0%
	Not working for other reasons	1%	0.4%	4%
	Total	100%	100%	100%

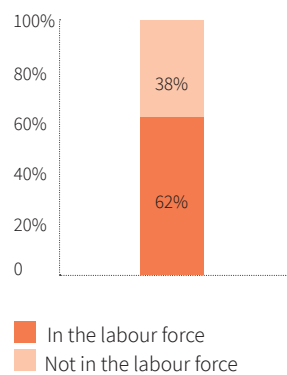
Table 2 : Economic status - LIRNE*asia* surveys vs. Myanmar government census (% of population aged 15-65)

Socio-Economic Status

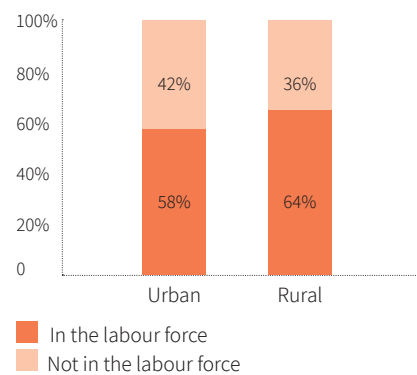
1.1 Labor and earnings

The survey results indicate that 62% of the population was in the labor force in 2016, that is, either currently employed or not employed but seeking employment. Of those in the labor force, 98% were employed or working, while 2% were unemployed and seeking work. A gap in the labor force participation between males and females was observed. Labor participation was significantly higher among males compared to females. A higher percentage of the rural population participated in the labor force over the six months prior to the survey, compared to that of urban population (Figure 5).

Labor force participation over the previous six months (%15-65 population)



Labor force participation over the previous six months (%15-65 population)



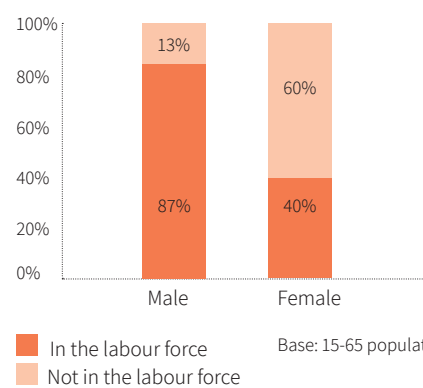


Figure 5 : Labor force participation in the six months prior to data collection
(% of population aged 15-65)

Base: 15-65 population

Farmers constituted a large segment (16%) of the population, and of them, 82% were male. Nearly six percent of respondents[2] were business owners – a third of which were female.

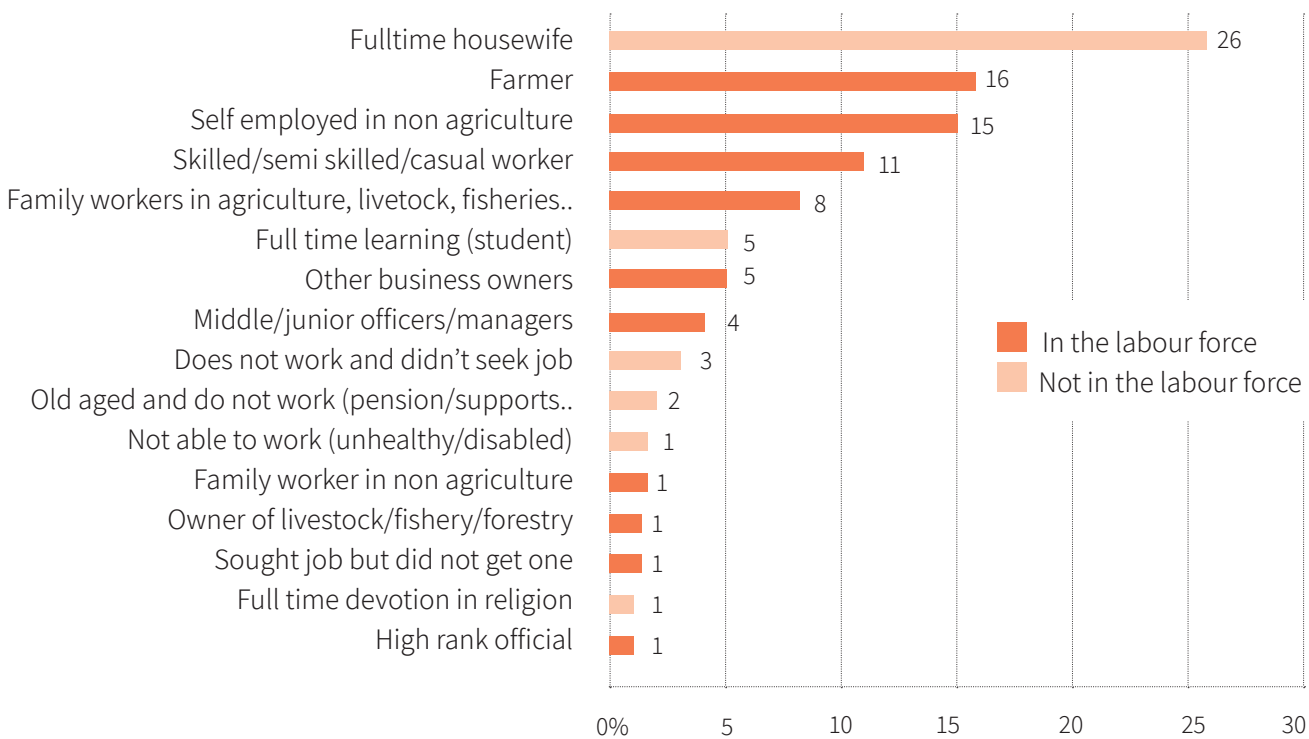


Figure 6: Main occupational groups (% of population aged 15-65)

[2] "Respondent" refers to a randomly selected household member on whom the survey is administered

The types of earnings of the working population were placed in five main categories; profit/dividends/interest, daily wage, monthly salary, in kind/no earning in cash, and contract earning/piece rate. A mere 12% earned a monthly salary. (Figure 7)

The majority of those working earn via profit/dividend/interest basis

Type of earning (% of those engaged in economic activity in the previous six months)

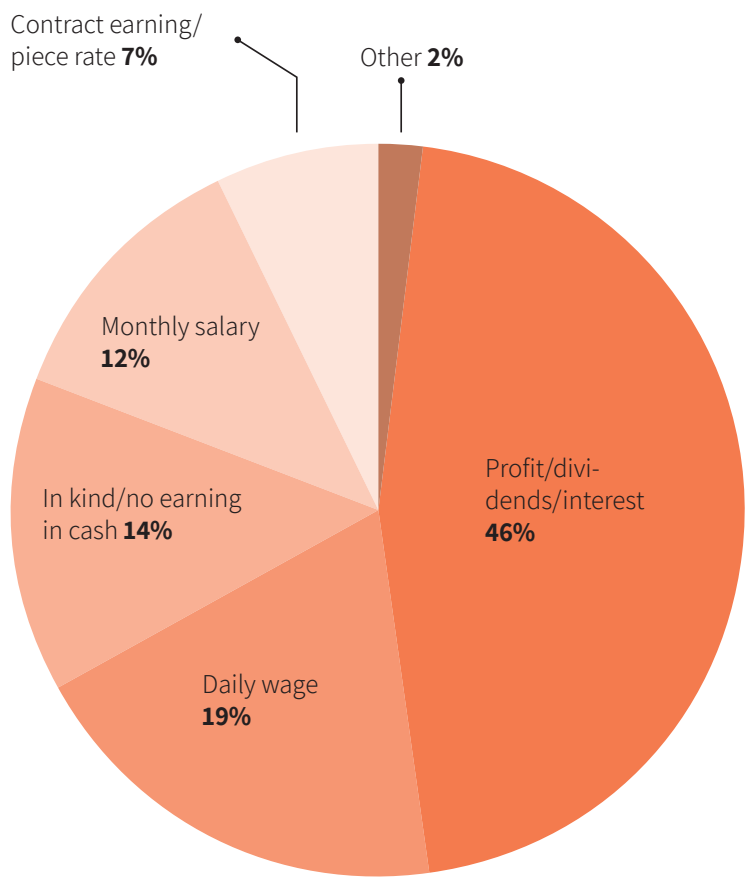


Figure 7: Type of earning (% of those engaged in economic activity in the six months prior to data collection)

We then examined the occupation groups those with the different types of earnings fell into:

Profit dividend interest earned by

- **85%** of farmers
- **80%** of owners of livestock/fishery and forestry
- **58%** of other business owners
- **55%** of those self-employed in non-agriculture sectors

Daily wage earned by

- **70%** of skilled/semi-skilled and casual workers

Monthly salary earned by

- **80%** of high ranked officials (government/private sector), law makers, professionals and technicians
- **90%** of middle/junior officers/managers (government/private sector)

In-kind/no earning cash reported by

- **68%** of family workers in agriculture/livestock/fishery/forestry sectors
- **72%** of family workers in non-agriculture sectors

Shifting focus to those not engaged in the labor force, it is noteworthy is that 26% of the population aged 15-65 identified themselves as fulltime housewives. This accounted for 49% of the female population aged 15-65. In Myanmar, the economic power of women has been seen in a slightly more complex manner than in more patriarchal societies of, for example, India, Bangladesh and Pakistan. Women in Myanmar often have a direct impact on the financial stability of the household even when they are not involved in direct income generation activities (GSMA Connected Women & LIRNE*asia*, 2015). Kanawami (2013) writes of how economic power enabled women to undertake merit-taking activities such as making donations to pagodas. Gender dimensions of mobile ownership and use are explored in other sections of this report.

1.2. Household income and expenditure

The median household income in Myanmar in 2016 was MMK 200,000 (USD 165) and median expenditure was MMK150,000 (US$124)[3] (Table 3). The gap between income and expenditure in both urban and rural areas was approximately MMK100,000 (US$83) (Table 4).

	Income		Expenditure	
	(MMK)	(USD)	(MMK)	(USD)
Mean	267,620	221	178,669	148
Median	200,000	165	150,000	124

Table 3: Household income and expenditure (mean MMK/USD)

	Income		Expenditure	
	MMK	USD	MMK	USD
Urban	352,941	292	235,002	194
Rural	228,017	189	152,511	126
Myanmar total	267,620	221	178,669	148

Table 4: Household income and expenditure – urban vs. rural (mean MMK/USD)

1.3 Type of housing

Wooden houses were prevalent across both urban and rural areas. The proportion of wooden houses had increased in both urban and rural areas. A seven percent increase in wooden houses was also observed, an indication of rural Myanmar moving towards better housing. The proportion of huts had reduced considerably in both urban and areas from 2015 to 2016. The proportion of bamboo houses had also fallen. (Figure 8, 9 and 10)

Wooden house

Figure : 8 Type of housing (% of households)

Bamboo house

Figure : 9 Type of housing (% of households)

[3] Exchange rate: US$1= MMK1209 (exchange rate for the period of the survey: June to August 2016).

Type of house (% of households)

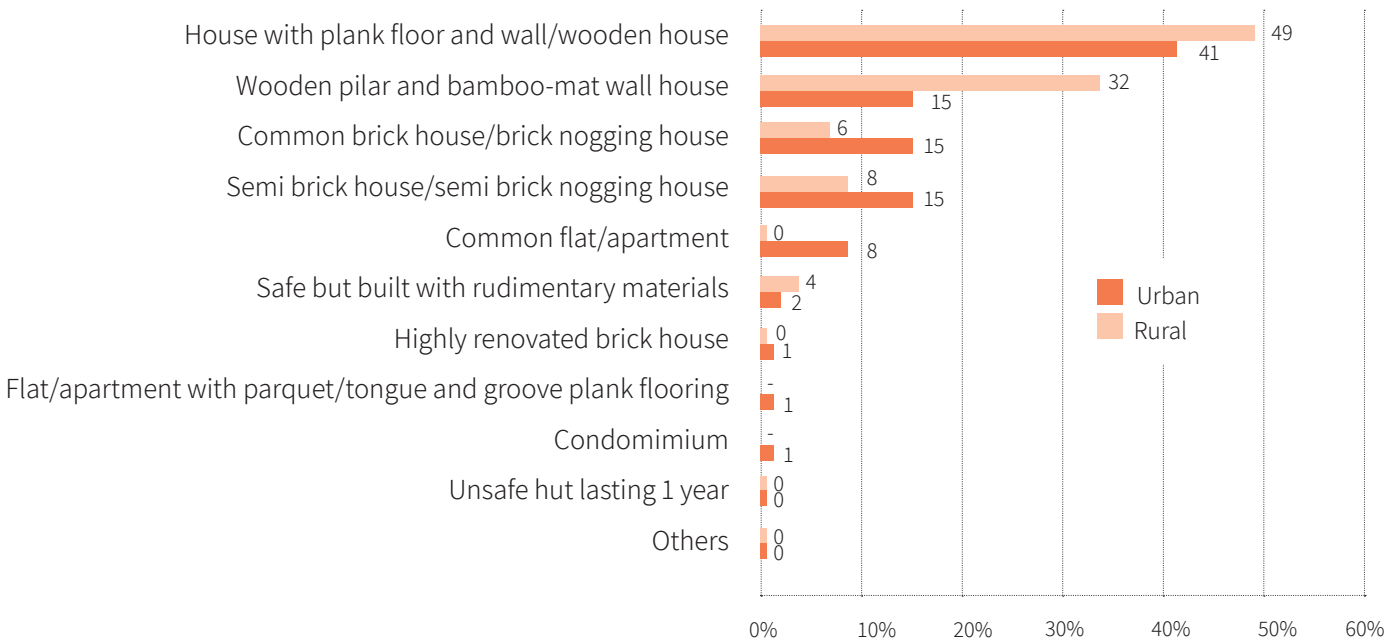
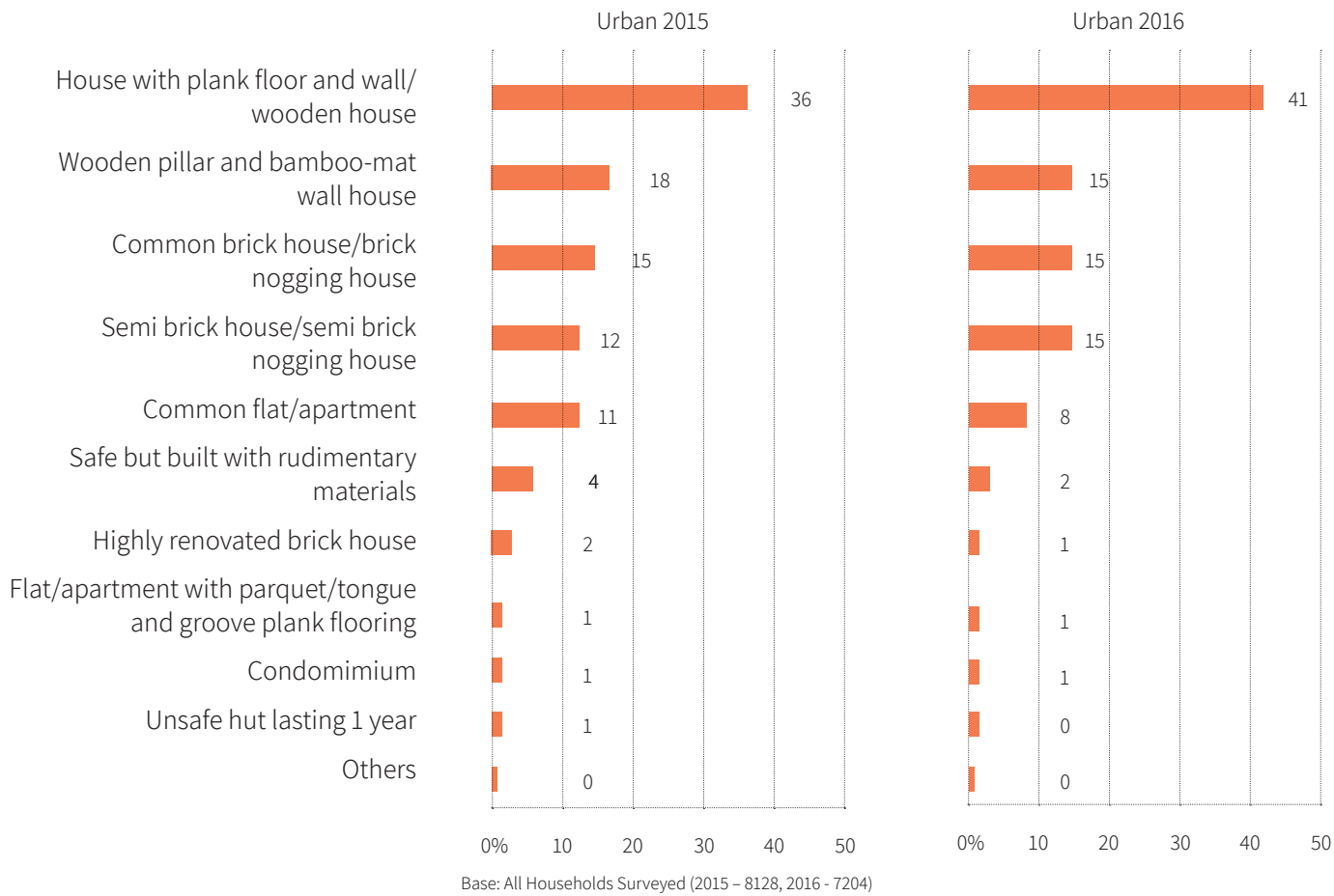


Figure 10: Type of housing (% of households)



Base: All Households Surveyed (2015 – 8128, 2016 - 7204)

Figure 11 Type of housing – urban (% of households)

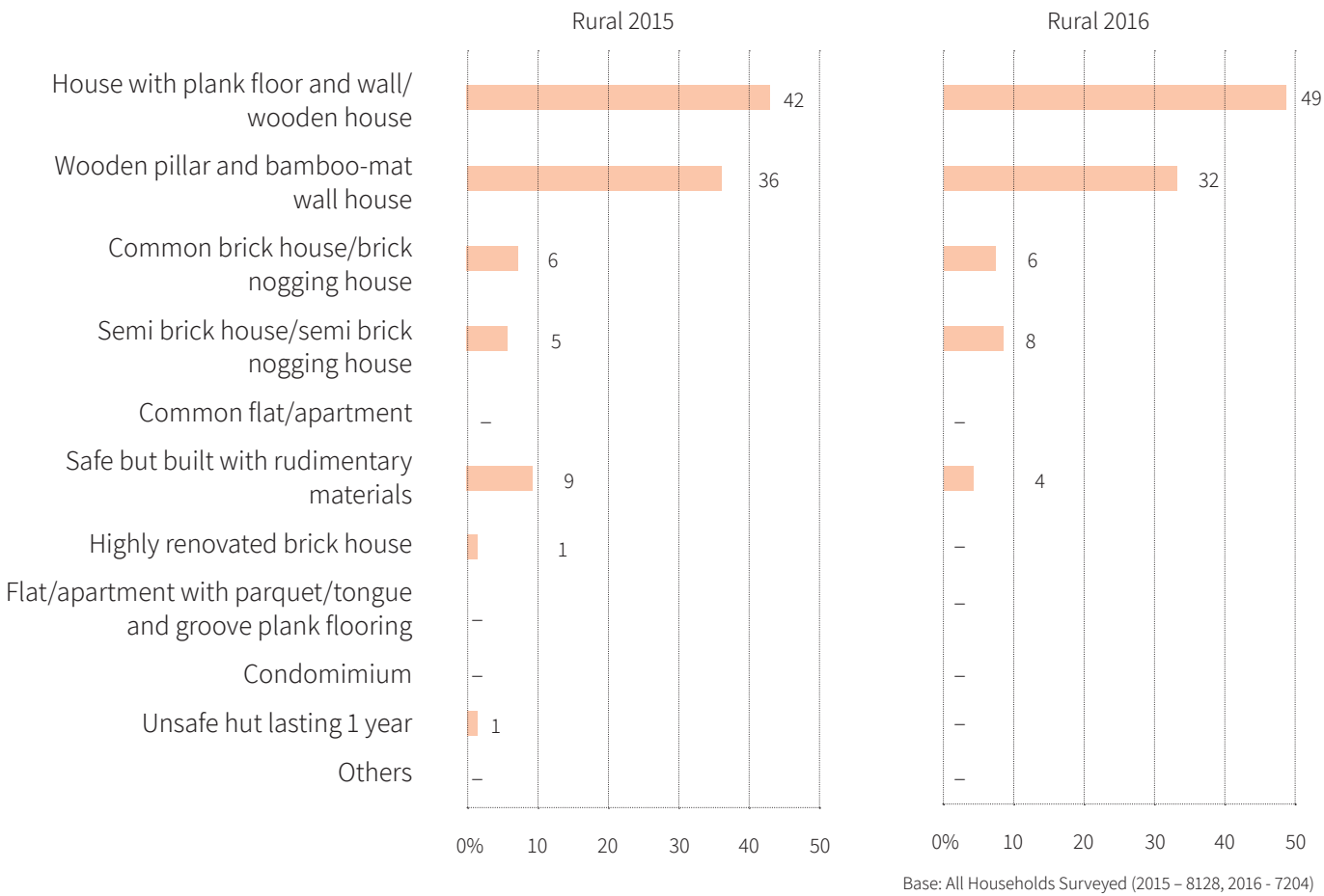


Figure 12: Type of housing – rural (% of households)

1.4 Electricity

Fifty-four percent of households had access to some form of electricity in both 2015 and 2016[4]. The proportion of households that did not have access to electric power supply remained constant at 46%.

However, among those who did have electricity, the source changed somewhat. The government power supply was the main power source in both years, while a smaller portion of households used other power sources such as commercially owned private generators and solar energy. But between 2015 to 2016, there was a five percent shift away from such sources towards the government electric supply (i.e. people who used other sources got connected to the grid) (Figure 13). This shift happened in rural areas, indicating the extension of the grid by the government to areas previously unreached (Figure 10 inset, Figure 14).

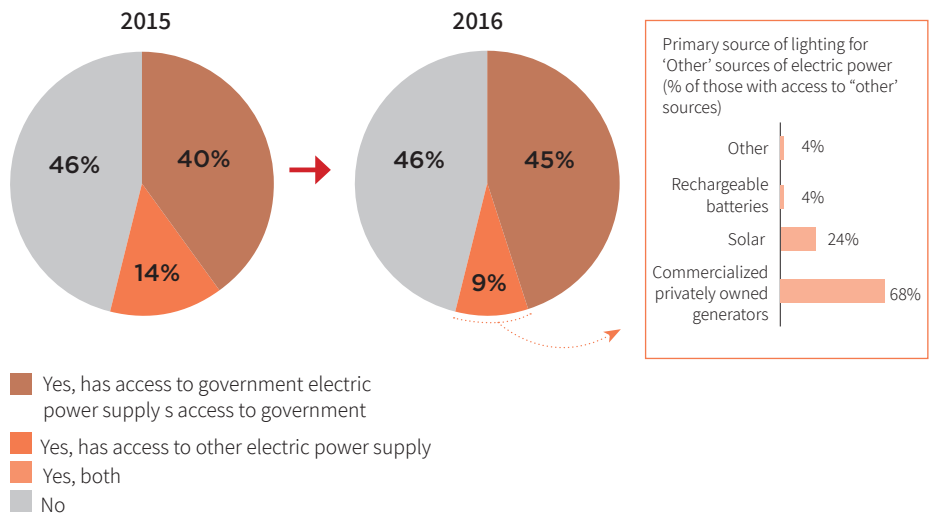


Figure 13: Access to electric power supply (% of households)

4 Note: According to WB data for 2012, 52.4% of the population (as opposed to households, which our data describes) had access to electricity.

3 Note: Myanmar Census refers to "Main Source of Lighting" (where electricity is one of the options) therefore, this data cannot be compared with LIRNEasia survey data.

Among all households, only 23% had electricity for 24 hours in the day prior to the survey being administered (Figure 15). The government-owned power supply was the predominant source of lighting in urban and rural areas. It accounted for lighting in 89% of households in urban areas. The primary source of lighting in rural areas was more varied, with solar power being the main source of lighting. Only a quarter of households in rural areas relied on the government owned power supply as their primary source of lighting (Table 5).

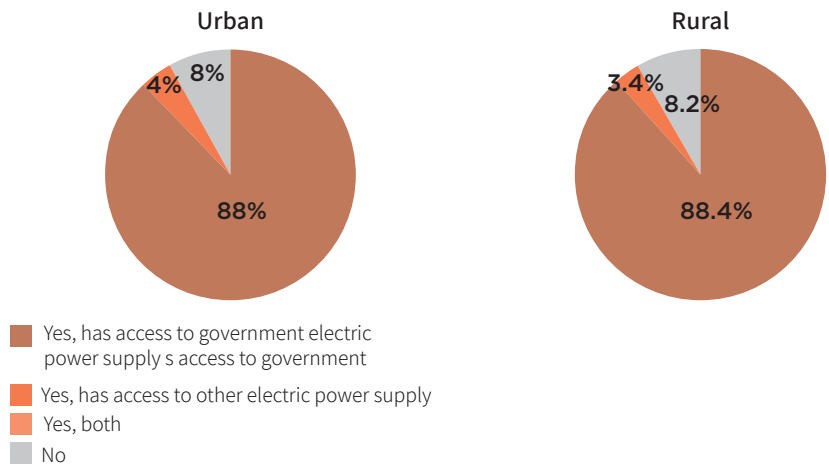


Figure 14: Access to electric power supply (% of households)

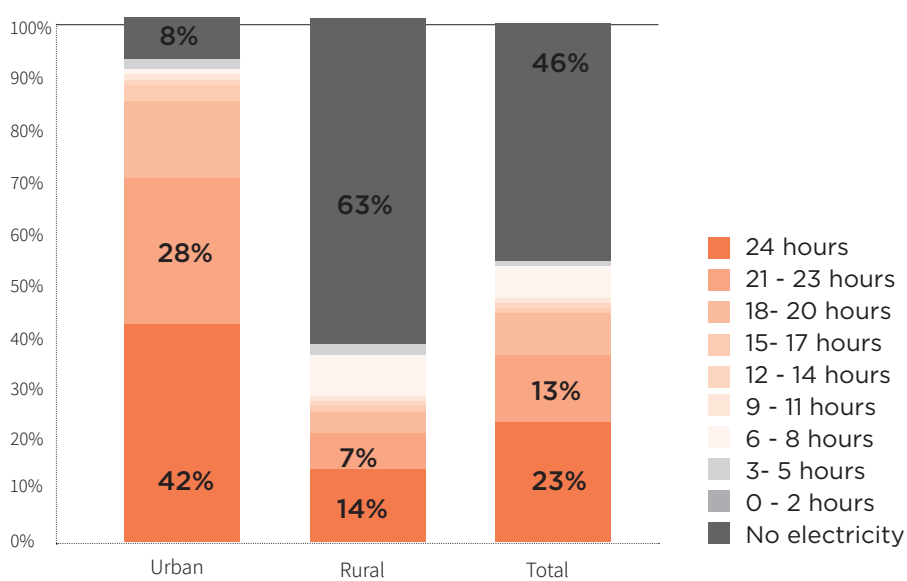


Figure 15: Electric power supply – urban vs. rural (% of households)

Main source of lighting	Urban	Rural	Total
Government owned electric power supply	89%	25%	45%
Commercialized privately owned electric power/generator	3%	12%	9%
Own generator	0%	1%	1%
Solar power (Solar panel)	2%	37%	26%
Car battery	0%	3%	2%
Rechargeable battery	4%	12%	10%
Kerosene, diesel	0%	1%	1%
Candle	1%	6%	5%
Others	0%	2%	2%

Table 5: Main source of lighting (% of households with electricity)

1.5 Transportation

Motorcycles and three-wheeled vehicles were found to be the dominant modes of transportation. Car ownership doubled since 2015 (Figure 16), even though the 2015 figure is small. Car ownership was concentrated in the big cities in 2016, with nearly half of the cars being owned by households in Yangon, Mandalay and Nay Pyi Taw. Seventy-two percent of all households with cars were found in urban areas.

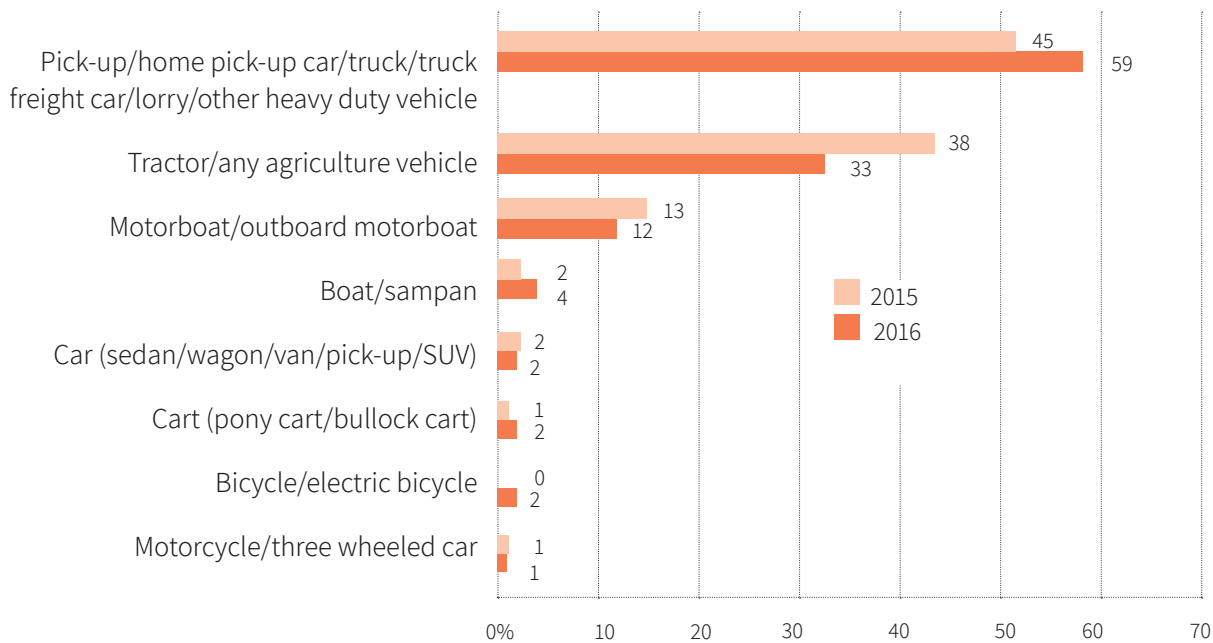


Figure16: Ownership of modes of transportation (% of households)

2 ICT ownership and use

2.1 Household ICT ownership

Eighty-three percent of households had a mobile phone by July 2016 and the average number of phones owned by households was 2.3. The corresponding figures for active SIM cards were higher, at 84% and 2.9 respectively, hinting at the use of dual SIMs (see section on individual use for more detail). Household ownership of mobile phones and SIMs had increased considerably since 2015. (Figure 17)

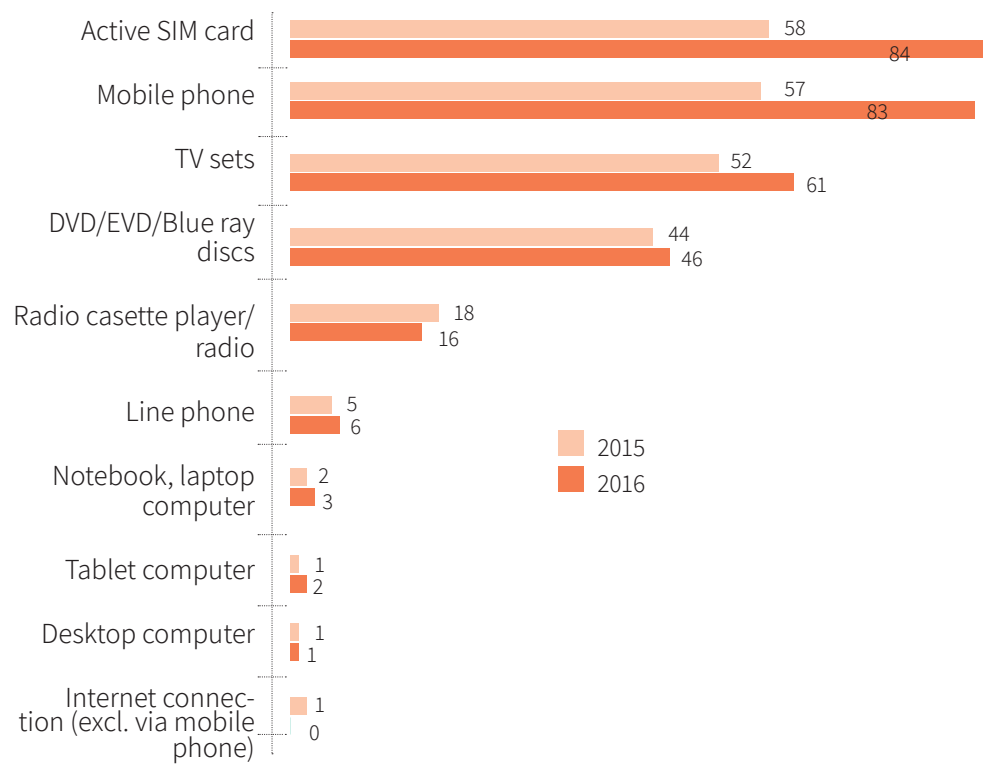


Figure 17: Household ownership of ICTs (% of households)

Geographic analysis on handset and active SIM ownership provides insight into the access to ICTs in big cities, other major cities and smaller townships. The increase in the proportion of households with mobile phones and SIMs was seen largely in the smaller townships. Hence, households with mobile phones/SIMs were less concentrated in the cities, and had moved towards the smaller townships (Figure 18). A similar, though less stark, diffusion was also observed in the case of televisions.

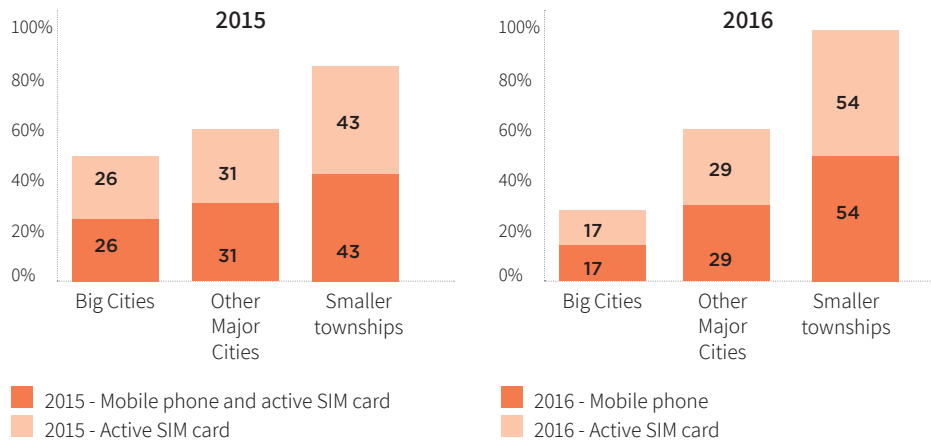


Figure 18: Household handset and active SIM ownership distribution by geography (% of households)

The reported per capita monthly household income and the urbanization status of the area to which the household belongs are used to place households in socioeconomic classifications (SECs)(for more information see Annex 1).

Mobile ownership among households was relatively high across socioeconomic groups. Over threequarters of households belonging to SEC E, the poorest segment of society, owned a mobile phone. (Figure 19)

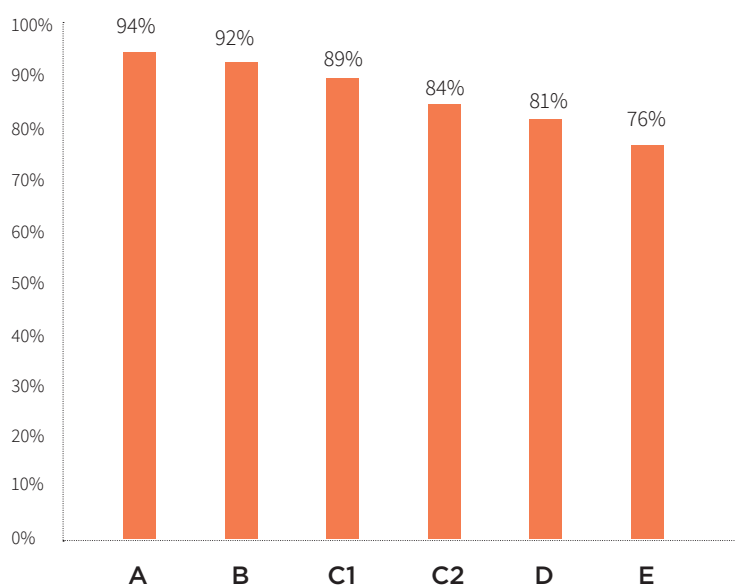


Figure 19: Mobile ownership by SEC (% of households)

2.2 Individual use of ICTs

2.2.1 Most recent use of a phone

The daily use of phones had increased from 29 to 45% between 2015 and 2016. Furthermore, the population that had never used a phone had decreased from 31 to nine percent (Figure 20).

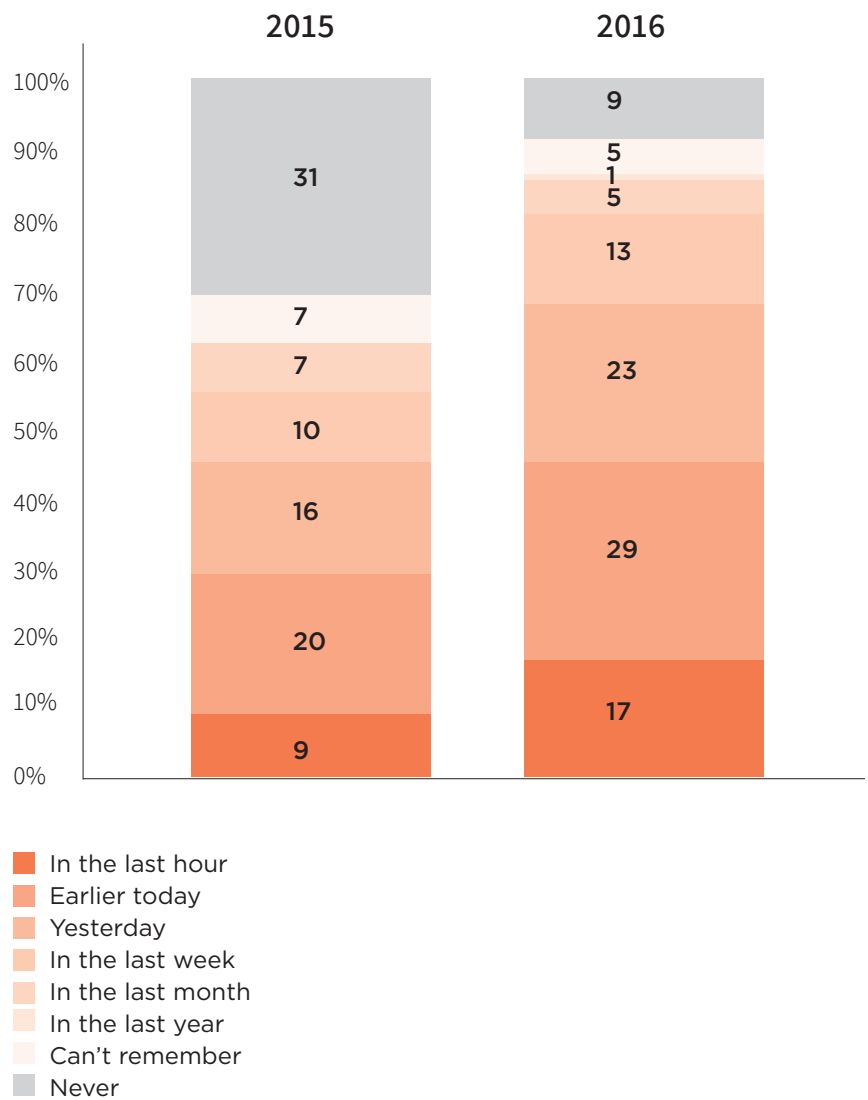


Figure 20: Last use of a phone- 2015 vs. 2016 (% of population aged 15-65)

The frequency of taking and receiving calls had increased everywhere, especially in rural areas— the rural population that had never used a phone dropped from 37 to ten percent (Figure 21).

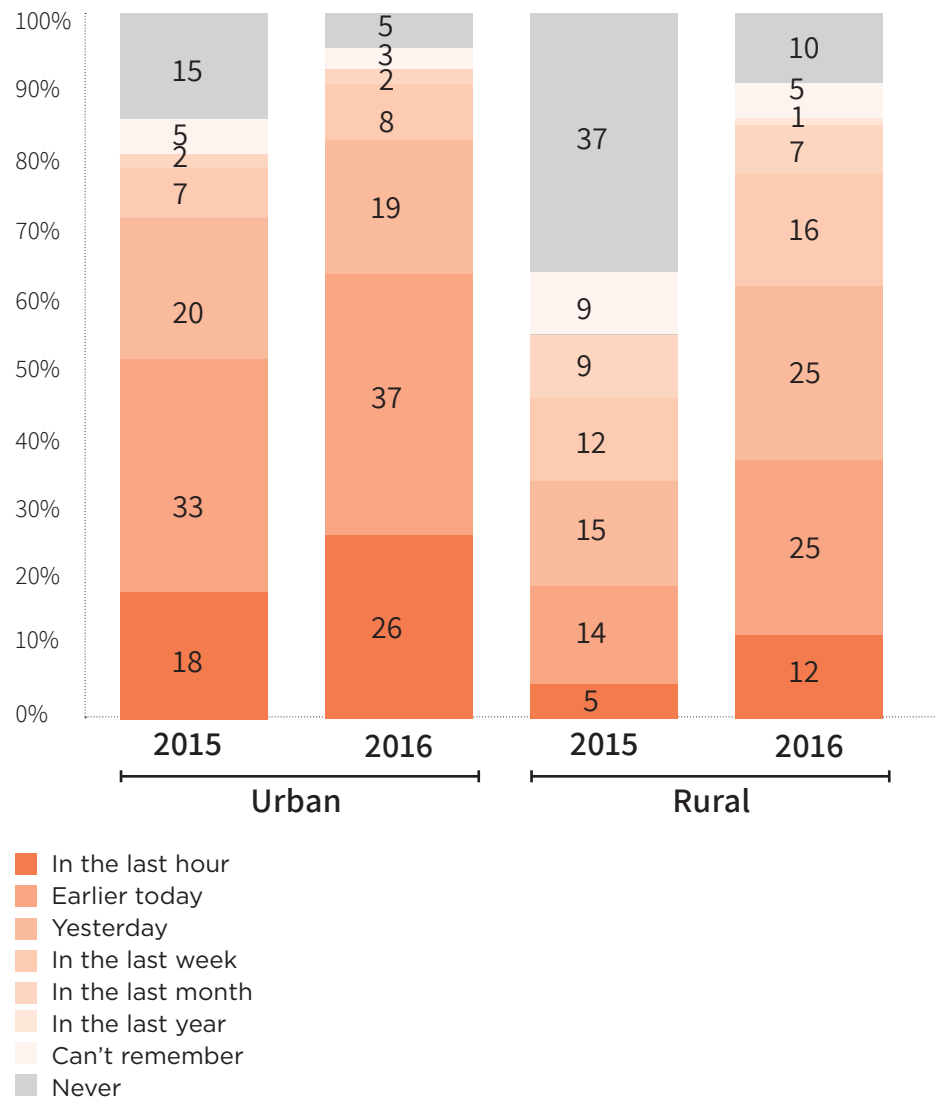
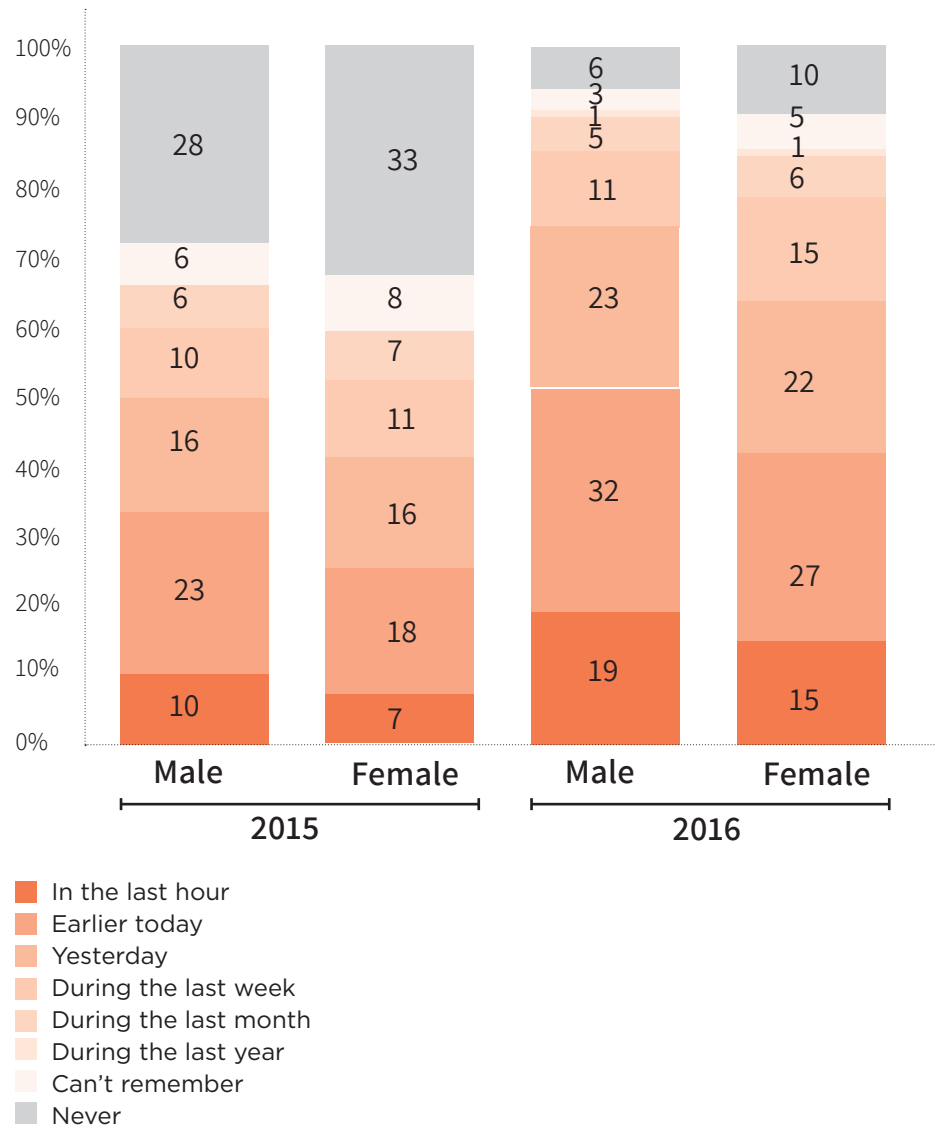


Figure 21: Last use of a phone- urban vs. rural (% of population aged 15-65)

Female usage of phones improved from 2015 to 2016, partially catching up with that of males— thus narrowing the gender gap (Figure 22).



GENDER GAP IN USE = ([USE BY MALES-USE BY FEMALES]/USE BY MALES) X100

Year	Used phone within the last hour	Used phone within the day	Used phone within the last week
2015	30%	24%	12%
2016	22%	18%	7%

Figure 22: Last use of a phone - male vs. female

From a socio-economic perspective, those belonging to higher SECs were found to be more frequent teleusers. Nearly 70% of those belonging to SEC A had made a call on the day of survey; they were also 3.5 times more likely to use a phone than those belonging to SEC E. Conversely, over ten percent of respondents belonging to SEC E had never made a phone call (Figure 23).

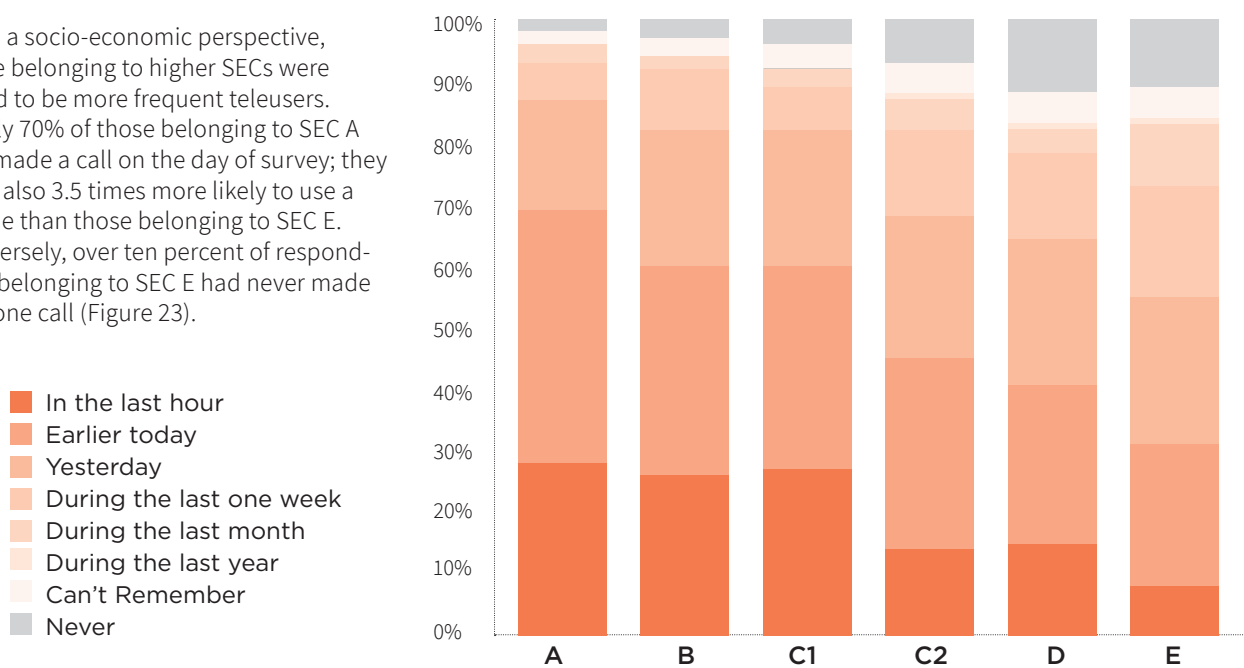


Figure 23: Distribution of phone use by SEC (% of population aged 15-65)

2.2.2 Type of phone last used

Mobile increasingly dominated phone use in 2016. While a fifth of phone users in 2015 stated that their most recent phone call was through a fixed phone, this number more than halved by 2016 — only six percent had used a fixed phone to make their last phone call. Females were twice as likely to use fixed phones as males in 2016 (Figure 24).

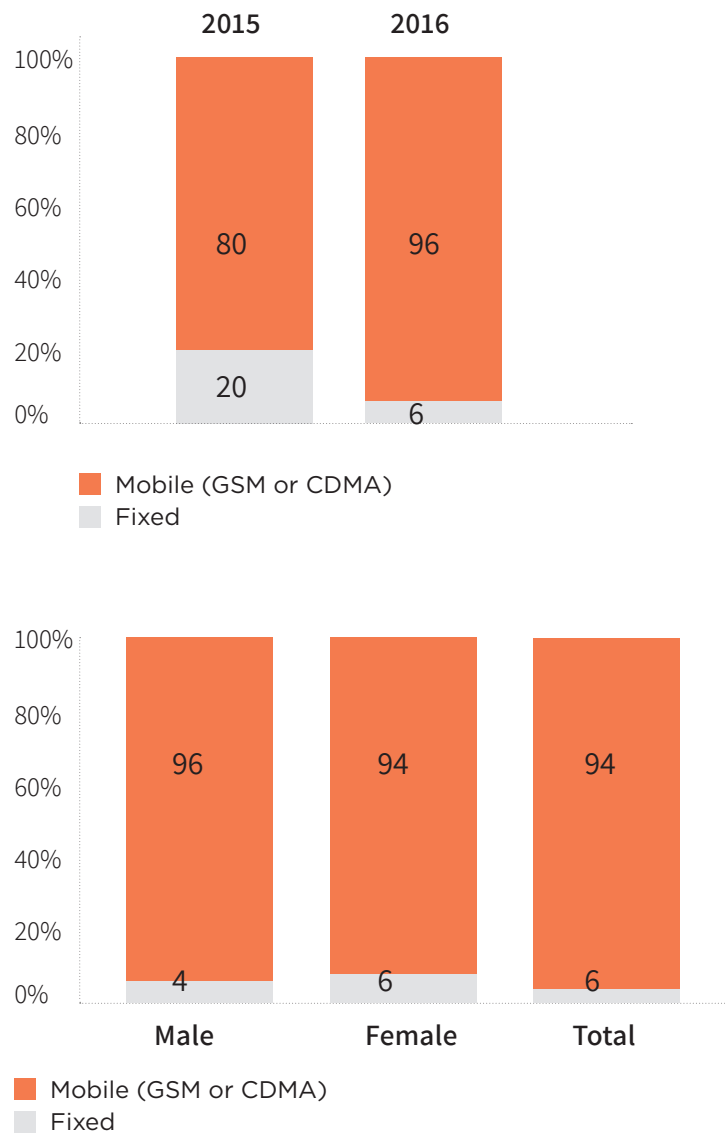


Figure 24: Type of phone last used to make/receive a phone call (% of phone users aged 15-65)

2.2.3 Purpose of last phone call

A majority of phone users stated that their last phone call was taken for social purposes. The proportion of users whose last phone call was for social purposes increased between 2015 and 2016 (Figure 25), with the shift coming from coordination, emergency and other communication. Sixteen percent said their last phone call was for livelihood purposes, not too different from 2015.

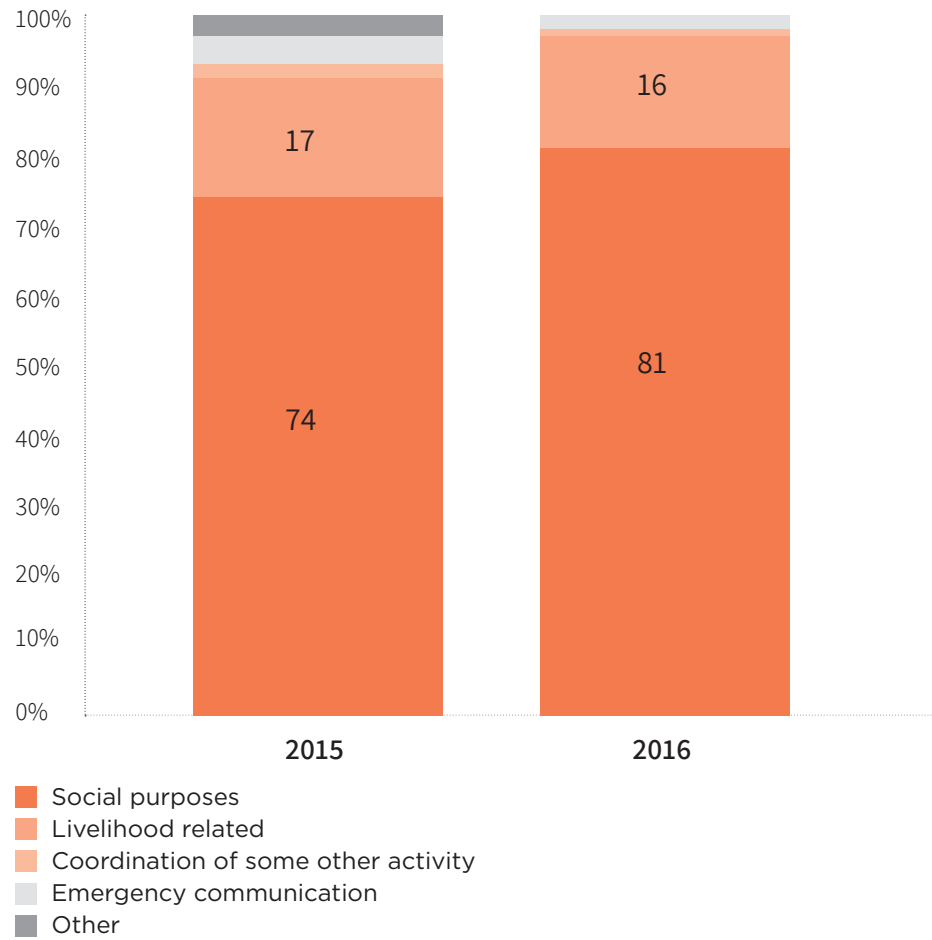


Figure 25: Purpose of last phone call - 2015 vs. 2016 (% of phone users aged 15-65)

were more likely to have made their last phone call for livelihood purposes (Figure 26). Both rural and urban males were twice as likely as urban females to use a phone for livelihood purposes (Figure 36).

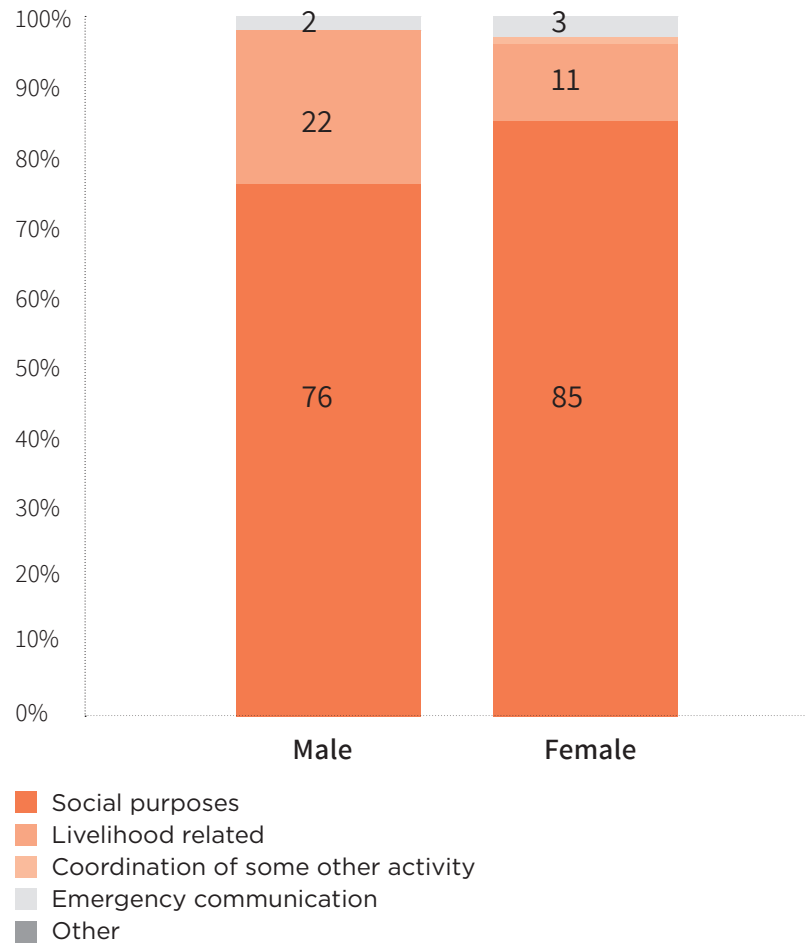


Figure 26: Purpose of last phone call- male vs. female (% of phone users aged 15-65)

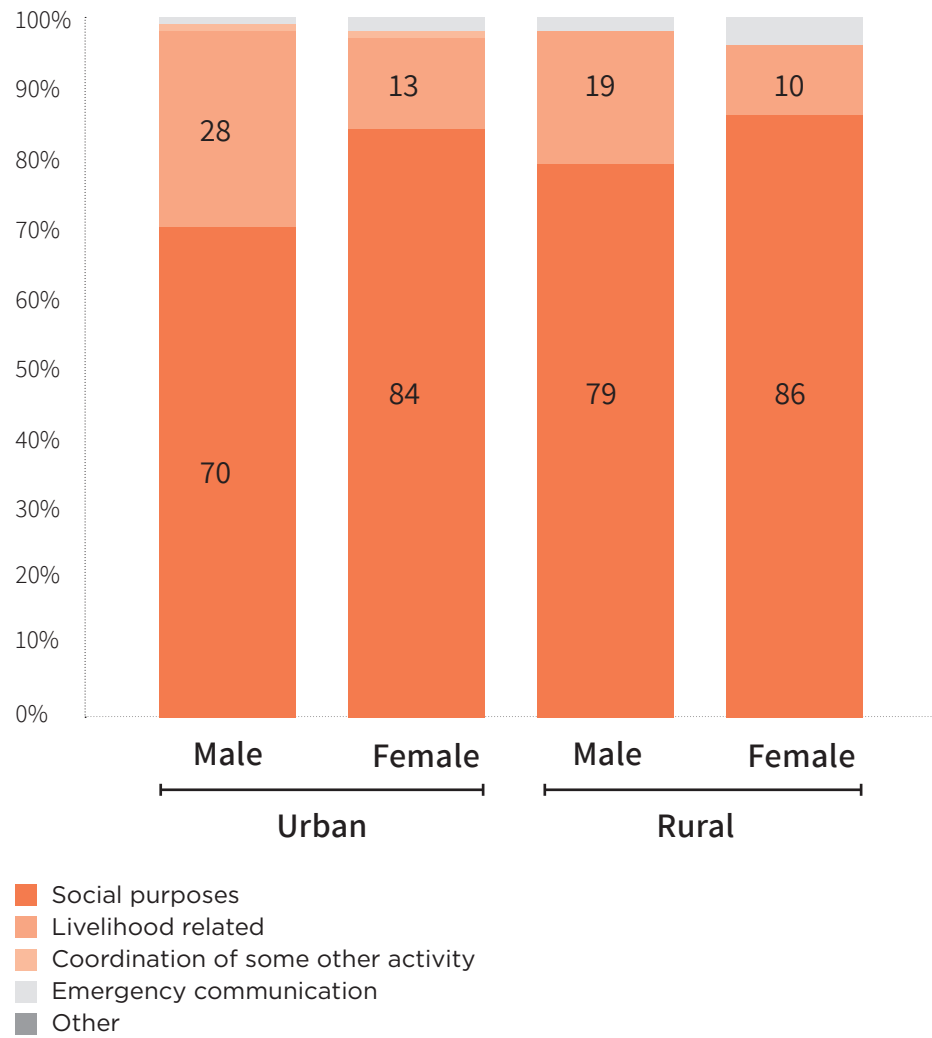


Figure 27: Purpose of last phone call - urban vs. rural (% of phone users aged 15-65)

The use of phones differed between mobile owners and non-owners. Livelihood related phone calls were more frequent among mobile owners (Figure 28). Moreover, length of mobile ownership appeared to be correlated with use: who had owned a SIM for a longer time had last used their phone for a livelihood purpose more often than those who had purchased a SIM more recently (Figure 29).

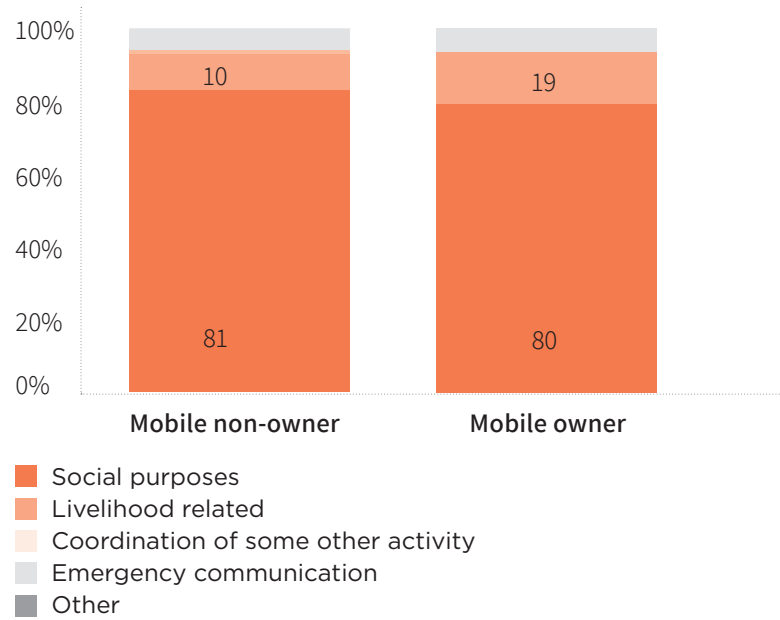


Figure 28: Purpose of last phone call - mobile owners vs. non owners (% of phone users aged 15-65)

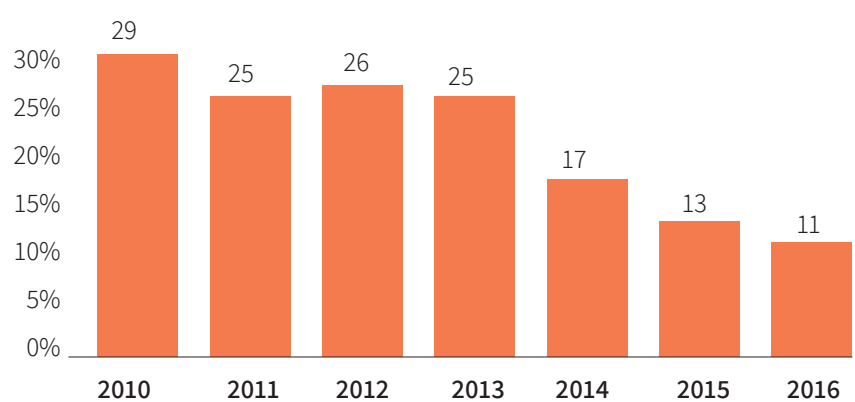


Figure 29: Last call made for livelihood purposes, by SIM purchase year (% of mobile owners aged 15-65)

2.2.4 Ownership of the phone last used

Respondents who had used a phone before were asked who owned the phone that they last used. Those that had used their own phone increased from 48% to 63% between 2015 and 2016 while the use of household phones had reduced from eight to one percent within the same year (Figure 30).

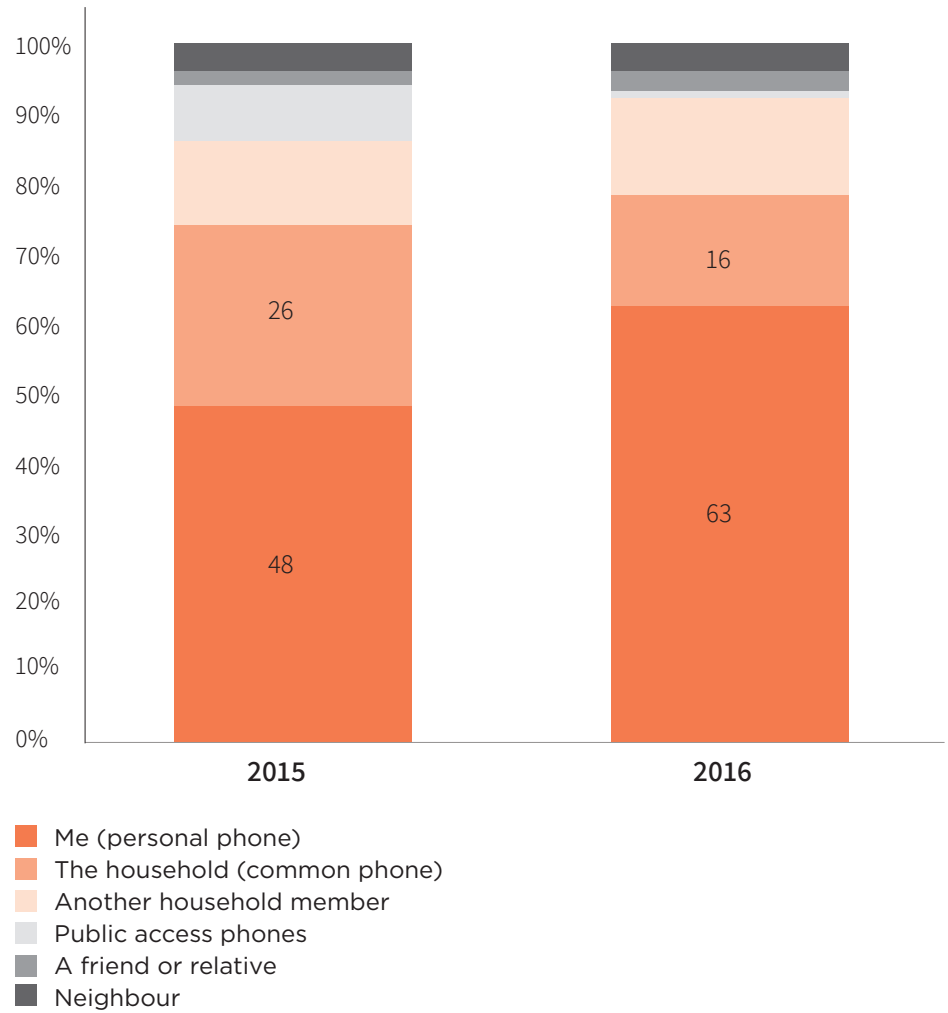


Figure 30: Ownership of the phone last used - 2015 vs. 2016 (% of phone users aged 15-65)

Urban users were more likely to have used a personal phone to make their last call. However, noteworthy is the fact that the use of personal phones in rural areas increased significantly, while the proportion of shared phones decreased (Figure 31).

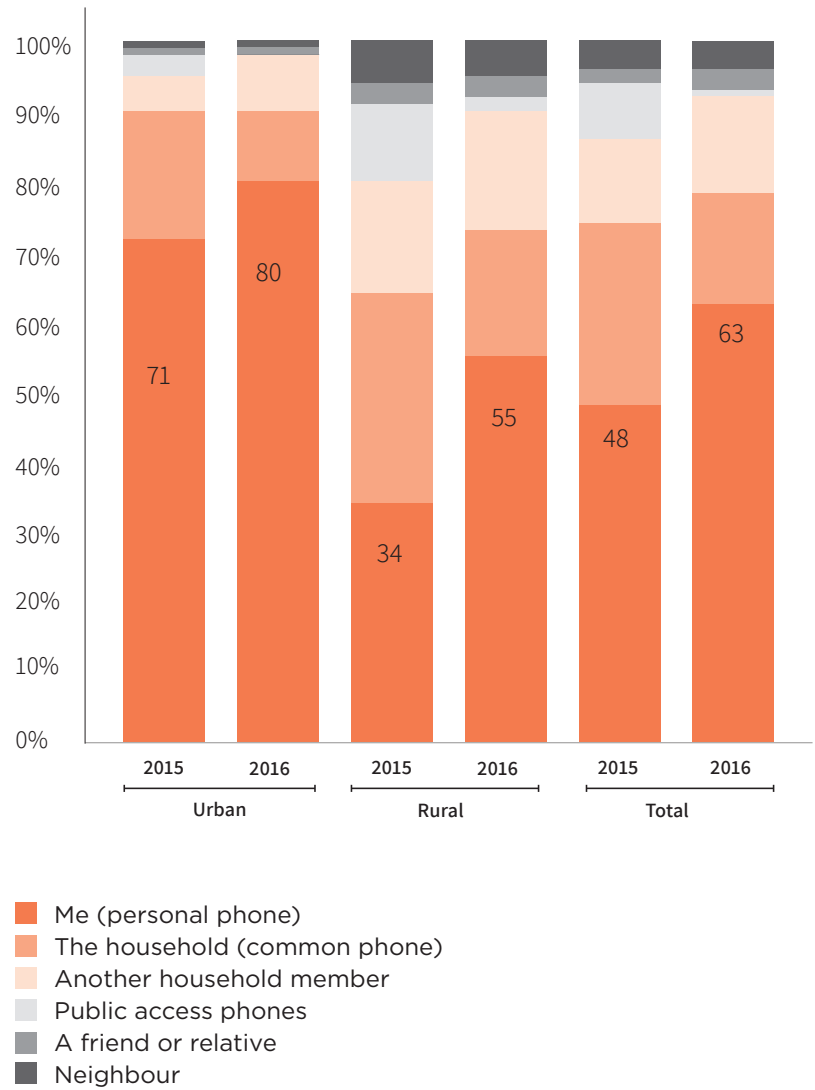


Figure 31: Ownership of the phone last used - urban vs. rural (% of phone users aged 15-65)

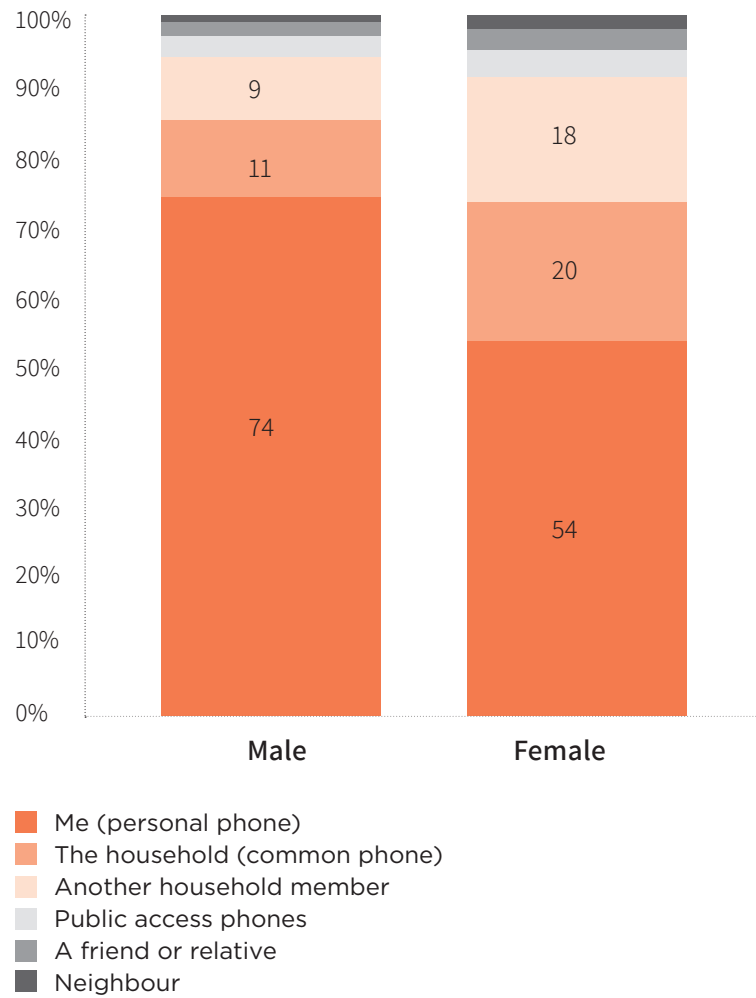


Figure 32: Ownership of phone last used - male vs. female (% of phone users aged 15-65)

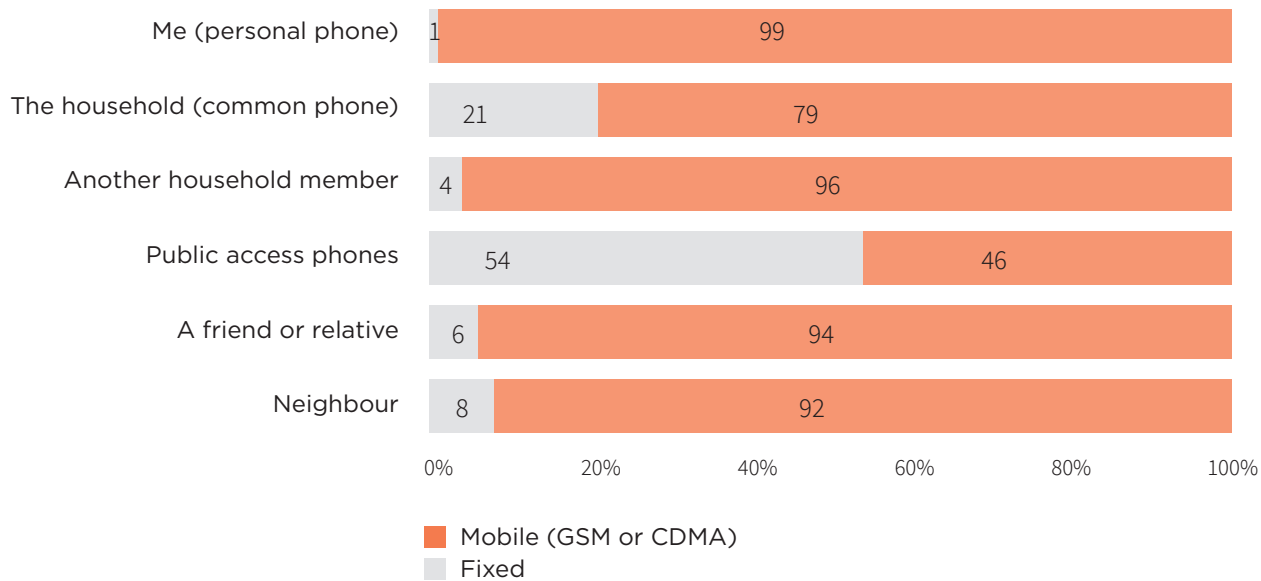


Figure 33: Ownership of the last phone used (% of phone users aged 15-65)

3 Mobile ownership and expenditure

3.1 Mobile ownership demographics

Mobile phone ownership has nearly doubled from 39% to 61% over a year (Figure 34), indicating the rapidly increasing mobile ownership in Myanmar.[4]

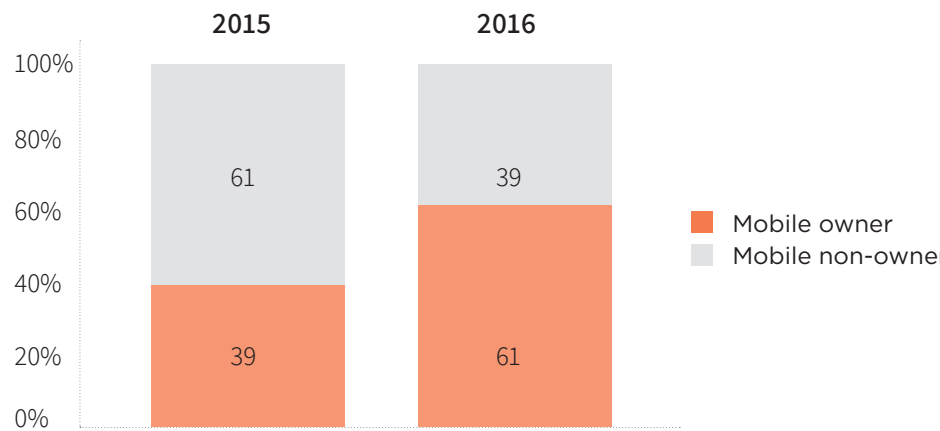


Figure 34: Mobile ownership- 2015 vs. 2016 (% of 15-65 population)

4 Note: Mobile ownership refers to having both at least one active SIM and mobile device

This increase has resulted in more mobile phones in rural areas than urban (Figure 34, 36).

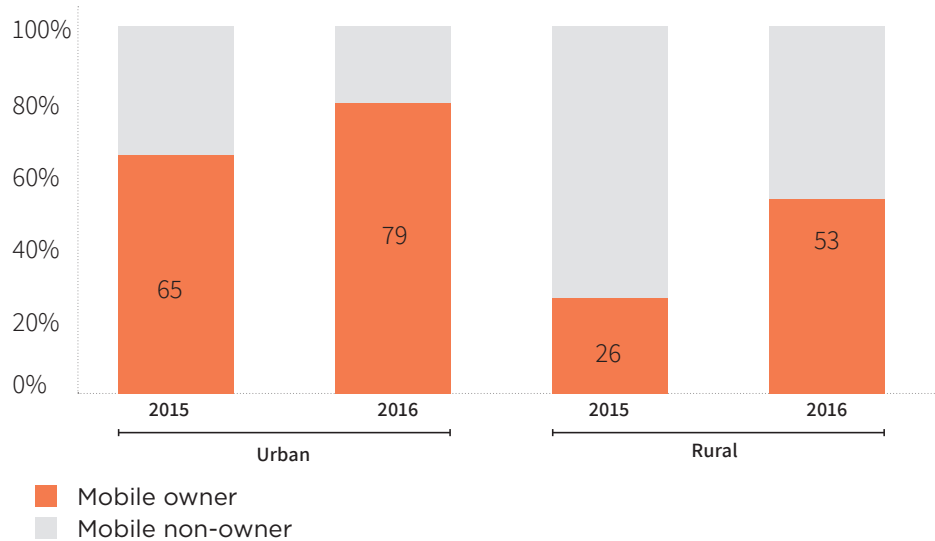


Figure 35: Mobile ownership– urban vs. rural (% of 15-65 population)

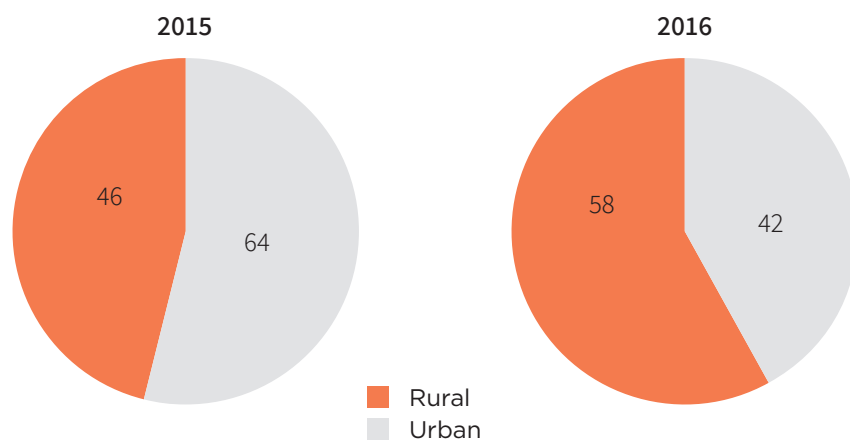


Figure 36: Mobile ownership by geography– urban vs. rural (% of phone owners aged 15-65)

The increase in mobile phone ownership has mainly occurred in smaller townships and has contributed to much of the market's growth (Table 6).

The population belonging to higher SECs (Annex 1) were more likely to be mobile owners. Individuals in SEC A, B and C1 were more likely to be mobile owners than not, while the opposite was true for the lower SECs D and E. Equal proportions of those belonging to the lower middle income category SEC C2 were mobile owners and non-owners (Figure 37)

Year	2015	2016
Big cities	33	19
Other major cities	31	30
Smaller townships	36	50

Table 6: Geographic analysis of distribution of mobile phones (% of mobile owners in 15-65 population)

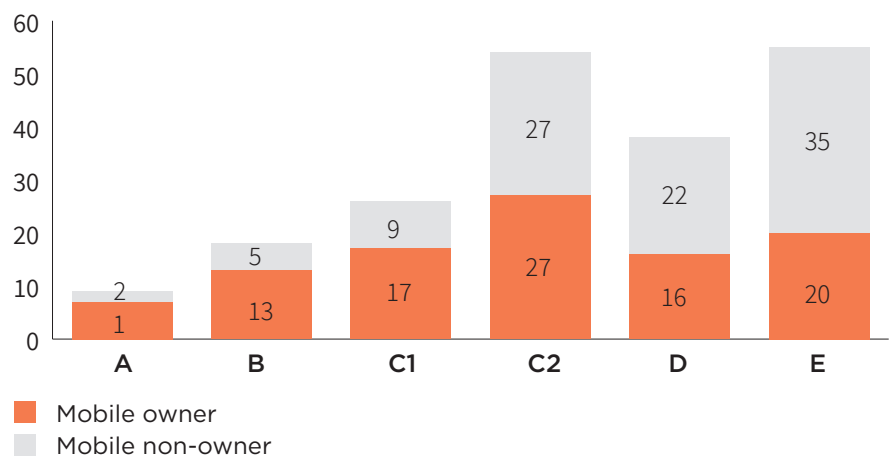
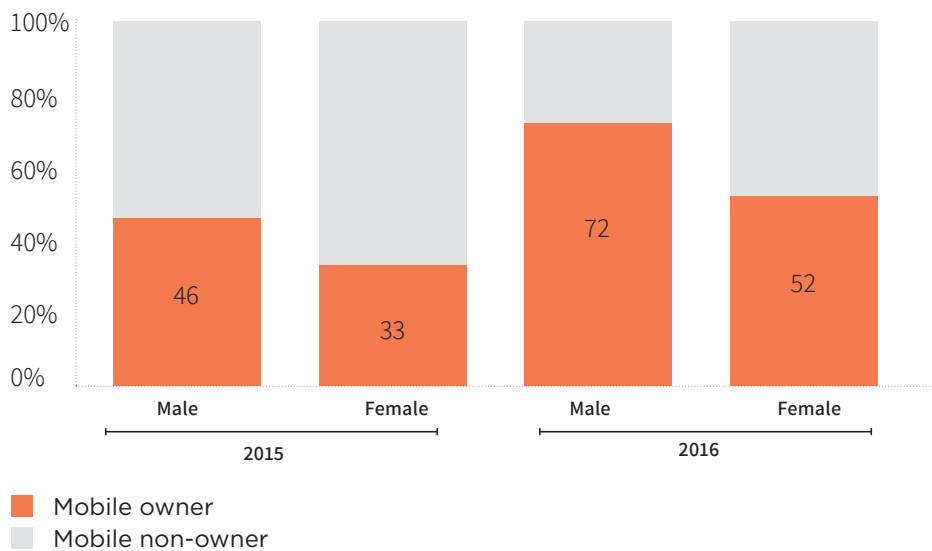


Figure 37: SEC distribution of mobile phones (% of mobile owners in 15-65 population)

Gender gap in mobile ownership in Myanmar



	2015	2016
Gender gap	28%	28%

$$\text{Gender gap in ownership} = \frac{\text{(Male mobile owners - Female mobile owners)}}{\text{Male mobile owners}} \times 100$$

Figure 38: Mobile ownership– 2015 vs. 2016 (% of population aged 15-65)

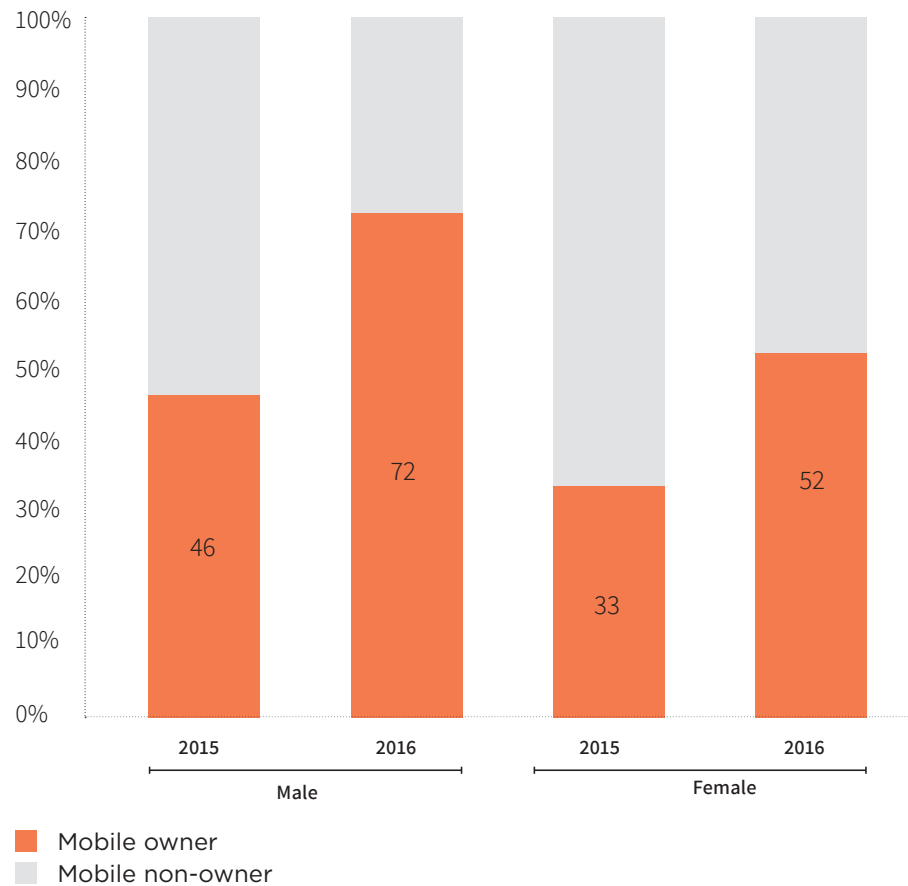


Figure 39: Mobile ownership– male vs. female (% of population aged 15-65)

A gender gap in mobile ownership was observed in Myanmar, with females being 28% less likely to own a phone than males in 2016 (Figure 35) A similar gap of 29% was observed in 2015, despite an increase in female ownership of mobile phones (Figure 36).

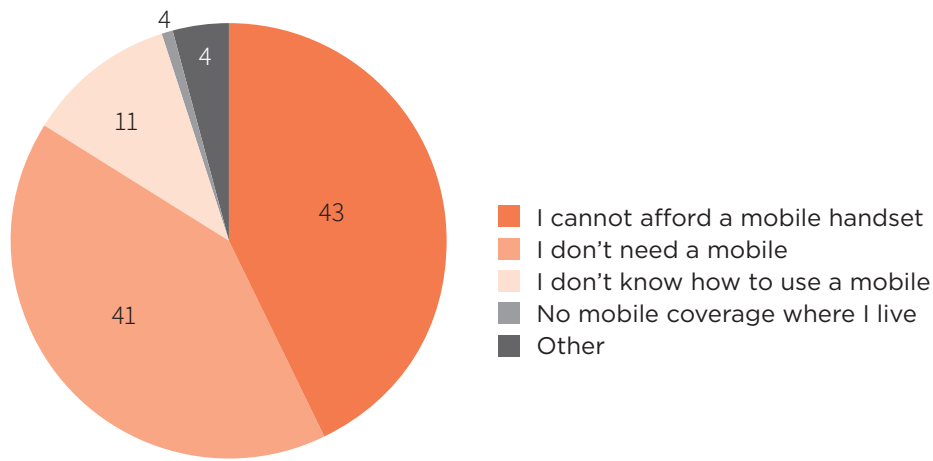


Figure 40: Primary reason for not owning a mobile phone amongst females (% of 15-65 female non owners)

To understand the reasons for this gender gap in mobile phone ownership, GSMA and LIRNEasia conducted a qualitative study among 91 males and females in Yangon, Myanmar's largest city, and Pantanaw, a small town in the southwestern part of the country.

The research showed that females in Myanmar play a prominent role in the management of household finances — even if they do not earn anything themselves — and are frequently involved in the financial decision to purchase a mobile phone for the family. Despite this, females' access to this family mobile phone is often limited, as the phone tends to travel outside the home with the person who is deemed to need it the most. Since males more often undertake activities outside the home, this mobile access and usage gender gap is exacerbated. As such, getting a second mobile phone into the household (which has a higher likelihood of staying inside the household) seems key to increasing females' access and usage.

The top two reasons among females for not owning a mobile phone — lack of affordability or need — are connected. 43% and 41% of female mobile non-owners stated these as their reasons for not owning a phone in 2016 (Figure 40). "Not needing" a mobile is relative to the cost-benefit trade-off of purchasing an additional phone for the household. Many females without a mobile phone said that they don't "need" one because they do not leave the house for work or studies. Though many would like to have their own mobile, they felt that even if they did buy one, the top-ups would be unaffordable as they are either not earning an income, or are earning a lot less than the male household members. The clear

preference for particular high-end brands of smartphones was also a factor, since many females were willing to delay the purchase until they could afford a particular brand.

In addition, many females do not see spending on mobiles as a priority compared to other more pressing needs of the household, partly as a result of having limited experience with mobile phones. Even among females who already use or own a mobile, many did not possess the skills or knowledge to expand their current use to potentially valuable data services, and usually relied on others (primarily males) for instruction.

The qualitative insights are based primarily on a report prepared by Ayesha Zainudeen and Helani Galpaya of LIRNEasia based on findings from a GSMA Connected Women-LIRNEasia study on Mobile phones, internet, and gender in Myanmar.

3.2 Smartphone ownership

78% of mobile owners aged 15-65 in Myanmar had a smartphone at the time of our 2016 survey, an increase from the 66% observed in 2015. This translates to 48% of the population aged 15-65 owning a smartphone as at mid-2016 (Figure 48).

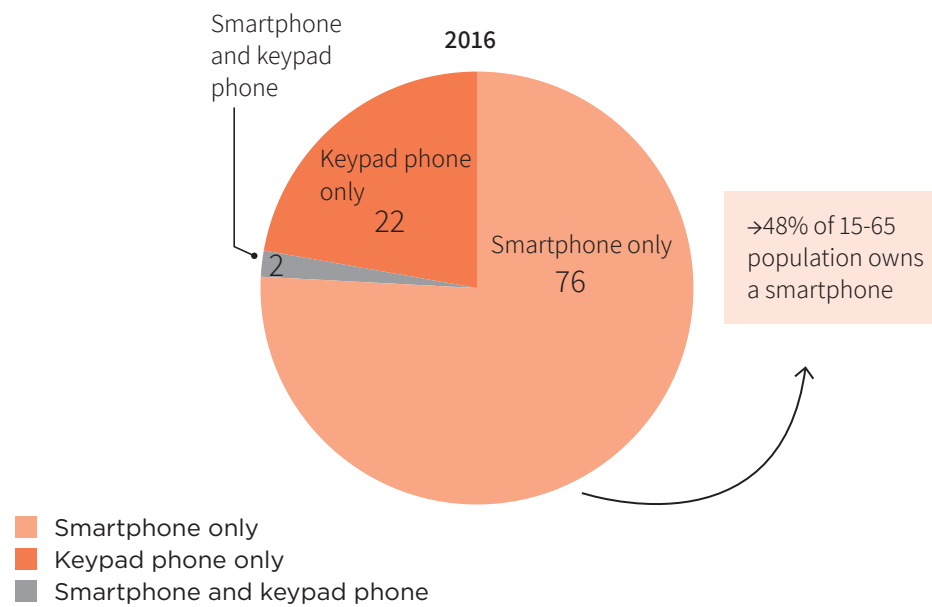


Figure 41: Mobile handset type (% of mobile owners aged 15-65)

Analyzing features of the primary mobile handset of mobile phone owners reveals that these handsets are equipped with capabilities needed for a good Internet experience. Most of the available features were Internet experience-related such as camera, touch screen, applications, Wi-Fi and Internet browser (Figure 42).

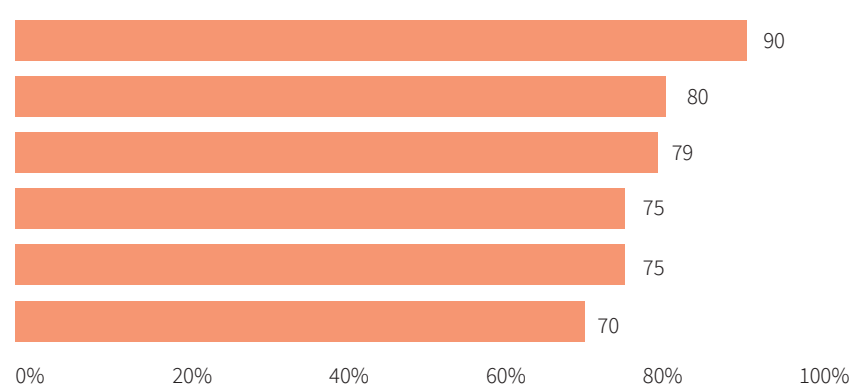


Figure 42: Features of primary mobile handset (% of mobile owners aged 15-65)

The urban-rural gap in smartphone ownership reduced, given a sharp increase in rural areas (Figures 43).

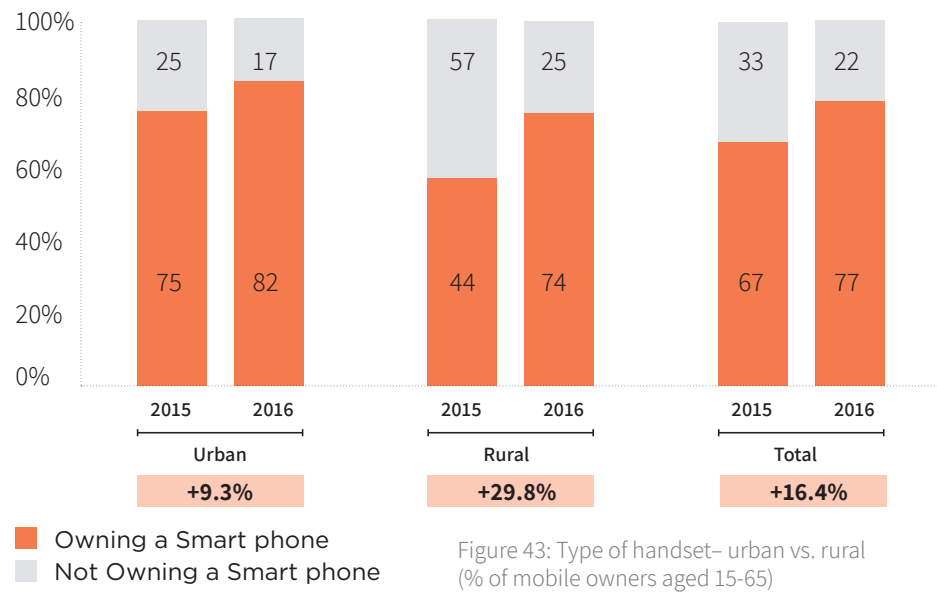


Figure 43: Type of handset– urban vs. rural (% of mobile owners aged 15-65)

Smartphone ownership amongst male and female mobile owners was roughly equal in 2016. This is interesting given that such equality was not observed in the case of mobile ownership (Figure 44), where males were 28% more likely to own mobile phones than females.

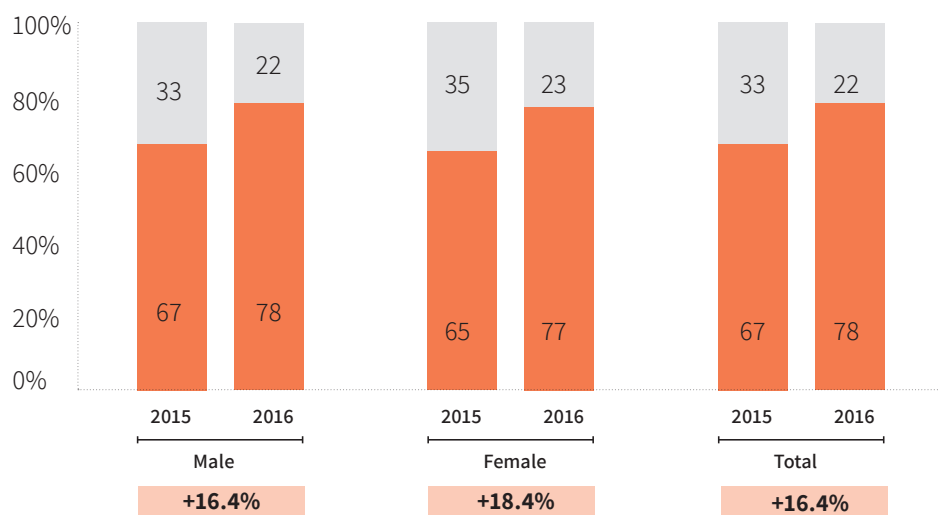


Figure 44: Type of handset– male vs. female (% of mobile owners aged 15-65)

Smartphone ownership was highest among those between 15 and 24 years of age. Smartphone penetration among the oldest age group had also increased from 44 to 55% between 2015 and 2016 (Figure 45).

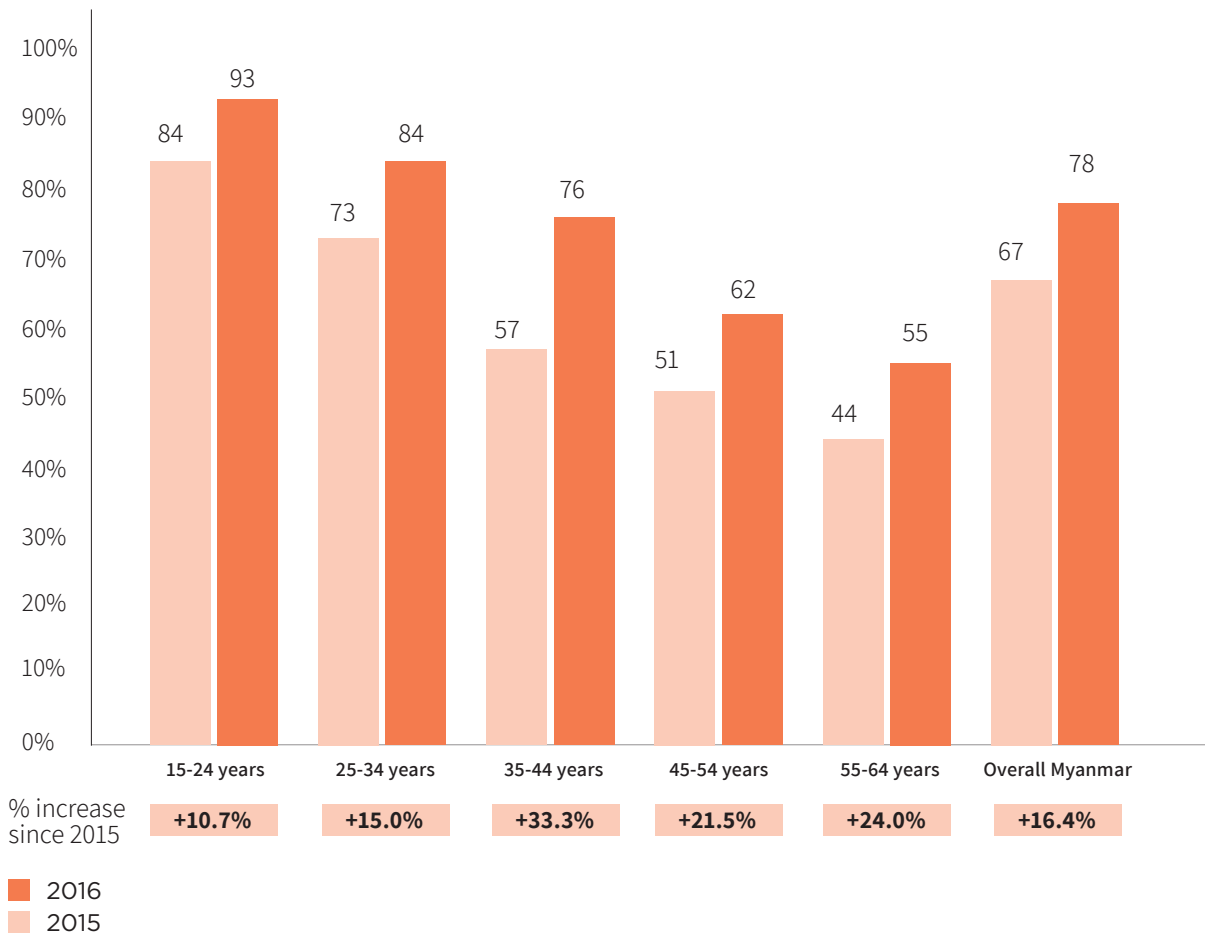


Figure 45: Smartphone ownership (% of mobile owners aged 15-65)

This general increase can be due to many reasons, particularly due to increased affordability. The introduction of installment plans and cheap bundles brought smartphones within the reach of many who would otherwise not be able to afford them. A want to keep up with the latest trends may also be a contributing factor. [5]

"I want the latest model to feel modern"

FGD Yangon, female non-owner, 18-29, non-working, SEC C/D
Source: GSMA and LIRNEasia (2015)

3.3 Operator market shares

Supply side numbers suggest that MPT was the market leader as at mid-2016, at the time of the survey. Telenor's market share was double that of Ooredoo's despite commencing operations within a month of each other. The demand side numbers from the survey roughly correspond to these numbers. The primary SIM for 49% of respondents was MPT, higher than the proportion suggested by the supply side numbers. 15% of those with a primary SIM from MPT had a secondary SIM from Telenor, and vice versa. (Table 7)

	Market share (%)	
Operator	Supply side: (Mobile SIMs sold)	Demand side (Primary SIM for mobile owners)
MPT	41	49
Telenor	34	34
Ooredoo	17	12
MECtel	8	5

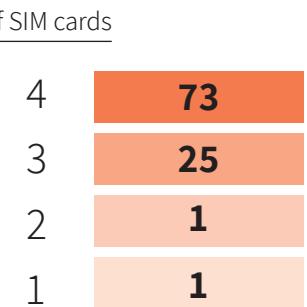
Sources: Supply side-Operator websites, press releases, Härkki (2017), demand side: LIRNEasia 2016 survey

Table 7: Market share of mobile operators: Supply side

5 Note: Zainudeen & Galpaya, 2015

3.4 Ownership of multiple SIMs

70% of mobile phone owners aged 15-65 reported that their primary phone had dual SIM capabilities. Meanwhile, a quarter of the active SIM owners owned more than one SIM. This number had more than doubled since 2015. A third of those between the ages of 15 and 34 owned multiple SIMs. Furthermore, urban users had more multi-SIMs than rural users (Figure 46).



% of active SIM card owners with more than one SIM by Urban/ Rural

	Urban	Rural	Total
2015	17	8	13
2016	30	24	27

% of active SIM card owners with more than one SIM by age group

15-24 years	35 - 44 years	45 - 54 years	55 - 65 years	Total
33	33	23	20	27

Figure 46: Active SIM card owners (% of multi-SIM owners aged 15-65)

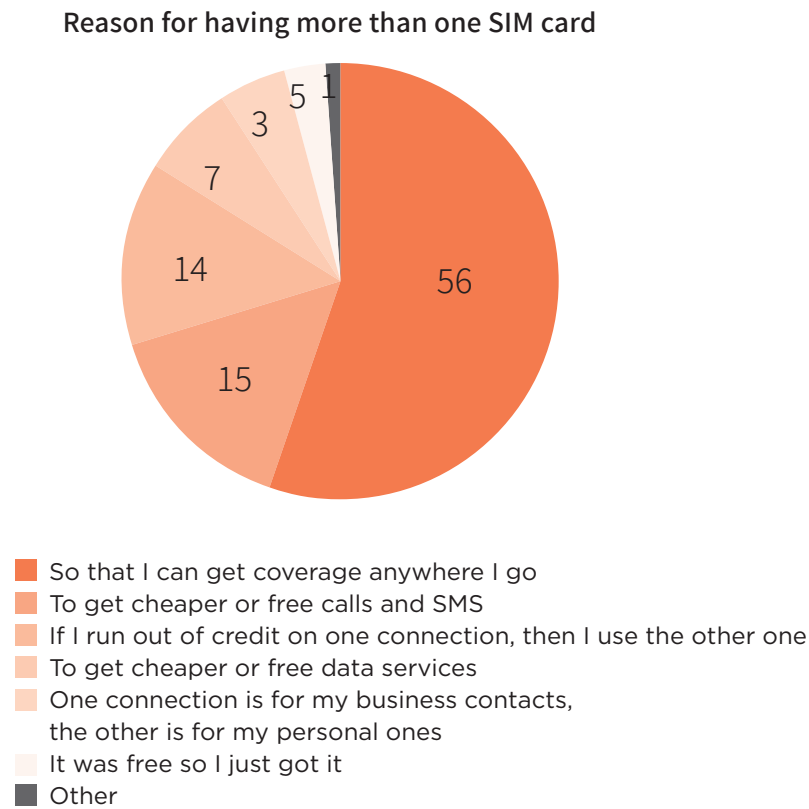
Fifty-six percent of those who were using multiple SIMs said they did this to get coverage wherever they went. This sentiment was echoed in both urban and rural areas, though it was more prevalent in rural areas and small townships. The proportion of respondents who stated that they owned multiple SIMs for cheaper or free calls and SMS was twice as large as those stating they owned it for cheaper or free data services. (Figure 47) (Both these sentiments were echoed in our qualitative research in July 2016).

"I can't use MPT at the office. I use Telenor because Telenor transmission towers are placed on our office roof. I can use both SIMs outside."

Nay Lwin (male, 22, SEC C, urban)

"I use Telenor for using call packages than data packages. I sometimes buy MPT's plan when it gives additional 1 GB bonus for 1 GB package buying."

Su Myat (female, 26, SEC B, urban)



Source: Cihon & Galpaya (2017)

Figure 47: Primary reason for having more than one SIM card (% of multi SIM owners aged 15-65)

Two distinct behaviors were observed among those who owned multiple SIMs. One segment used their secondary SIM just enough to keep it from getting disconnected, whereas another kept their primary and secondary SIMs switched on most of the time (Figure 48). 63% of those who stated that they used their secondary SIM just enough to keep it from getting disconnected lived in rural areas, while 57% of those who kept their primary and secondary SIMs switched on most of the time lived in urban areas.

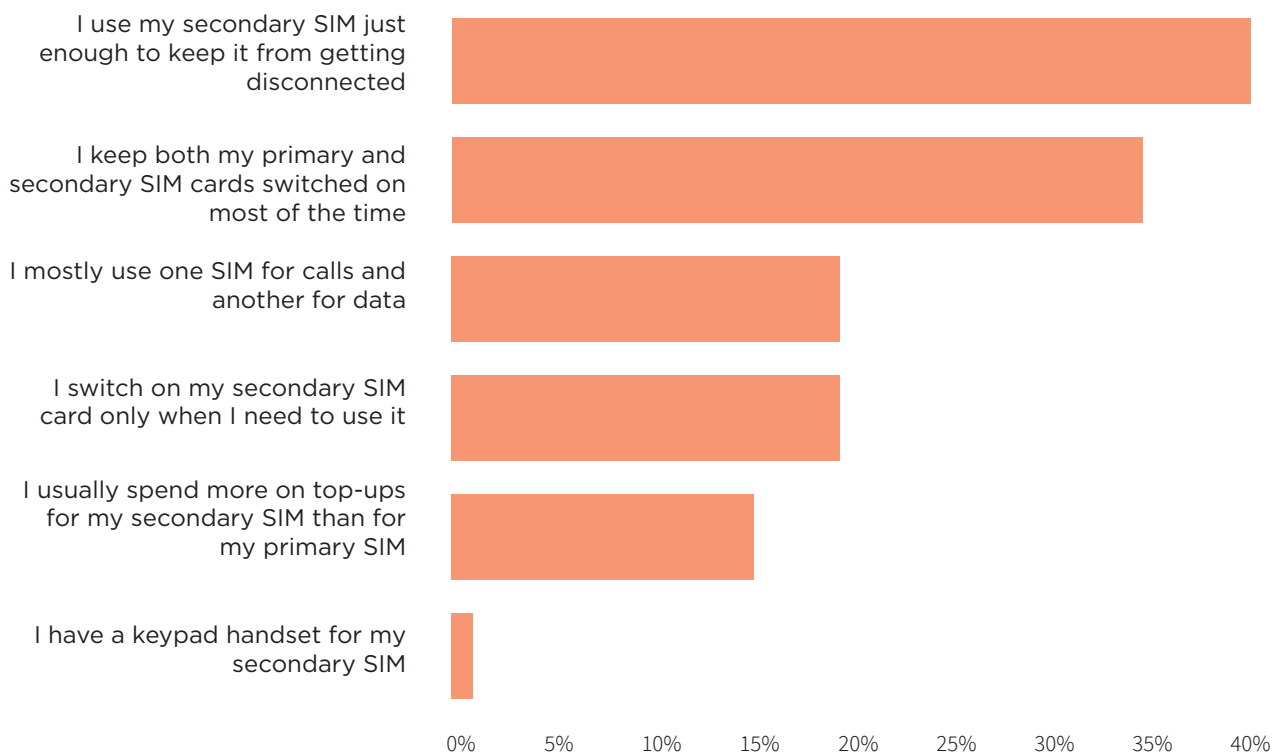


Figure 48: Behavior of multi-SIM owners (% multi- SIM owners aged 15-65)

Meanwhile, more females had multiple SIMs to make cheaper calls and use data services (Figures 49).

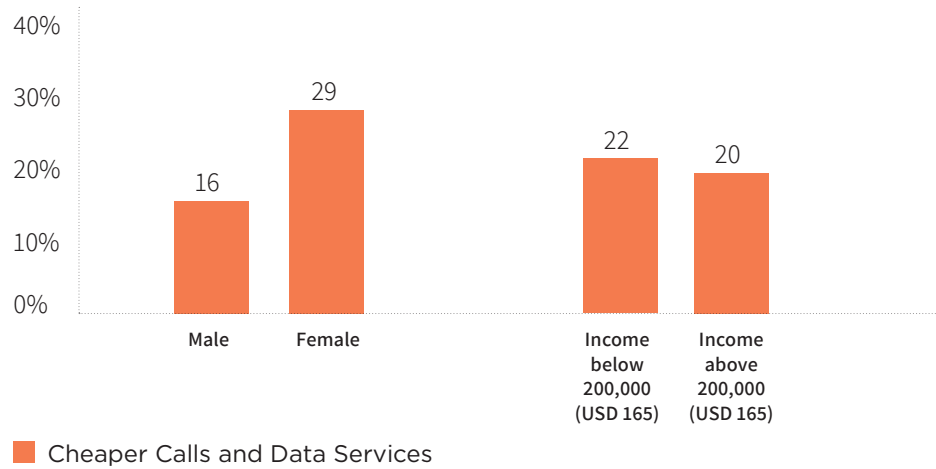


Figure 49: Owning more than one SIM card for cheaper calls and data services (% of multi-SIM owners)

3.5 Expenditure on mobile phones and top-ups

MMK 105,198 (USD 88) was spent on average to buy a mobile phone in 2016, compared to MMK 94,500 (USD 90) in 2015 5(Figure 50).

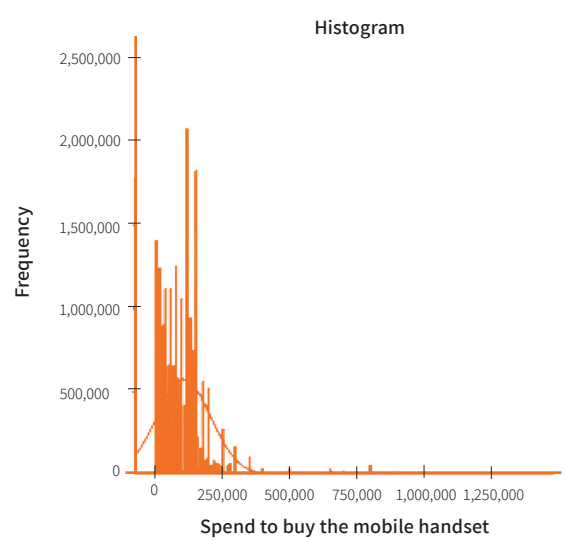


Figure 50: Expenditure on purchasing mobile phone (% of mobile owners aged 15-65)

The most common method of phone top-up in Myanmar was the use of top-up cards. Ninety-eight percent of active SIM card owners used top-up cards to pay for their day to day phone expenditures. (Figure 51).

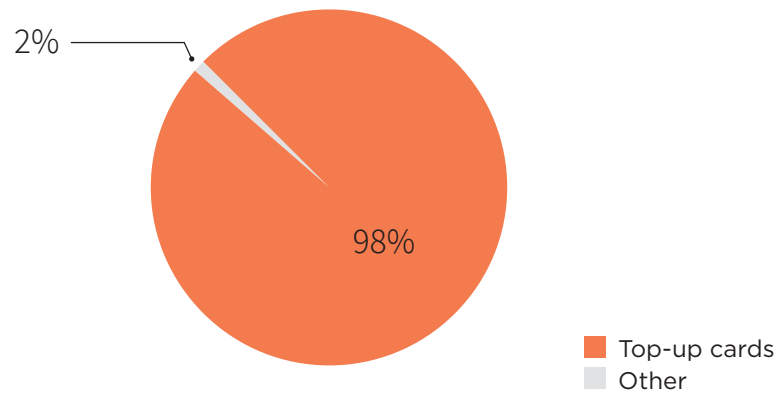


Figure 51: Method of top-up for primary SIM card (% of active SIM card owners aged 15-65)

In 2016, the average spend on top-ups was MMK 7,494 (USD 6.2). If broken down, it is evident that the averages expenditure on primary SIM was greater at MMK 6,592 (USD 5.5), compared to the expenditure on the secondary SIM, which was MMK 3,857 (USD 3.2)[6] (Figure 52).

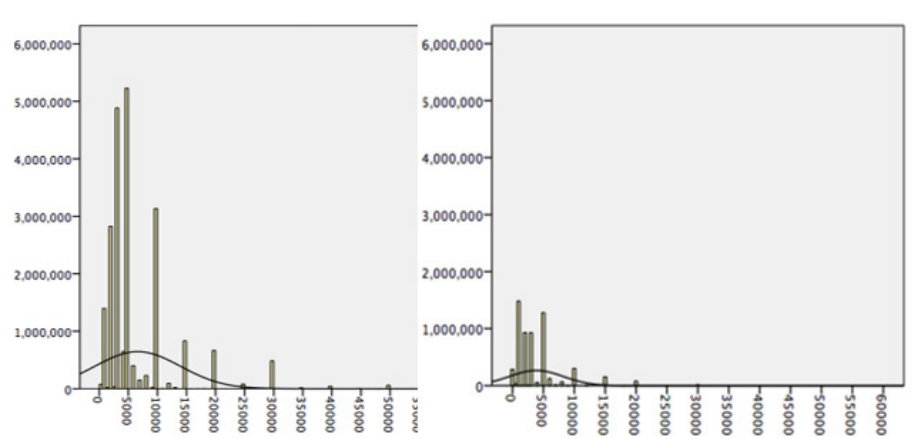


Figure 52: Expenditure on top-ups (MMK/USD)

6 Note: Exchange rate at the time of fieldwork used to convert MMK to USD. The currency had depreciated from 2015 to 2016, leading to different USD values.

Spending on top-ups was found to be higher in urban areas, accounting for MMK 9,331 (USD 7.8). Those in rural areas spend a monthly average of MMK 6,182 (USD 5.1). Males spent slightly more than females on top-ups at the time the survey was conducted (Figure 53). Though males spend more on top ups for their primary SIM, females tend to spend more for secondary SIMs (Figure 54).

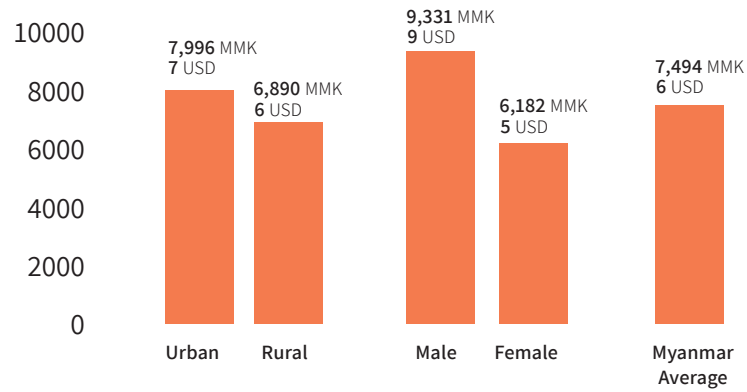


Figure 53: Average top-up made in the last month (MMK/USD)

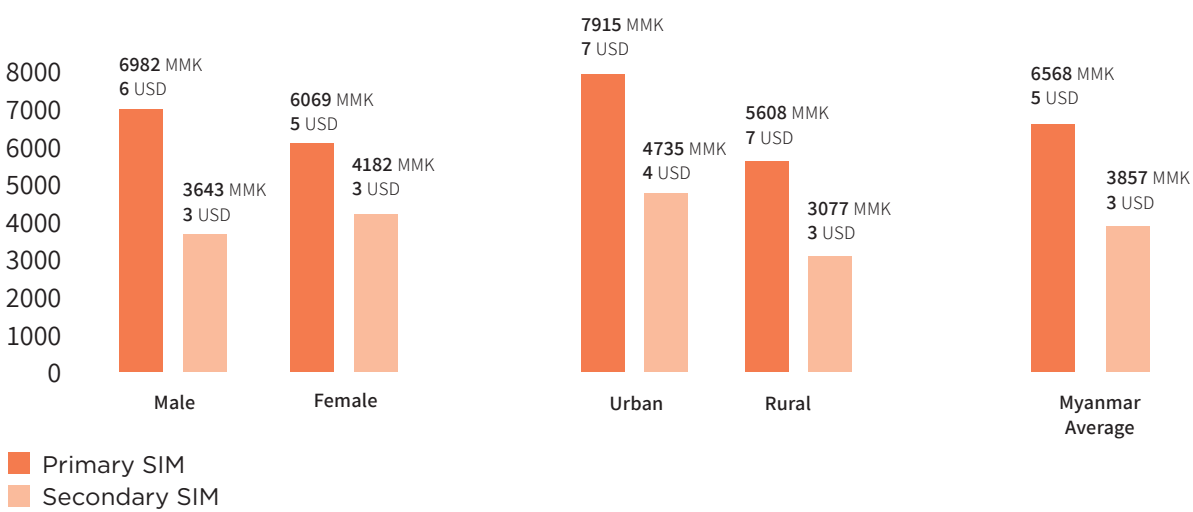


Figure 54: Average top-up made in the last month - primary vs. secondary SIM (MMK/USD)

4 Internet use

4.1 Devices used to connect to the Internet

Computer usage was low in Myanmar. In 2016, only two percent of the population owned and used a computer. Only three percent had ever used one. Seventeen percent didn't know what a computer was (Figure 55). Nearly all those who owned and used computers lived in urban areas (Figure 56). However, in both urban and rural areas, a majority of respondents did not own or use a computer. Among the identified small group of computer users, only 16% were daily Internet users (Figure 54). Hence, in Myanmar, it is clear that the computer is not the device most frequently used to access the Internet.

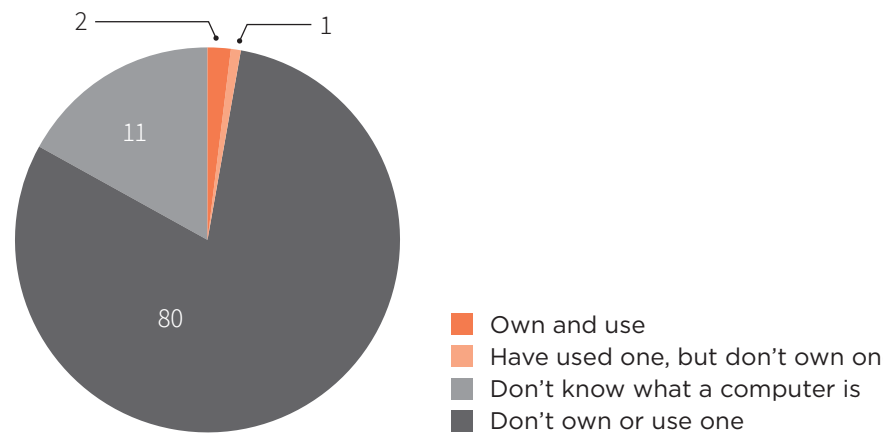


Figure 55: Ownership and use of a computer (% of population aged 15-65)

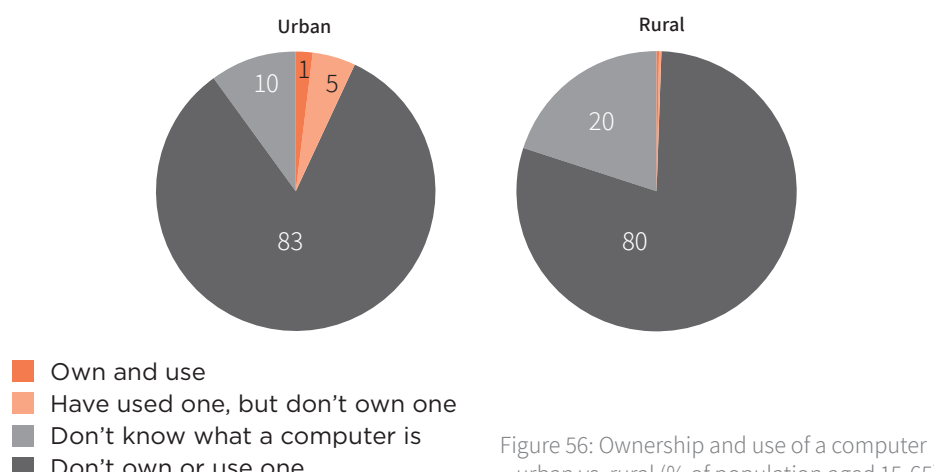


Figure 56: Ownership and use of a computer – urban vs. rural (% of population aged 15-65)

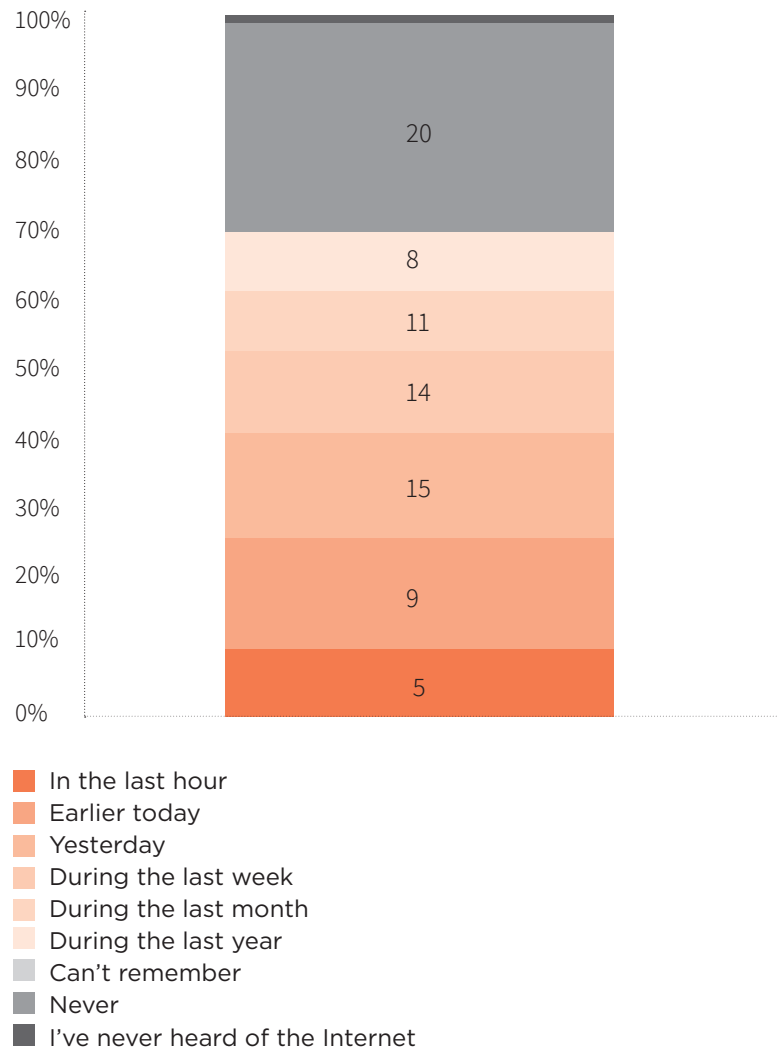


Figure 57: Internet use from a computer (% of those aged 15-65 that that have used a computer before)

Conversely, mobile ownership is high, and has been growing fast. Sixty-one percent of the population aged 15 to 65 owned mobile phones, of which 78% were smartphones. Forty-nine percent of mobile owners in Myanmar used data services. Data usage was approximately 30% higher in urban areas than rural areas. The difference was less stark amongst male and female mobile owners (Figure 58).

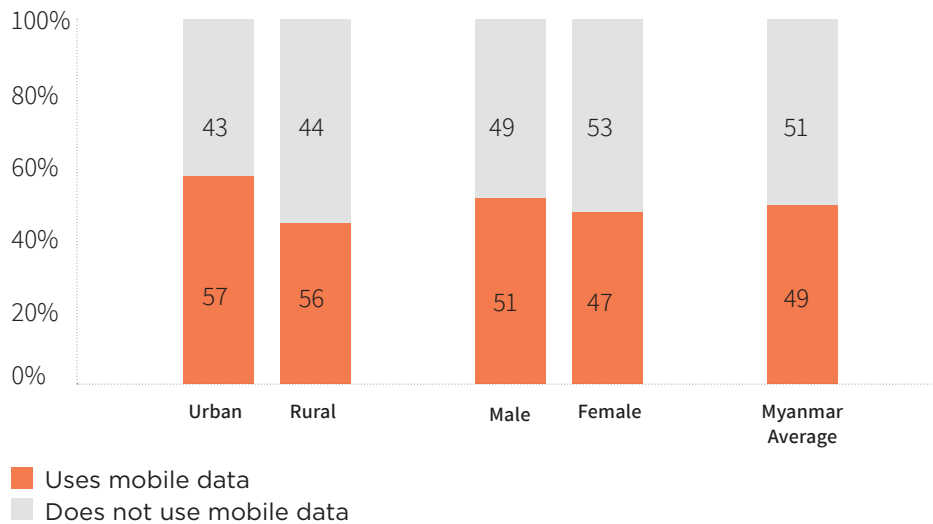


Figure 58: Internet access from mobile phone (% of mobile owners aged 15-65)

4.2 Uses of mobile phones

Although mobile phones were used primarily for network calls, missed calls and text messages, a substantial amount of activities that necessitated the use of the Internet were also used. While phones were rarely used to access online government services and mobile money and banking services, social activities such as chatting/instant messaging, accessing Facebook, making Internet calls and sharing pictures were popular (Figure 59).

Rural mobile owners lagged behind the urban population in their usage of such features/ applications (Figure 57). Furthermore, a large gap in usage was visible between mobile owners of high-spending households and low-spending households (Figure 58). The growth in its use between 2015 and 2016 surpassed that of Facebook (Figures 59 and 60).

The survey suggests that 35% of mobile owners used Facebook - of whom 60% accessed it daily. Facebook use has grown by 67% between 2015 and 2016, faster than the growth in mobile ownership (Figure 60).

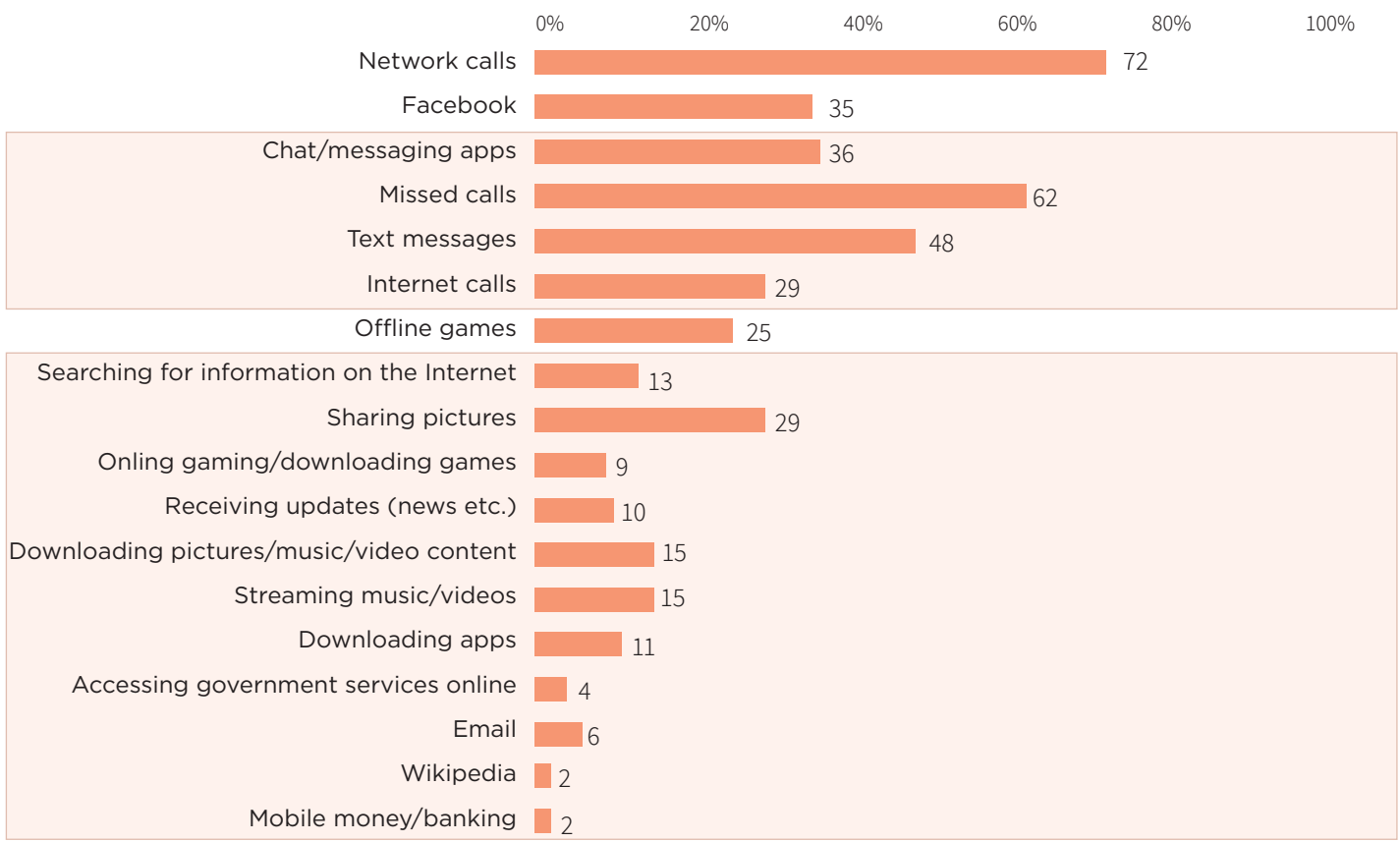


Figure 59: Uses of mobile phone (% of mobile owners aged 15-65)

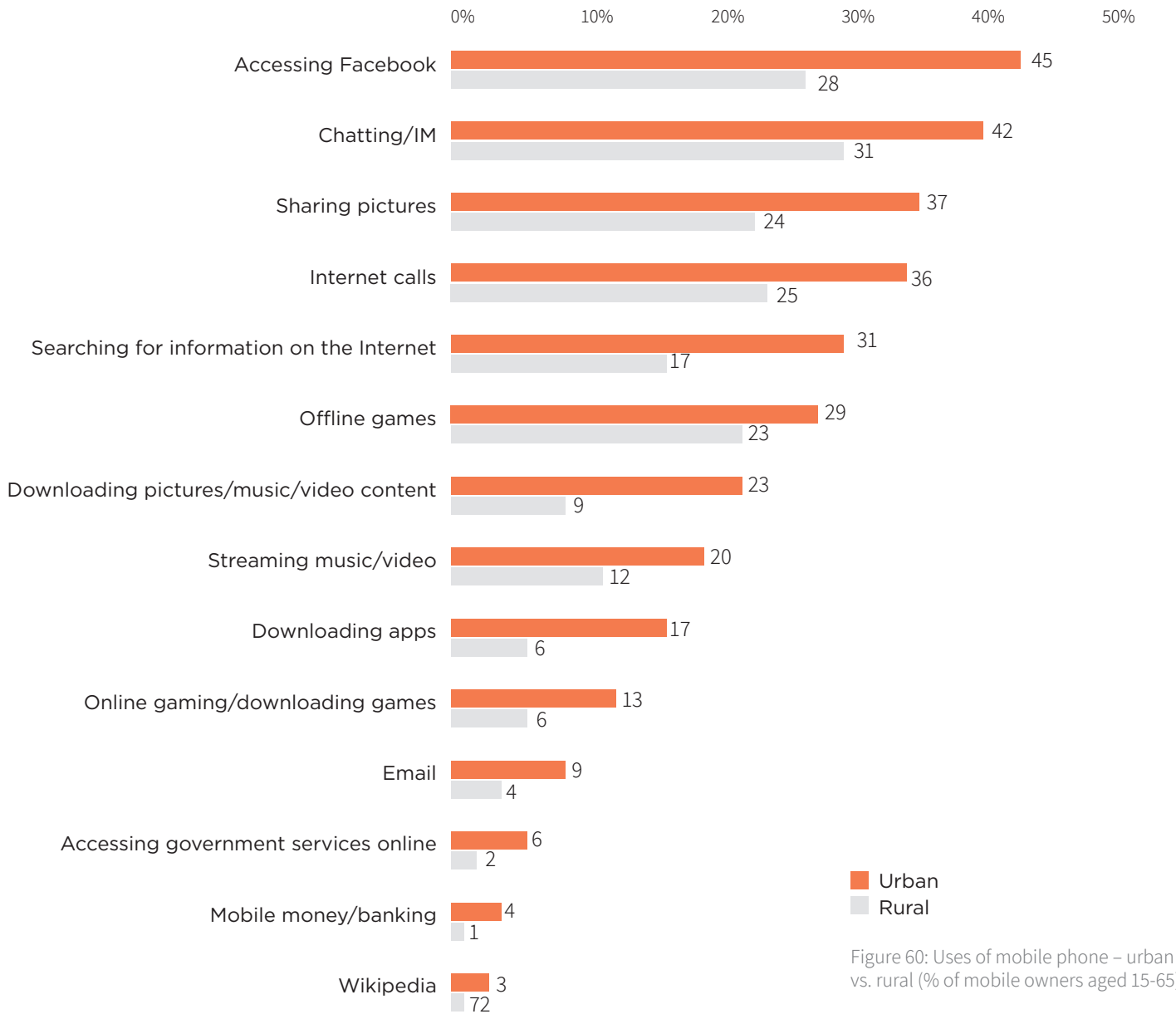


Figure 60: Uses of mobile phone – urban vs. rural (% of mobile owners aged 15-65)

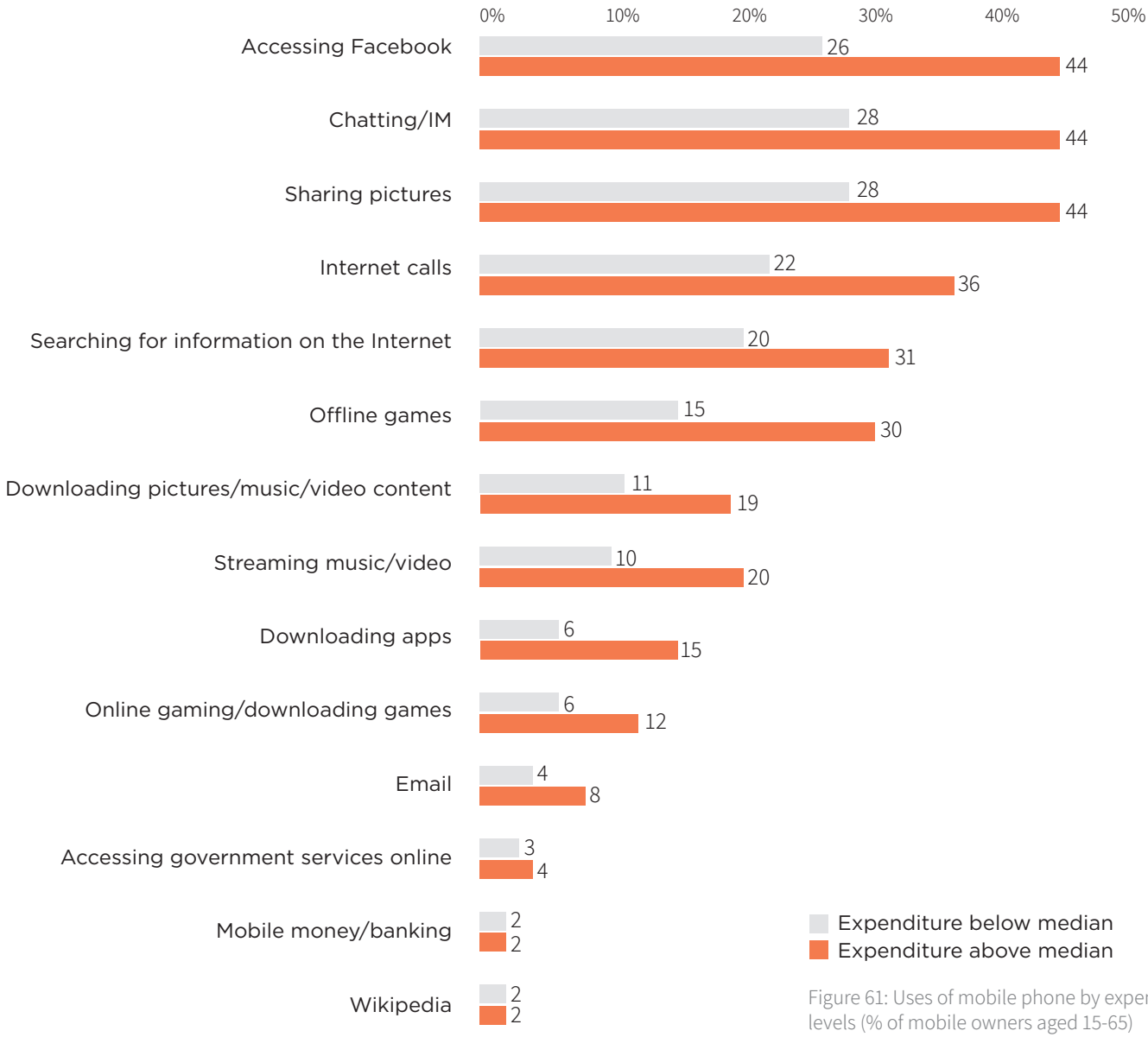


Figure 61: Uses of mobile phone by expenditure levels (% of mobile owners aged 15-65)

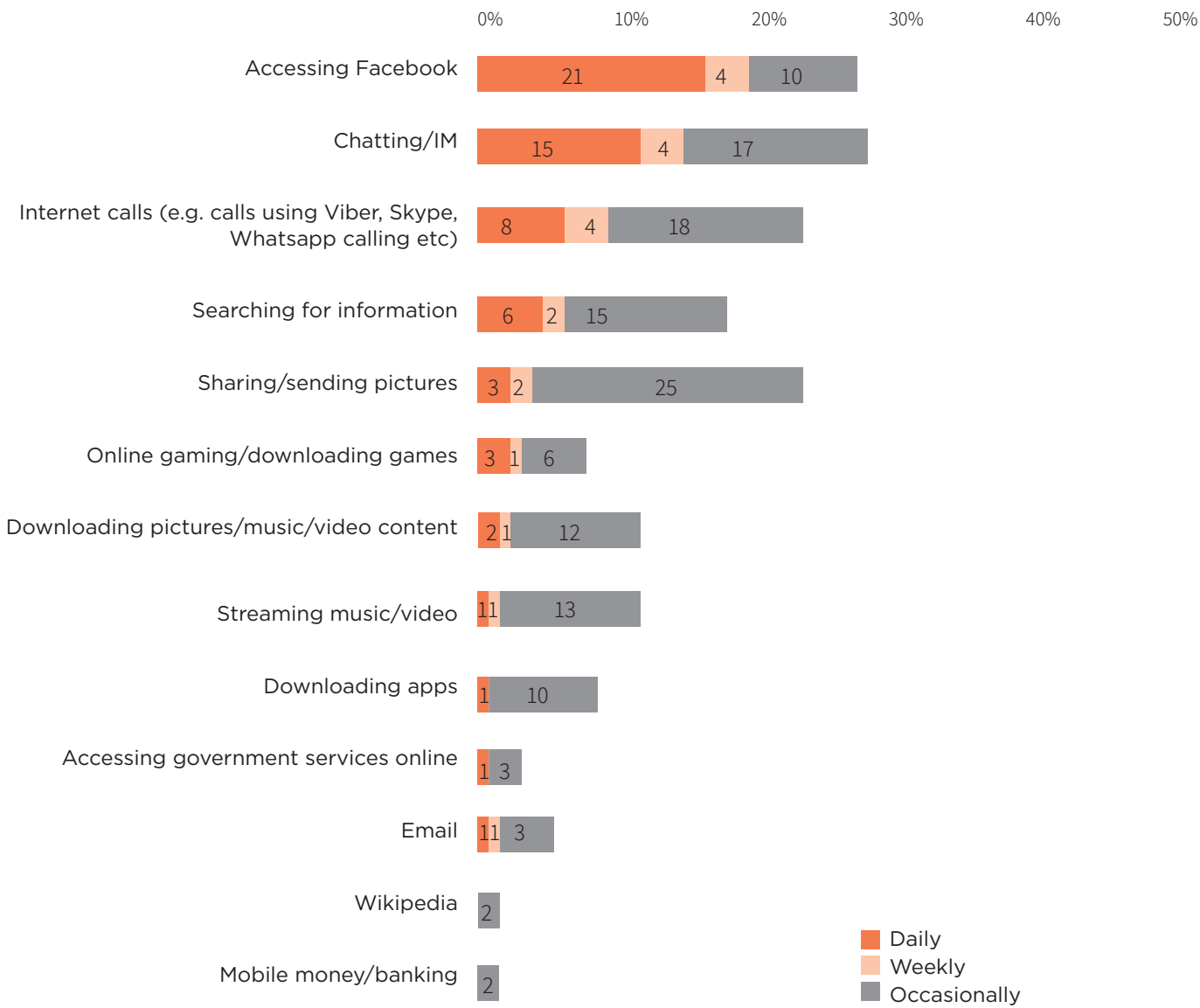


Figure 62: Uses of mobile phone (% of mobile owners aged 15-65)

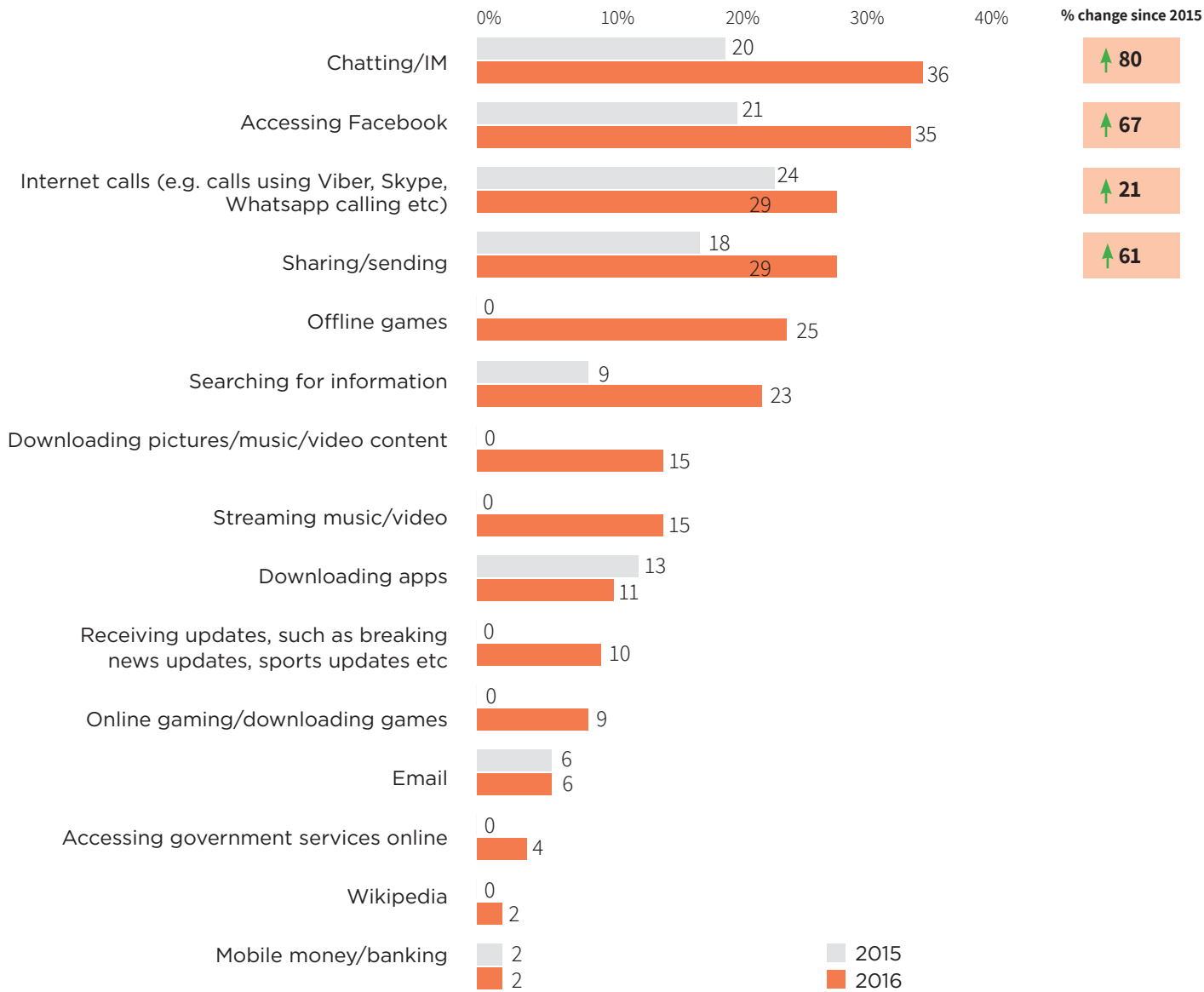


Figure 63: Uses of mobile phone – 2015 vs. 2016 (% of mobile owners aged 15-65)

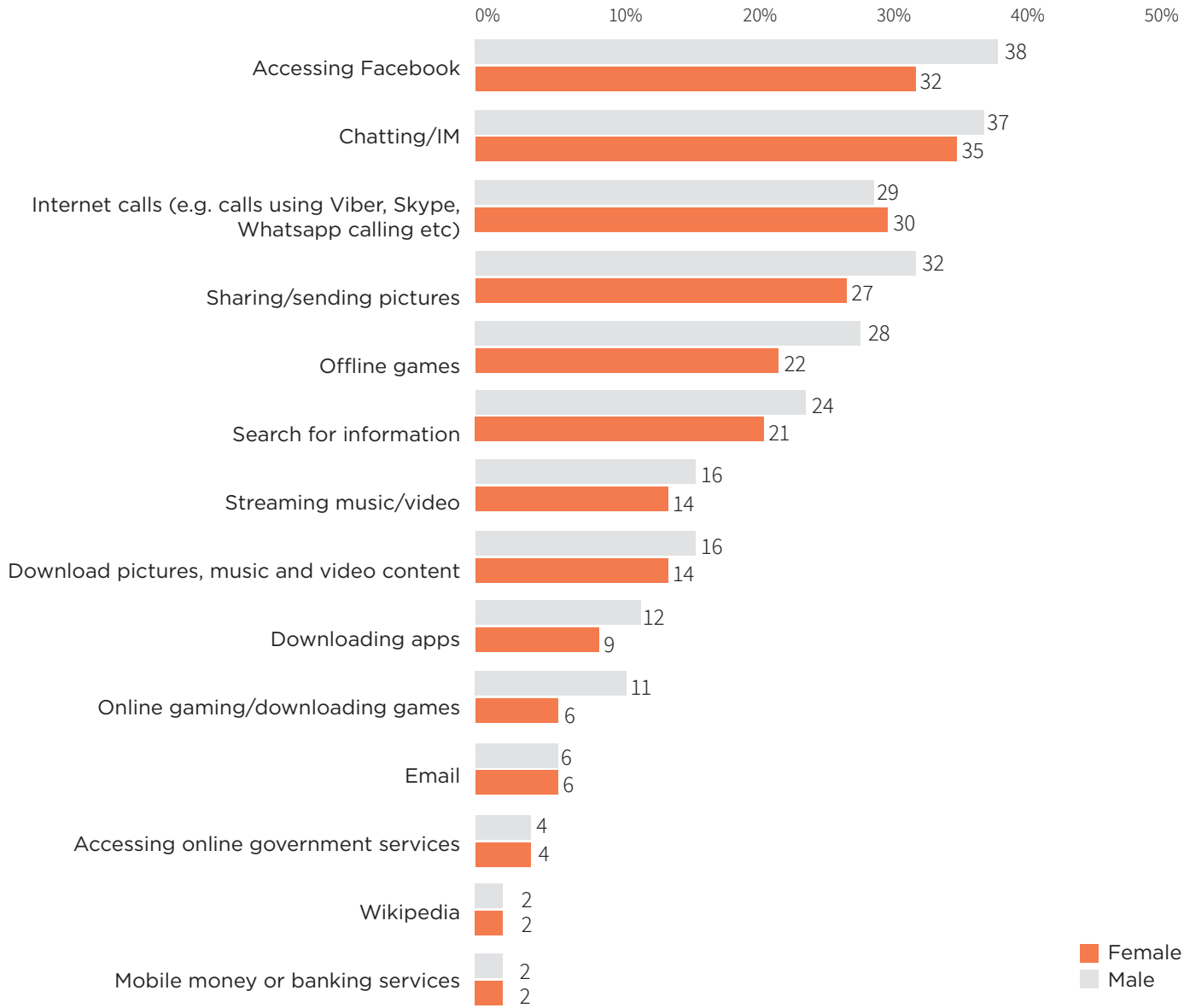


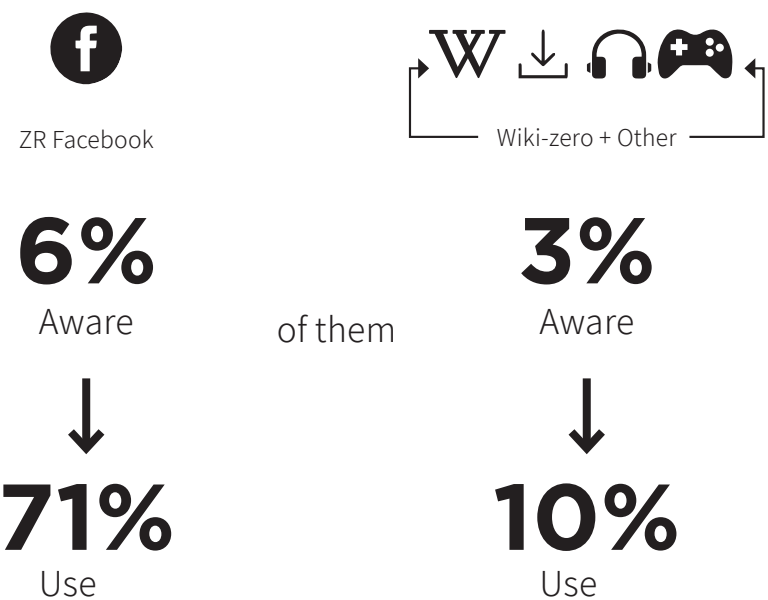
Figure 64: Uses of mobile phone – 2015 vs. 2016 (% of mobile owners aged 15-65)

Free (zero-rated) content

When a specific application or content is zero-rated, the user may consume an unlimited amount of that specific content without incurring data charges. Free content, including zero-rated content, was available in Myanmar at the time of fieldwork. MPT, for example, offered MPT Free Basics, a variation of Facebook's internet.org endeavor. Users had free access to selected content, including a text-only version of Facebook. Other free (though not zero-rated) content included an offer by Telenor, where one could access an unrestricted version of Facebook up to a daily limit of 150MB.

The zero-rating debate is a controversial one. One school of thought believes that zero-rated content acts as an on-ramp to the Internet, while others argue that it violates the principles of net neutrality by promoting some content over others, and limits user experiences by keeping them in a "walled garden".

LIRNE*asia* interviewed 63 individuals in urban and rural Yangon in July 2016 to understand their user experiences and relate it to concerns on the general zero rating debate. Though none of our respondents had used zero-rated content to get on the Internet for the first time, we can't say that this is representative of the population since non-random sampling method was used to recruit respondents.



The results of our survey suggested that awareness on the availability of this zero-rated content was low. While more were aware of zero-rated Facebook, there was also greater demand for Facebook from those who were aware of the free content. (Figure 68)

Qualitative research suggests that many of the respondents were dissatisfied with MPT Free Basics service due to the inability to view photos and videos for free. Sentiment surrounding the Telenor plan was more positive.

Moreover, the respondents' choice to stay within Facebook instead of moving out of it also depended on the type of data they obtained. With Telenor's plan (no longer available) where users were given 150MB a day of free access to a full version of Facebook with images and videos, users then tended to concentrate use on Facebook and not move outside it.

However, since MPT Free basics offered a text only, limited version of Facebook, those on this plan were more likely to realize that they were getting a limited version of Facebook. It's... ok as for me. But I can't see any photos. If I want to look at photos I switch to normal mode. I usually view photos after checking whether or not I know who posted it. If [an external link] seems interesting to me or the post was shared by my friends, I continue to click and see them although I know it will cut my bill." Aye Aye, F, 24, Myanmar (R10)

The qualitative insights are based primarily on a report prepared by Peter Cihon, and Helani Galpaya of LIRNE*asia based on findings from a Mozilla funded study on free and subsidized data packages in Myanmar.*

Digital skills

Digital skills were low in Myanmar in 2016. Many managed with someone else's help, especially installing applications, creating log-in details and a password, and locating and adjusting settings on an application or service (Figure 64). Digital literacy was lower among females, and they needed more help to manage tasks (Figure 65). Digital literacy was also lower among the rural population than the urban. They tended to need help installing applications and setting up accounts on Facebook, Viber etc. (Figure 66).

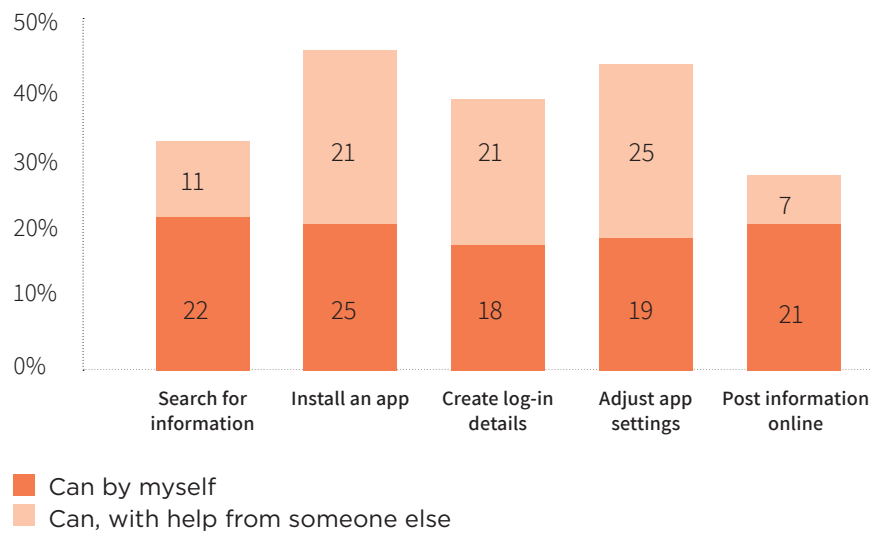


Figure 65: Digital skills (% of mobile owners aged 15-65)

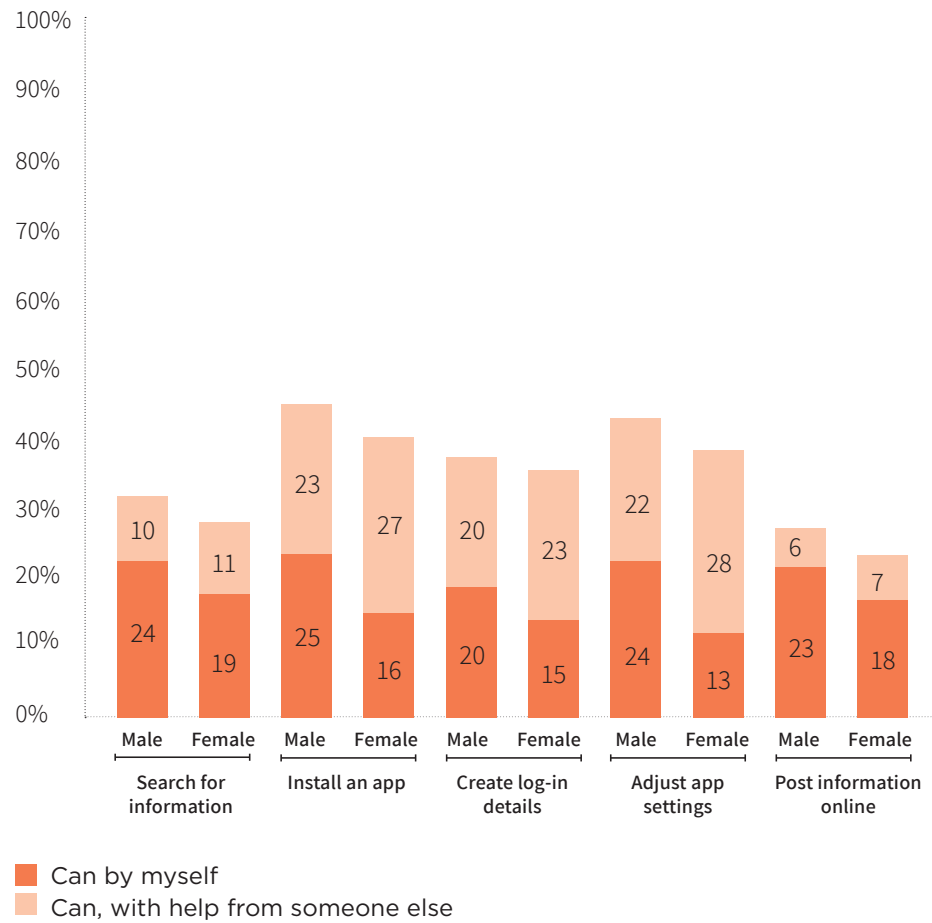


Figure 66: Digital skills – male vs. female (% of mobile owners aged 15-65)

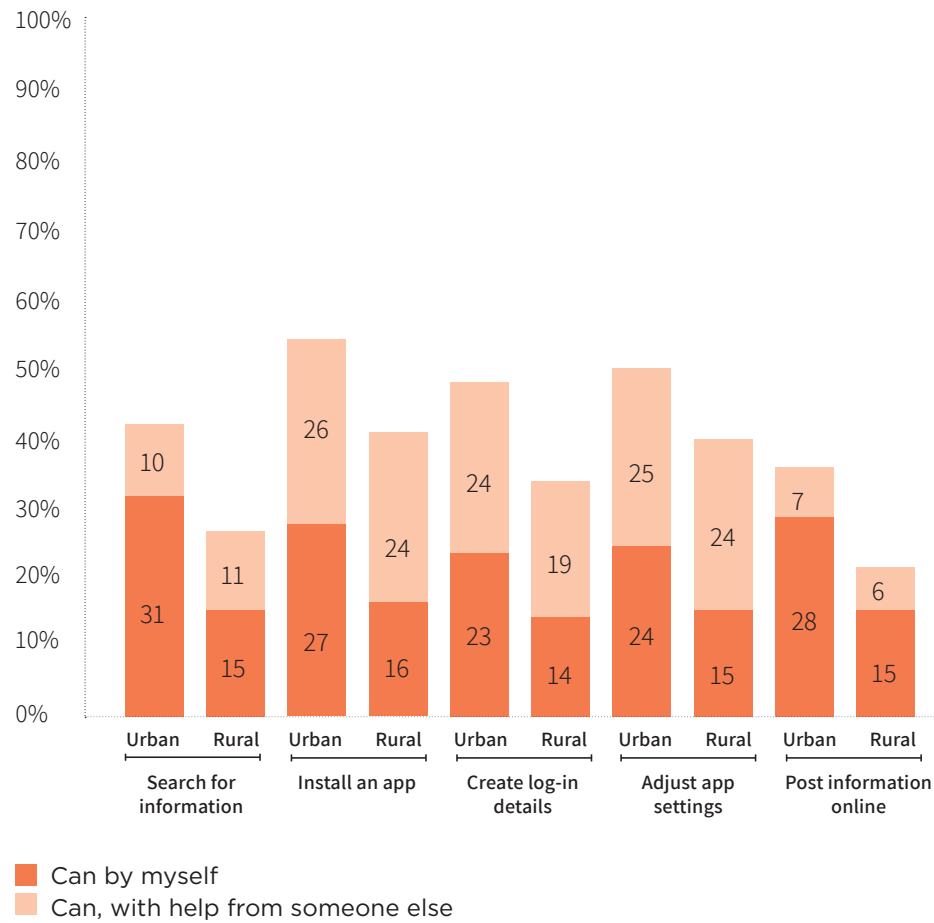


Figure 67: Digital skills – urban vs. rural (% of mobile owners aged 15-65)

6 Financial inclusion

6.1 Bank account and debit/credit card ownership

The results of our 2016 survey suggest that four percent of respondents had personal bank accounts, and that a third of those with bank accounts had debit/credit cards. This is an increase from 2015 when less than three percent had bank accounts. Furthermore, the urban population had a higher percentage of bank accounts than rural population (Figure 68).

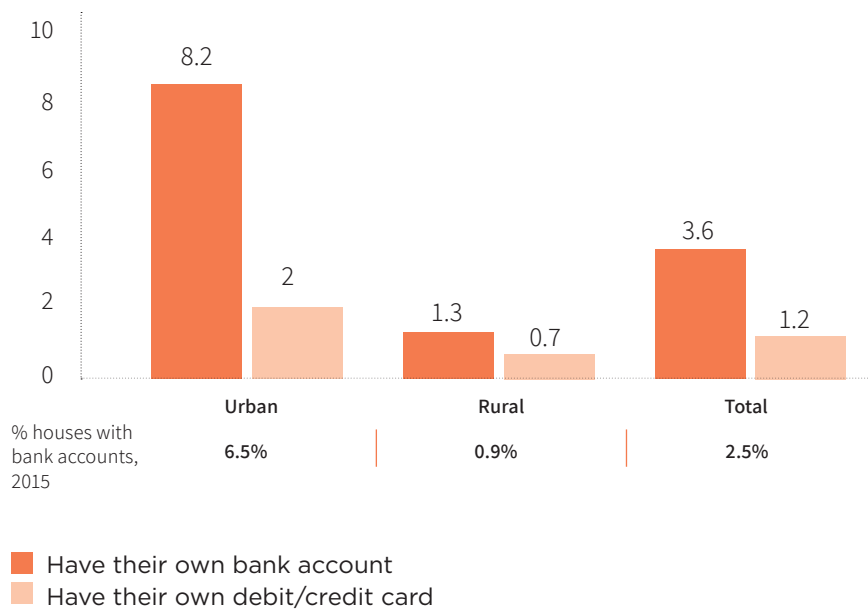


Figure 68: Population with their own bank account/s and debit/credit card/s (% of population aged 15-65)

6.2 Migrant family members, money transfer methods of household with immigrants

The survey results indicate that 21% of the population had a family member living in other parts of Myanmar or overseas (Figure 69). Money was most often transferred between migrants and other family members via bank or money transfer service, carrying it in cash by hand, or through someone known from the area (Figure 70). However, mobile money was not particularly popular among the respondents — only two percent had used mobile money or banking services, in 2015 and 2016. Even among the urban population, only four percent had used mobile money.

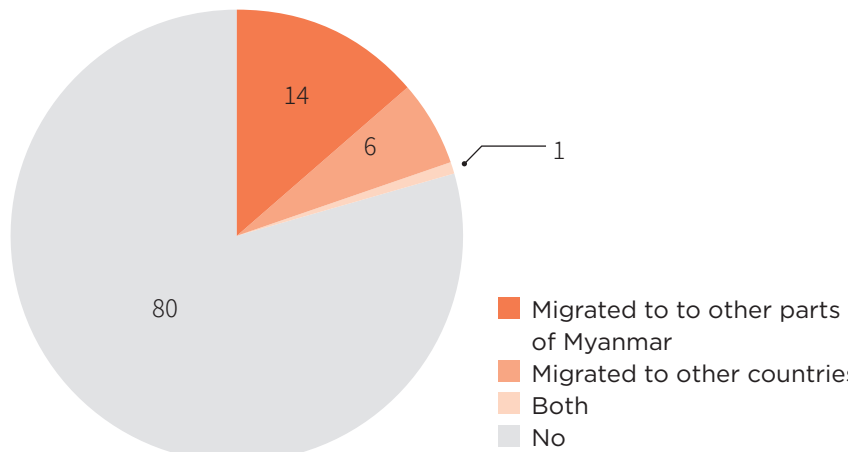


Figure 69: Households with migrant family members (% of households)

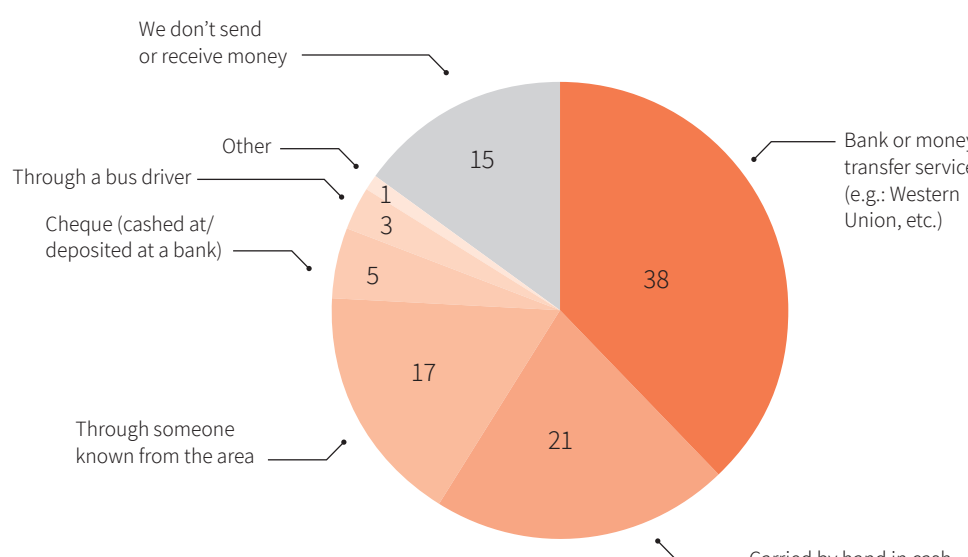


Figure 70: How money is sent and received (% of households with migrants)

Information sources, needs and access

7.1 Communication with those outside town or village

Phone calls were the preferred method of communication with people outside the town or village. Sixty-eight percent of the respondents opted for this method, followed by 31% preferring to communicate via in-person visits (Figure 71). This trend was seen among both mobile owners and non-owners, suggesting that phones were shared for such purposes (Figure 72).

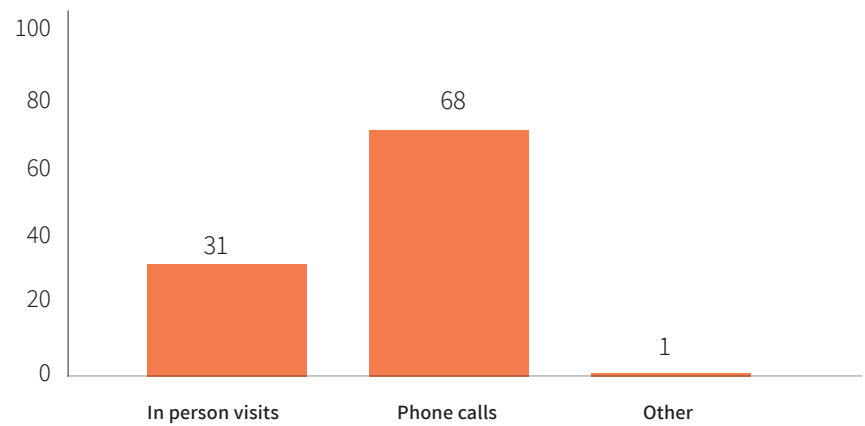


Figure 71: Preferred method of communication with people outside town or village (% population aged 15-65)

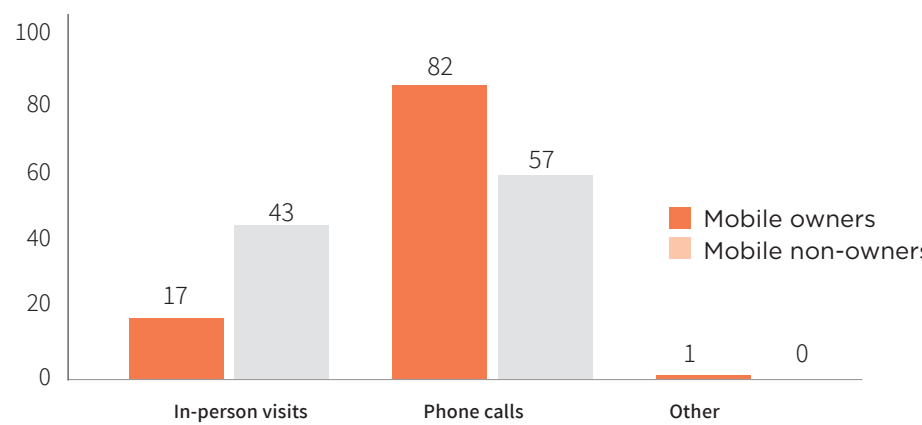


Figure 72: Preferred method of communication with people outside town or village –mobile owners vs. non-owners (% of population aged 15-65)

7.2 Information needs

The three most important types of information sought by our respondents were community news, weather information and national news. These three types of information were consistently in the top three ranks in both the 2015 and 2016 surveys, although weather information overtook national news in 2016 (Figure 72).

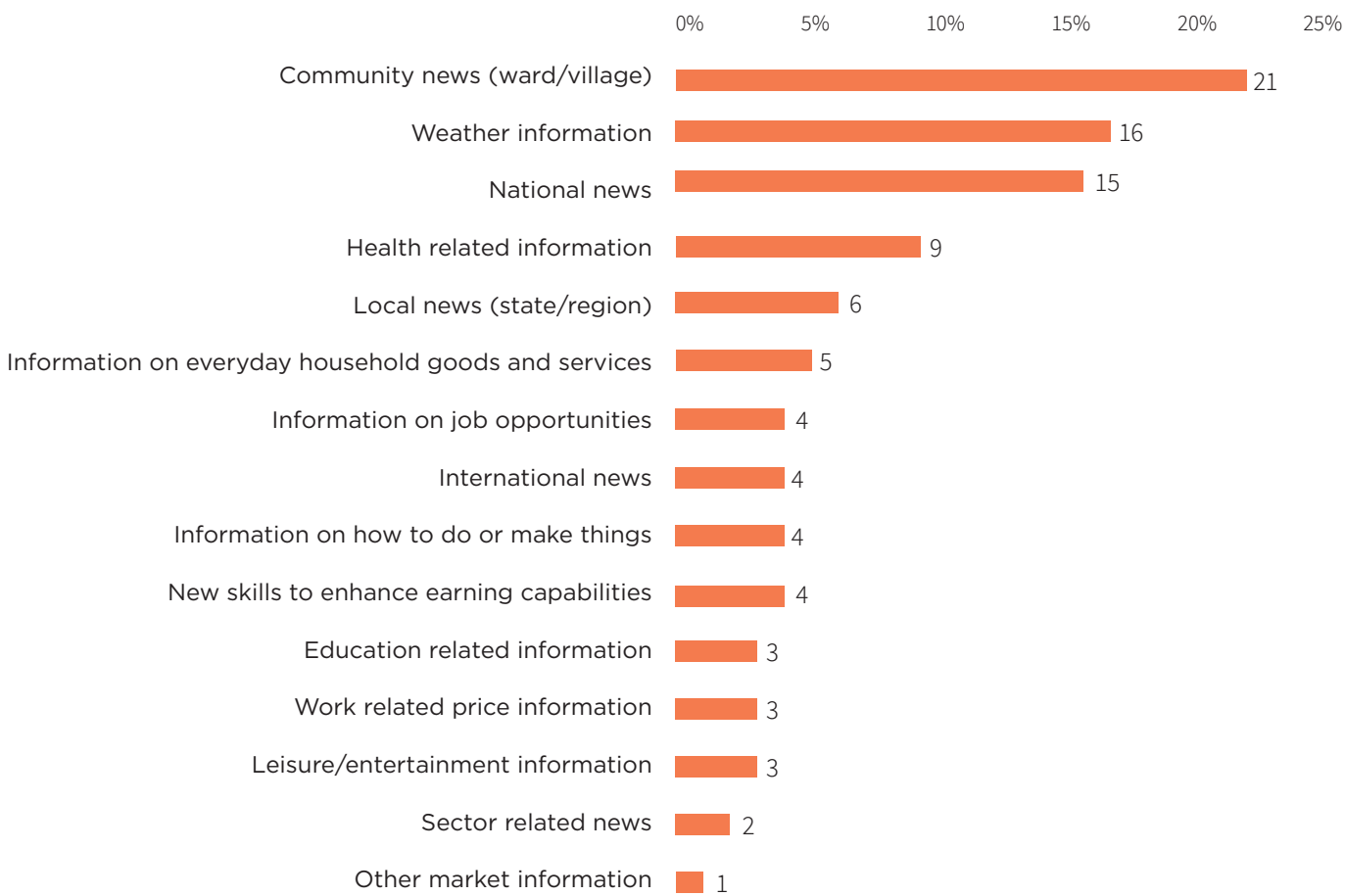


Figure 73: Single most important type of information in relation to day to-day activities (% of population aged 15-65)

7.3 Source of information

Friends and family were the main source of information, followed by mass media and neighbors (Figure 73).

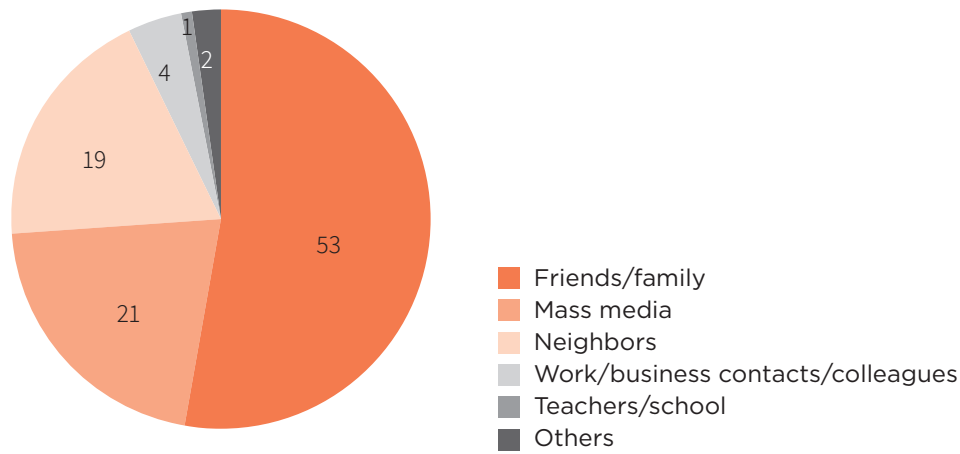


Figure 74: Source of information (% of population aged 15-65)

7.4 Mode of information

61% of respondents preferred face-to-face conversations for communication purposes. Other popular modes of getting information in the Myanmar context were mobile phone calls, Internet, and TV. While the percentage of face-to-face conversations remained constant between 2015 and 2016, people have shifted from mobile calls to Internet since 2015 (Figure 74).

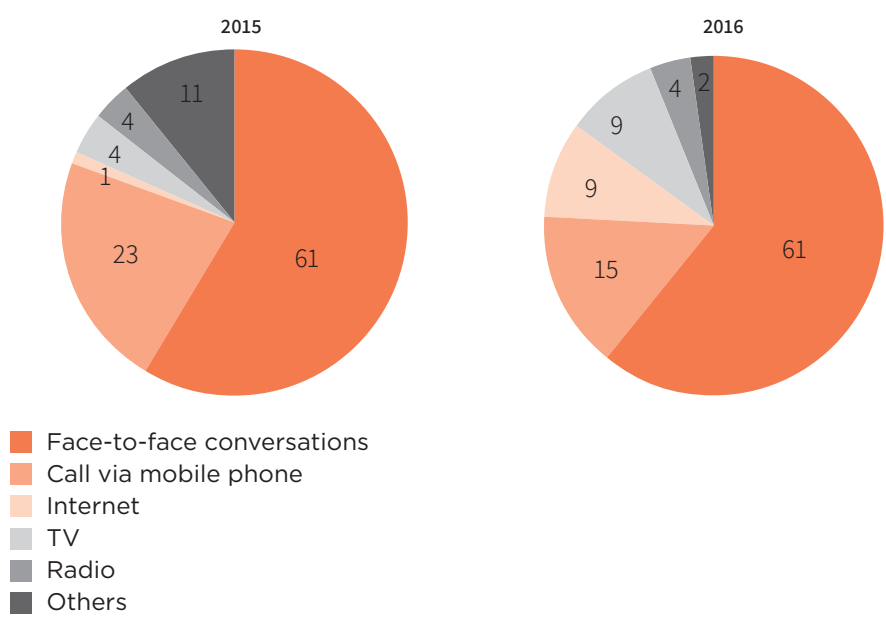


Figure 75: Mode of information – 2015 vs. 2016 (% of 15-65 population)

8 Perceptions of mobile technology and its impacts

8.1 Perceived benefits of mobile use and access

Numerous perceived benefits of mobile use and access were identified in the survey. The biggest perceived improvement of using a phone was the ability to contact others in an emergency (Figure 76). Many perceptions of benefits of phone use have improved between 2015 and 2016 (Figure 77). While the ability to act or contact others in an emergency was the most commonly perceived benefit in 2016, the perceived benefit of this was larger in 2015. It hints to the fact that as mobiles become more widespread and more embedded in daily lives and routines, the purposes of use (and benefits perceived) become more diverse.

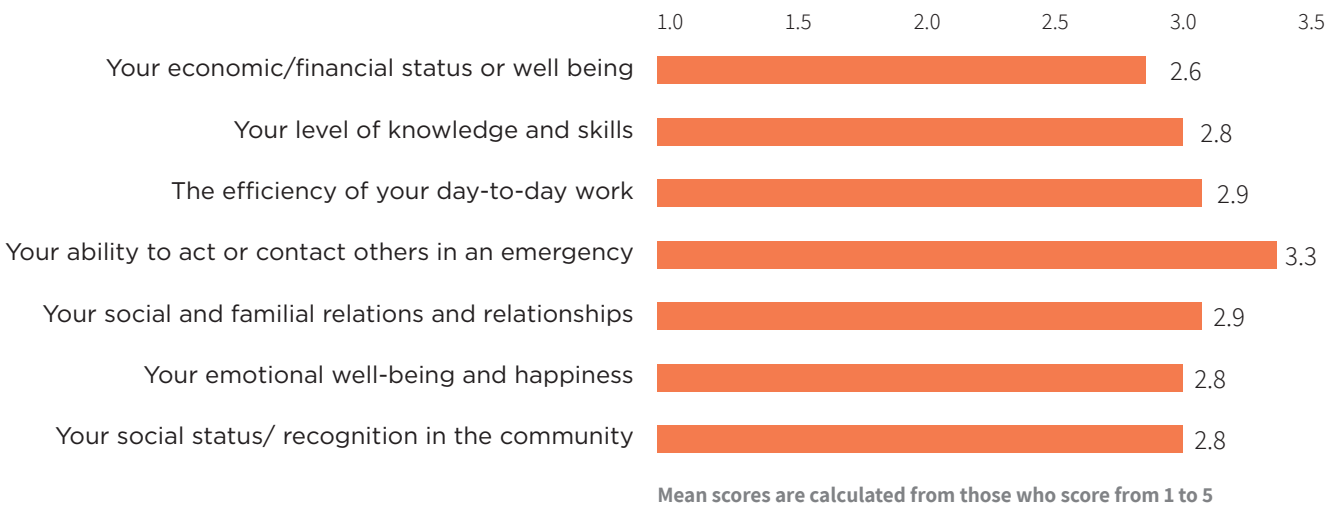


Figure 76: Perceived benefits of mobile use and access (mean response)

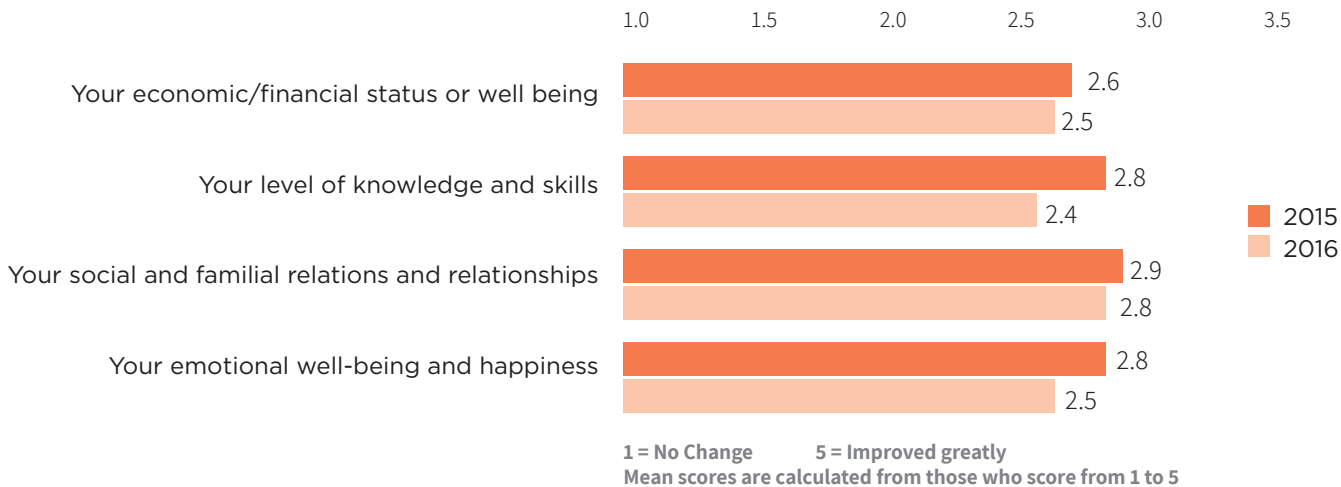


Figure 77: Changes in perceived benefit of mobile use and access (mean response) 2015 vs. 2016

8.2 Concerns about mobile use and access

The respondents' main concern was regarding their children being exposed to inappropriate content. They were also worried about private information becoming exposed to others, and the high costs incurred with mobile phone use (Figure 78). The perceived negatives of mobile use and access were found to be higher among non-owners than owners (Figure 79). Qualitative research suggests that the negative perceptions of mobile ownership dissipate once people become owners, with the actual benefits outweighing the perceived negatives. This shift in perceptions was most evident once people become data users.

"Children before grade 11 shouldn't use a mobile. They could fall in love on FB, use drugs and meet unsuitable persons. They should concentrate on their education."

HV Yangon, female owner, 19, non-working, SEC C

GSMA and LIRNE*asia* (2015)

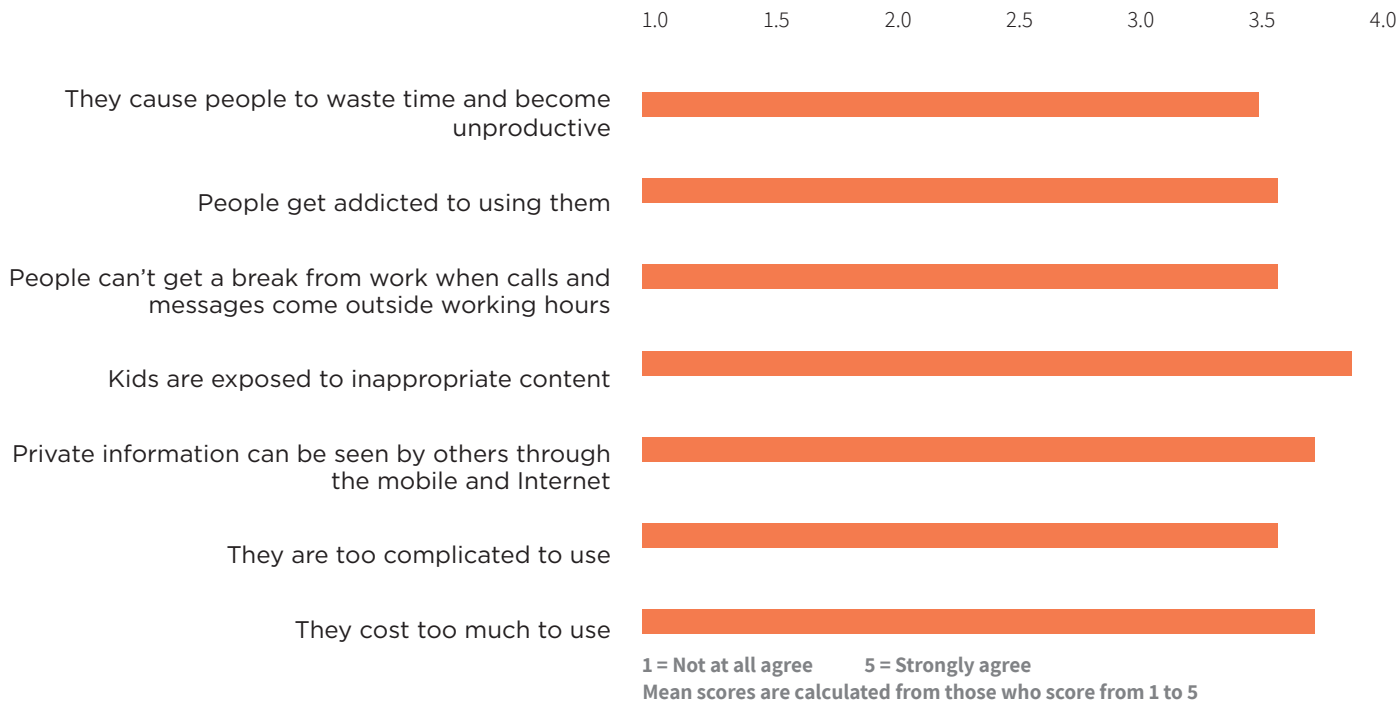


Figure 78: Concerns of mobile use and access (mean response)

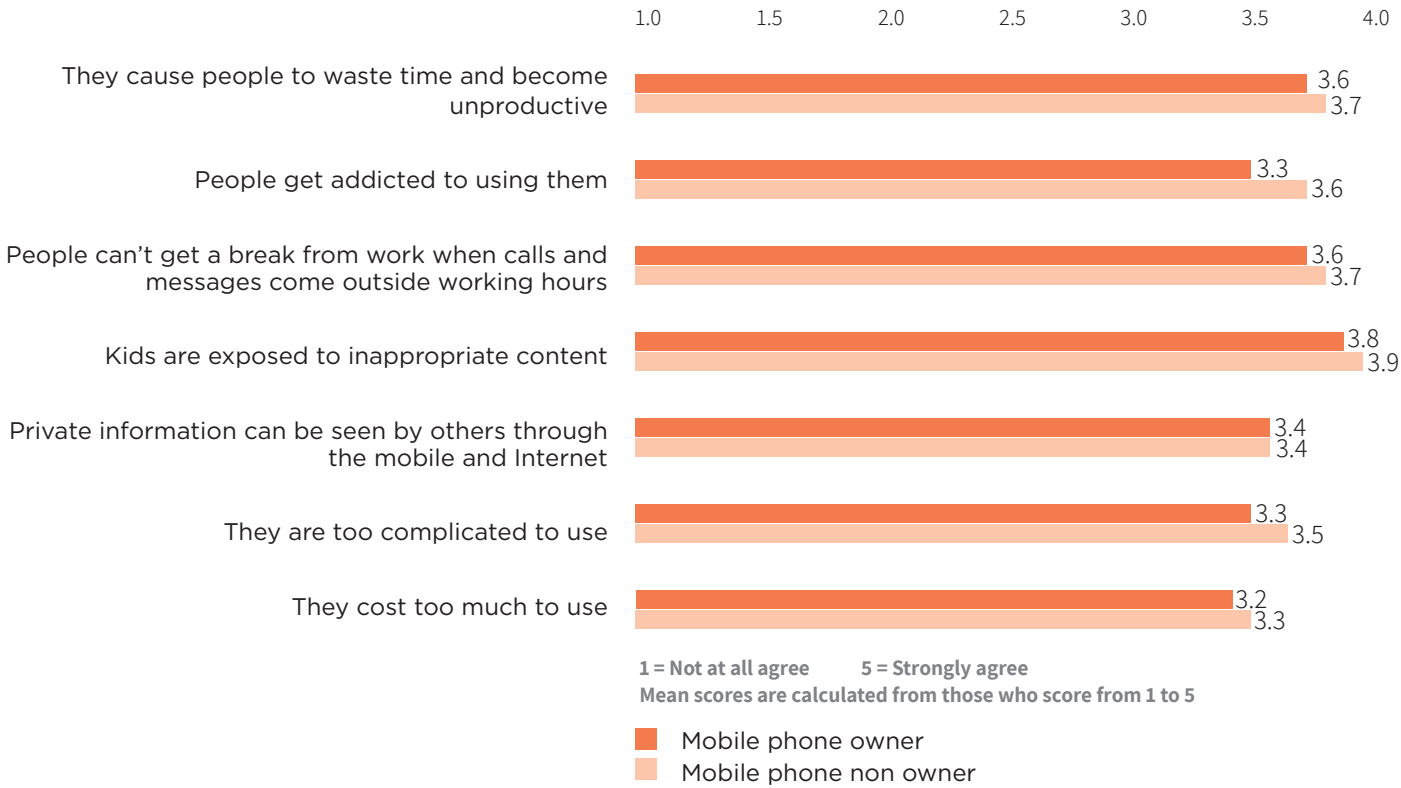


Figure 79: Concerns of mobile use and access (mean response) mobile ETC.– mobile phone owner vs. non-owner

Annex 1 –Methodology note

1. Sample Design

1.1 Survey Representativeness

- The survey aimed to be representative of both households and individuals aged 15 to 65 years old, in all accessible areas of Myanmar. The survey represents 298 townships (97% and 96.3% of total households and total population respectively) of entire Myanmar. Detailed statistics are provided in Table 1.

- Myanmar has 330 townships. These townships were set to be Primary Sampling Units (PSUs). 32 townships from Kachin State, Kayah State, Kayin State, Chin State, Sagaing Region, Rakhine State and Yangon Region were excluded from the PSU sampling due to security concerns and inaccessibiity due to prevailing weather conditions. Details of excluded townships are given in Table 1.

- The margin of error at a national level is no more than ±3%. The results can be disaggregated into six geographic regions and state/regional level. It can be further disaggregated as urban vs. rural locations, gender and age as appropriate.

Table 1: Distribution of Enumerated Population

		Number	Percent of Total
Total population			
	Number of townships	330	
	Both sexes	50,213,067	100.0%
	Males	24,225,304	
	Females	25,987,763	
	Sex Ratio (Males per 100 females)	93.2	
Population in conventional households			
	Number of townships	330	
	Households	10,889,348	100.0%

	Both sexes	47,848,821 95.	95.3%
	Males	22,544,622	
	Female	25,304,199	
	Sex Ratio (Males per 100 females)	89.1	
	Household size	4.39	
Population in institutions			
	Both sexes	2,364,246	4.7%
	Males	1,680,682	
	Sex Ratio (Males per 100 females)	245.9	
Population / households in excluded townships from the survey			
	Number of townships	32	
	Households	322,775	3.0%
	Both genders	1,740,867	3.5%
	Household size	5.39	
	Both sexes in total	1,842,523	3.7%
Population / households represented by the survey			
	Number of townships/ sub-townships	298	
	Households	10,566,178	97.0%
	Household size	4.36	
	Both genders amongst individuals	48,369,570	96.3%

Source: Results of Population and Housing Census of Myanmar 2014, Dept of Population (pp 21-36)

Table 2 : Townships excluded from sampling frame:

	Township Name	State/ Region
1	Injangyang	Kachin State
2	Tanai	Kachin State
3	Chipwi	Kachin State
4	Tsawlaw	Kachin State
5	Hpakan	Kachin State
6	Puta-O	Kachin State
7	Sumprabum	Kachin State
8	Machanbaw	Kachin State
9	Nawngmun	Kachin State
10	Khaunglanhpu	Kachin State
11	Shadaw	Kayah State
12	Bawlakhe	Kayah State
13	Mese	Kayah State
14	Hpapun	Kayin State
15	Paletwa	Chin State
16	Lay Shi	Sagaing Region
17	Lahe	Sagaing Region
18	Nanyun	Sagaing Region
19	Rathedaung	Rakhine State
20	Maungdaw	Rakhine State
21	Buthidaung	Rakhine State
22	Cocokyun	Yangon Region
23	Kunlong	Shan State
24	Laukkaing	Shan State
25	Konkyan	Shan State
26	Pangsang	Shan State
27	Narphan	Shan State
28	Pangwaun	Shan State
29	Mongmao	Shan State
30	Hopang	Shan State
31	Matman	Shan State
32	Mongyawng	Shan State

1.2 Sample Size determination

The minimum sample required to produce results at a 95% confidence interval and a ±3% margin of error was determined using the following multi-stage sampling procedure.

$$n = \frac{4 * p(1-p)}{d^2} * deff$$

where

n = number of sample required for the survey

d = margin of error (3% of proportion)

p = sample proportion (here we set the proportion at 0.5, therefore the variance p(1-p)=0.25 at the maximum)

deff = Design Effect (1.6)

Therefore, the minimum sample required at the national level was $\frac{4 * 0.5\ (1\text{-}0.5)}{(0.5 \times 0.03)^2} * 1.6 = 7{,}110.$

1.3 Sampling Method

Stratified Four Stage Probabity Proportional to Size (PPS) cluster sampling was used.

- Main strata: The country was divided into six geographic areas – Northern Hills, Eastern Hills, Middle Dry Zone, Lower Valley, Ayeyarwady Delta and Long Coast. (Figure 3)

- First level sub-strata: The population was further subdivided into three sub strata according to the population size of the cities or townships. Second level sub-strata: Urban and rural areas were selected within selected sample cities/townships.

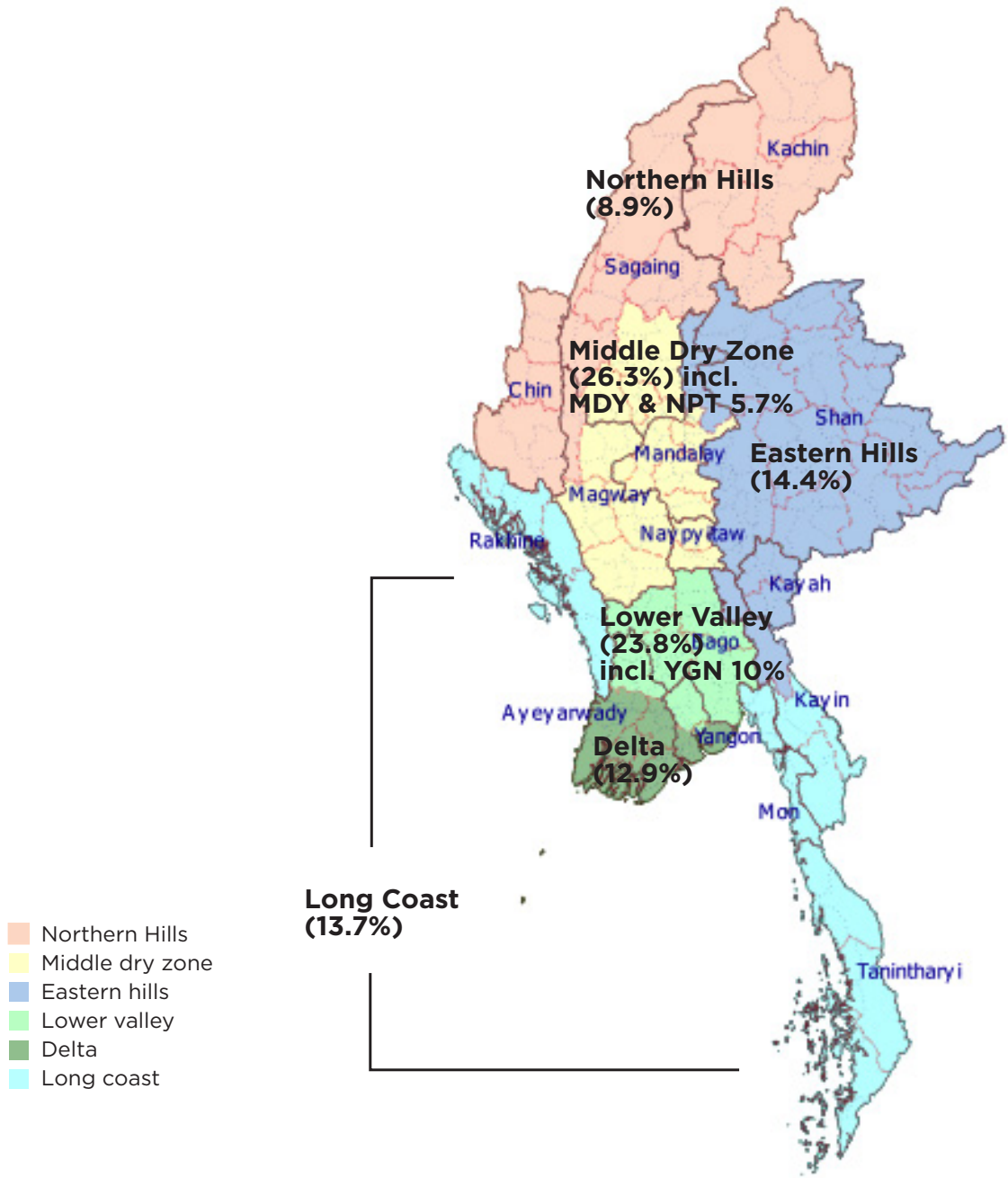


Figure 3: Six geographical regions of Myanmar

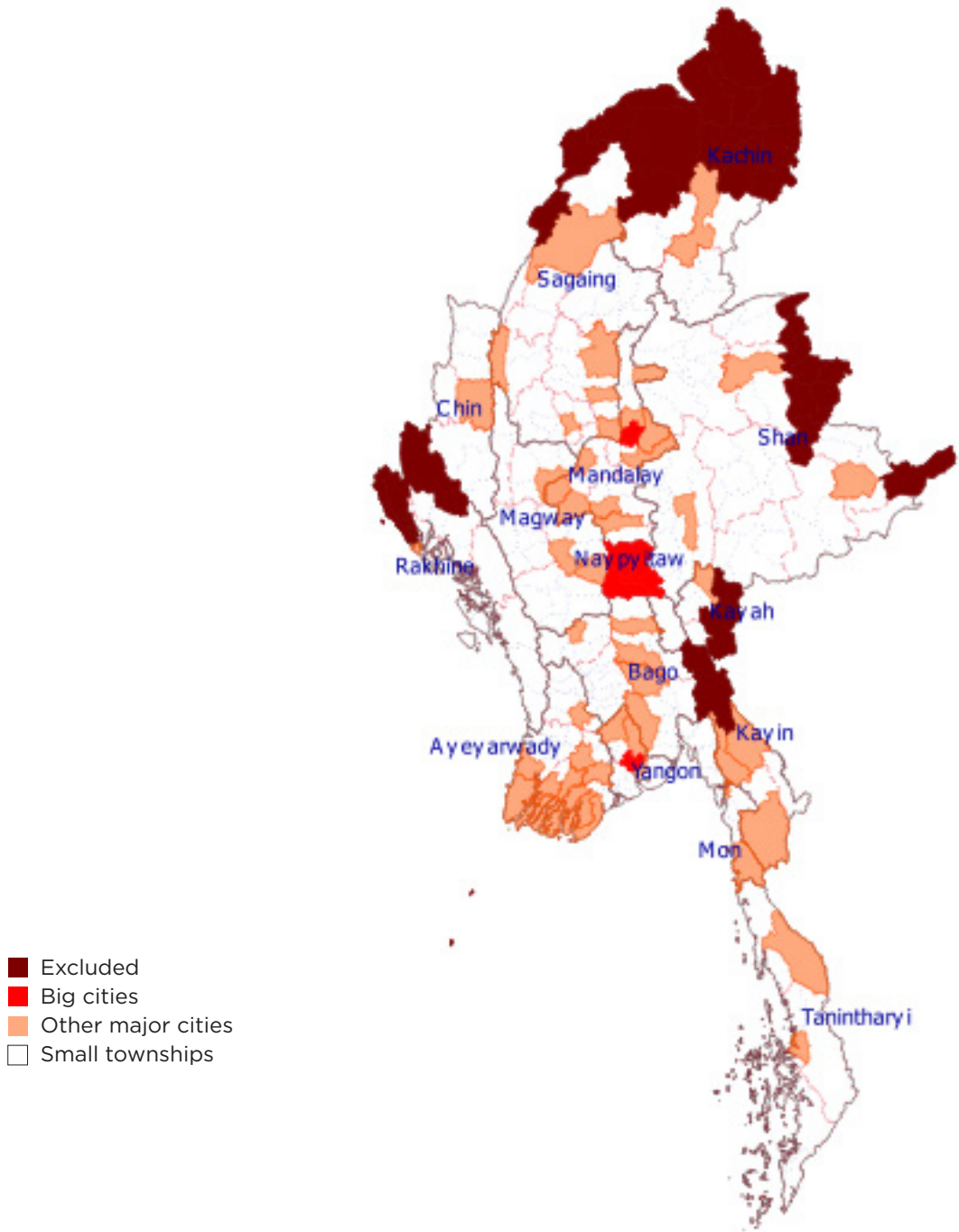


Figure 4: Cities and townships

Table 3: First level of sub–strata for quantitative research

Type of sub-strata	Population size of cities or townships
Big cities	Greater or equal to 1 million (> =1 million)
Other major cities	Between 0.25 million and 1 million (0.25 – 10
Smaller townships	Less than 0.25 million (< 0.25 million)

Various stages of sampling

Stage 1: Townships

- Townships were the primary sampling units (PSUs). A list of townships with the respective number of households (Source: Results of Population and Housing Census of Myanmar 2014, Dept of Population (pp 21-36)) was obtained and functioned as the sampling frame for the PSU.
- The sample townships were selected with probability proportionate to size with replacement (PPSWR) to enable simpler calculation of sampling weights.

Stage 2: Wards in urban and village tracts in rural

- A list of wards/village tracts with respective number of households in the sample township was the sampling frame for this stage.
- In most sample cities/townships, 2 sample wards from urban areas and 3 village tracts from rural areas were selected with PPSWR.

Stage 3: Segments in wards and village tracts

- A segment was defined as a street/block[7] in urban areas and a village in rural areas
- The sampling frame for this third stage was a list of segments with the respective number of households within sample ward/village tract. This was constructed in the field for selection of third stage unit.
- Two clusters (segments) per sample ward and three per village tract was selected with PPS Systematic Sampling

7 Note: As per Myanmar's administrative system

Stage 4: Households in sample segment

- All households in the selected sample segment were listed using using sample survey listing forms. The right hand rule (RHR) was used for listing.
- The field supervisor selected 10 sample households using circular systematic random sampling. The supervisor then assigned sample households to the interviewers.
- Replacement for non-respondent household was made by predetermined rules.

The household head was first interviewed to obtain household related information. Kish Grids were then used to select a single respondent between the age of 15 – 65 years in each household for individual related questionnaires.

1.4 Sample Allocations

Samples were allocated proportionally allocated based on the abovementioned sampling technique, and adjusted to meet and minimum required sample size at the township level. The allocated sample sizes and the margin of error at each level given in Table 4.

Table 4: Numbers of sample household per STATE/REGION, GEOGRAPHIC AREA by urban/rural

	Total Townships	No. of Sample Townships (FSU)	No. of Sample Wards/ Village Tracts (SSU)			Number of Sample Households/ Respondents (LSU)			Margin of error at 95% CI
			Urban	Rural	Total	Urban	Rural	Total	
Total	298	75	181	194	375	3620	3880	7500	3%
Urban			181		181	3620		3620	4%
Rural				194	194		3880	3880	4%
State/Region									
Kachin	8	3	6	9	15	120	180	300	13%
Kayah	4	2	4	6	10	80	120	200	15%
Kayin	6	2	4	6	10	80	120	200	15%
Chin	8	2	4	6	10	80	120	200	15%
Sagaing	34	6	12	18	30	240	360	600	10%
Tanintharyi	10	3	6	9	15	120	180	300	13%
Bago	28	5	10	15	25	200	300	500	11%
Magway	25	5	10	15	25	200	300	500	11%
Mandalay	28	10	28	22	50	560	440	1000	7.5%
Mon	10	3	6	9	15	120	180	300	13%
Rakhine	14	3	6	9	15	120	180	300	13%
Yangon	44	13	49	16	65	980	320	1300	7%
Shan	45	6	12	18	30	240	360	600	10%
Ayeyarwady	26	8	16	24	40	320	480	800	8%

Naypyitaw	8	4	8	12	20	160	240	400	12%
Geographic Area									
Northern Hills	31	8	16	24	40	320	480	800	8%
Eastern Hills	54	10	20	30	50	400	600	1000	7.5%
Dry Zone	75	20	48	52	100	960	1040	2000	6%
Lower Valley	73	19	61	34	95	1220	680	1900	6%
Ayeyarwady Delta	25	7	14	21	35	280	420	700	9%
Long Coast	40	11	22	33	55	440	660	1100	7%

1.5 List of Survey Covered Townships

The survey was conducted in 85 townships in Myanmar. The lists of townships in which the survey was conducted are provided below. It is also worth to note that one township each from Shan State, Kayah State and Tanintharyi Region (3 townships in total) were replaced during fieldwork due to security and difficulties faced in coordination at the township level. Replacement was done by finding the most comparable township in terms of population size and economic conditions.

- **Kachin State**
  1. Myitkyina
  2. Mogaung
  3. Shwegu
- **Kayah State**
  1. Loikaw
  2. Demawso (substitute for Hpruso)
- **Kayin State**
  1. Hpa-An
  2. Kawkareik
- **Chin State**
  1. Hakha
  2. Mindat
- **Sagaing Region**
  1. Taze
  2. Monywa
  3. Pale
  4. Indaw
  5. Kale
  6. Mawlaik
- **Tanintharyi Region**
  1. Myeik (Substitute for Dawei)
  2. Yebyu
  3. Tanintharyi

- **Bago Region**
  1. Bago
  2. Daik-U
  3. Htantabin
  4. Pyay
  5. Paungde
- **Magway Region**
  1. Magway
  2. Myothit
  3. Aunglan
  4. Pakokku
  5. Myaing
- **Mandalay Region**
  1. Mandalay -Chanayethazan
  2. Mandalay -Chanmyathazi
  3. Mandalay -Amarapura
  4. Mandalay -Patheingyi
  5. Pyinoolwin
  6. Singu
  7. Kyaukse
  8. Taungtha
  9. Kyaukpadaung
  10. Thazi
- **Mon State**
  1. Mawlamyine
  2. Thanbyuzayat
  3. Bilin
- **Rakhine State**
  1. Sittwe
  2. Mrauk-U
  3. Toungup
- **Yangon Region**
  1. Yangon-Insein
  2. Yangon-Hlaingtharya
  3. Yangon-Thingangyun
  4. Yangon-North Okkalapa
  5. Yangon-Yankin
  6. Yangon-Tamwe
  7. Yangon-Dagon Myothit (South)
  8. Yangon-Kyauktada
  9. Yangon-Pabedan
  10. Yangon-Lanmadaw
  11. Yangon-Latha
  12. Yangon-Ahlone
  13. Yangon-Kyeemyindaing
  14. Yangon-Sanchaung
  15. Yangon-Hlaing
  16. Yangon-Kamaryut
  17. Yangon-Dagon
  18. Yangon-Bahan
  19. Yangon-Seikkan
  20. Taikkyi
  21. Htantabin
  22. Thongwa
  23. Twantay
- Shan State
  1. Taunggyi
  2. Loilen
  3. Lashio
  4. Kyaukme
  5. Kengtung
  6. Kun Hein (Substitute for Mongping)
- Ayeyarwady Region
  1. Pathein
  2. Kyonpyaw
  3. Hinthada
  4. Lemyethna
  5. Myanaung
  6. Maubin
  7. Pyapon
  8. Dedaye
- **Nay Pyi Taw Union Territory**
  1. Nay Pyi Taw-Tatkon
  2. Nay Pyi Taw-Pyinmana
  3. Nay Pyi Taw-Pokeba Thiri
  4. Nay Pyi Taw-Oketara Thiri
  5. Nay Pyi Taw-Zabu Thiri
  6. Nay Pyi Taw-Detkhina T

2. Selection probabilities and sampling weights

The survey aimed to represent households and population (aged 15 – 65 years) in all accessible areas of Myanmar, both urban and rural. Hence, two sets of selection probabilities were used – one for households and others for individuals aged 15 – 65 years old. These two sets of sampling probabilities yielded the sampling weights for households and individual aged 15 – 65 years old.

2.1 Selection probabilities for different sampling stages

First Stage Unit (FSU or PSU), Township

The sample township selection probability can be obtained as follows given the selection of townships using probability proportionate to size with replacement (PPSWR),

$$\text{Probabilty (FSU)} = \frac{\text{No. of sample townships} * \text{Total households in sample township}}{\text{Total household in entire strata}}$$

Second Stage Unit (SSU), Ward or Village Tract

Sample wards and village tracts were drawn similarly, by probability proportionate to size with replacement (PPSWR). Selection probability of SSU can be obtained as follows.

$$\text{Probabilty (SSU)} = \frac{\text{No. of sample wards OR village tracks} * \text{Total households in sample ward OR village track}}{\text{Total household in township urban (forwards) OR township rural (for village tracts)}}$$

Third Stage Unit (TSU), Segments

Segments (street/block in urban areas and a village in rural areas) were the third stage unit. The field teams determined the TSU sampling frame for each SSU together with respective up to date number of households in each TSU with the assistance of respective ward/village tract authority. Two segments (clusters) per sample ward/village tract were then selected with PPS Systematic Sampling. Selection probability of TSU can be obtained as follows.

$$\textit{Probabilty (TSU)} = \frac{\textit{2 * Total updated number of households in segment}}{\textit{Total updated number of households in SSU}}$$

Households

For the selection of households from each sample segment (TSU), it was imperative that an exhaustive household listing operation be carried out in each segment. All the households in respective sample segment were listed with RHR using sample survey listing forms. 10 sample households were selected using circular systematic random sampling by the field supervisor who assigned sample households to the interviewers. Selection probability of households can be obtained as follows.

$$\textit{Probabilty (Household)} = \frac{\textit{10}}{\textit{Total updated number of households listed in segment}}$$

2.2 Sampling Weights for Households

Household sampling weights were obtained from multiplication of inverse of selection probabilities at various sampling stages. In this case we had four sampling stages. Household sampling weights were thus obtained by the formulae mentioned below.

$$\textit{Household Sampling weights} = \textit{Probability (FSU)}^{-1} * \textit{Probability (SSU)}^{-1} * \textit{Probability (TSU)}^{-1} * \textit{Probability (Household)}^{-1}$$

2.3 Sampling Weights for household members aged 15 – 65 years-old

Once the sample has been selected, one respondent aged 15 – 65 was selected per household by using Kish selection grid. With this method, all eligible individuals (aged 15 – 65) in a household had an equal chance of selection.

One eligible respondent per household was selected. , Post-stratification was done under second level sub-strata by gender and age groups (15 – 24 years, 25 – 34 years, 35 – 44 years, 45 – 54 years and 55 – 65 years) to get reliable estimates for each age group by gender (demographic group)considering differences in their behaviors.

The "Household Sampling Weights" were basis for calculation of sampling weights for target household members of aged 15 – 65 years old. First, we estimated total population of each gender by age group for each strata up to second level sub strata using household sampling weights. Second, we counted number of respondents we sampled for the survey at that level.

Sampling Weights for household members aged 15 – 65 years old can be obtained by formulae mentioned below.

$$\textit{Sampling Weights for Household Member aged 15 - 65 years old} = \frac{\textit{Estimated population of respective demographic group under second level sub stratum}}{\textit{Total respondents from demographic group under second level sub stratum}}$$

Household socioeconomic classification (SEC)

Socio-economic classification is defined in Myanmar taking into consideration the reported per capita monthly household income and the area sampled; different income thresholds are used to benchmark incomes in Yangon and Mandalay, and the rest of the country (Table 6).

SEC	Yangon/Mandalay		Rest of Myanmar	
	MMK	**USD**	**MMK**	**USD**
A	>= 200,000	>=165	>= 120,000	>=99
B	120,000- 199,999	99-165	80,000-119,000	66-99
C	1 80,000-119,000	66-99	60,000-79,999	50-66
C	2 60,000-79,999	50-66	40,000-59,999	33-50
D	40,000-59,999	33-50	30,000-39,999	25-33
E	<40,000	<33	<30,000	<25

Table 6: Socio-economic classification- definitions

The questionnaire can be accessed here: **http://bit.ly/2ifQU4q**

Notes

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