

Case Number: NCCT107042

Telecommunications Market Survey

Report Commissioned by:

National Communications Commission

Taiwan Institute of Economic Research

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List of Contents

I.	Purpose.....	1
II.	Survey Methods	1
A.	Questionnaire Design	1
B.	Population and Sampling Strategy	2
1.	Survey population	2
2.	Sampling method	2
3.	Survey period	10
C.	Implementation of Survey	13
1.	Timeline	13
2.	Survey method	13
3.	Statistical analysis method	13
4.	Sample structure.....	15
D.	Research Limitations	17
1.	Sample frame limitations	17
2.	Sample recovery restrictions.....	17
3.	Sample Inference Restrictions	18
III.	Results.....	19
A.	Phone Usage	19
B.	Mobile Phone Usage	25
C.	Mobile Phone Plans.....	31
D.	Mobile Broadband Data Allowance	35
E.	Internet Usage.....	45
F.	Fixed-line Broadband Usage at Home	47
G.	Usage of Voice Calls over the Internet.....	56

List of Figures

Figure 1 Household Phone Usage.....	19
Figure 2 The Possibility of Installing a Landline at Home in the Next 12 Months	23
Figure 3 The Reasons for Not Installing a Local Phone Line at Home in the Next 12 Months (Top 10).....	24
Figure 4 Smartphone Usage.....	25
Figure 5 Smart Phone Usage in Households	26
Figure 6 Most Frequently Used Mobile Internet Service Outside Homes	27
Figure 7 The Most Commonly Used Mobile Phone Networking Sites....	28
Figure 8 The Reasons to Choose the Telecoms Suppliers	29
Figure 9 The Main Reasons to Change the Habitual Telecoms Suppliers	30
Figure 10 Most Common Mobile Phone Tariff Plans	31
Figure 11 Mobile Phone Plans Chosen.....	33
Figure 12 The Usage of Free Voice Hotline and Intra-Network Phone Calls	34
Figure 13 Mobile Broadband Data Allowance	35
Figure 14 The Places to Buy Mobile Phones.....	38
Figure 15 Behaviors of Non-Internet Mobile Use.....	40
Figure 16 Searching Information through the Internet.....	41
Figure 17 Socializing or Communicating functions of Phone through Internet	42
Figure 18 Using Services by Phone through Internet.....	43
Figure 19 Using Functions by Phone through Internet (Top 10).....	44
Figure 20 Internet Usage.....	45
Figure 21 Access to the Internet at Home.....	48
Figure 22 Fixed-line Broadband at Home	49
Figure 23 Fixed-line Broadband at Home	50
Figure 24 Whether There is a New Cable Operator Joining the Market..	51
Figure 25 Whether to Change to the New Cable Operator after the Cross-Areaed Market is Open	52
Figure 26 The Most Common Ways Used to Access the Internet at Home	53
Figure 27 Speed of Fixed-Line Applied at Home.....	54
Figure 28 Whether Respondents or Family Members Have Made Voice	

Calls over the Internet.....	56
Figure 29 The Use of VoIP Service by Respondents or Families.....	57
Figure 30 Frequency of the use of VoIP services	58

List of Tables

Table 1 Levels of Townships and Districts	2
Table 2 Geographic Stratifications	6
Table 3 Plan for Allocation of Samples at Survey Sites in All Communities	8
Table 4 Plan for Allocation of Samples at Survey Sites in All Communities after Adjustment by Age	9
Table 5 Implementation of Formal Sampling	10
Table 6 Contingency Table for Digital Convergence Survey Site before Weighting	13
Table 7 Contingency Table for Broadcasting Market Survey Samples	16
Table 8 Change Rate of the Numbers of Sample by Age Group after Weighting	17
Table 9 The Monthly Phone Bill at Home (by Region)	20
Table 10 The Satisfaction of the Communication Quality of Landline (by Region).....	21
Table 11 Satisfaction with the Landline Provider (by Region)	22
Table 12 Monthly Mobile Phone Bill (By Region)	32
Table 13 Satisfaction with the Quality of Mobile Phone Voice Quality (By Region).....	36
Table 14 Satisfaction with the Quality of Accessing the Internet by Mobile Phone (By Region).....	37
Table 15 Total Hours Spending in Internet Per Week (By Region).....	47
Table 16 Satisfaction with Quality of Fixed-Line Broadband (By Region)	55

I. Purpose

The rapid development in information and communications technologies has driven the overall digital economy to flourish. With the trend of convergence, the communications industry is vital to the national economy and development. In particular, how consumers use communications services in the communications market is not only closely related to the business operations and technological development in the overall communications industry, but its impact is also expanding to numerous other industries.

A survey on the communications provides an overview of the national development and consumer behavior. A mechanism of surveys and investigations on the market and consumer behavior has been established for a long time in many developed countries worldwide, such as Ofcom, the communications regulator in the UK, the Ministry of Internal Affairs and Communications in Japan, KCC in Korea and IMDA in Singapore. In these countries, related information is regularly collected and documented to provide important statistics about the communications industry. A regular survey can serve as a key indicator of overall national development on one hand and offer an understanding of the consumer behavior and the market on the other.

The National Communications Commission (NCC) of Taiwan conducted its first comprehensive communications market survey in 2017. The survey aims to obtain first-hand objective and detailed data on consumer behavior and the status of innovative applications through a comprehensive and in-depth investigation of the demand side. In addition, the obtained information will serve as an indicator of the development of Taiwan's digital economy, as well as the basis for the development of future policies and regulations.

II. Survey Methods

A. Questionnaire Design

The questionnaires used in this survey are designed with reference to the way Ofcom, the British communications regulator, has surveyed consumer behavior and trends in the communications market, and modified based on the latest development of Taiwan's convergence.

B. Population and Sampling Strategy

1. Survey population

The survey was conducted in Taiwan, Penghu, Kinmen and Matsu proper with people aged 16 and over (those who were born on and before December 31, 2003) being approached.

2. Sampling method

Using the principle of PPS (probabilities proportional to size) sampling, sampling was performed in three stages. In the first and second stages, samples were allocated based on the proportion of the population in the area; while in the third stage, samples were selected using convenience sampling.

The stratified sampling used in this research is based on the classifications established by Peichun Hou et al. (2008), where villages, towns, cities and districts are grouped into seven levels based on the development. Thus, Taiwan's 358 townships and districts are divided into seven levels. They are city cores, commercial and industrial areas, emerging cities and townships, traditional industry townships, less-developed townships, established townships and remote townships. The primary sampling units were townships, the secondary sampling units were villages, and the third sampling units were gathering places in the townships where an interview point was set up.

Table 1 Levels of Townships and Districts

Level Code	Names of Districts and Townships
1	Songshan District of Taipei City, Xinyi District of Taipei City, Da'an District of Taipei City, Zhongzheng District of Taipei City, Datong District of Taipei City, Wanhua District of Taipei City, Yonghe District of New Taipei City, Central District of Taichung City, West District of Taichung City, North District of Taichung City, East District of Tainan City, West Central District of Tainan City, Yancheng District of Kaohsiung City, Sanmin District of Kaohsiung City, Xinxing District of Kaohsiung City, Qianjin District of Kaohsiung City, Lingya District of Kaohsiung City
2	Zhongshan District of Taipei City, Wenshan District of Taipei City, Nangang District of Taipei City, Neihu District of Taipei City, Shilin District of Taipei City, Beitou District of Taipei City, Banqiao District of New Taipei City, Sanchong District of New Taipei City, Zhonghe District of New Taipei City, Xinzhuang District of New Taipei City, Tamsui District of New Taipei City, Luzhou District of New Taipei City, Linkou District of New Taipei City, Taoyuan City of Taoyuan County, Zhongli City of Taoyuan County, Zhubei City of Hsinchu County, East District of Hsinchu City, North District of Hsinchu City, South District of Taichung City, Xitun District of Taichung City, Nantun District of Taichung City, Beitun District of Taichung City, North District of Tainan City,

	Gushan District of Kaohsiung City, Zuoying District of Kaohsiung City, Fengshan District of Kaohsiung City
3	Xindian District of New Taipei City, Shulin District of New Taipei City, Yingge District of New Taipei City, Sanxia District of New Taipei City, Xizhi District of New Taipei City, Tucheng District of New Taipei City, Taishan District of New Taipei City, Yangmei City of Taoyuan County, Luzhu Township of Taoyuan County, Dayuan Township of Taoyuan County, Guishan Township of Taoyuan County, Bade City of Taoyuan County, Longtan Township of Taoyuan County, Pingzhen City of Taoyuan County, Zhudong Township of Hsinchu County, Hukou Township of Hsinchu County, Xinfeng Township of Hsinchu County, Qionglin Township of Hsinchu County, Baoshan Township of Hsinchu County, Xiangshan District of Hsinchu City, Zhunan Township of Miaoli County, Toufen Township of Miaoli County, Fengyuan District of Taichung City, Shalu District of Taichung City, Wuqi District of Taichung City, Tanzi District of Taichung City, Daya District of Taichung City, Wuri District of Taichung City, Longjing District of Taichung City, Taiping District of Taichung City, Dali District of Taichung City, Shanhua District of Tainan City, Rende District of Tainan City, Guiren District of Tainan City, Yongkang District of Tainan City, Annan District of Tainan City, Anping District of Tainan City, Nanzi District of Kaohsiung City, Xiaogang District of Kaohsiung City, Daliao District of Kaohsiung City, Dashe District of Kaohsiung City, Renwu District of Kaohsiung City, Niasong District of Kaohsiung City, Gangshan District of Kaohsiung City
4	Zhongzheng District of Keelung City, Qidu District of Keelung City, Nuannuan District of Keelung City, Renai District of Keelung City, Zhongshan District of Keelung City, Anle District of Keelung City, Xinyi District of Keelung City, Wugu District of New Taipei City, Shenkeng District of New Taipei City, Bali District of New Taipei City, Miaoli City of Miaoli County, East District of Taichung City, Changhua City of Changhua County, Yuanlin Township of Changhua County, Douliu City of Yunlin County, East District of Chiayi City, West District of Chiayi City, Xinying District of Tainan City, South District of Tainan City, Qianzhen District of Kaohsiung City, Qijin District of Kaohsiung City, Pingtung City of Pingtung County, Yilan City of Yilan County, Luodong Township of Yilan County, Hualien City of Hualien County, Ji'an Township of Hualien County
5	Ruifang District of New Taipei City, Sanzhi District of New Taipei City, Shimen District of New Taipei City, Jinshan District of New Taipei City, Wanli District of New Taipei City, Daxi Township of Taoyuan County, Xinwu Township of Taoyuan County, Guanyin Township of Taoyuan County, Xinpu Township of Hsinchu County, Guanxi Township of Hsinchu County, Hengshan Township of Hsinchu County, Beipu Township of Hsinchu County, Yuanli Township of Miaoli County, Tongxiao Township of Miaoli County, Houlong Township of Miaoli County, Gongguan Township of Miaoli County, Tongluo Township of Miaoli County, Touwu Township of Miaoli County, Sanyi Township of Miaoli County, Zaoqiao Township of Miaoli County, Sanwan Township of Miaoli County, Dajia District of Taichung City, Qingshui District of Taichung City, Houli District of Taichung City, Shengang District of Taichung City, Shigang District of Taichung City, Waipu District of Taichung City, Da'an District of Taichung City, Dadu District of Taichung City, Wufeng District of Taichung City, Lugang Township of Changhua County, Hemei Township of Changhua

	County, Xianxi Township of Changhua County, Shengang Township of Changhua County, Fuxing Township of Changhua County, Xiushui Township of Changhua County, Huatan Township of Changhua County, Fenyuan Township of Changhua County, Xihu Township of Changhua County, Tianzhong Township of Changhua County, Datsuen Township of Changhua County, Puyan Township of Changhua County, Puxin Township of Changhua County, Yongjing Township of Changhua County, Shetou Township of Changhua County, Beidou Township of Changhua County, Pitou Township of Changhua County, Nantou City of Nantou County, Puli Township of Nantou County, Caotun Township of Nantou County, Dounan Township of Yunlin County, Huwei Township of Yunlin County, Linnei Township of Yunlin County, Taibao City of Chiayi County, Minxiong Township of Chiayi County, Shuishang Township of Chiayi County, Zhongpu Township of Chiayi County, Yanshui District of Tainan City, Liuying District of Tainan City, Madou District of Tainan City, Xiaying District of Tainan City, Liujia District of Tainan City, Guantian District of Tainan City, Jiali District of Tainan City, Xuejia District of Tainan City, Xigang District of Tainan City, Qigu District of Tainan City, Jiangjun District of Tainan City, Beimen District of Tainan City, Xinhua District of Tainan City, Xinshi District of Tainan City, Anding District of Tainan City, Shanshang District of Tainan City, Guanmiao District of Tainan City, Linyuan District of Kaohsiung City, Dashu District of Kaohsiung City, Qiaotou District of Kaohsiung City, Yanchao District of Kaohsiung City, Alian District of Kaohsiung City, Luzhu District of Kaohsiung City, Hune District of Kaohsiung City, Jiading District of Kaohsiung City, Yongan District of Kaohsiung City, Mituo District of Kaohsiung City, Ziguan District of Kaohsiung City, Chaozhou Township of Pingtung County, Donggang Township of Pingtung County, Hengchun Township of Pingtung County, Wandan Township of Pingtung County, Changzhi Township of Pingtung County, Linluo Township of Pingtung County, Jiuru Township of Pingtung County, Neipu Township of Pingtung County, Xinyuan Township of Pingtung County, Su'ao Township of Yilan County, Toucheng Township of Yilan County, Jiaoxi Township of Yilan County, Zhuangwei Township of Yilan County, Yuanshan Township of Yilan County, Dongshan Township of Yilan County, Wujie Township of Yilan County, Taitung City of Taitung County
6	Shiding District of New Taipei City, Pinglin District of New Taipei City, Pingxi District of New Taipei City, Shuangxi District of New Taipei City, Gongliao District of New Taipei City, Emei Township of Hsinch County, Zhuolan Township of Miaoli County, Dahu Township of Miaoli County, Nanzhuang Township of Miaoli County, Xihu Township of Miaoli County, Shitan Township of Miaoli County, Tai'an Township of Miaoli County, Dongshi District of Taichung City, Xinshe District of Taichung City, Heping District of Taichung City, Ershui Township of Changhua County, Erlin Township of Changhua County, Tianwei Township of Changhua County, Fangyuan Township of Changhua County, Dacheng Township of Changhua County, Zhutang Township of Changhua County, Xizhou Township of Changhua County, Zhushan Township of Nantou County, Jiji Town of Nantou County, Mingjian Township of Nantou County, Lugu Township of Nantou County, Zhongliao Township of Nantou County, Yuchi Township of Nantou County, Guoshing Township of Nantou County, Shuili Township of Nantou County, Xinyi Township of Nantou County, Xiluo Township of Yunlin County, Tuku Township of Yunlin County,

	Beigang Township of Yunlin County, Gukeng Township of Yunlin County, Dapi Township of Yunlin County, Citong Township of Yunlin County, Erlun Township of Yunlin County, Lunbei Township of Yunlin County, Dongshi Township of Yunlin County, Baozhong Township of Yunlin County, Taixi Township of Yunlin County, Yuanchang Township of Yunlin County, Sihu Township of Yunlin County, Kouhu Township of Yunlin County, Shuilin Township of Yunlin County, Puzi City of Chiayi County, Budai Township of Chiayi County, Dalin Township of Chiayi County, Xikou Township of Chiayi County, Xingang Township of Chiayi County, Liujiao Township of Chiayi County, Dongshi Township of Chiayi County, Yizhu Township of Chiayi County, Lucao Township of Chiayi County, Zhuqi Township of Chiayi County, Meishan Township of Chiayi County, Fanlu Township of Chiayi County, Baihe District of Tainan City, Houbi District of Tainan City, Dongshan District of Tainan City, Danei District of Tainan City, Yujing District of Tainan City, Nanxi District of Tainan City, Nanhua District of Tainan City, Zuozhen District of Tainan City, Longqi District of Tainan City, Tianliao District of Kaohsiung City, Qishan District of Kaohsiung City, Meinong District of Kaohsiung City, Liugui District of Kaohsiung City, Jiaxian District of Kaohsiung City, Shanlin District of Kaohsiung City, Neimen District of Kaohsiung City, Ligang Township of Pingtung County, Yanpu Township of Pingtung County, Gaoshu Township of Pingtung County, Wanluan Township of Pingtung County, Zhutian Township of Pingtung County, Xinpi Township of Pingtung County, Fangliao Township of Pingtung County, Kanding Township of Pingtung County, Linbian Township of Pingtung County, Nanzhou Township of Pingtung County, Jiadong Township of Pingtung County, Checheng Township of Pingtung County, Manzhou Township of Pingtung County, Fangshan Township of Pingtung County, Huxi Township of Penghu County, Baisha Township of Penghu County, Xiyu Township of Penghu County, Wangan Township of Penghu County, Qimei Township of Penghu County, Sanxing Township of Yilan County, Fenglin Township of Hualien County, Yuli Township of Hualien County, Shoufeng Township of Hualien County, Guangfu Township of Hualien County, Fengbin Township of Hualien County, Ruisui Township of Hualien County, Fuli Township of Hualien County, Chenggung Township of Taitung County, Guanshan Township of Taitung County, Beinan Township of Taitung County, Luye Township of Taitung County, Chishang Township of Taitung County, Donghe Township of Taitung County, Changbin Township of Taitung County, Taimaili Township of Taitung County
7	Wulai District of New Taipei City, Fuxing Township of Taoyuan County, Jianshi Township of Hsinchu County, Wufeng Township of Hsinchu County, Renai Township of Nantou County, Mailiao Township of Yunlin County, Dapu Township of Chiayi County, Alishan Township of Chiayi County, Maolin District of Kaohsiung City, Taoyuan District of Kaohsiung City, Namaxia District of Kaohsiung City, Liuqiu Township of Pingtung County, Sandimen Township of Pingtung County, Wutai Township of Pingtung County, Majia Township of Pingtung County, Taiwu Township of Pingtung County, Laiyi Township of Pingtung County, Chunri Township of Pingtung County, Shizi Township of Pingtung County, Mudan Township of Pingtung County, Magong City of Penghu County, Datong Township of Yilan County, Nan'ao Township of Yilan County, Xincheng Township of Hualien County, Xiulin Township of Hualien County, Wanrong Township of Hualien County, Zhuoxi Township of Hualien County, Dawu Township of Taitung County, Ludao Township of Taitung County

	County, Haiduan Township of Taitung County, Yanping Township of Taitung County, Jinfeng Township of Taitung County, Daren Township of Taitung County, Lanyu Township of Taitung County
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Table 2 Geographic Stratifications

Geographic Area	Level Code	Combined Level Code
Taipei City, New Taipei City, Keelung, Yilan	1	1
	2	2
	3, 4	3
	5, 6, 7	4
Taoyuan, Hsinchu, Miaoli	1, 2	1
	3, 4	2
	5, 6, 7	3
Taichung, Changhua, Nantou	1, 2	1
	3, 4	2
	5	3
	6, 7	4
Yunlin, Chiayi, Tainan	1, 2, 3	1
	4, 5	2
	6, 7	3
Kaohsiung, Pingtung, Penghu	1, 2	1
	3, 4	2
	5, 6, 7	3
Hualien, Taitung	4, 5	1
	6, 7	2

(1) Pilot Test

A stratified three-stage probability proportional to size sampling was adopted for the pre-test interviews. Since not many completed samples were expected during the pretest, the stratification system used in this project's formal survey was adjusted in order to meet the project deadline and save survey costs. With the Hualien and Taitung area excluded, only one geographic stratum was sampled within each of the five geographic areas: "Taipei City, New Taipei City, Keelung, Yilan," "Taoyuan, Hsinchu, Miaoli," "Taichung, Changhua, Nantou," "Yunlin, Chiayi, Tainan," and "Kaohsiung, Pingtung, Penghu." Once the proportions of population in the geographic areas were calculated based on the demographic data provided by the Ministry of the Interior at the end of December 2018, the numbers of samples for all geographic areas were determined based on the proportions, with the numbers of townships and the expected

number of completed samples within every township adjusted. The actual number of successful samples is 30.

(2) Formal survey

Prior to conducting the formal survey, the proportions of population in the geographic areas were calculated based on demographic data provided by the Ministry of the Interior at the end of December 2018, and the number of samples for all geographic areas were determined based on the proportions, with the number of townships and the expected number of completed samples within every township adjusted. Consequently, a total of 1,100 samples were expected to be completed in each of the four investigations. In view of the small population and extremely uneven distribution of population in the Hualien and Taitung area, stratified two-stage PPS (probabilities proportional to size) sampling was actually used, while stratified three-stage PPS sampling was used in other areas. During the third stage, a survey point was set up at gathering places (such as village office, activity center, and market) in the townships selected to conduct the survey with local residents.

The sampling units in each stage are explained as below.

- During two-stage sampling, the primary sampling units were “township” and then “people.” All of the “districts and townships” in the geographic stratum were included.
- During three-stage sampling, the primary sampling units were “townships,” and the second sampling units were “villages.” The last sampling units were “people.”

During the implementation of the survey, the gender and age structures of all communities were strictly controlled with the view to ensuring that the structure of the survey results is similar to that of the target population. In case of any inconsistency between obtained samples and the population, the results were weighted based on variables like gender, age, and community. The weighted sample number in every age group could not exceed the original sample number by 60 percent.

(3) Allocation of samples

To meet the request of the agency that commissioned this project, at least 1,100 valid samples were investigated in each questionnaire with a sampling error of within ± 3 percent at a 95 percent confidence level.

Table 3 Plan for Allocation of Samples at Survey Sites in All Communities

Geographic stratum	Level	No. of People Aged 16 and above	Population Percentage	Planned Allocation of Samples	No. of Townships and Districts Selected	No. of Villages Selected	Expected No. of Samples by Village	Total No. of Samples by Village
Taipei City, New Taipei City, Keelung, Yilan	Level 1	1,229,181	18.98%	67	3	2	11	6
	Level 2	3,193,854	49.32%	174	7	2	12	14
	Level 3	1,648,552	25.46%	90	4	2	11	8
	Level 4	404,406	6.24%	22	1	2	11	2
	Subtotal	6,475,993	32.10%	353	14			30
Taoyuan, Hsinchu, Miaoli	Level 1	1,157,116	36.61%	63	3	2	11	6
	Level 2	1,480,087	46.83%	81	3	2	13	6
	Level 3	523,555	16.56%	29	1	2	14	2
	Subtotal	3,160,758	15.67%	172	7			14
Taichung, Changhua, Nantou	Level 1	914,020	23.40%	50	2	2	12	4
	Level 2	1,276,263	32.68%	70	3	2	12	6
	Level 3	1,278,250	32.73%	70	3	2	12	6
	Level 4	437,235	11.19%	24	1	2	12	2
	Subtotal	3,905,768	19.36%	213	9			18
Yunlin, Chiayi, Tainan	Level 1	926,449	31.73%	51	2	2	13	4
	Level 2	1,215,361	41.63%	66	2	2	17	4
	Level 3	777,832	26.64%	42	2	2	11	4
	Subtotal	2,919,642	14.47%	159	6			12
Kaohsiung, Pingtung, Penghu	Level 1	1,132,289	34.97%	62	2	2	15	4
	Level 2	989,921	30.57%	54	2	2	13	4
	Level 3	1,115,675	34.46%	61	2	2	15	4
	Subtotal	3,237,885	16.05%	177	6			12
Hualien, Taitung	Level 1	251,882	52.86%	14	1	1	14	1
	Level 2	224,652	47.14%	12	1	1	12	1
	Subtotal	476,534	2.36%	26	2			2
Total		20,176,580	100.00%	1,100				88

Since the original allocation of the survey site sampling is based on proportions of the entire population, calculated decimal numbers had to be rounded to the nearest integers when the survey was actually performed. Moreover, to meet a specific requirement this year that the number of weighted samples in every age group must not exceed the original number of samples by 60 percent, the samples were allocated and adjusted accordingly in this project. The adjusted allocation of survey site sampling is shown in the table below.

Table 4 Plan for Allocation of Samples at Survey Sites in All Communities after Adjustment by Age

				Originally Planned Allocation of Samples at Survey Sites					First adjustment		Adjustment of Site Allocation Based on Age Distribution in the Population (Expected No. by Site)							
Geographic stratum	Level	No. of People Aged 16 and above	Population Percentage	Planned Allocation of Samples	No. of Townships and Districts Selected	No. of Villages Selected	Expected No. of Samples by Village	Total No. of Samples by Village	Expected No. of Samples by Level	Expected No. of Samples by Level	Expected No. of Samples with Ages 16-25	Expected No. of Samples with Ages 26-35	Expected No. of Samples with Ages 36-45	Expected No. of Samples with Ages 46-55	Expected No. of Samples with Ages 56-65	Expected No. of Samples with Ages 66 and Above	Expected No. of Samples by Village	Expected No. of Completed Samples in Each Level by Age Group
Taipei City, New Taipei City, Keelung, Yilan	Level 1	1,229,181	18.98%	67	3	2	11	6	66	66	1	2	2	2	2	2	11	66
	Level 2	3,193,854	49.32%	174	7	2	12	14	168	170	2	2	2	2	2	2	12	168
	Level 3	1,648,552	25.46%	90	4	2	11	8	88	88	2	2	2	2	2	1	11	88
	Level 4	404,406	6.24%	22	1	2	11	2	22	24	2	2	2	3	2	1	12	24
	Subtotal	6,475,993	32.10%	353	14			30	344	348								346
Taoyuan, Hsinchu, Miaoli	Level 1	1,157,116	36.61%	63	3	2	11	6	66	66	2	2	2	2	2	1	11	66
	Level 2	1,480,087	46.83%	81	3	2	13	6	78	78	3	3	2	2	2	1	13	78
	Level 3	523,555	16.56%	29	1	2	14	2	28	28	3	3	2	3	2	1	14	28
	Subtotal	3,160,758	15.67%	172	7			14	172	172								172
Taichung, Changhua, Nantou	Level 1	914,020	23.40%	50	2	2	12	4	48	48	2	2	2	3	2	1	12	48
	Level 2	1,276,263	32.68%	70	3	2	12	6	72	72	2	2	2	2	2	2	12	72
	Level 3	1,278,250	32.73%	70	3	2	12	6	72	72	2	2	2	2	2	2	12	72
	Level 4	437,235	11.19%	24	1	2	12	2	24	24	2	3	2	2	2	1	12	24
	Subtotal	3,905,768	19.36%	213	9			18	216	216								216
Yunlin, Chiayi, Tainan	Level 1	926,449	31.73%	51	2	2	13	4	52	52	3	3	2	2	2	1	13	52
	Level 2	1,215,361	41.63%	66	2	2	17	4	68	68	2	3	3	3	3	3	17	68
	Level 3	777,832	26.64%	42	2	2	11	4	44	44	1	1	2	3	2	2	11	44
	Subtotal	2,919,642	14.47%	159	6			12	164	164								164
Kaohsiung, Pingtung, Penghu	Level 1	1,132,289	34.97%	62	2	2	15	4	60	60	3	3	2	3	2	2	15	60
	Level 2	989,921	30.57%	54	2	2	13	4	52	54	2	3	3	2	2	2	14	56
	Level 3	1,115,675	34.46%	61	2	2	15	4	60	60	3	3	3	2	2	2	15	60
	Subtotal	3,237,885	16.05%	177	6			12	172	174								176
Hualien, Taitung	Level 1	251,882	52.86%	14	1	1	14	1	14	14	2	3	3	3	2	1	14	14
	Level 2	224,652	47.14%	12	1	1	12	1	12	12	2	3	2	2	2	1	12	12
	Subtotal	476,534	2.36%	26	2			2	26	26								26
Total		20,176,580	100.00%	1,100				88	1,094	1,100								1,100

3. Survey period

The interviews took place in the selected areas between June 1 and July 31, 2019.

Table 5 Implementation of Formal Sampling

Sampling Frame		Selected	By Survey Site	
Area	Level	District or Township for Survey	No. of Expected Samples (1,160 samples in total)	No. of Completed Samples (1,165 samples in total)
Taipei City, New Taipei City, Keelung, Yilan	Level 1	Yonghe District of New Taipei City	22	22
		Wanhua District of Taipei City	22	22
		Songshan District of Taipei City	22	22
	Level 2	Sanchong District of New Taipei City	24	23
		Banqiao District of New Taipei City	24	24
		Beitou District of Taipei City	24	24
		Neihu District of Taipei City	24	24
		Shilin District of Taipei City	24	25
		Zhonghe District of New Taipei City	24	24
		Zhongshan District of Taipei City	24	24
	Level 3	Renai District of Keelung City	22	24
		Bali District of New Taipei City	22	22
		Xinyi District of Keelung City	22	25
		Xindian District of New Taipei City	22	22
	Level 4	Dongshan Township of Yilan County	24	24
	Subtotal		346	351
Taoyuan, Hsinchu, Miaoli	Level 1	Zhubei City of Hsinchu County	22	23
		Zhongli City of Taoyuan County	22	22
		Taoyuan District of Taoyuan City	22	22

Sampling Frame		Selected	By Survey Site	By Survey Site
Area	Level	District or Township for Survey	No. of Expected Samples (1,160 samples in total)	No. of Completed Samples (1,165 samples in total)
	Level 2	Bade City of Taoyuan County	26	26
		Xiangshan District of Hsinchu City	26	27
		Zhudong Township of Hsinchu County	26	26
	Level 3	Shitan Township of Miaoli County	28	28
	Subtotal		172	174
Taichung, Changhua, Nantou	Level 1	Xitun District of Taichung City	24	24
		West District of Taichung City	24	25
	Level 2	Dali District of Taichung City	24	24
		Fengyuan District of Taichung City	24	24
		Daya District of Taichung City	24	22
	Level 3	Fuxing Township of Changhua County	24	24
		Shengang District of Taichung City	24	22
		Xianxi Township of Changhua County	24	25
	Level 4	Yuchi Township of Nantou County	24	24
	Subtotal		216	214
Yunlin, Chiayi, Tainan	Level 1	Anping District of Tainan City	26	27
		East District of Tainan City	26	25
	Level 2	East District of Chiayi City	34	33
		Dounan Township of Yunlin County	34	34
	Level 3	Dalin Township of Chiayi County	22	23
		Xiluo Township of Yunlin County	22	21
	Subtotal		164	163
	Level 1	Qianzhen District of Kaohsiung City	30	30

Sampling Frame		Selected	By Survey Site	By Survey Site
Area	Level	District or Township for Survey	No. of Expected Samples (1,160 samples in total)	No. of Completed Samples (1,165 samples in total)
Kaohsiung, Pingtung, Penghu		Zuoying District of Kaohsiung City	30	30
	Level 2	Renwu District of Kaohsiung City	28	28
		Niaosong District of Kaohsiung City	28	27
	Level 3	Chaozhou Township of Pingtung County	30	30
		Magong Township of Penghu County	30	30
	Subtotal		176	175
Hualien, Taitung	Level 1	Hualien City of Hualien County	14	14
	Level 2	Luye Township of Taitung County	12	12
	Subtotal		26	26
Kinmen, Matsu	Kinmen County		30	32
	Lianjiang County		30	30
	Subtotal		60	62
Grand total			1,160	1,165

The differences between the actual number of completed samples and the planned number of samples at survey sites are explained as below:

- (1) This survey was completely implemented as planned in terms of sites and allocation of samples. However, due to reasons like age control and people's willingness to be interviewed at different sites, fewer survey samples were completed than expected at several sites.
- (2) Although fewer samples were collected than planned at some sites, samples of all areas were verified to represent the population in terms of distribution, through a test prior to weighting (See Table 6).
- (3) Table 6 shows the planned numbers of samples and the actual numbers of valid samples completed by interviewers at selected sites. These numbers are representative prior to weighting. However, the survey analysis and results adopted by this report were tested and weighted based on the registered domicile of interviewees and the data of the entire population. Since the survey did not limit the interviewees to those with their domicile registered where they received the interview and the survey was simultaneously conducted in Taiwan proper, Kinmen and Matsu this year, all the data were consolidated, tested, weighted and grouped based on the registered domicile of the interviewees.

Table 6 Contingency Table for Telecommunications Market Survey Site before Weighting

Allocation of Survey Site No.	Allocation of Samples		No. of Samples before Weighting		Chi-Square Test before Weighting
	No. of People	Percentage	No. of People	Percentage	
Total	1,100	100.0%	1,103	100.0%	The Chi-square value is 0.000, and p-value (= 0.999) is below the accepted significance level of 5%, meaning no significant difference between the distribution of samples and the original allocation of samples.
Survey Site					
Taipei City, New Taipei City, Keelung, Yilan	346	31.5%	351	31.8%	
Taoyuan, Hsinchu, Miaoli	172	15.6%	174	15.8%	
Taichung, Changhua, Nantou	216	19.6%	214	19.4%	
Yunlin, Chiayi, Tainan	164	14.9%	163	14.8%	
Kaohsiung, Pingtung, Penghu	176	16.0%	175	15.9%	
Hualien, Taitung	26	2.4%	26	2.4%	

C. Implementation of Survey

1. Timeline

Before the survey was formally launched, preparations for questionnaires and related affairs were undertaken from April. After the questionnaires were modified based on the conclusions from the meeting with the agency that commissioned this study, the survey formally began on June 1, 2019. The timeline was:

- (1) Preparation period: April 1 to May 24, 2019
- (2) Survey period:
 - Phase 1: May 20 to May 23, 2019.
 - Phase 2: June 1 to July 31, 2019.
- (3) Review period: July 30 to August 4, 2019

2. Survey method

Face-to-face interviews were employed for this survey; a computer-assisted interview survey system was used during the interview, and was supplemented with printed questionnaires.

3. Statistical analysis method

(1) Sample representativeness and weighting

After the survey results were reviewed, the NPAR Chi-square test was used to examine the difference between the allocation of samples and the structure of the population in terms of age, gender, and population percentage, to enhance the representativeness and reliability of the survey so that these samples could reflect the population structure. In case a significant difference in structure was identified between the samples and the population. Weighting was used to make the sample structure identical to that of the population.

About weighting, the raking method was used to adjust the sampling weights based on variables in the order of gender, age and area of registered household until no significant difference existed between the allocation of samples and the population in every variable.

All the data in the results were multiplied by the adjustment weight. $\frac{N_i}{N} / \frac{n'_i}{n}$, N_i and n'_i represent the number of the population and the number of sample population weighted in the Cross Group i , while N and n represent the number of the total population and the number of the total sample population weighted. This way, the sampling distribution was completely the same as the population distribution after weighting. The last weight was gained by multiplying all the adjustment weights.

(2) Reliability analysis

Reliability refers to trustworthiness or consistency of a survey. Namely, when the survey is performed under the same or similar conditions, consistent or stable results can be obtained. Cronbach's (1951) α reliability coefficient is currently the most used reliability indicator. Nunnally (1967) suggests that a reliability of 0.7 or higher, also known as high reliability, is acceptable.

(3) Frequency

How people understand and rate each of the aspects can be realized through the data presented in allocation of frequencies and percentages in all questions.

(4) Cross analysis and Chi-square test

A cross analysis table was established with the basic data for "all the issues" to realize whether a difference existed between the respondents with different backgrounds in all the issues. Pearson's Chi-square test was used in the cross table. The Chi-square test value (W) is defined as below:

$$W = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \sim \chi^2((r-1)(c-1))$$

, wherein

O_{ij} is the observed frequency from Row j, Column i, and

E_{ij} is the expected frequency from Row j, Column i.

When p-value in the Chi-square test is less than 0.05, the two variables are not independent at a 95% confidence level. That is, a significant statistic difference exists between the respondents with different backgrounds in the issue.

(5) Analysis of variance (ANOVA)

The total variation can be divided into the variation between groups and the variation within groups. Analysis of variance is used to calculate the rate of variation between groups to variation within groups. If the variation between groups is significantly greater than the variation within groups, significant differences among group means exist between two or more groups. If the variation between groups is not highly different from the variation within groups, few differences exist among groups. The ANOVA F-test calculations are as below.

$$F = \frac{MS_b}{MS_w} = \frac{SS_b / k - 1}{SS_w / n - k}$$
, where n represents the number of samples and k represents the number of groups,

$$SS_b = n \sum_{i=1}^k (\bar{X}_i - \bar{X})^2$$
 is the total sum of squared deviations of group means from grand mean, and

$$SS_w = \sum_{i=1}^k \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2$$
 is the total sum of the squared deviations within groups.

4. Sample structure

As of August 4, 2019, the survey for this research has been implemented and reviewed by the research team, with 1,115 questionnaires completed¹ as valid samples. The sample structure is shown in Table 7.

¹ This survey was conducted in Taiwan, Penghu, Kinmen and Matsu. Since Kinmen's and Matsu's populations are too small for analysis, the samples of Taiwan proper (including Penghu) were separated from those of Kinmen and Matsu. The numbers were weighted by city or county, and samples were regrouped according to where interviewees register their domicile. (Namely, an interviewee who registered his domicile in Kinmen or Matsu and received the interview in Taiwan would be classified as a valid sample of Kinmen and Matsu; while an interviewee who registered his domicile in Taiwan proper and received the interview in Kinmen or Matsu would be processed as a valid sample of Taiwan proper.) This led to a slight difference between the final numbers of valid samples and the numbers of completed samples shown in Tables 5 & 6, which were sorted by "survey site."

Table 7 Contingency Table for Telecommunications Market Survey Samples

Population variables	Population		No. of Samples before Weighting		No. of Samples after Weighting		Chi-Square Test before Weighting	Chi-Square Test after Weighting
	No. of People	Percentage	No. of People	Percentage	No. of People	Percentage		
Total	20,176,580	100.0%	1,115	100.0%	1,115	100.0%		
Gender							The Chi-square value is 0.00, and p-value (= 0.968) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of gender.	The Chi-square value is 0.000, and p-value (= 0.999) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of gender.
Male	9,940,336	49.3%	550	49.3%	549	49.3%		
Female	10,236,244	50.7%	565	50.7%	566	50.7%		
Age							The Chi-square value is 19.268, and p-value (= 0.001) is below the accepted significance level of 5%, meaning significant difference between samples and the target population in distribution of age.	The Chi-square value is 0.000, and p-value (= 1.000) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of age.
Age 16-25	2,946,481	14.6%	196	17.6%	163	14.6%		
Age 26-35	3,281,796	16.3%	197	17.7%	181	16.3%		
Age 36-45	3,877,239	19.2%	193	17.3%	214	19.2%		
Age 46-55	3,618,661	17.9%	204	18.3%	200	17.9%		
Age 56-65	3,326,481	16.5%	191	17.1%	184	16.5%		
Age 66 and above	3,125,922	15.5%	134	12.0%	173	15.5%		
City or County							The Chi-square value is 290.458, and p-value (=0.000) is below the accepted significance level of 5%, meaning significant difference between samples and the target population in distribution of city and county.	The Chi-square value is 0.000, and p-value (=1.000) is below the accepted significance level of 5%, meaning no significant difference between samples and the target population in distribution of city and county.
New Taipei City	3,468,998	17.2%	157	14.1%	192	17.2%		
Taipei City	2,282,576	11.3%	140	12.6%	126	11.3%		
Taoyuan City	1,862,558	9.2%	58	5.2%	103	9.2%		
Taichung City	2,369,481	11.7%	134	12.0%	131	11.7%		
Tainan City	1,636,231	8.1%	50	4.5%	90	8.1%		
Kaohsiung City	2,415,699	12.0%	121	10.9%	133	12.0%		
Yilan County	396,388	2.0%	29	2.6%	22	2.0%		
Hsinch County	459,988	2.3%	35	3.1%	25	2.3%		
Miaoli County	474,519	2.4%	33	3.0%	26	2.4%		
Changhua County	1,097,895	5.4%	42	3.8%	61	5.4%		
Nantou County	438,392	2.2%	27	2.4%	24	2.2%		
Yilan County	600,275	3.0%	59	5.3%	33	3.0%		
Chiayi County	454,426	2.3%	34	3.0%	25	2.3%		
Pingtung County	729,662	3.6%	29	2.6%	40	3.6%		
Taitung County	191,014	0.9%	16	1.4%	11	0.9%		
Hualien County	285,520	1.4%	16	1.4%	16	1.4%		
Penghu County	92,524	0.5%	32	2.9%	5	0.5%		
Keelung City	328,031	1.6%	45	4.0%	18	1.6%		
Hsinch City	363,693	1.8%	35	3.1%	20	1.8%		
Chiayi City	228,710	1.1%	23	2.1%	13	1.1%		

Note: The source of the population data is the 2018 December Demographic Data of Households in Each Village provided on the Open Data platform by the Ministry of the Interior.

Note: The numbers of samples by county or city shown in Table 7 were weighted based on the registered domicile and the consistency between numbers of samples before and after weighting was tested.

The change rate of the numbers of sample in all age groups after weighting is shown in Table 8. They are all in compliance with the requirement that no number of sample in any age group shall increase or reduce by more than 60% after weighting.

Table 8 Change Rate of the Numbers of Sample by Age Group after Weighting

Population variables	No. of Samples before Weighting		No. of Samples after Weighting		Change Rate of the No. of Sample by Age Group after Weighting
	No. of People	Percentage	No. of People	Percentage	
Total	1,115	100.0%	1,115	100.0%	
Age					
Age 16-25	196	17.6%	163	14.6%	0.83
Age 26-35	197	17.7%	181	16.3%	0.92
Age 36-45	193	17.3%	214	19.2%	1.11
Age 46-55	204	18.3%	200	17.9%	0.98
Age 56-65	191	17.1%	184	16.5%	0.96
Age 66 and above	134	12.0%	173	15.5%	1.29

D. Research Limitations

To keep on top of how Taiwanese people use communications in the digital economic era, a survey on the Broadband Usage trends in the communications industry was implemented by means of interviews with people aged 16 and over (those who were born on and before December 31, 2003) in Taiwan proper (exclusive of Kinmen County and Lian jiang County), at the request of the NCC. However, the following study limitations exist when actually performing the survey:

1. Sample frame limitations

Based on the requirements of the NCC, at least 1,100 successful samples were to be completed with the allocation of samples proportional to the population of every county or city.

In order to undertake rigorous sampling, research was conducted with reference to the sample structure used in Taiwan Social Change Survey by Academia Sinica. Nonetheless, it may be worth noting that this research differed from Taiwan Social Change Survey, where household registrations were used as a sampling frame. With no access to Taiwan's household registration database, a household survey seemed impossible. Instead, interviews were carried out at gathering places in townships or cities.

2. Sample recovery restrictions

The survey questionnaires contained 78 questions. In order to meet the requirement of at least 1,100 successful sample responses, groups of two interviewers

were arranged at busy locations, such as parks and crossroads, to perform interviews.

During this survey, the average number of those who did not comply was 7.7. Among the aged 55 and over groups, the average number of refusals was 12, making it much harder to achieve the planned number of interviews when compared with young people. Even so, the interviewers were urged to obtain the required number of samples by gender and age, so the weighted number of all age groups would not exceed the original number of samples by 60%.

3. Sample Inference Restrictions

After weighting, the sample number of young people, such as ages 16-25, was 0.83 times greater; the sample number of ages 26-35 was 0.92 times greater; the sample number of ages 36-45 was 1.11 times greater; the sample number of middle-aged people such as ages 46-55 was 0.98 times greater; the sample number of ages 56-65 was 0.96 times greater; and the sample number of ages 66 and above was 1.29 times greater.

Non-probability sampling was employed in this research; therefore, care should be taken when using the resulting statistical inferences.

III. Results

A. Phone Usage

Household Phone Usage Q5

1. Overall analysis

For household phone usage, 68.2% of people in Taiwan aged 16 and over have both landline and mobile phones. With the ubiquity of mobile and broadband networks, 27.5% people responded that they rely fully on mobile phones, while 3.2% people use only landline phones at home (see Figure 1).

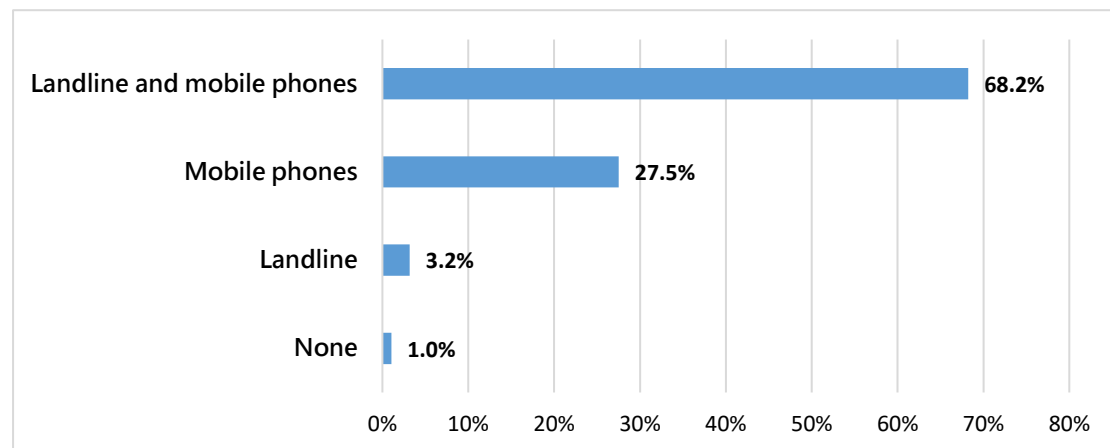


Figure 1 Household Phone Usage

Base: N=1,115, single-choice

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that people in all region have landline and mobile phones at the same time, with the highest ratio of 70.7% in Taichung, Changhua and Nantou and the lowest ratio of 55.9% in Yilan, Hualien, and Taitung.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the household phone usage significantly varies by gender.

When analyzed by gender, both men (64.9%) and women (71.5%) have the highest proportion for having both a landline and a mobile phone at the same time.

When analyzed by age, all age groups have the highest proportion of using both landlines and mobile phones, with the highest ratio of 77.1% of those aged 46-55 and the lowest ratio of 57% in people aged 26-35.

In addition, people aged 66 and over have the higher proportion of using only landlines, and people aged have the higher proportion of using only mobile phones than other age groups.

When analyzed by marital status, the highest proportion regardless of marital status is for using both landlines and mobile phones, with the highest rate 75.9% of those married and the lowest rate 59.3% of those widowed or separated.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that household phone usage significantly varies by housing tenure.

When analyzed by housing tenure, home owners have the highest proportion (76.4%) for using both landlines and mobile phones, while house renters have the highest proportion (59.6%) for using only mobile phones.

The Monthly Phone Bill at Home Q6

1. Overall analysis

The average monthly phone bill at home is NT\$417 (N = 796).

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that the average monthly telephone bill at home is NT\$340 in Kaohsiung, Pingtung and Penghu is and over NT\$400 for other regions, with the highest average of NT\$492 in Taoyuan, Hsinchu and Miaoli, and the lowest NT\$340 in Kaohsiung, Pingtung and Penghu.

Table 9 The Monthly Phone Bill at Home (by Region)

Unit : NTD

Region	Average Bill
Taipei City, New Taipei City and Keelung	421
Taoyuan, Hsinchu and Miaoli	492
Taichung, Changhua and Nantou	411
Yunlin, Chiayi and Tainan	424
Kaohsiung, Pingtung and Penghu	340
Yilan, Hualien and Taitung	461
Average	417

Source: Results of this research

(2) Analysis of basic differences

When analyzed by gender, the average monthly landline bill at home is NT\$424 for women, which is higher than the average bill of NT\$407 for men.

When analyzed by age, the highest bill is NT\$483 for 26-35 year-olds, and the lowest bill is NT\$372 for 16–25 year-olds.

When analyzed by marital status, the highest bill is NT\$433 among married people, and the lowest bill is NT\$348 among unmarried.

The Satisfaction of the Communication Quality of Landline Q8

1. Overall analysis

The average score of the satisfaction with the quality of the communication quality of landline is 7.73 (1-point is very dissatisfied, and 10 points is very satisfied; N=865).

2. Comparative analysis

(1) Analysis of regional differences

The difference test analysis shows that the average score for satisfaction with the communication quality of landline is significantly related to the region where one lives.

The cross analysis suggests that average score for satisfaction in all regions is higher than 7 points. Among them, the highest point is 8.16 in Taoyuan, Hsinchu and Miaoli, followed by 7.81 in Taipei city, New Taipei City and Keelung.

Table 10 The Satisfaction of the Communication Quality of Landline (by Region)

Region	Average Score
Taipei City, New Taipei City and Keelung	7.84
Taoyuan, Hsinchu and Miaoli	7.67
Taichung, Changhua and Nantou	7.29
Yunlin, Chiayi and Tainan	6.69
Kaohsiung, Pingtung and Penghu	7.89
Yilan, Hualien and Taitung	7.26
Average	7.52

Source: Results of this research

(2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that the average score of the satisfaction with the communication quality of landline significantly varies by age and marital status.

When analyzed by gender, the average satisfaction score for men using landline is 7.63 points, higher than the satisfaction score for women (7.42).

When analyzed by age, the average score for satisfaction with the communication quality of landline increases by age group, with 66 year-olds and over having the highest score of 7.84, and 16–25 year-olds having the lowest score of 7.02.

When analyzed by marital status, the highest score is 7.86 for those widowed or separated, and the lowest score is 7.08 for those unmarried.

(3) Analysis of differences in social and economic status

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the communication quality of landline significantly varies by housing tenure.

When analyzed by housing tenure, the average satisfaction for home owners

using a landline is 7.58 points, higher than the satisfaction of house renters (7.02).

The Overall Satisfaction with the Landline Provider Q9

1. Overall analysis

The overall satisfaction with the landline providers is 7.65 points on average (1-point is very dissatisfied, and 10-points is very satisfied; N=865, people who use a landline).

2. Comparative analysis

(1) Analysis of regional differences

When analyzed by region, except for Yunlin, Chiayi, and Tainan (6.69) and Yilan, Hualien, and Taitung (6.93), the overall satisfaction with landline providers in all regions is higher than 7 points. Among them, the highest point is 7.92 in Kaohsiung, Pingtung and Penghu (Refer to Table 11).

Table 11 Satisfaction with the Landline Provider (by Region)

Region	Average Score
Taipei City, New Taipei City and Keelung	7.74
Taoyuan, Hsinchu and Miaoli	7.54
Taichung, Changhua and Nantou	7.3
Yunlin, Chiayi and Tainan	6.69
Kaohsiung, Pingtung and Penghu	7.92
Yilan, Hualien and Taitung	6.93
Average	7.46

Source: Results of this research

(2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that overall satisfaction with a landline provider significantly varies by housing tenure.

When analyzed by gender, men have a higher score (7.49) than women (7.44).

When analyzed by age, the overall satisfaction with a landline provider frequently decreases by age group, the highest score is 7.81 for 66 year-olds and over, and the lowest score is 7.15 for 16–25 year-olds.

When analyzed by marital status, the highest score is 7.77 of those widowed or separated people, and the lowest score is 7.03 of those unmarried.

(3) Analysis of differences in social and economic status

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the communication quality of landlines significantly varies by housing tenure.

When analyzed by housing tenure, home owners have a higher score (7.55) for average satisfaction with landline quality than house renters (6.87).

The Possibility of Installing a Landline at Home in the Next 12 Months Q10 Q11

1. Overall analysis

In the next 12 months, 9.4% (including certainly yes, very likely and likely) of the participants will be installing a landline at home. There are 87.5% (including certainly not, very unlikely and unlikely) of participants who have no plans to install a landline (see Figure 2). Among the reasons for not having a landline, already using a mobile phone is the most common answer (80.7%), followed by no need for a landline service (36.3%), and inconvenient/usually not using a landline at home (21.7%) (see Figure 3).

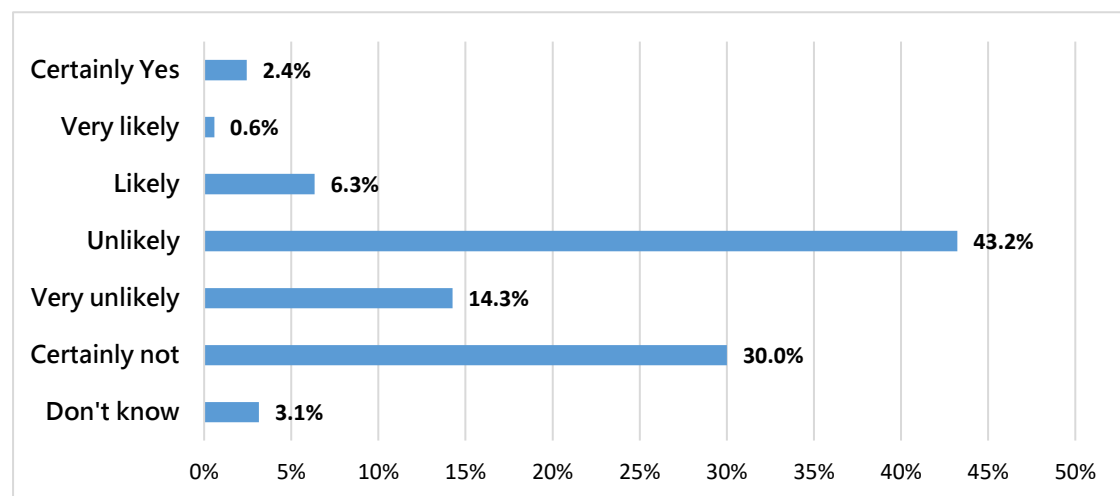


Figure 2 The Possibility of Installing a Landline at Home in the Next 12 Months

Base : N=319, single-choice (people who do not use landline at home)

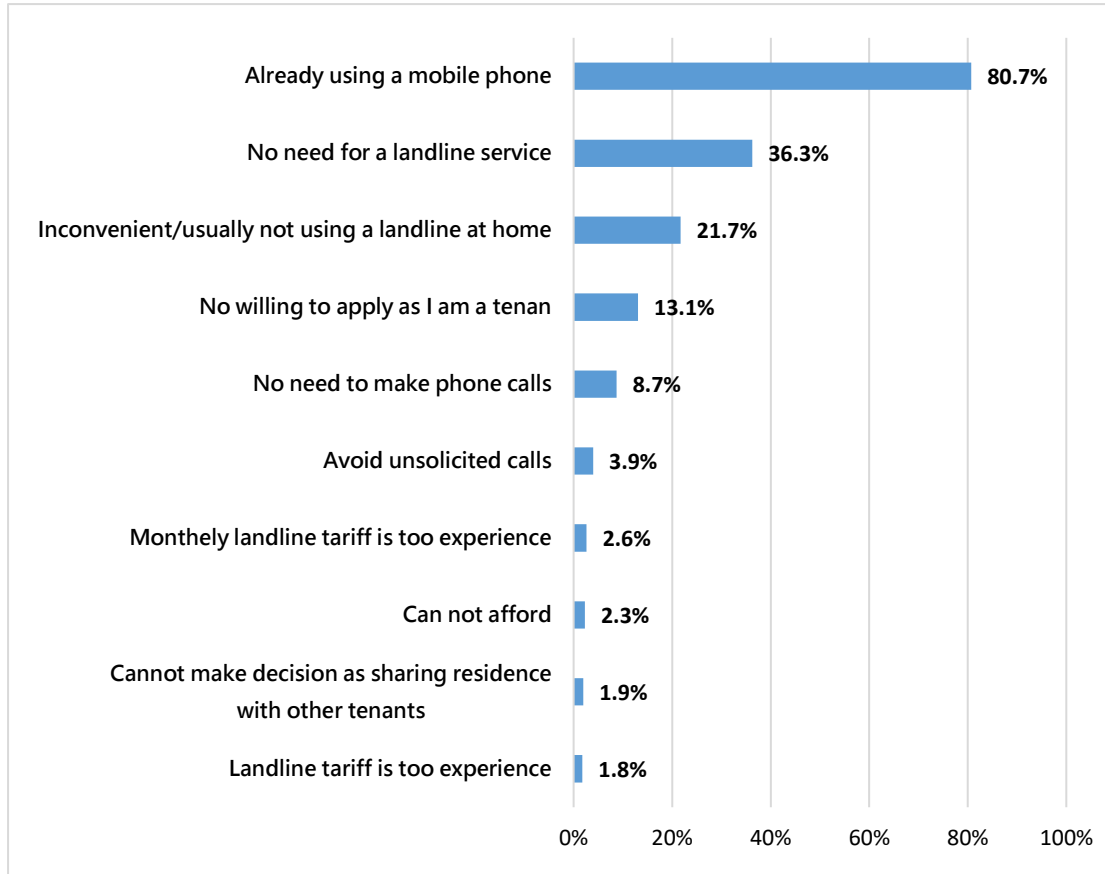


Figure 3 The Reasons for Not Installing a Local Phone Line at Home in the Next 12 Months (Top 10)

Base : N=279, multiple-choice (people who do not use landline at home)

2. Comparative analysis

(1) Analysis of regional differences

When analyzed by region, the proportion of all groups of participants who do not have a plan to install a landline is the highest. Among them, the highest rate is 94.1% in Kaohsiung, Pingtung and Penghu, and the lowest rate is 75.7% in Taichung, Changhua and Nantou.

The highest rate for people installing a landline is in Yunlin, Chiayi, and Tainan (19.7%), and the lowest rate is in Kaohsiung, Pingtung and Penghu (2.4%).

In terms of the reasons for not installing landline, all regions have the highest proportion for already using mobile phone, with the highest rate 89% in Taipei City, New Taipei City and Keelung, and the lowest rate 70.8% in Taichung, Changhua and Nantou. People in Kaohsiung, Pingtung and Penghu (38.2%) have the highest rate for it being “inconvenient/usually not using a landline at home” than other regions.

(2) Analysis of basic differences

When analyzed by gender, 90.5% of men and 83.5% of women do not plan to install a landline. In terms of the reasons, 83.2% of men and 77.1% of women think that

mobile phones can be an alternative.

When analyzed by age, all groups of participants who do not have a plan to install a landline is the highest percentage, with the highest 94.3% of 36–35 year-olds and the lowest rate 83.3% of 16–25 year-olds.

In terms of the reasons, the highest rate (94.7%) of people who think that mobile phones can be an alternative is among 36–45 year-olds, and the lowest rate (70.6%) is among 56–65 year-olds.

When analyzed by marital status, the highest rate of people who have no plans to install a landline is among those widowed or separated (91.8%), the lowest are those unmarried (84.8%). In terms of the reasons, the highest rate (83.3%) who think that mobile phones can be an alternative are those married, while the lowest rate (74.5%) are those widowed or separated.

B. Mobile Phone Usage

Smart Phone Usage in households Q16 Q17

1. Overall analysis

The proportion of people who mainly use smartphones is 94.8%, much higher than those who do not use smart phones (5.2%) (see Figure 4). The proportion of households using smartphones is 95.2% (Refer to Figure 5).

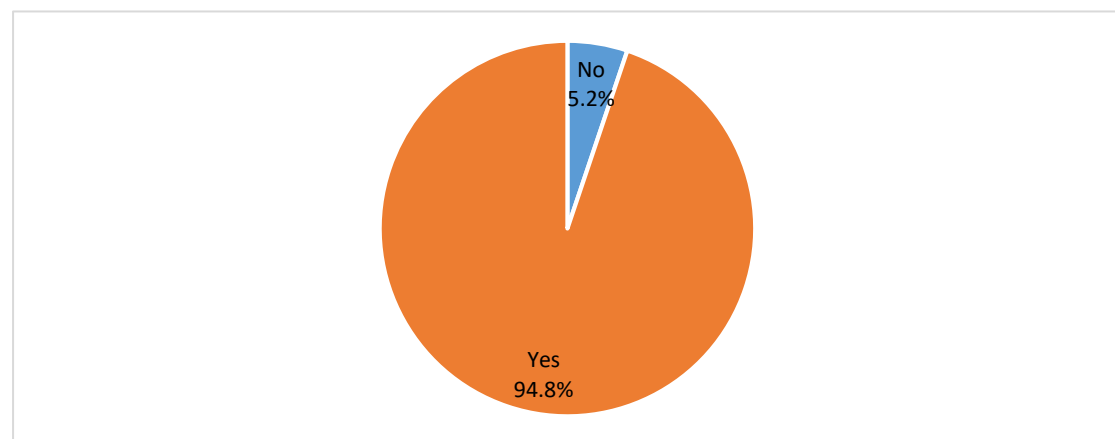


Figure 4 Smartphone Usage

Base : N=1,072, single-choice (people who use mobile phones)

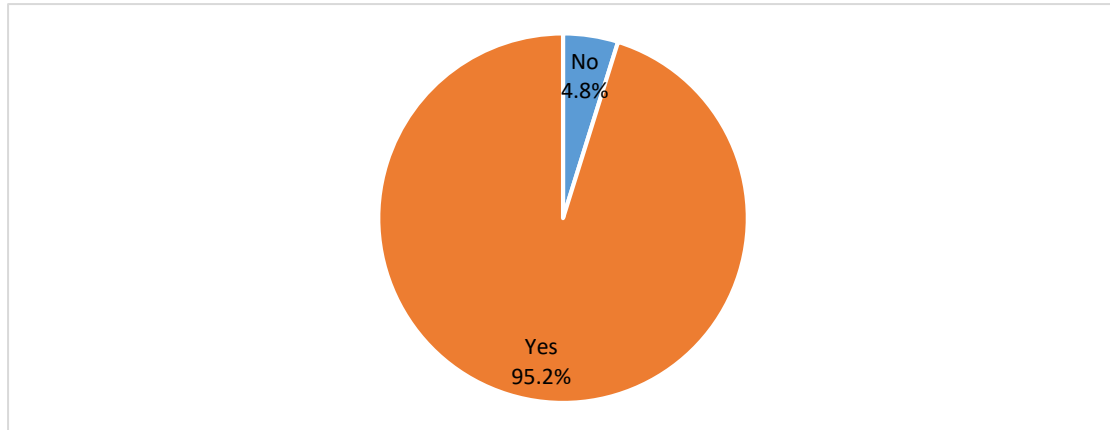


Figure 5 Smart Phone Usage in Households

Base : N=1,115, single-choice

2. Comparative analysis

(1) Analysis of regional differences

The result of Chi-square tests indicates that people who mainly use smartphones and smart phone usage in households significantly vary by region.

The cross analysis suggests that smartphone users have the highest percentages in all regions, with the highest 99.1% in Kaohsiung, Pingtung and Penghu and the lowest rate 91% in Yilan, Hualien, and Taitung. Regarding smart phone usage in households, except for Yilan, Hualien, and Taitung (86.3%), the other regions have more than 90% with the highest rate 97.9% in Kaohsiung, Pingtung and Penghu.

(2) Analysis of basic differences

The result of Chi-square tests indicates that people who mainly use smartphones and smart phone usage in households significantly vary by region.

When analyzed by gender, the men have a higher rate (95.3%) of mainly using smartphones than the women (94.4%). The proportion of households using smartphones for both men (95.7%) and women (94.6%) are more than 90%.

When analyzed by age, all age groups mainly use smartphones, except for 66 year-olds and over (69.4%), the rate for each age group is more than 90%, with the highest rate 100% for 16–25 year-olds and 26–35 year-olds.

When analyzed by marital status, 99.1% people of those unmarried mainly use smartphones, followed by those married (90.0%).

Regarding smart phone usage in households, the proportions for those unmarried (96.8%) and married (95.2%) are over 90%, and those widowed or separated is 89.6%.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that people who mainly use smartphones significantly varies by housing tenure and individual average monthly income.

When analyzed by housing tenure, house renters have a higher rate (98%) of mainly using smartphones than home owners (93.9%).

When analyzed by individual average monthly income, all income groups mainly use smartphones, with the highest rate 99.2% among those earning NT\$40,000-49,999 and the lowest rate 84.5% among those earning NT\$10,000-19,999.

The Most Frequently Used Mobile Internet Service Outside Homes Q18

1. Overall analysis

The most frequently used mobile internet service when people are outside their homes is 4G, up to 95.2% (see Figure 6).

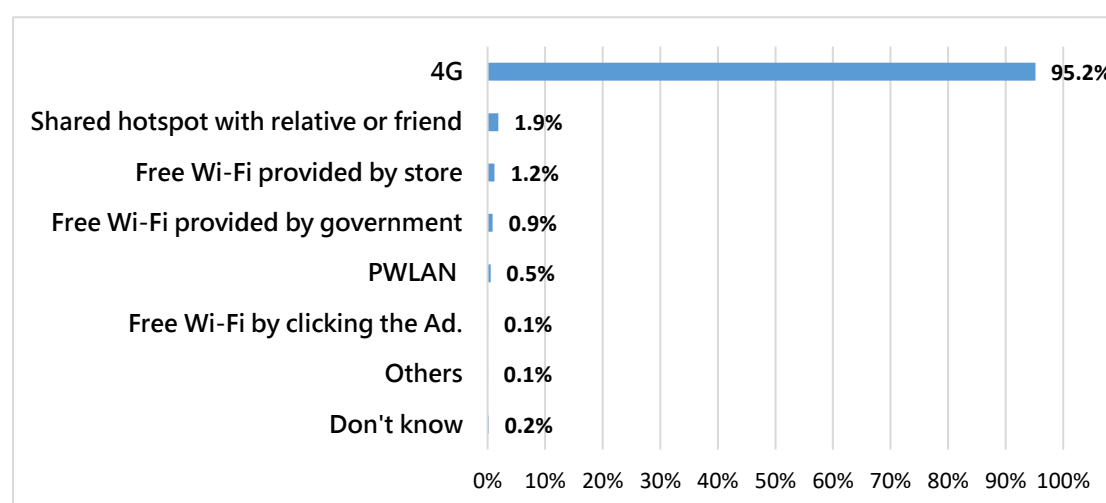


Figure 6 Most Frequently Used Mobile Internet Service Outside Homes

Base : N=967, single-choice (people who mainly use smartphones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that 4G service users are the highest proportions in all regions, the highest rate is 97.4% in Taipei City, New Taipei City and Keelung, and the lowest rate is 91.9% in Taichung, Changhua and Nantou.

(2) Analysis of basic differences

When analyzed by gender, both men (96.8%) and women (93.6%) mainly use 4G services.

When analyzed by age, 4G service users have the highest proportions in all age groups, except 66 year-olds and over (83.9%), the other age groups are over 90%, with the highest rate 98% of 26–35 year-olds.

When analyzed by marital status, 4G service users have the highest proportions regardless of marital status, with the highest rate 96.5% of those unmarried and the lowest rate 93.2% of those widowed or separated.

The Most Common Place to Access Internet through Mobile Phones Q19

1. Overall analysis

The survey shows that most Taiwanese people use mobile phones to access the network at home (49.5%), followed by workplace (33.6%) (see Figure 7).

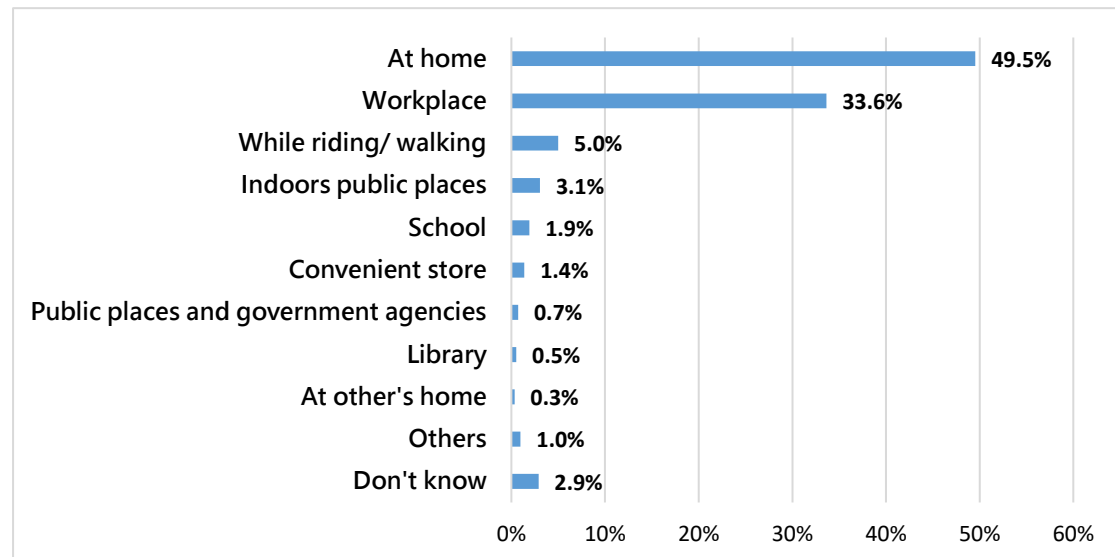


Figure 7 The Most Commonly Used Mobile Phone Networking Sites

Base : N=985, single-choice (people who mainly use smart phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that using mobile phones to access the internet at home has a higher rate in all regions, with 57% in Taichung, Changhua and Nantou being the highest and 42.9% in Kaohsiung, Pingtung and Penghu the lowest.

(2) Analysis of basic differences

When analyzed by gender, homes are the most common places used to access the internet by mobile phone for 55.6% of women 43.6% of men.

When analyzed by age, 45.5% of 26–35 year-olds access the internet at workplaces, while for other age groups, homes are the most common place to access the internet by mobile phone, with the highest rate 65.7% of 66 year-olds and over, and the lowest rate 42% of 36–45 year-olds.

Regardless of marital status, homes are the most frequent place to access the internet by mobile phone, with the highest rate 54.9% of those married and the lowest rate 43.1% of those unmarried.

The Reasons for choosing the Telecoms Operators Q24

1. Overall analysis

Using a personal habitual provider is the most common reason for choosing a telecoms service provider for 31.3%, followed by better quality of communication

(27.2%) and a favorite of relatives and friends (26.3%) (see Figure 8).

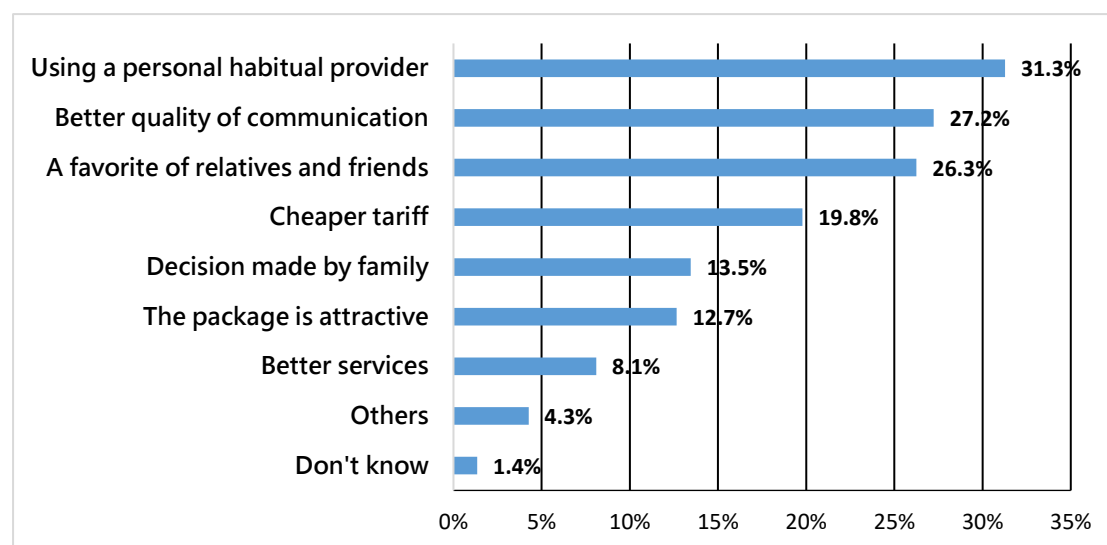


Figure 8 The Reasons to Choose the Telecoms Suppliers

Base: N=1,070, multiple-choice (people who use mobile phones and whose telecoms suppliers are known)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that using a personal habitual provider is the top reason for choosing a telecoms service provider in Taipei City, New Taipei City, and Keelung (39.3%); Taoyuan, Hsinchu, Miaoli (39.7%); Yilan, Hualien and Taitung (33.6%).

In Taichung, Changhua, Nantou (33.8%) and Yunlin, Chiayi and Tainan (36.8%), better communication quality of the provider is the top reason. Being a favorite provider of relatives or friends is the top reason in Kaohsiung, Pingtung and Penghu (36.8%).

(2) Analysis of basic differences

When analyzed by gender, 32% of men and 30.5% of women are the highest rates for choosing a service provider because of using a personal habitual provider.

When analyzed by age, 16–25 year-olds have the highest rate (29.7%) for choosing a telecoms service provider because of a decision made by family. Better communication quality of the provider is the top reason for 26–35 year-olds (30.1%) and 36–45 year-olds (40.3%). Choosing a service provider because it is their personal habitual provider is the highest rate for 46–55 year-olds (35.1%), 56–65 year-olds (34.7%) and 66 year-old and over (31.9%).

When analyzed by marital status, the majority of people regardless of marital status have highest rate for choosing a service provider because it is their personal habitual provider, with the highest rate 33.7% of those widowed or separated and the lowest rate 29.4% of those unmarried.

The Main Reasons to Change the Habitual Telecoms Operators Q27

1. Overall analysis

Bad quality of communication is the most common reason for changing telecoms service provider for 23.8%, followed by a cheaper tariff with the original number (19%), and the previous provider's tariff being more expensive (19%) (see Figure 9).

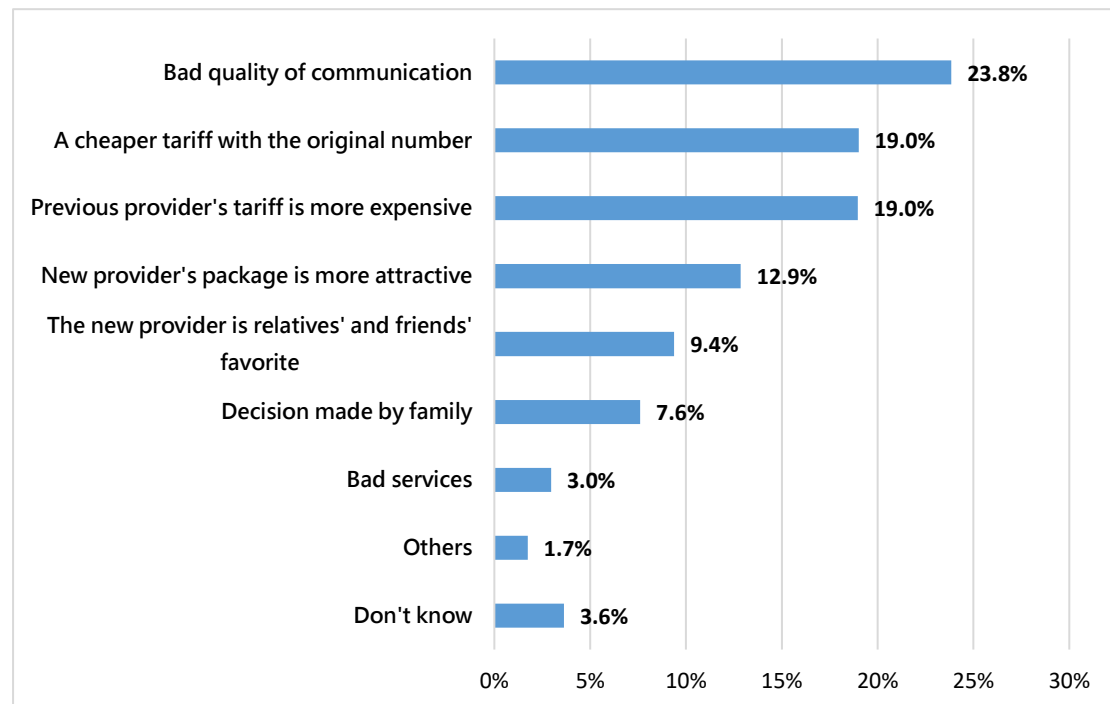


Figure 9 The Main Reasons to Change the Habitual Telecoms Suppliers

Base : N=468, single-choice (people who use mobile phones and whose telecoms suppliers are known and have been changed)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that the top reason (25.2%) for changing provider in Taipei City, New Taipei City, and Keelung is the tariff is cheaper with the original number. The new provider's package is more attractive is the top reason in Yilan, Hualien, and Taitung (22%). For the other regions, poor communication quality of the previous provider is the top reason, with the highest rate 29.8% in Yunlin, Chiayi, and Tainan and the lowest rate 23.5% in Kaohsiung, Pingtung and Penghu.

(2) Analysis of basic differences

When analyzed by gender, for 26.1% of men and 21.4% of women, bad quality of communication are the highest rates.

When analyzed by age, cross analysis suggests that the top reason for changing provider for 16–25 year-olds (21.2%) and 36–45 year-olds (25.6%) is because the tariff is cheaper with the original number. Poor communication quality of the previous provider is the top reason for 26–35 year-olds (27.8%), 45–55 year-olds (25.3%) and

56–65 year-olds (26.4%).

People aged 66 years-old and over have the highest proportion of 22.1% that the new provider is a relative or friends' favorite.

When analyzed by marital status, bad quality of communication has the highest rate regardless of marital status, with the highest rate 33.1% of widowed or separated people and the lowest rate 23% of those married.

C. Mobile Phone Plans

Most Common Mobile Phone Tariff Plans and Types Q29

1. Overall analysis

The most commonly used mobile phone tariff plans and types are monthly based (92.7%), followed by prepaid (4%) and both (1.2%) (see Figure 10).

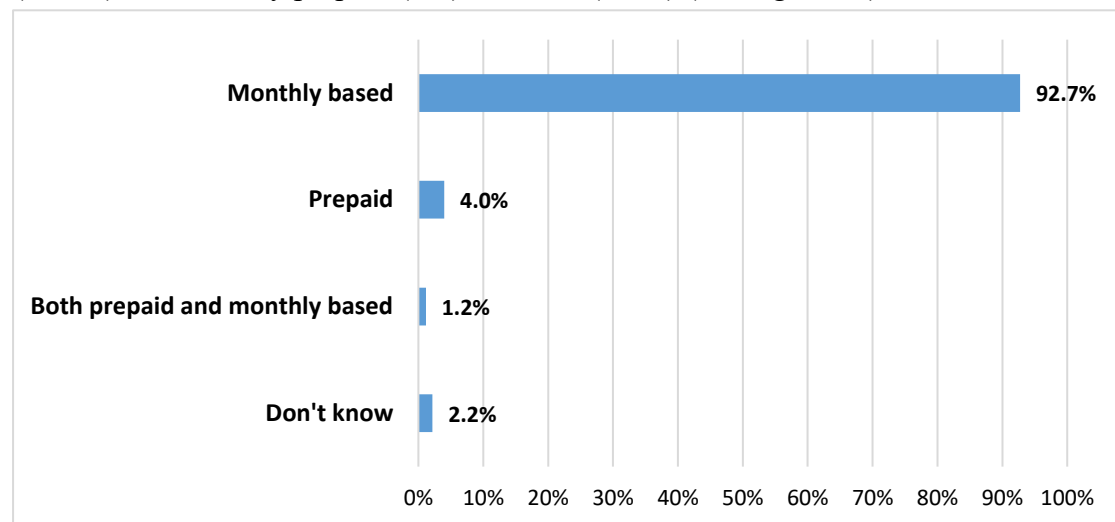


Figure 10 Most Common Mobile Phone Tariff Plans

Base : N=1,072, single-choice (people who use mobile phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggested that more than 90% of people in all regions use a monthly paid mobile phone tariff plan. Among all, people in Yunlin, Chiayi, and Tainan have the highest rate of 94.4% while people in Taoyuan, Hsinchu and Miaoli the lowest of 91.3%.

(2) Analysis of basic differences

When analyzed by gender, 93.4% of men and 92.1% of women mostly use a monthly paid mobile phone tariff plan.

When analyzed by age, over 90% of all age groups use a monthly paid mobile phone tariff plan except for those 66 years-old and over (74.1%). Among all, people aged 26–35 years-old have the highest rate of 98.8%.

When analyzed by marital status, all people mostly use a monthly paid mobile phone tariff plan. Among them, those unmarried have the highest rate (95.3%) while those widowed or separated have the lowest rate (89%).

Monthly Mobile Phone Bill Q32

1. Overall analysis

The average monthly cost of a mobile phone bill is NT\$728 (N = 1007, people who use mobile phones and monthly-based plan).

2. Comparative analysis

(1) Analysis of regional differences

Cross analysis found that, except Taoyuan, Hsinchu and Miaoli (NT\$685) and Taichung, Changhua and Nantou (NT\$684), the average monthly mobile phone bills for all regions are above NT\$700. Among them, the highest average bill is NT\$799 in Yilan, Hualien, and Taitung (see Table 12).

Table 12 Monthly Mobile Phone Bill (By Region)

Unit : NTD

Region	Average Bill (NTD)
Taipei City, New Taipei City and Keelung	777
Taoyuan, Hsinchu and Miaoli	685
Taichung, Changhua and Nantou	684
Yunlin, Chiayi and Tainan	713
Kaohsiung, Pingtung and Penghu	723
Yilan, Hualien and Taitung	799
Average Score	728

Source: Results of this research

(2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that the average monthly cost of a mobile phone bill significantly varies by age.

When analyzed by gender, the monthly bills of men (NT\$753) are higher than those of women (NT\$703).

When analyzed by age, except for 56-65 year-olds (NT\$650) and 66 year-olds and over (NT\$517), monthly bills are over NT\$700 for all age groups. The highest average monthly mobile phone bills (NT\$844) is among 36–45 year-olds.

When analyzed by marital status, those unmarried have the highest average monthly mobile phone bills (NT\$776), and those widowed or separated have the lowest bills (NT\$638).

(3) Analysis of differences in social and economic status

The results of the one-way ANOVA analysis indicates that the average monthly

cost of a mobile phone bill significantly varies by education level and profession.

When analyzed by education level, the junior college group has the highest average monthly mobile phone bills (NT\$811), and the elementary school and lower group has the lowest bills (NT\$473).

When analyzed by profession, people in publishing, audio-video production, mass communication, information, and communications have the highest bills (NT\$1014) and the retired have the lowest bills (NT\$487).

Mobile Phone Plans Q34

1. Overall analysis

People in Taiwan mainly opt for mobile phone plans with a phone number-binding contract (60.2%) or handset-binding contract (29.7%). Only 6.9% people opt for a SIM-only plan (see Figure 11).

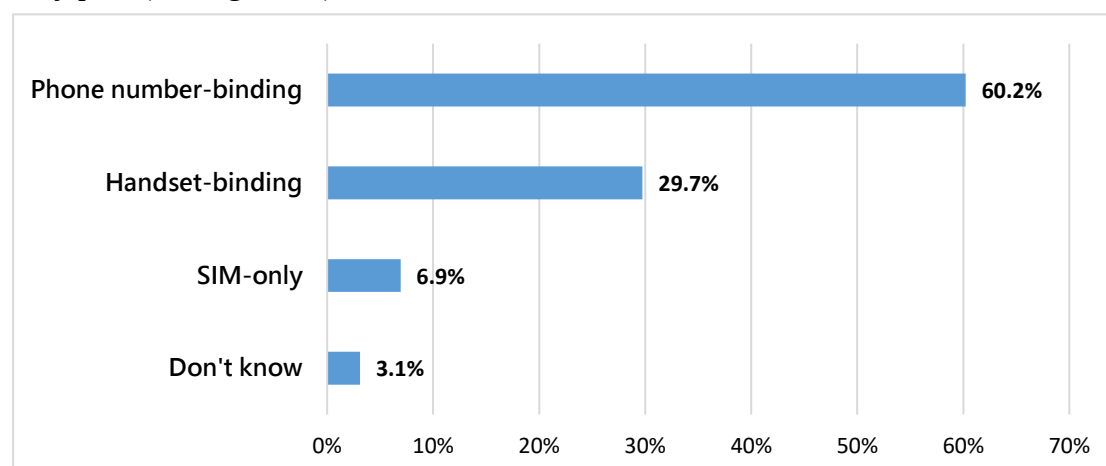


Figure 11 Mobile Phone Plans Chosen

Base : N=1,049, single-choice (people who use mobile phone and know which phone plan they choose)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that the phone number-binding contract has a higher rate in all regions, with the highest rate 67.2% in Kaohsiung, Pingtung and Penghu and the lowest rate 53.3% in Yilan, Hualien, and Taitung.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the mobile phone plan chosen significantly varies by age and marital status.

When analyzed by gender, 60.3% of women and 60.2% of men mainly choose the phone number-binding contract.

When analyzed by age, the phone number-binding contract plan has the higher rate for all age groups. Among them, the highest rate (69.8%) is for 16–25 year-olds, and the lowest rate (41.7%) 66 year-olds and over.

When analyzed by marital status, a phone number-binding contract is the most frequent choice regardless of marital status, with the highest rate 66.5% of those unmarried and the lowest rate 55.5% of those married.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that the type of mobile phone plan chosen significantly varies by individual average monthly income.

When analyzed by individual average monthly income, all income groups mainly choose a phone number-binding contract, with the highest rate 67.4% for those earning NT\$30,000-39,999 and the lowest rate 50.1% for those earning NT\$60,000 or more group.

The Usage of Free Voice Hotline and Intra-Network Phone Calls Q38

1. Overall analysis

In terms of the usage of free voice hotline and free intra-network, 47.7% only use a free intra-network, 3.3% only use free voice hotlines, 12.9% use both functions, and 22.8% use neither of these functions (see Figure 12).

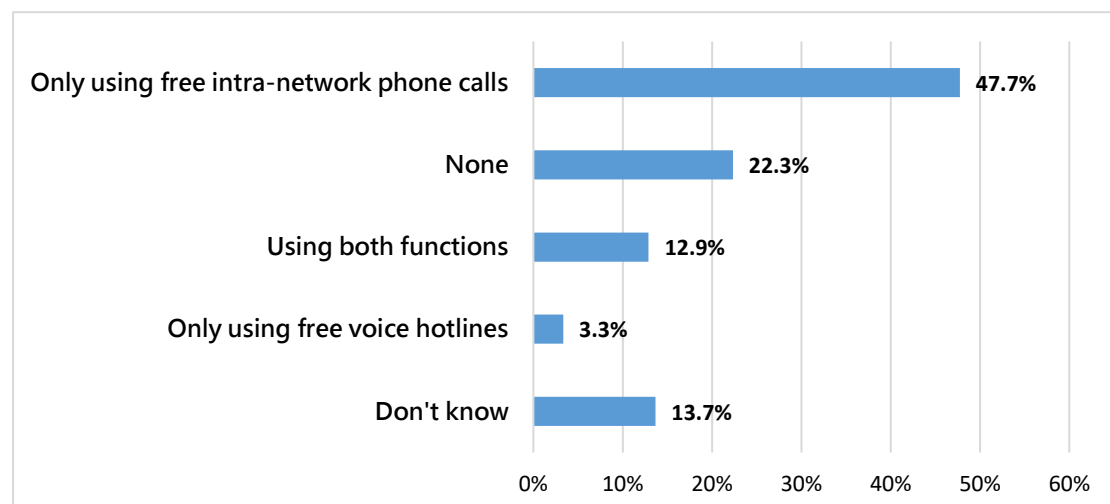


Figure 12 The Usage of Free Voice Hotline and Intra-Network Phone Calls

Base : N=1,049, single-choice (people who use mobile phone and know which phone plan they choose)

2. Comparative analysis

(1) Analysis of regional differences

When analyzed by region, 59.8% of people in Kaohsiung, Pingtung and Penghu only use a free intra-network is the highest, and the lowest rate (43.3%) in Taoyuan, Hsinchu and Miaoli.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the free voice hotline and free intra-network call use significantly varies by gender, age and marriage status.

When analyzed by gender, the highest for both men (45.3%) and women (50.3%)

is for only using free intra-network calls.

When analyzed by age, 66 year-olds and over (43.2%) have the highest rate for not using intra-network calls, while those of other age groups have the highest rates of only using free intra-network calls, with the highest rate 58.5% of 46–55 year-olds and the lowest rate of 42% of 16–25 year-olds.

When analyzed by marital status, the highest proportions are for only using free intra-network calls regardless of marital status, with the highest rate 50.7% of those unmarried and the lowest rate of 46.9% for those widowed or separated.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that the use of free voice hotlines and free intra-network calls significantly varies by education level.

When analyzed by education level, except for those with elementary school education or lower (40.5%) who have the highest proportion for not using these, those of other education levels have the highest rates of only using free intra-network calls, with the highest rate 58.5% for those with junior college education and the lowest rate 42% of those with high school or secondary school education.

D. Mobile Broadband Data Allowance

Mobile Broadband Data Allowance Q41

1. Overall analysis

Consumers in Taiwan take great advantage of serious competition in unlimited data plans between telecom operators. The unlimited data plan (unlimited speed) has the highest rate of use (65.7%), followed by the unlimited data plan (limited speed) (7.8%), and unlimited data plan (unknown speed) (7.3%) (see Figure 13).

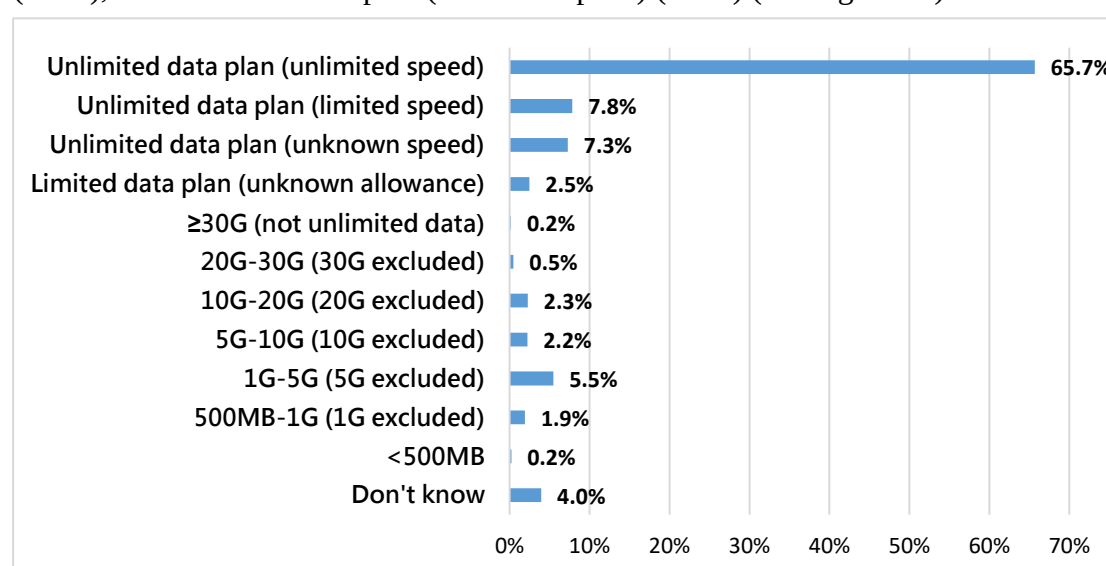


Figure 13 Mobile Broadband Data Allowance

Base : N=930 (people who use mobile phone and the internet-accessible project)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that the unlimited data plan (unlimited speed) has the highest rate in all regions, with the highest rate 71.1% in Taipei City, New Taipei City and Keelung, and the lowest rate 49.2% in Yilan, Hualien, and Taitung.

(2) Analysis of basic differences

When analyzed by gender, both men (68.2%) and women (63.1%) have the highest proportions for unlimited data plans (unlimited speed).

When analyzed by age, all age groups have the highest proportions for unlimited data plans (unlimited speed) and frequently decreases by age group, with the highest rate 73.9% of 16–25 year-olds and the lowest rate 31% year-olds of 66 year-olds and over.

When analyzed by marital status, the highest proportion regardless is for unlimited data plans (unlimited speed), with the highest rate 74% of those unmarried and the lowest rate 53% of those widowed or separated people.

Satisfaction with the Quality of Mobile Phone Voice Q42

1. Overall analysis

The average score for satisfaction with mobile phone voice quality is 7.46 (1- point is very dissatisfied, and 10-points is very satisfied) (N=943, people who use mobile phones which include voice services).

2. Comparative analysis

(1) Analysis of regional differences

The cross test suggests that, except for Yunlin, Chiayi, and Tainan (6.87), the average satisfaction rates for mobile phone voice quality by region are higher than 7. Among them, people in the Taoyuan, Hsinchu and Miaoli have the highest score (7.68) (see Table 13).

Table 13 Satisfaction with the Quality of Mobile Phone Voice Quality (By Region)

Region	Average Score
Taipei City, New Taipei City and Keelung	7.64
Taoyuan, Hsinchu and Miaoli	7.68
Taichung, Changhua and Nantou	7.25
Yunlin, Chiayi and Tainan	6.87
Kaohsiung, Pingtung and Penghu	7.64
Yilan, Hualien and Taitung	7.25
Average Score	7.46

Source: Results of this research

(2) Analysis of basic differences

When analyzed by gender, the satisfaction of men with mobile phone voice quality is 7.5 on average, and for women, the average score is 7.42.

When analyzed by age, the average satisfaction rates for mobile phone voice quality is higher than 7 for all age groups. Among them, 16–25 year-olds have the highest score (7.68) and 66 year-olds and over have the lowest score (7.28).

When analyzed by marital status, average satisfaction rates for mobile phone voice quality are higher than 7, with the highest score (7.54) for those unmarried and the lowest score (7.29) for those widowed or separated.

Satisfaction with the Quality of Access to the Internet by Mobile Phone Q43

1. Overall analysis

The average level of satisfaction with the quality of access to the internet by mobile phone is 7.22 (1-point is not satisfied, 10-points is very satisfied) (N=930, people who use mobile phones which include internet services).

2. Comparative analysis

(1) Analysis of regional differences

The results of the one-way ANOVA analysis indicates that average satisfaction with the quality of access to the internet by mobile phone significantly varies by regions.

The cross analysis suggests that the scores for satisfaction with the quality of access to the internet by mobile phone are higher than 6 in all regions. Among them, satisfaction in Taipei City, New Taipei City and Keelung is at the highest (7.44), followed by Yilan, Hualien, and Taitung (6.64) (see Table 14).

Table 14 Satisfaction with the Quality of Accessing the Internet by Mobile Phone (By Region)

Region	Average Score
Taipei City, New Taipei City and Keelung	7.44
Taoyuan, Hsinchu and Miaoli	7.24
Taichung, Changhua and Nantou	7.03
Yunlin, Chiayi and Tainan	6.85
Kaohsiung, Pingtung and Penghu	7.42
Yilan, Hualien and Taitung	6.64
Average Score	7.22

Source: Results of this research

(2) Analysis of basic differences

When analyzed by gender, men have an average score of satisfaction with the

quality of access to the internet by mobile phone of 7.27, which is similar to the average score for women (7.16).

When analyzed by age, the average satisfaction with the quality of access to the internet by mobile phone in all groups is higher than 7. Among them, 66 year-olds and over have the highest score (7.42), and 36–45 year-olds have the lowest scores (7.04).

When analyzed by marital status, the average satisfaction with the quality of access to the internet by mobile phone for all groups is higher than 7. Among them, married people have the highest scores (7.25), and unmarried people have the lowest scores (7.18).

The Places to Buy Mobile Phones Q47

1. Overall analysis

In terms of the places to buy mobile phones, the most common place to buy a mobile phone is at the most-visited telecoms provider's store (43.8%), followed by buying at physical stores (non-telecoms providers) (30.7%) (see Figure 14).

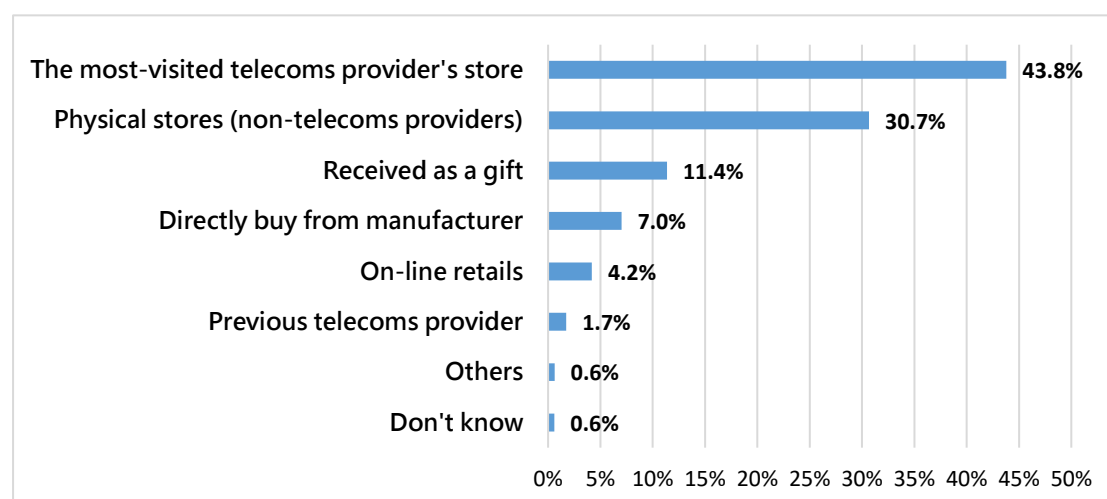


Figure 14 The Places to Buy Mobile Phones

Base : N=1,072, single-choice (people who use mobile phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that people in all regions have the highest proportion for buying mobile phones from the most-visited telecoms provider's store, with the highest rate 50% in Yilan, Hualien, and Taitung and the lowest rate 41.8% in Taipei City, New Taipei City and Keelung.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the places to buy mobile phones significantly varies by gender and marriage status.

When analyzed by gender, 46.3% of women and 41.3% of men buy mobile phones

from providers' stores. Moreover, 15.4% of women received their phone as a gift, higher than for men (7.3%).

When analyzed by age, 16–25 year-olds have the highest rate (41.1%) for buying mobile phones at non-provider stores, 66 year-olds and over have the highest proportion (42.5%) for receiving their phone as a gift. The other age groups have highest percentage for buying mobile phones at a provider's store, with the highest 52.7% of 56–65 year-olds and the lowest 40.7% of 26–35 year-olds.

When analyzed by marital status, the highest proportion for buying mobile phones is from the most-visited telecoms provider's stores regardless of marital status, with the highest rate 46.9% for married people and the lowest rate 40.3% for unmarried people.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that the places to buy mobile phones significantly varies by housing tenure.

When analyzed by housing tenure, home owners (42.4%) and house renters (48.4%) have the highest proportions for buying mobile phones from the most-visited telecoms provider's store, but home owners (12.6%) have the higher proportion than house renters (7.1%) for receiving their phones as a gift.

Behaviors Related to Non-Internet Mobile Use beyond Phone Calls Q48

1. Overall analysis

In terms of the behaviors of non-internet mobile use beyond phone calls, the highest rate of these behaviors is taking photos (85.7%), followed by using them as alarm clocks (65.1%) and calculators (59.8%) (see Figure 15).

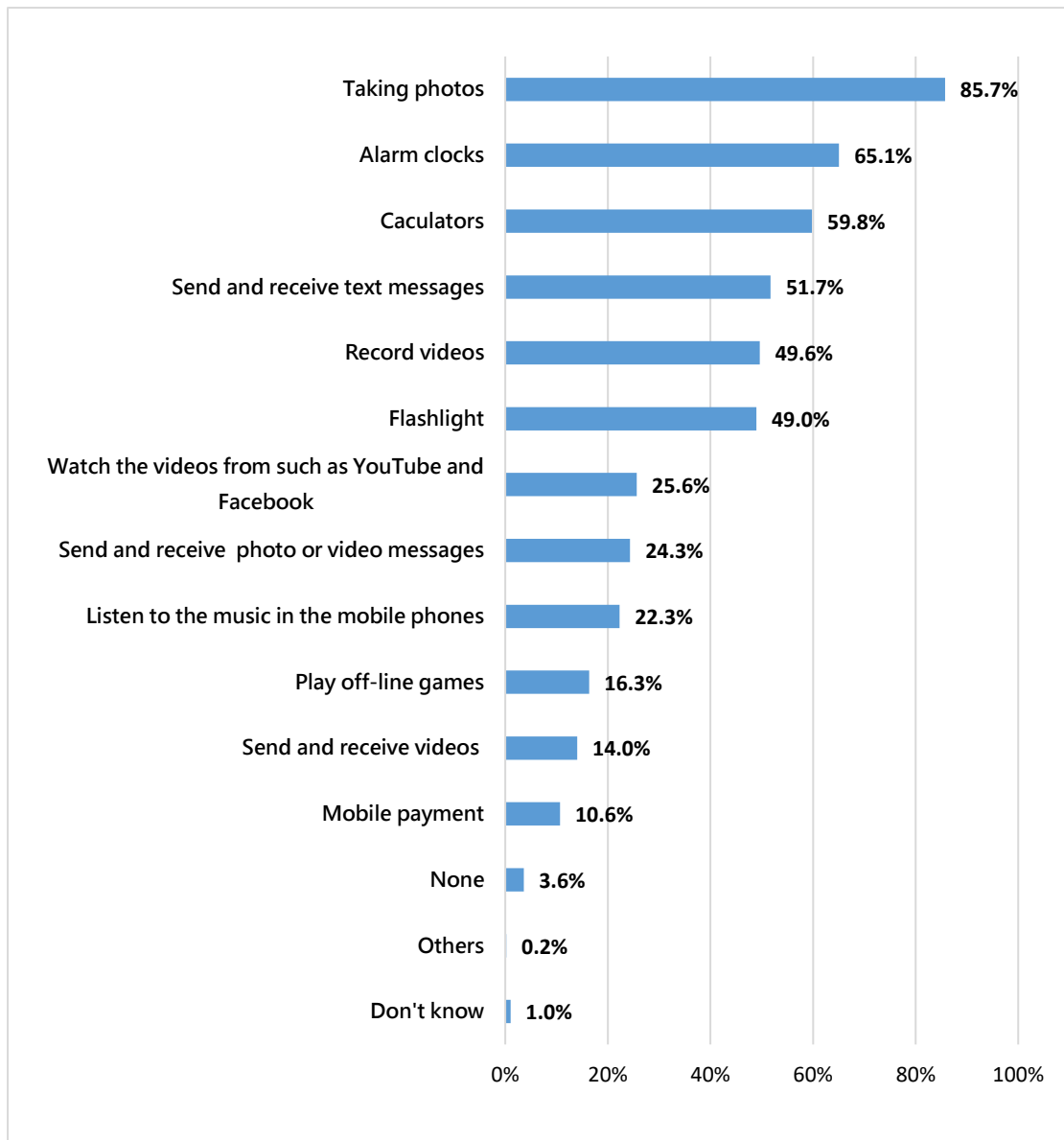


Figure 15 Behaviors of Non-Internet Mobile Use

Base : N=1,072, multiple-choice (people who use smartphones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that people in all regions have the highest proportion for taking photos, with the highest rate 93.6% in Kaohsiung, Pingtung and Penghu and the lowest rate 76.2% in Yilan, Hualien, and Taitung.

(2) Analysis of basic differences

When analyzed by gender, 86.7% of women and 84.8% of men use mobile phones to take photos.

When analyzed by age, people in all age groups have the highest proportion for taking photos, with the highest rate 92.6% of 16–25 year-olds and the lowest rate 67.3% of 66 year-olds and over.

When analyzed by marital status, the highest proportions are for taking photos regardless of marital status, with the highest rate 90.3% of those unmarried and the lowest rate 81.7% of those widowed or separated.

Searching Information through the Internet by Phone Users beyond Phone Calls Q49

1. Overall analysis

In terms of the behaviors of phone users beyond phone calls, 76.2% browse the web/query, followed by 55% who seek product/service information and 54.9% who learn the latest news (see Figure 16).

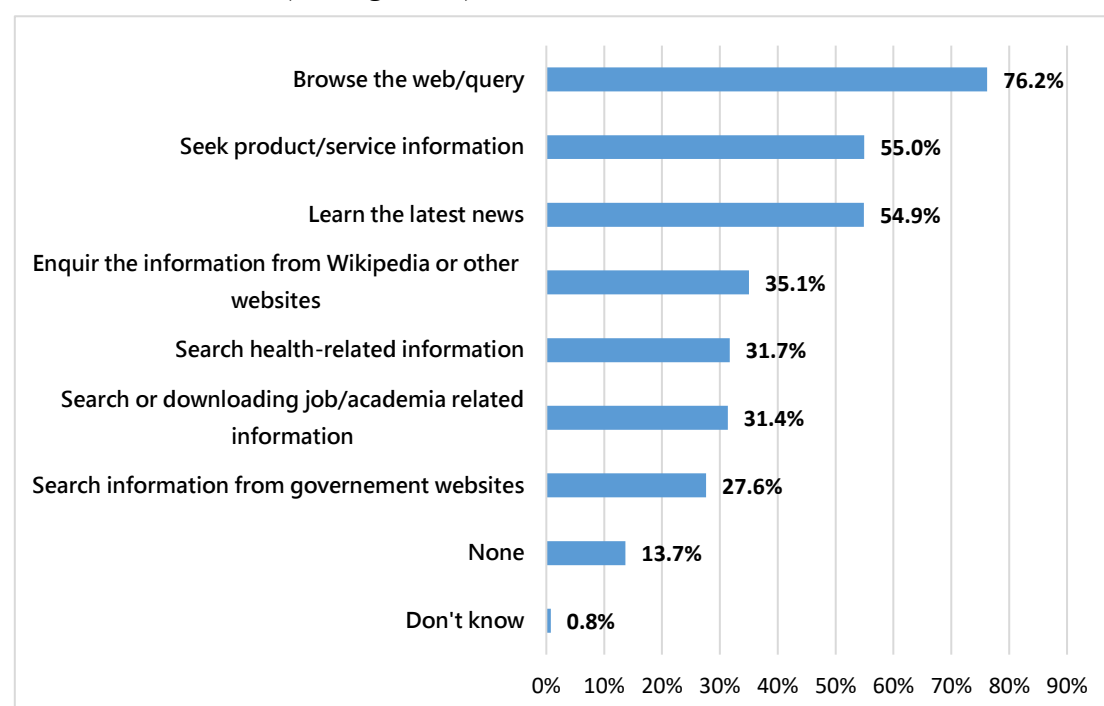


Figure 16 Searching Information through the Internet

Base : N=1,017, multiple-choice (people who mainly use smartphones as their mobile phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that, beyond phone calls, browsing the web/query is at the highest rate for all regions. The highest rate is in Kaohsiung, Pingtung and Penghu (85.4%) and the lowest rate is in Taipei City, New Taipei City and Keelung (68.7%).

(2) Analysis of basic differences

When analyzed by gender, both men (82%) and women (70.4%) have the highest proportion for browsing the web/query.

When analyzed by age, people in all age groups have the highest proportion for browsing the web/query, with the highest rate 94.4% of 26–35 year-olds and the lowest rate 45.8% of 66 year-olds and over.

When analyzed by marital status, the highest proportion is for browsing the web/query regardless of marital status, with the highest rate 90.9% of those unmarried and the lowest rate 53.2% of those widowed or separated.

Behaviors around Socializing or Communicating functions of Phone through Internet Q50

1. Overall analysis

Beyond phone calls, browsing/reading/commenting/pressing the Like button /posting on social media are most popular (86.4%) for socializing and communicating functions which people use by phone through internet, followed by using instant messaging to communicate (71.7%), and making voice calls over the internet (66.8%) (see Figure 17).

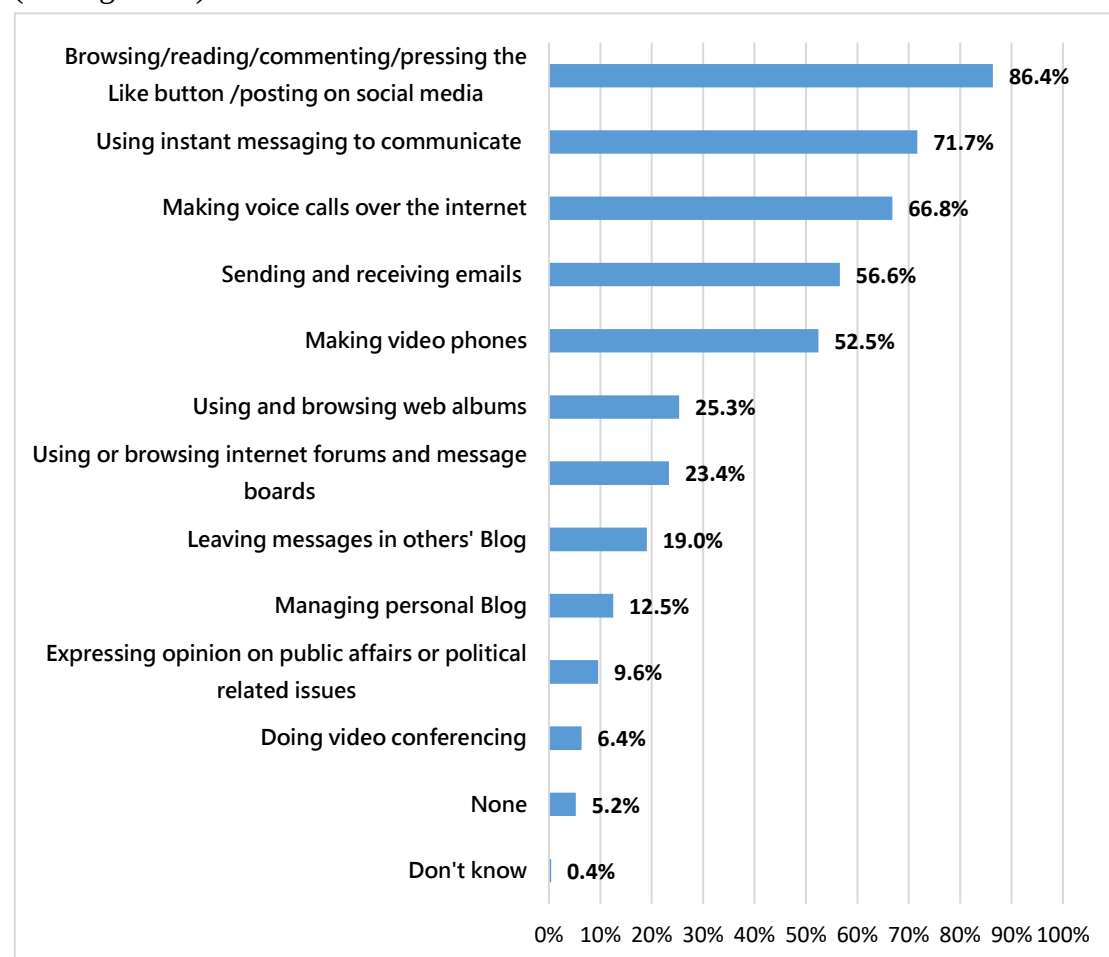


Figure 17 Socializing or Communicating functions of Phone through Internet

Base : N=1,017, multiple-choice (people who mainly use smartphones as their mobile phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that, except for Yilan, Hualien, and Taitung which as the highest proportion (77.2%) for using instant messaging to communicate, those in

the other regions have the highest proportions for browsing/reading/commenting /pressing the Like button/posting on social media, with the highest rate 92.1% in Kaohsiung, Pingtung and Penghu and the lowest rate 83.4% in Yunlin, Chiayi, and Tainan.

(2) (2) Analysis of basic differences

When analyzed by gender, both men (87.7%) and women (85.1%) have the highest proportions for using instant messaging to communicate.

When analyzed by age, people in all age groups have the highest proportion for using instant messaging to communicate, with the highest rate 95.2% of 16–25 year-olds and the lowest rate 67% of 66 year-olds and over.

When analyzed by marital status, the highest proportion is for using instant messaging to communicate regardless of marital status, with the highest rate 91% of those unmarried people and the lowest rate 78.6% of those widowed or separated.

Using Services by Phone through Internet Q51

1. Overall analysis

Beyond phone calls, banking services (39.1%) is the most popular service people use, followed by uploading and downloading files from a cloud (32%), and attending social groups (31.3%). The rate for not using any service is 31.4% (see Figure 18).

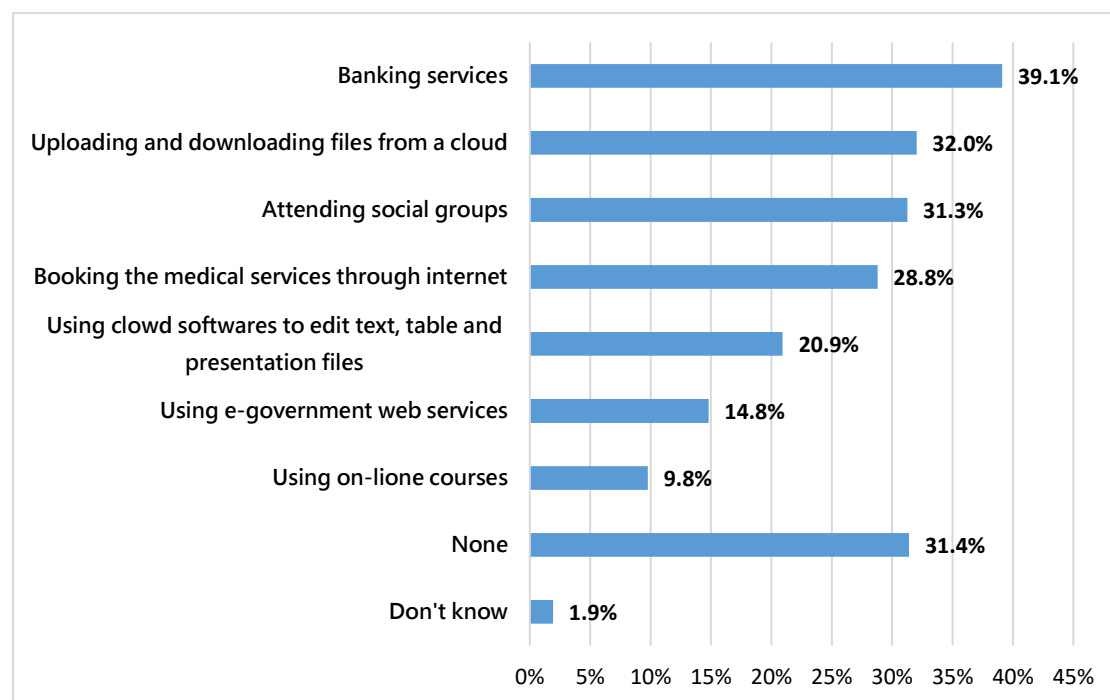


Figure 18 Using Services by Phone through Internet

Base : N=1017, multiple-choice (people who mainly use smartphones as their mobile phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that, 37.4% of those in Yunlin, Chiayi, and Tainan do not use these services, 39.4% in Kaohsiung, Pingtung and Penghu have the highest rate for booking medical services over the Internet, while other regions mainly use banking services, with the highest rate 45.6% in Taoyuan, Hsinchu and Miaoli and the lowest rate 37.5% in Taichung, Changhua and Nantou.

(2) Analysis of basic differences

When analyzed by gender, the highest rates for both men (42.8%) and women (35.4%) use banking services.

When analyzed by age, 16–25 year-olds have the highest rate (48%) for using cloud services for uploading and downloading files, while 65% of 26 – 35 year-olds and 54.9% of 36–45 year-olds are the highest rates for using banking services, and 38.2% of 46–55 year-olds (), 57.3% of 56–65 year-olds and 67.8% of 66 year-olds and over do not use these services.

When analyzed by marital status, 51.3% of unmarried have the highest rate for using banking services, while 38.6% of those married and 51.6% of those widowed or separated do not use these services.

Using Functions by Phone through Internet Q52

1. Overall analysis

Beyond phone calls, watching videos (66%) is the most popular function people use by phone, followed by online shopping (54.5%) and watching free TV shows or online movies (34.7%) (see Figure 19).

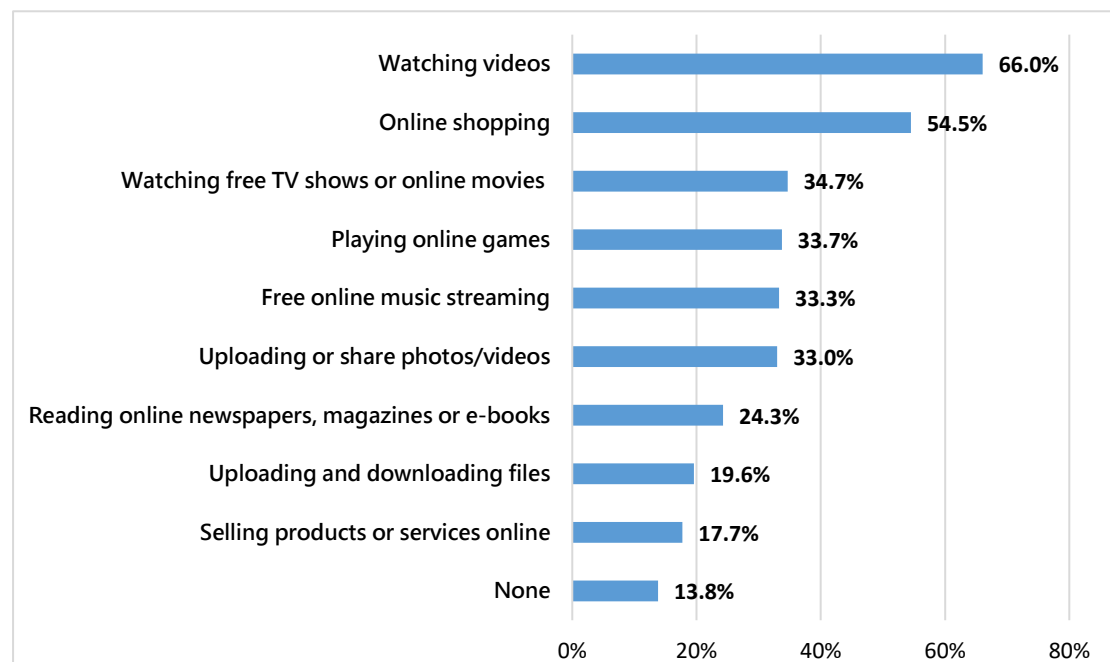


Figure 19 Using Functions by Phone through Internet (Top 10)

Base : N=1,017, multiple-choice (people who mainly use smartphones as their mobile phones)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that people in all regions have the highest rate for watching videos, with the highest rate 80.3% in Kaohsiung, Pingtung and Penghu and the lowest rate 58.2% in Taipei City, New Taipei City and Keelung.

(2) Analysis of basic differences

When analyzed by gender, both men (68.8%) and women (63.3%) have the highest rate for watching videos.

When analyzed by age, except for people aged 26-35 who have the highest rate (82.6%) for online shopping, 66 year-olds and over (43.3%) do not use these functions, while the other age groups have the highest rate for watching videos, with the highest rate 80.7% of 16–25 year-olds and the lowest rate 48.6% of 56–65 year-olds.

When analyzed by marital status, the highest rate for watching videos occurs regardless of marital status, with the highest rate 77.2% of those unmarried and the lowest rate 52% of those widowed or separated.

E. Internet Usage

Internet Usage Q3

1. Overall analysis

The survey shows that 88.9% of people in Taiwan aged 16 and over use the internet, while 11.1% of them do not (see Figure 20).

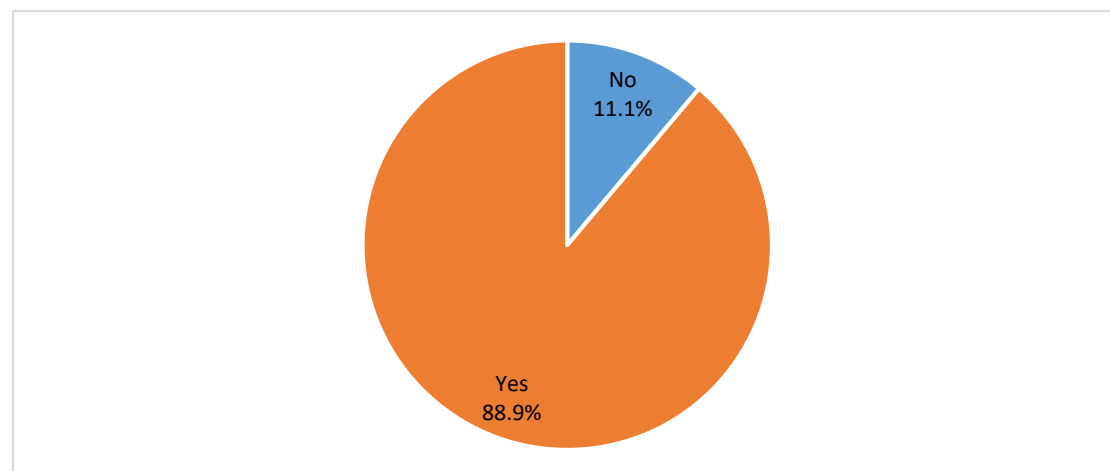


Figure 20 Internet Usage

Base : N=1,115, single-choice

2. Comparative analysis

(1) Analysis of regional differences

The result of Chi-square tests indicates that internet usage by people aged 16 and over significantly varies by region.

The cross test suggests that, except for Yilan, Hualien, and Taitung (73.8%), the rates of internet use are over 80% for all regions, with the highest rate 93.2% in Taoyuan, Hsinchu and Miaoli and the lowest rate 73.8% in Yilan, Hualien, and Taitung.

(2) Analysis of basic differences

The result of Chi-square tests indicates that internet usage by people aged 16 and over significantly varies by age and marital status.

When analyzed by gender, men have a higher rate (90.6%) of internet usage than women (87.1%).

When analyzed by age, except for 66 year-olds and over (52.5%), the highest proportion for other age groups is for internet usage, with the highest rate 99.6% of 16–25 year-olds and the lowest rate 82.3% of 56–65 year-olds.

When analyzed by marital status, the highest proportion is for internet usage regardless of marital status, with the highest rate 98.4% of those unmarried and the lowest rate 9.9% of those widowed or separated.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that internet usage by people aged 16 and over significantly varies by housing tenure, individual average monthly income, and education level.

When analyzed by housing tenure, house renters have higher internet usage (93.7%) than homeowners (87.7%).

When analyzed by education level, all groups have a higher rate of internet use, except those with elementary school education lower. Among them, people with a master's degree or higher have the highest internet usage (100%), those with high school or secondary school education have the lowest rates of internet usage (73.1%). Internet usage frequently decreases by education level.

When analyzed by individual average monthly income, all income groups have a higher rate of internet use, with the highest rate 98.9% among those who earn NT\$60,000 or more and the lowest rate 72.9% of those who earn NT\$1-9,999.

Total hours spending on the internet per week Q4

1. Overall analysis

The survey shows that Taiwanese people aged 16 and over on average spend 37 hours on the internet per week (N = 921, people who use internet).

2. Comparative analysis

(1) Analysis of regional differences

Cross analysis shows that people in all regions spend over 30 hours using internet. Among them, people in Taichung, Changhua and Nantou spend the most hours (40.24) using internet, people in Yunlin, Chiayi, and Tainan spend the least hours (30.34) (see

Table 15).

Table 15 Total Hours Spending in Internet Per Week (By Region)

Unit : hour

Region	Average Hours
Taipei City, New Taipei City and Keelung	35.34
Taoyuan, Hsinchu and Miaoli	39.72
Taichung, Changhua and Nantou	40.24
Yunlin, Chiayi and Tainan	30.34
Kaohsiung, Pingtung and Penghu	37.39
Yilan, Hualien and Taitung	38.81
Average Score	36.81

Resource: Results of this research

(2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that total hours spent on the internet per week significantly varies by gender.

When analyzed by gender, men spend more hours (39.83 hours) using internet than women (33.67 hours).

When analyzed by age, internet usage frequency decreases by age group. Among them, 16-25 year-olds use the internet the most (47.55 hours) and 66 year-olds and over use internet the least (15.55 hours).

When analyzed by marital status, those unmarried spend the most hours per week using internet (47.21 hours), followed by those married (29.79 hours).

(3) Analysis of differences in social and economic status

The results of the one-way ANOVA analysis indicates that total number of hours spent on the internet per week significantly varies by residence.

When analyzed by housing tenure, house renters spend more time using the internet per week (43.59 hours), while homeowners spend 35 hours.

F. Fixed-line Broadband Usage at Home

Accessing Internet at Home Q53

1. Overall analysis

In Taiwan, 86.2% access the internet at home, while only 13.8% do not (see Figure 21).

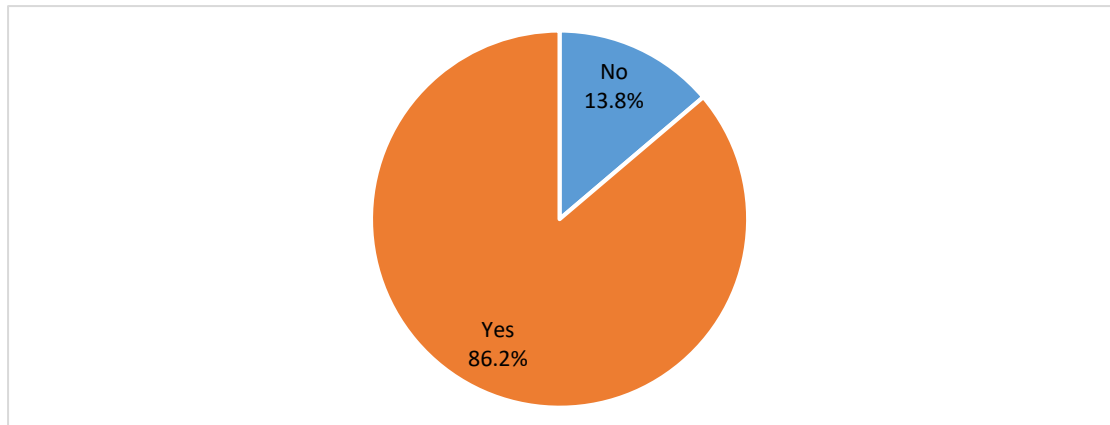


Figure 21 Access to the Internet at Home

Base : N=1,115, single-choice

2. Comparative analysis

(1) Analysis of regional differences

The result of Chi-square tests indicates that accessing the internet at home significantly varies by region.

The cross test shows that the rates of accessing the internet for all regions are the highest percentages, with the highest rate 93% in Kaohsiung, Pingtung and Penghu and the lowest rate 70.4% in Yilan, Hualien and Taitung.

(2) Analysis of regional differences

The result of Chi-square tests indicates that accessing the internet at home significantly varies by region.

When analyzed by gender, 86.8% of men and 85.6% of women access the Internet at home.

When analyzed by age, all age groups have a greater proportion who can access the internet at home, with the highest rate 95.5% for 16–25 year-olds and the lowest rate 59.3% for 66 year-olds and over.

When analyzed by marital status, regardless of marital status, those who can access the Internet at home has the higher percentage, with the highest rate 89.7% of those unmarried and the lowest rate 72.6% of those widowed or separated.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that accessing the internet at home significantly varies by education level and individual average monthly income.

When analyzed by education level, the rates of people who can access the internet at home for all education levels are the highest, with the highest rate 97.8% of those with a master's degree or higher, and the lowest rate 51.4% for those with elementary school education or lower.

When analyzed by individual average monthly income, the rates of people who can access the internet at home for all income groups are the highest, with the highest

rate 94.8% for those in the NT\$30,000-39,999 group, and the lowest rate 75.9% in the NT\$10,000-19,999 group.

Fixed-line Broadband at Home Q54

1. Overall analysis

The rate of people having fixed-line broadband at home is 68.2%, while the rate is 28.8% for those who do not (see Figure 22).

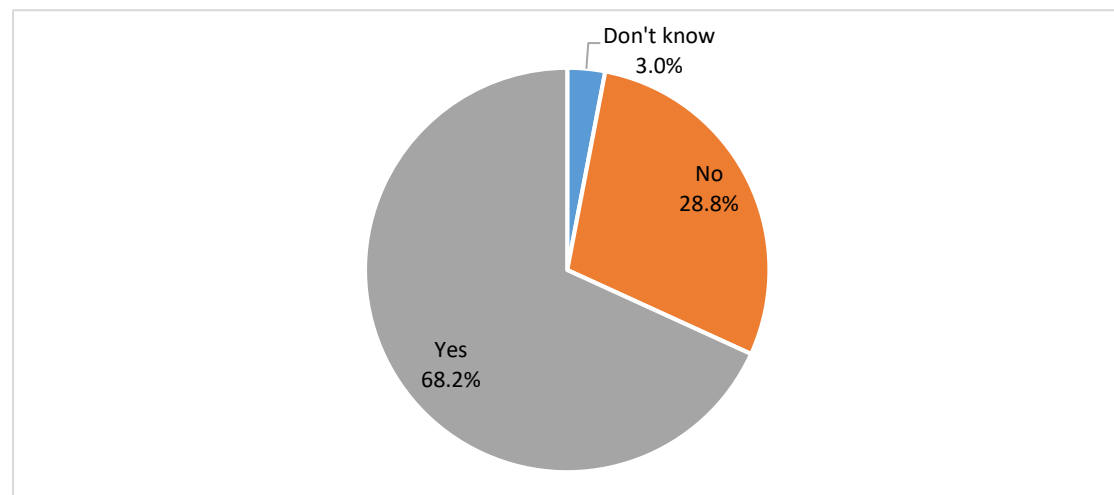


Figure 22 Fixed-line Broadband at Home

Base : N=961, single-choice (people who have fixed broadband at home)

2. Comparative analysis

(1) Analysis of regional differences

The cross test shows that all age groups mainly have fixed-line broadband at home, with the highest rate 72.4% in Taichung, Changhua and Nantou and the lowest rate 55.2% in Yilan, Hualien, and Taitung.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the fixed-line broadband at home significantly varies by age and marital status.

When analyzed by gender, 68.9% of women and 67.5% women have fixed broadband at home.

When analyzed by age, all age groups mainly have fixed-line broadband at home, with the highest rate 79.9% of 66 year-olds and over and the lowest rate 60.3% of 56–65 year-olds.

When analyzed by marital status, the majority of people regardless of marital status mainly have fixed-line broadband at home, with the highest rate 74% of those married people and the lowest rate 53.8% of those widowed or separated.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that fixed-line broadband at home

significantly varies by housing tenure and profession.

When analyzed by housing tenure, both home owners (70.6%) and house renters (59.6%) mainly have fixed-line broadband at home.

When analyzed by profession, except for those in real estate which has the highest proportion (67.6%) of not having fixed-line broadband at home, the other professions mainly have fixed broadband at home, with the highest rate 87.9% of those in publishing, audio-video production, mass communication, information, and communications, and the lowest rate 50.7% for those in health care and social work.

Fixed-line Broadband at Home Q58

1. Overall analysis

Among the types of fixed-line broadband used at home, ADSL (including xDSL) accounts for the highest rate (38.1%), followed by optical fiber (28.8%) and Cable Modem (20.8%) (see Figure 23).

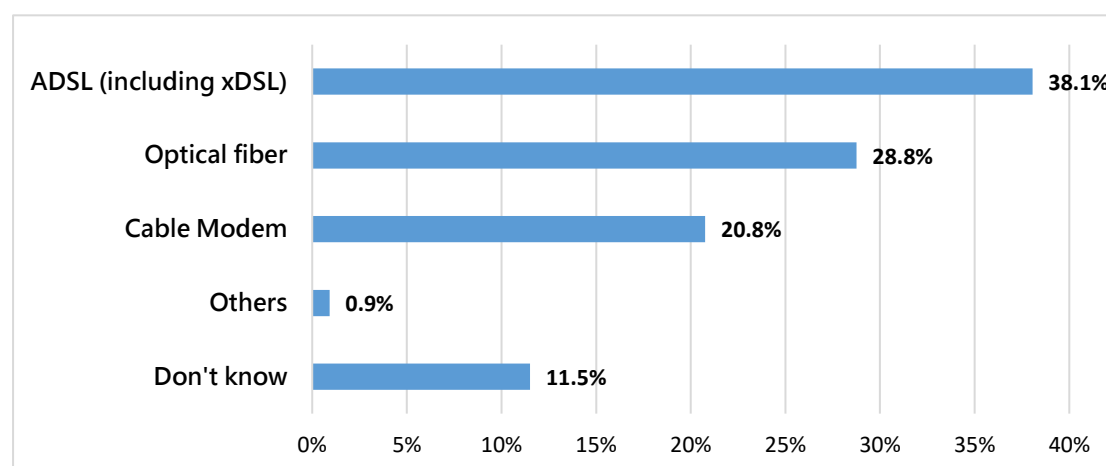


Figure 23 Fixed-line Broadband at Home

Base: N=655, single-choice (people who have fixed-line broadband at home and know which way they use to access the internet at home)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that people in Yunlin, Chiayi, and Tainan mostly use optical fiber (30.7%) while most in the other regions use ADSL (including xDSL). Among them, people in Taoyuan, Hsinchu and Miaoli have the highest rate of 43.4% while those in Yilan, Hualien, and Taitung the lowest rate of 33.6%.

(2) Analysis of basic differences

When analyzed by gender, both men (38.1%) and women (38.0%) have the highest rates for using ADSL (including xDSL).

When analyzed by age, 36-45 year-olds (37.4%) and 56-65 year-olds (36.4%) mostly use optical fiber while most in the other age groups use ADSL (including xDSL).

Among them, 26-35 year-olds have the highest rate (42.5%) while 46-55 year-olds have the lowest rate (38%).

When analyzed by marital status, those unmarried (42%) and those married (36.4%) both have the highest rates for using ADSL (including xDSL) while those widowed or separated (32.5%) have the highest rate for using optical fiber.

Whether there are new cable operators joining the market Q59

1. Overall analysis

Concerning whether there are new cable operators providing broadband service in people's living area, 40.6% answered "Yes" while 25.4% answered "No." 34% do not know (See Figure 24).

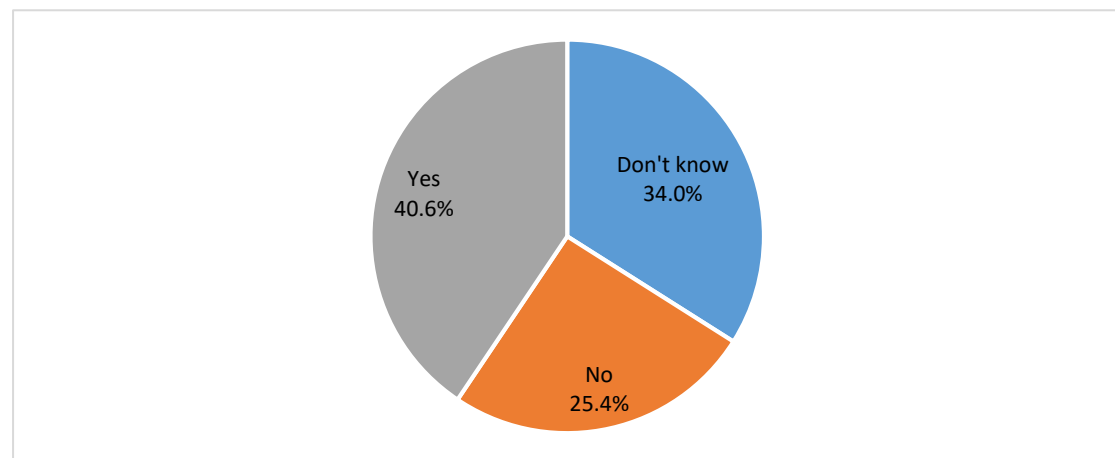


Figure 24 Whether There is a New Cable Operator Joining the Market

Base: N=508, single-choice (there are new cable operators joining the market in living area)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that among the cities where new operators have joined (New Taipei City, Taipei City, Kaohsiung, and Changhua), people in New Taipei City (42.1%) and Taipei City (56.3%) have higher rates answering "Yes" while those in Kaohsiung (42.2%) and Changhua (37.6%) have higher rates not knowing.

(2) Analysis of basic differences

The Chi-square test shows that whether there are new operators providing broadband service is significantly related to age.

When analyzed by gender, both men and women have higher rates answering "Yes" (39.8% and 41.3%) .

When analyzed by age, people aged 16-25 (47.7%) and above 66 (40.8%) have higher rate to not know while 26-35 year-olds (39.6%), 36-45 year-olds (50.5%), and 46-55 year-olds (50.8%) have higher rates to answer "Yes." The highest rate for 56-65 year-olds (37.6%) is to answer "No."

When analyzed by marital status, those unmarried (39.2%) and those married (43.8%) both have higher rates answering “Yes,” while the highest rate (37%) for those widowed or separated people is not knowing.

(3) Analysis of differences in social and economic status

The Chi-square test shows that knowing whether there are new operators providing broadband service is significantly related to education level and average monthly individual income.

When analyzed by education level, people in the elementary and below group (36.9%) and those with a master’s degree or higher (45%) have higher rates of not knowing; people in the high school and secondary school group have a higher rate (47.2%) of answering “No”; people in the senior high and vocational school group (42%), junior college group (46.5%), and people with a bachelor’s degree (45.3%) have a higher rate of answering “Yes.”

When analyzed by individual average monthly income, the NT\$10,000-19,999 group have a highest rate (50%) for answering “No”; people of no income (52%) and those in the NT\$1-9,999 group have a highest rate (42.9%) for not knowing; the other groups have the highest rates for answering “Yes.” Among those who answer “Yes,” the NT\$40,000-49,999 and NT\$50,000-59,999 groups have the highest rate of 50.2% while those in the NT\$60,000 and over group have the lowest rate (37.3%).

Whether to change to the new cable operator after the cross-areaed market is opened Q60

1. Overall analysis

After the crossed-areaed market of cable is opened, 19.6% of people have changed cable operator while 80.4% have not (See Figure 25).

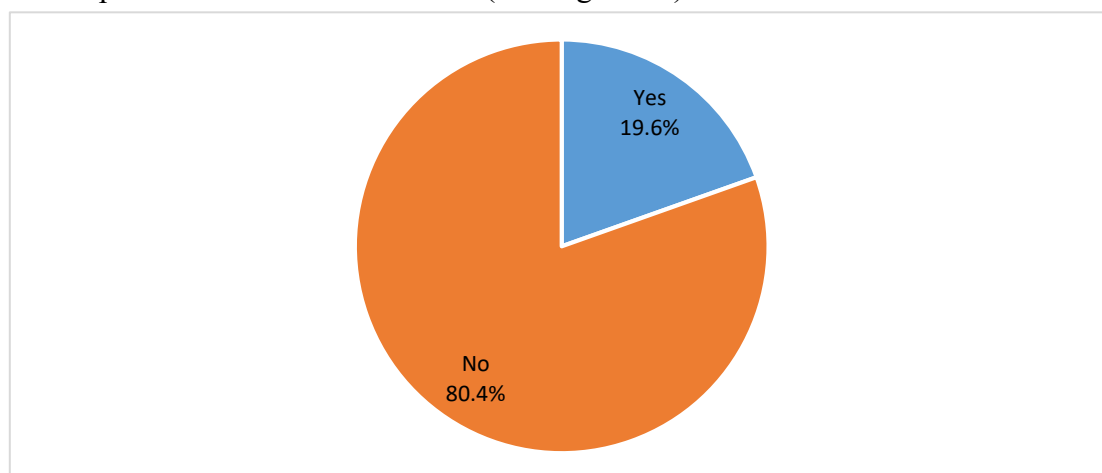


Figure 25 Whether to Change to the New Cable Operator after the Cross-Areaed Market is Open

Base: N=206, single-choice (people who know there are new cable operators joining the market in their living area)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that among the cities where new operators have joined the market (New Taipei City, Taipei City, Kaohsiung, and Changhua), people in the four regions all have higher rates for not changing to a new operator. Among those who have changed operator, New Taipei City has the highest rate of 23.4% while those in Taipei City the lowest of 16%.

(2) Analysis of basic differences

The Chi-square test shows that whether changing cable operator after the market is opened to new operators is significantly related to gender.

When analyzed by gender, 74.6% of men and 86% of women never change to new operators.

When analyzed by age, higher rates in all age groups never change to new cable operators. Among those who do change, 29.8% of 36-45 year-olds is the highest rate while 9.5% of 16-25 year-olds is the lowest.

When analyzed by marriage status, the higher rates never change to new cable operators. Among those who change, those widowed or separated have the highest rate of 31.8% while those married have the lowest of 17.1%.

The Most Common Ways Used to Access the Internet at Home Q62

1. Overall analysis

As mobile broadband has become widespread, the way that people access the internet is not limited to fixed broadband. There are 68% accessing the internet through mobile broadband (4G), followed by optical fiber (12.1%) (see Figure 26).

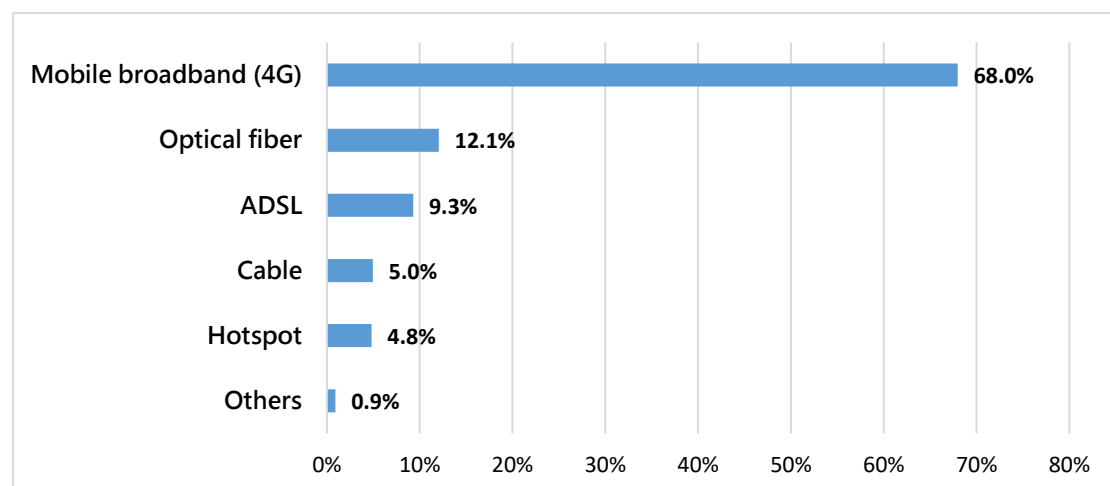


Figure 26 The Most Common Ways Used to Access the Internet at Home

Base : N=912, single-choice (people who have fixed broadband at home and know which way they use to access the internet at home)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that the rate of people using 4G to access the internet is the highest in all regions. Among them, the highest rate is in Yilan, Hualien, and Taitung (80.1%), and the lowest rate is in Taoyuan, Hsinchu and Miaoli (63.3%).

(2) Analysis of basic differences

The result of Chi-square tests indicates that the most common ways used access the internet at home significantly varies by age.

When analyzed by gender, 70% of women and 65.9% of men use 4G to access the internet.

When analyzed by age, the rate of people using 4G to access the internet is the highest in all age groups, with the highest rate 69.8% of 16–25 year-olds, and the lowest rate 58.6% 66 years-old and over. In addition, 20.5% of 66 year-olds and over is the highest proportion of using Wi-Fi to access the internet through cable than other groups.

When analyzed by marital, the rate for using 4G to access the internet is the highest regardless of marital status, with the highest rate of 71.4% among those widowed or separated, and the lowest rate 66.6% of those married.

Speed of Fixed-Line at Home Q69

1. Overall analysis

The highest rate of Taiwanese people applying a fixed-line speed at home is 15.4% for 100-300Mbps, followed by 9.4% for 20-60Mbps. However, there are 53.6% people who do not know the speed of their fixed line at home (see Figure 27).

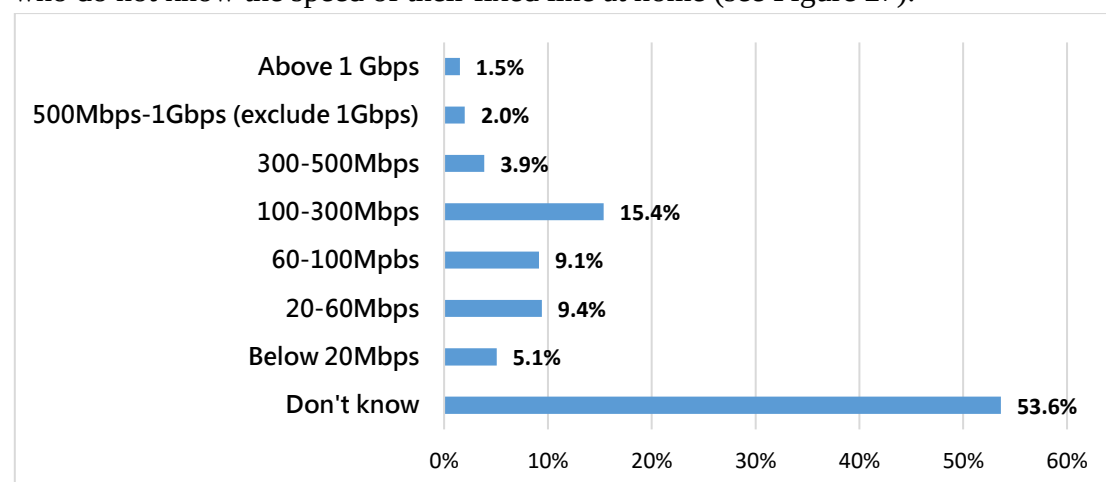


Figure 27 Speed of Fixed-Line Applied at Home

Base : N=655, single-choice (people who have fixed broadband at home)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that the proportion of those who do not know the speed

of their fixed line at home is the highest in all regions, with the highest 65.4% in Taoyuan, Hsinchu and Miaoli and the lowest 44.3% in Taichung, Changhua and Nantou.

(2) Analysis of basic differences

When analyzed by gender, both not knowing the speed is the proportion for both men (44.6%) and women (62.4%).

When analyzed by age, the highest in all age groups is for those who do not know the speed of their fixed line at home, with the highest 71.4% of 66 year-olds and over and the 42.2% of 26–35 year-olds.

When analyzed by marital status, the proportion of people who do not know the speed of their fixed line at home is the highest regardless of marital status, with the highest rate 67.3% widowed or separated and the lowest rate 42.6% unmarried.

Satisfaction with Quality of Fixed-Line Broadband Q74

1. Overall analysis

The average score for satisfaction with the quality of fixed-line broadband is 6.77 (1-point is very dissatisfied, and 10 points is very satisfied; N=655, people have fixed-line broadband at home)

2. Comparative analysis

(1) Analysis of regional differences

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the quality of fixed-line broadband significantly varies by regions.

The cross analysis suggests that, except in Yunlin, Chiayi and Tainan (5.82), the average satisfaction for all regions is higher than 6 points. Among them, the highest score is 7.25 in Kaohsiung, Pingtung and Penghu.

Table 16 Satisfaction with Quality of Fixed-Line Broadband (By Region)

Region	Average Hours
Taipei City, New Taipei City and Keelung	7.09
Taoyuan, Hsinchu and Miaoli	6.85
Taichung, Changhua and Nantou	6.53
Yunlin, Chiayi and Tainan	5.82
Kaohsiung, Pingtung and Penghu	7.25
Yilan, Hualien and Taitung	6.33
Average Score	6.77

Resource: Results of this research

(2) Analysis of basic differences

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the quality of fixed-line broadband significantly varies by regions.

When analyzed by gender, the average satisfaction for women using fixed-line broadband is 6.82 points, which is higher than the satisfaction of men (6.71).

When analyzed by age, the average satisfaction for 46–55 year-olds is the highest (7.11) while the score for 66 year-olds and over is the lowest (6.43).

When analyzed by marital status, the average satisfaction score for using fixed-line broadband is the highest among those married (6.94), and the lowest score is for those widowed or separated (6.0).

(3) Analysis of differences in social and economic status

The results of the one-way ANOVA analysis indicates that the average score for satisfaction with the quality of fixed-line broadband significantly varies by profession.

When analyzed by profession, the average satisfaction scores for using fixed-line broadband is the highest among people in the finance and insurance (7.66), and the lowest score is among jobseekers.

G. Usage of Voice Calls over the Internet

Usage of Voice Calls over the Internet Q76

1. Overall analysis

With the development of smartphone and mobile broadband services, there are 94.1% Taiwanese people making voice calls over the internet. On the other hand, there are 5.8% people who never use (see Figure 28).

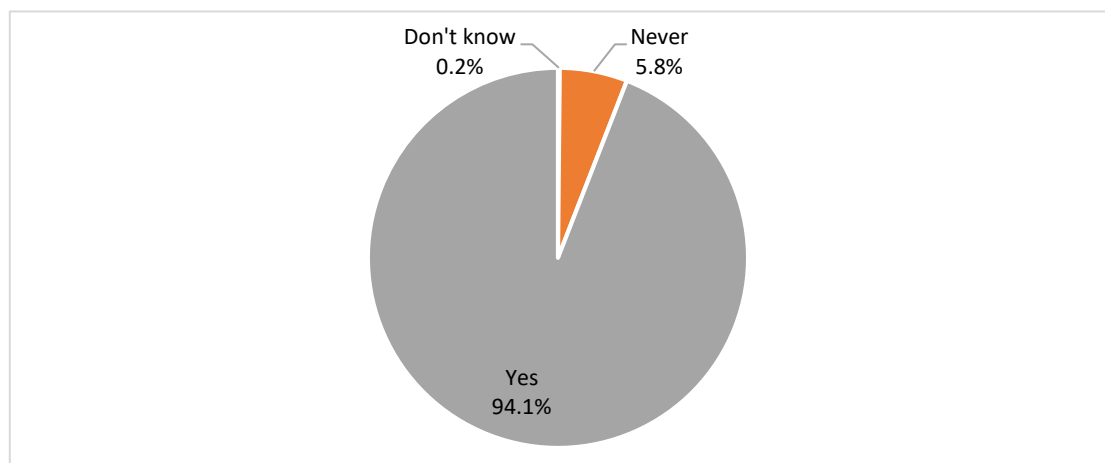


Figure 28 Whether Respondents or Family Members Have Made Voice Calls over the Internet

Base : N=1,032, single-choice (people who know it is possible to make voice calls over the internet)

2. Comparative analysis

(1) Analysis of regional differences

The cross test suggests that the rate of people who have made voice calls over the internet is the highest in all regions. Among them, the highest rate is 96.2% in Taipei

City, New Taipei City and Keelung, and the lowest rate is 90.7% in Taichung, Changhua and Nantou.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the rate of people who have made voice calls over the internet significantly varies by gender, age and marital status.

When analyzed by gender, both women (96.8%) and men (91.4%) have the highest rates for making voice calls over the internet.

When analyzed by age, the highest rate in all age groups have made voice calls over the internet, with the highest 98.4% of 16-25 year-olds and the lowest rate 80.9% of 66 year-olds and over.

When analyzed by marital status, the highest rate is for making voice calls over the internet regardless of marital status, with 95.8% of unmarried the highest rate and the lowest 85.6% of widowed or separated.

(3) Analysis of differences in social and economic status

The result of Chi-square tests indicates that those who have made voice calls over the internet significantly varies by gender, age and marriage status.

When analyzed by individual average monthly income, the highest rate for all income groups is for making voice calls over the internet, with the highest rate 98.8% in the NT\$60,000 and over group and the lowest 89.1% in the NT\$10,000-19,999 group.

Voice over Internet Protocol Telephone Service Used Q77

1. Overall analysis

LINE is the most popular for Voice over Internet Protocol (VoIP) with rates reaching 99.2%, followed by Facebook Messenger (46.4%). The rates for using other types of VoIP are all less than 20% (see Figure 29).

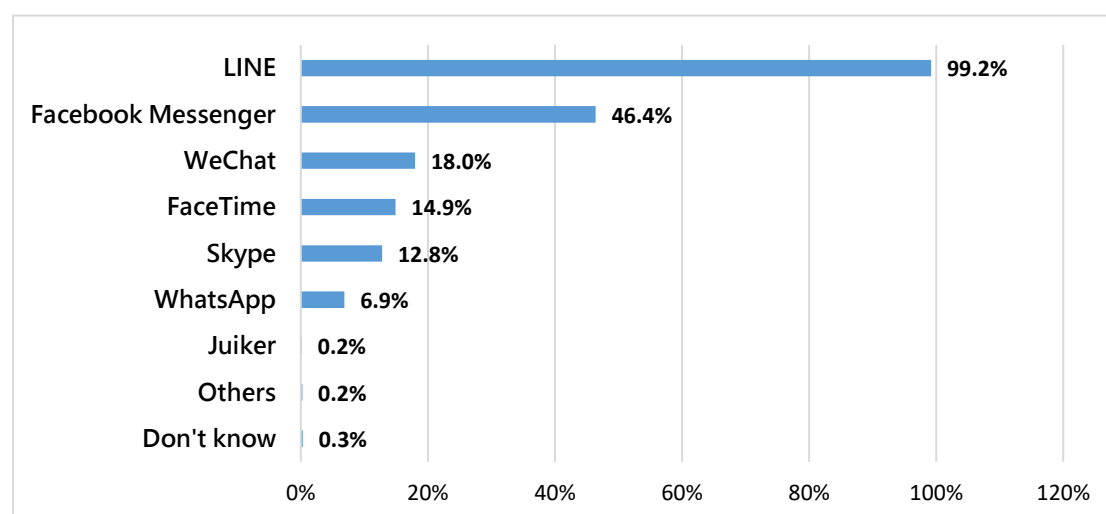


Figure 29 The Use of VoIP Service by Respondents or Families

Base : N=971, multiple choice (respondents or family members who have made voice calls over the internet)

2. Comparative analysis

(1) Analysis of regional differences

The cross analysis suggests that Line has the highest rate of use for all regions, all over 90%. Among them, the highest rate is 100% for Yilan, Hualien and Taitung, and the lowest rate is 97.9% for Yunlin, Chiayi, and Tainan.

(2) Analysis of basic differences

When analyzed by gender, using Line for VoIP has the highest rate for men (99.5%) and women (98.9%).

When analyzed by age, the rate for using of Line for all age groups are over 90%, with the highest rate 99.8% of 16–25 year-olds and 26–35 year-olds, and the lowest rate 98.1% of 56–65 year-olds.

When analyzed by marital status, the rates for using Line regardless of marital status are over 90%, with the highest rate 100% among those widowed or separated, and the lowest rate 98.7% among married.

Frequency of the use of VoIP services Q78

1. Overall analysis

The frequency of using VoIP services for people aged over 16 to be at least once per day accounts for the highest rate of 48.5%, followed by at least once per week with a rate of 21.4% (see Figure 30).

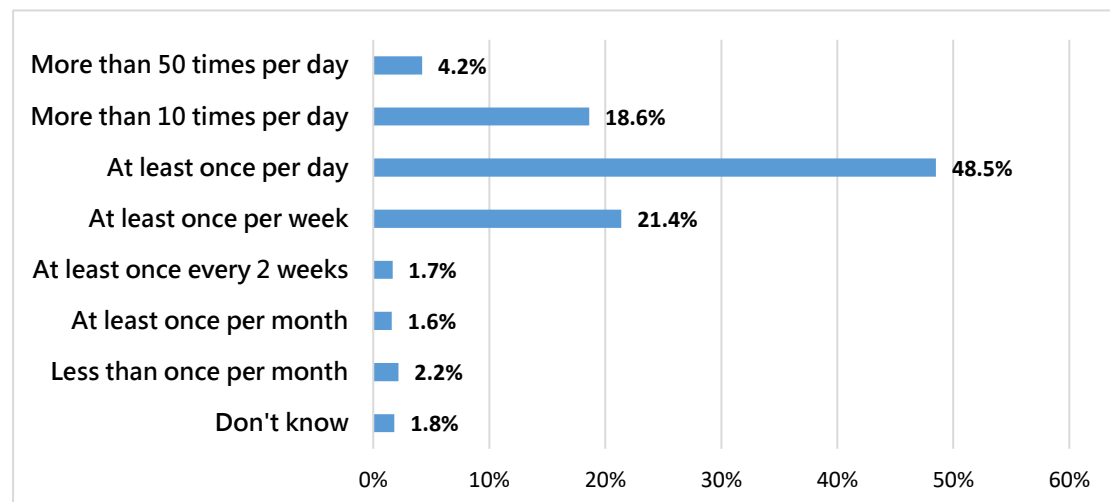


Figure 30 Frequency of the use of VoIP services

Base: N = 971, single-choice (respondents or family members who have made voice calls over the internet)

2. Comparative analysis

(1) Analysis of regional differences

The result of cross analysis finds that the frequency of using VoIP services with the highest rate at least once per day in all regions, with the highest rate 59.6% in

Kaohsiung, Pingtung and Penghu, and the lowest rate 40.3% in Taichung, Changhua and Nantou.

(2) Analysis of basic differences

The result of Chi-square tests indicates that the frequency of using VoIP services for different age groups varies significantly by marital status.

When analyzed by gender, the frequency of using VoIP services at least once per day has the highest rate of 49.3% among men and 47.8% among women.

When analyzed by age, the frequency of using VoIP services at least once per day has the highest rate for all age groups, with the highest rate of 55.6% for 66 year-olds and over, and the lowest rate 42.2% for 16-25 year-olds.

When analyzed by marital status, the frequency of using VoIP services at least once per day has the highest rate regardless of marital status, with the highest rate 53.1% of those married, and the lowest rate 36.6% of those widowed or separated.