

Communications Market Report 2020

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Communications Market Report

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Foreword

Continual rapid development in information and communications technologies is clearly the driving force behind the flourishing digital economy. Consequently, the communications sector has become more vital than ever to a nation's economy and its overall development. This can be underscored by the use of communications services not only affecting business operations and technological development within the communications industry, but also playing a key role in other sectors.

Conducting a comprehensive survey of communications thereby provides valuable insight to national development and has long been a means for organizations, such as Ofcom, the communications regulator in the UK, Ministry of Internal Affairs and Communications in Japan, KCC in Korea and IMDA in Singapore, to ascertain consumer behavior so that information can be regularly compiled and analyzed so as to determine key statistics and specific industry trends. Likewise, The National Communications Commission (NCC) in Taiwan conducted its first comprehensive communications market survey in 2017.

The aim of this year's survey was to acquire objective and detailed data on consumer behaviors and the status of the innovative applications through a comprehensive and in-depth investigation. Subsequently, the acquired information may serve as an indicator of the development of the digital economy of Taiwan, as well as a reference when determining future policies and regulations.

Part I: Overview of Communications in Taiwan provides an outline of the communications industry in Taiwan. Part II: Survey of Development of Digital Convergence in Communications begins with an outline of the background and research methods undertaken for this survey. The questionnaire was designed with particular referral to those conducted by Ofcom. With respect to sampling, a stratified three-stage probabilities proportional to size sampling was employed. In the first and second stages, samples were allocated based on the PPS principle; while in the third stage, samples were selected using purpose sampling and interviews to survey how Taiwanese people aged 16 and over use services in four categories: Telecommunications, Broadcasting, Broadband Usage, and Digital Convergence. In addition to the methods and structure, limitations of the sampling structure, samples received and the sample reasoning of this survey have all been clearly explained. Thus, this report contains the results of the four surveys of telecommunications, broadcasting, broadband usage and digital convergence, which have then been combined to present an overall analysis and provide a comprehensive picture of consumer behavior in Taiwan.

Part III contains a comparison of domestic and international trends of digital convergence, whereby both international trends and global development in the communications industry have been shown alongside those of Taiwan. And then, in Part IV, final conclusions are given, as well as some suggestions for further consideration.

01

Overview of Communications in Taiwan



Telecommunications

Market Revenue

The total revenue of both the telecommunications market and mobile communications services in Taiwan have been decreasing over recent years. The former fell from US\$12.915 billion in 2011 to US\$9.659 billion in 2019, while the latter decreased from US\$7.381 billion in 2011 to US\$5.241 billion in 2019 (Figure 1).

Number of Telecommunications Subscribers and Penetration

When comparing the numbers of subscribers of various telecommunications services in Taiwan between 2011 and 2019, it can be seen that the number of landline subscribers decreased from 16.91 million in 2011 to 12.97 million in 2019; meanwhile, the number of fixed broadband subscribers slightly increased from 5.46 million to 5.83 million over the same period. Meanwhile, the number of mobile phone subscribers fluctuated

slightly and by the end of 2019 had decreased a little from 29.34 million in 2018 to 29.29; in contrast, the number of mobile broadband subscribers grew significantly over the same period, from 9.93 million in 2011 and by the close of 2019, had reached 27.28 million (Figure 2).

When comparing the penetration of various telecommunications services in Taiwan between 2011 and 2019, it can be noted that the penetration of landline decreased from 72.66% in 2011 to 54.56% in 2019; meanwhile, fixed broadband penetration remained comparatively stable but by the end of 2019 had slightly increased from 24.13% in 2018 to 24.53%. As for mobile phone penetration over the same period, this fluctuated only slightly but decreased from 123.66% in 2018 to 123.21% the following year; finally, the penetration of mobile broadband more than doubled over the same period, from 42.67% in 2011 to 114.76% in 2019 (Figure 3).

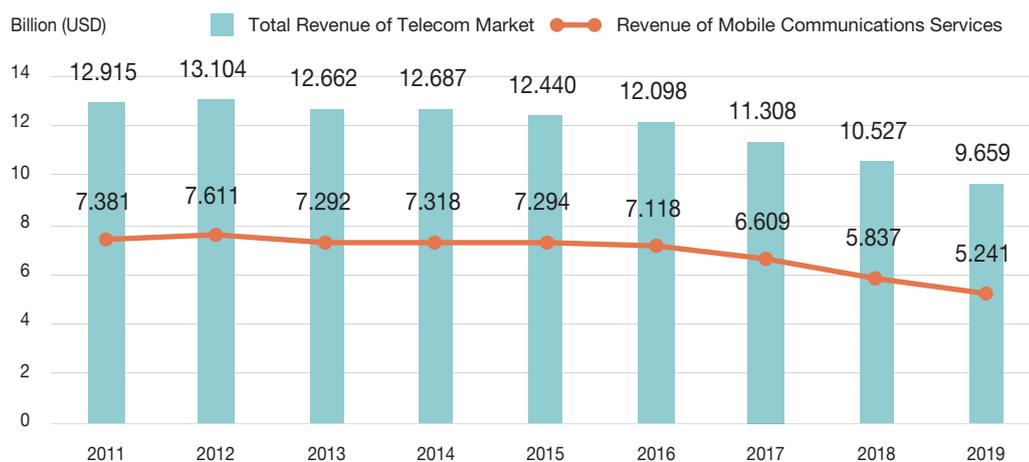


Figure 1 Telecommunications Market and Mobile Communications Services Revenues in Taiwan

Source: National Communications Council (NCC)

Note: Revenues of the telecommunications market and mobile communications services were originally calculated in NTD. For the sake of comparison, the figures have been converted to USD based on the exchange rates of Central Bank of the Republic of China during those years.

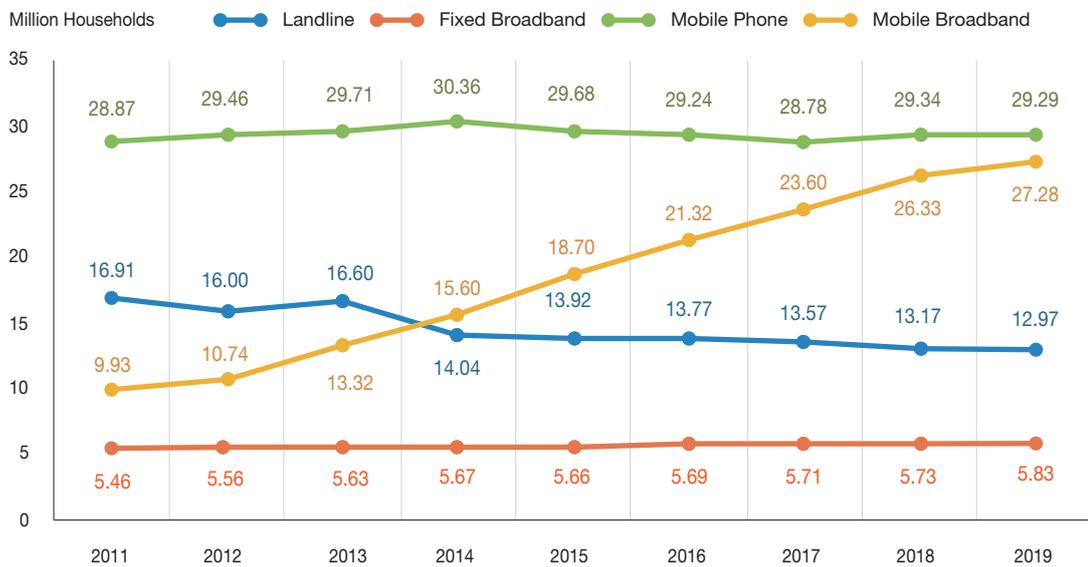


Figure 2 Subscriber Numbers of Various Telecommunications Services in Taiwan
Source: NCC

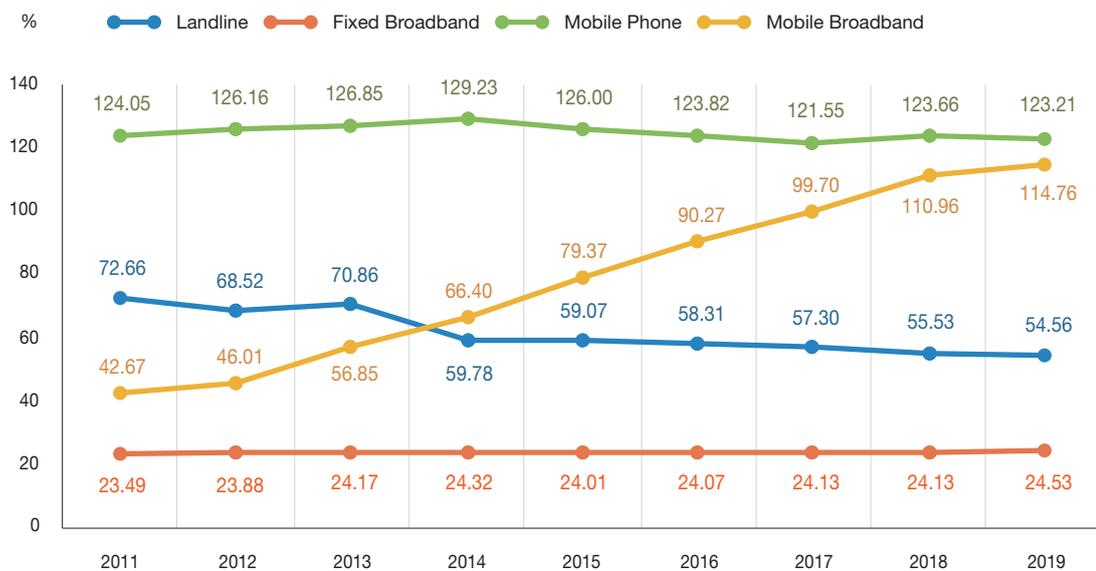


Figure 3 Penetration of Various Telecommunications Services in Taiwan
Source: NCC

Broadcasting

Market Revenue

Since 2017, the revenue of Taiwan’s broadcast market has been calculated on a different basis from previous years; therefore, only revenues of 2017, 2018 and 2019 have been included in this report. The revenue of the broadcasting market in various service sectors in 2019 have been provided henceforth: Satellite TV revenue increased from NT\$66.1 billion in 2017 to NT\$67.7 billion in 2018, but had decreased to NT\$65.6 billion in 2019; revenue of Cable TV decreased from NT\$38.2 billion in 2017 to NT\$35.8 billion in 2019; meanwhile, the revenue of terrestrial TV remained NT\$8.3 billion in 2017 and 2018, but had increased to NT\$8.4 billion in 2019; As for terrestrial radio, revenue had increased from NT\$4.1 billion in 2017 to NT\$4.4 billion in 2018 and 2019. In total, revenue of Taiwan’s broadcasting industry amounted to NT\$114.2 billion, a decrease of NT\$4 billion from 2018 (Figure 4).

Number of Pay TV Subscribers

Cable television has remained the most popular form of pay television over recent years. Between 2011 and 2018, the number of subscribers fluctuated before

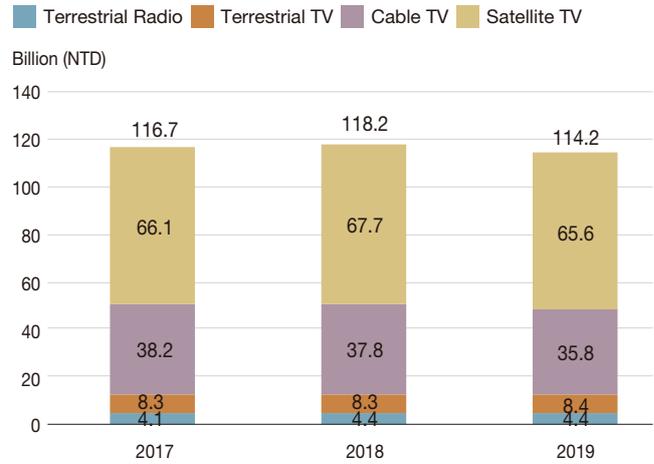


Figure 4 Broadcasting Revenue by Industry in Taiwan

Source: NCC

Note 1: Statistics submitted by public broadcast media have been included in the annual statistics from 2017.

Note 2: The financial information of all broadcast radio and television and cable radio and television enterprises with a satellite television license should be included in the satellite radio and television enterprise category from 2017 in accordance with the regulations.

moving down to 4.975 million in 2019, a decrease of 0.25 million from 2017; in contrast, the number of IPTV subscribers had grown steadily over the same period and increased significantly in 2017 and 2018, reaching 2.087 million in 2019; meanwhile, the number of satellite TV subscribers declined gradually to 7,000 in 2018 after reaching its peak in 2012 (Figure 5).

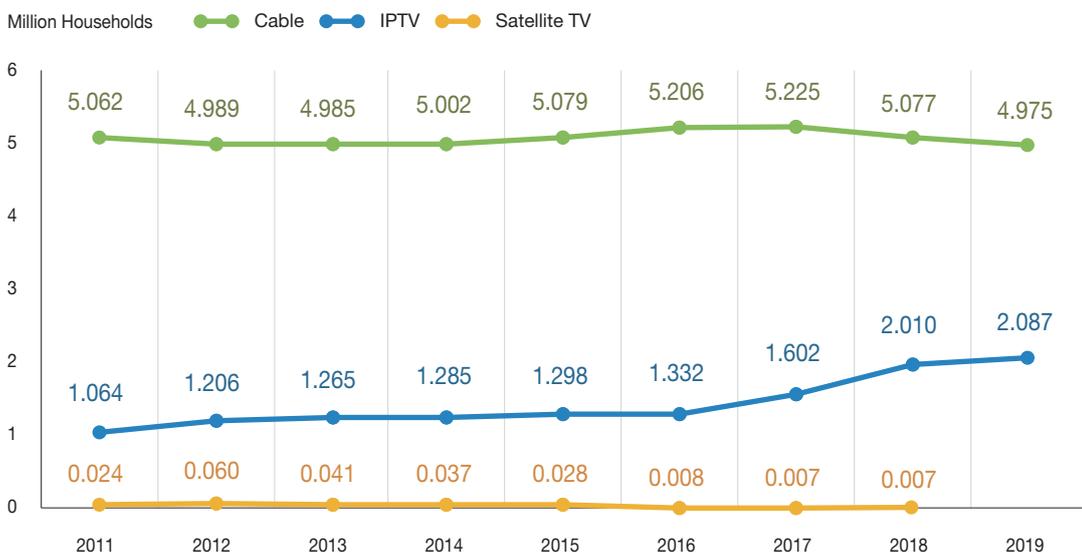


Figure 5 Pay TV Subscriber Numbers in Taiwan

Source: NCC

Note: Statistics for satellite TV subscribers up until 2018 only.

02

Survey of Development of Digital Convergence



Methodology

Questionnaire Design

The questionnaires used for this survey were adapted from research undertaken by Ofcom, which has gained extensive experience of surveying consumer behavior and trends in the communications industry. The survey, which covers four categories, telecommunications, broadcasting, broadband usage, and digital convergence, was conducted with the objective of obtaining data on consumer behavior and preferences, as well as key developments and innovations in the digital economy so as to obtain a thorough analysis and comprehensive in-depth investigation of demand for such services.

Population and Sampling Strategy

Survey Population

The survey was conducted in Taiwan, Penghu, Kinmen and Matsu with people aged 16 and over (those who were born on and before December 31, 2004).

Sampling Method

Due to the Personal Information Protection Act, household registers from the Ministry of the Interior were unavailable and a limited budget meant that sampling was designed and performed in three stages according to the principle of PPS (probabilities proportional to size) sampling. In the first and second stages, samples were allocated based on the PPS principle, while in the third stage samples were selected using purpose sampling.

Pilot Test

Prior to the formal survey, pilot tests were conducted. Thirty successful samples were taken in each of the four categories, a total of 120 successful samples. The original seven levels were merged to five after the pretest¹.

Formal Survey

Prior to conducting the formal survey, 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 2019, and 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. Consequently, a total of 1,100 samples were expected to be completed in each of the four investigations in Taiwan proper (including Penghu); Kinmen and Matsu a total of 60 samples. In view of the small population and extremely uneven distribution of population in the Hualien and Taitung areas, the stratified two-stage PPS (probabilities proportional to size) sampling was actually used, while the 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 certain townships.

The sampling units in each stage are explained as follows:

- A. During the two-stage sampling, the primary sampling units were “township” and then “people.” All of the “districts and townships” in the geographic stratum were included.
- B. During the 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 view to ensuring that the structure of

¹ In the pilot study, the classifications established by Pei-jun Hou et al. (2008) were adopted as the basis for the stratified sampling: villages, towns, cities and districts were grouped into seven levels based on the degree of development, being city centers, commercial and industrial areas, emerging cities and townships, traditional industry townships, less-developed townships, aged townships and remote

townships, with the last three levels— Levels 5, 6 and 7 – merged as one. The areas were defined as follows – North Area: Taipei City, New Taipei City, Keelung City, Taoyuan County, Hsinchu County and Hsinchu City, Miaoli County, Ilan County; Central

Table 1 Allocation of Samples

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	Total No. of Samples by Village
Taipei City, New Taipei City, Keelung, Yilan	Level 1	1,221,392	18.82%	66	3	2	6
	Level 2	3,205,432	49.40%	174	7	2	14
	Level 3	1,658,774	25.56%	90	4	2	8
	Level 4	403,164	6.21%	22	1	2	2
	Subtotal	6,488,762	32.06%	353	14		30
Taoyuan, Hsinchu, Miaoli	Level 1	1,176,640	36.79%	64	3	2	6
	Level 2	1,499,522	46.89%	82	3	2	6
	Level 3	521,746	16.32%	28	1	2	2
	Subtotal	3,197,908	15.80%	174	7		14
Taichung, Changhua, Nantou	Level 1	923,773	23.57%	50	2	2	4
	Level 2	1,283,279	32.74%	70	3	2	6
	Level 3	1,279,001	32.63%	70	3	2	6
	Level 4	433,564	11.06%	24	1	2	2
	Subtotal	3,919,617	19.37%	213	9		18
Yunlin, Chiayi, Tainan	Level 1	930,101	31.90%	51	2	2	4
	Level 2	1,214,657	41.65%	66	2	2	4
	Level 3	771,364	26.45%	42	2	2	4
	Subtotal	2,916,122	14.41%	159	6		12
Kaohsiung, Pingtung, Penghu	Level 1	1,134,075	35.00%	62	2	2	4
	Level 2	993,762	30.67%	54	2	2	4
	Level 3	1,111,938	34.32%	60	2	2	4
	Subtotal	3,239,775	16.01%	176	6		12
Hualien, Taitung	Level 1	251,969	53.14%	14	1	1	1
	Level 2	222,160	46.86%	12	1	1	1
	Subtotal	474,129	2.34%	26	2		2
Total		20,236,313	100.00%	1,100	44		88

the survey results could be 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 was not permitted to exceed the original sample number by $\pm 60\%$.

Allocation of Samples

At least 1,160 valid samples were investigated in each questionnaire with a sampling error of within $\pm 3\%$ at a 95% confidence level.

Since the original allocation of the survey site sampling was based on proportions of the entire population, these calculated decimal numbers had to be rounded to the nearest integers when the survey was actually performed. Moreover, to meet a specific requirement that the number of weighted samples in each age group must not exceed the original number of samples by $\pm 60\%$, the samples were allocated and adjusted accordingly.

Survey Period

The interviews took place in the selected areas between April 15 and June 5, 2020.

Implementation of Survey

Timeline

Before the survey was formally launched, preparations for questionnaires and related affairs were undertaken between April 2 and 10, 2020. After the questionnaires were modified based on the conclusions from the meeting with the agency that commissioned this study, the survey formally began on April 15, 2020. The timeline is outlined as follows.

A. Preparation period: February 20 to April 14, 2020

B. Survey period:

- Phase 1: April 2 to April 10, 2020
- Phase 2: April 15 to June 5, 2020

C. Review period: June 5 to June 14, 2020

Survey Method

Face-to-face interviews were adopted; a computer-assisted interview survey system was used during the interview, and was complemented with printed questionnaires.

Sample Structure

This survey was conducted in Taiwan, Penghu, Kinmen and Matsu. Since the total number of those aged 16 and above in Kinmen and Matsu is 137,933, which is too small for analysis, the number of samples from Kinmen and Matsu was reduced to eight when weighted analysis was performed with samples from all 22 cities and counties. In order to compare the annual data, the samples of Taiwan proper (including Penghu) were separated from those of Kinmen and Matsu.

As of June 14, 2020, the telecommunications, broadcasting, broadband usage and digital convergence survey for this research had been implemented and reviewed by the research team, with 1,103, 1,106, 1,105 and 1,103 questionnaires completed as valid samples respectively.

Research Limitations

Sample Frame Limitations

Based on the requirements of the NCC, at least 1,100 successful samples in Taiwan proper (including Penghu) 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.

Sample Recovery Restrictions

The survey questionnaires contained 83-103 questions. In order to meet the requirement of at least 1,100 successful sample responses, groups of two interviewers were arranged at bustling locations, such as parks and busy crossroads.

During telecommunications, broadcasting, broadband usage and digital convergence surveys, the average number of those who did not comply was 7.74, 7.98, 9.54 and 8.19 respectively. Among the aged 55 and over groups, the average number of refusals was 10.95, 9.53, 12.48 and 11.53 respectively, making it much harder to achieve the planned number of interviews when compared with young people. Even so, those conducting the individual surveys 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 $\pm 60\%$.

Sample Inference Restrictions

- A. Telecommunications Market: after weighing, the sample number of young people, such as ages 16-25, was 0.84 times greater; the sample number of ages 26-35 was 0.88 times greater; the sample number of ages 36-45 was 1.08 times greater; the sample number of middle-aged people such as ages 46-55 was 1.01 times greater; the sample number of ages 56-65 was 1.02 times greater; and the sample number of ages 66 and above was 1.22 times greater.
- B. Broadcasting Market: after weighing, the sample number of young people, such as ages 16-25, was 0.84 times greater; the sample number of ages 26-35 was 0.9 times greater; the sample number of ages 36-45 was 1.01 times greater; the sample number of middle-aged people such as ages 46-55 was 1.01 times greater; the sample number of ages 56-65 was 1.09 times greater; and the sample number of ages 66 and above was 1.2 times greater.
- C. Broadband Usage: after weighing, the sample number of young people, such as ages 16-25, was

0.83 times greater; the sample number of ages 26-35 was 0.91 times greater; the sample number of ages 36-45 was 1.02 times greater; the sample number of middle-aged people such as ages 46-55 was 1 times greater; the sample number of ages 56-65 was 1.01 times greater; and the sample number of ages 66 and above was 1.33 times greater.

- D. Digital Convergence: after weighing, the sample number of young people, such as ages 16-25, was 0.84 times greater; the sample number of ages 26-35 was 0.87 times greater; the sample number of ages 36-45 was 1.02 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 1.08 times greater; and the sample number of ages 66 and above was 1.31 times greater.

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

Results

Telecommunications Market

Mobile Phone Only Group Exceeds 30%

When asked which type of phone was used at home, although most of those surveyed replied that they still use both a landline and a mobile phone, that ratio has been steadily decreasing year by year, falling from 79% in 2017 to 64.3% in 2020. In contrast, the ratio of those who replied that they only used a mobile phone now exceeds 30%, rising from 17.7% in 2017 to 31.8% in 2020 (Figure 6).

Familiarity Is Main Criterion in Choosing a Telecom Operator

When asked about the main criteria for choosing a telecom operator, the answer “because of use by relatives

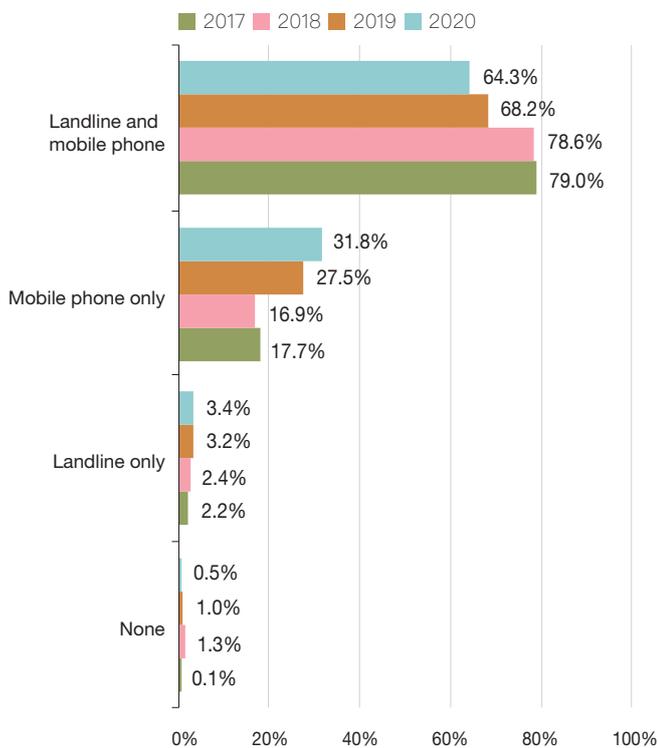


Figure 6 2017 - 2020 Type of Phone Used at Home

Base: N = 1,131 in 2017; N = 1,068 in 2018; N = 1,115 in 2019; N = 1,103 in 2020 (All interviewees)

Note: Those who answered “I don’t know” accounted for 0.7% with 0.3% refusing to answer in 2017; those who answered “I don’t know” accounted for 0.7% with 0.1% refusing to answer in 2018.

and friends” topped the list in 2017 and 2018, but the ratio has reduced year on year. In 2019 and 2020, being used to the operator’s services answers became the most common, with “communications quality is better” answers ranking the second since 2018 (Figure 7).

Unlimited Mobile Data Plans Preferred

Unlimited mobile data plans have been very popular in Taiwan. The respondents who were on an unlimited data plan have made up a growing percentage of the surveyed population, which has risen from 67.1% in 2017 to 81.7% in 2020 (including those who were on an unlimited data plan with or without a speed cap and those who did not know whether their unlimited data plan had a speed cap

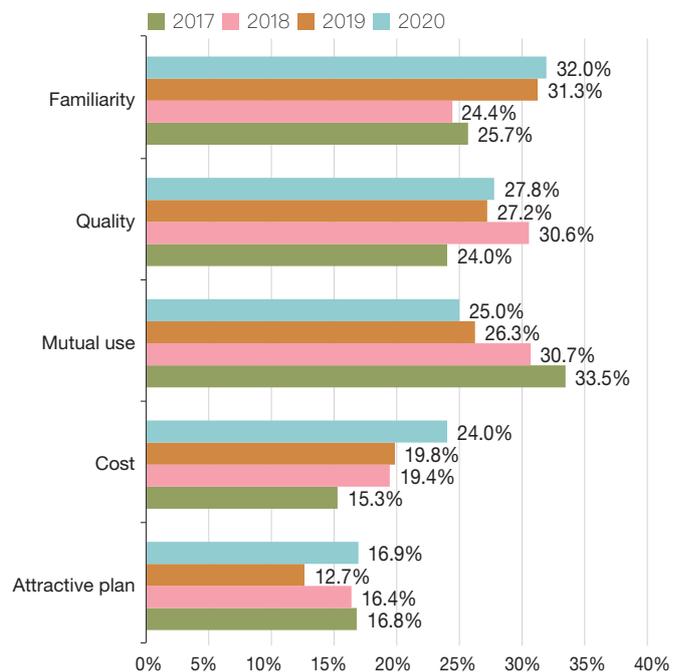


Figure 7 2017 - 2020 Criteria in Choosing a Telecom Operator (Top 5)

Base: N = 1,093 in 2017; N = 1,009 in 2018; N = 1,070 in 2019; N = 1,045 in 2020 (Multiple answers allowed; those who used a mobile phone and were aware which telecoms operator they were with)

Note: Those who answered “Others” and “I don’t know” accounted for 1.4% and 2.1% respectively with 0.3% refusing to answer in 2017; those who answered “Others” and “I don’t know” accounted for 2.1% and 1.8% respectively with 0.3% refusing to answer in 2018; while “Others” and “I don’t know” answers accounted for 4.3% and 1.4% in 2019.

or not). In contrast, the percentage of those on a limited data plan with a speed cap has decreased from 26.5% in 2017 to 15.1% in 2020 (Figure 8).

Mobile Internet Service Satisfaction Grows Year on Year

The satisfaction with mobile internet service by those surveyed has grown year on year from 6.93 in 2017 to 7.25 in 2020 (Figure 9).

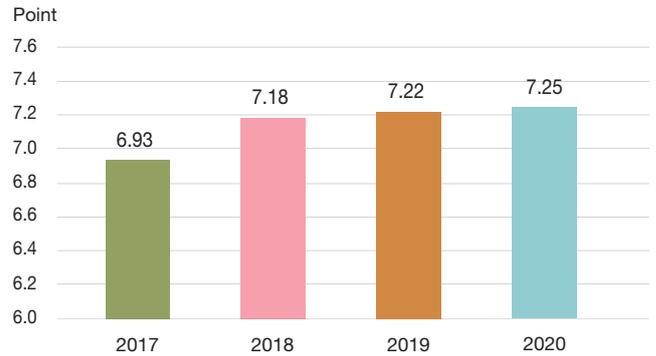


Figure 9 2017 - 2020 Satisfaction with Mobile Internet Service

Base: N = 899 in 2017; N = 838 in 2018; N = 930 in 2019; N = 886 in 2020 (Those who used a smart phone or traditional mobile phone with a mobile data plan)

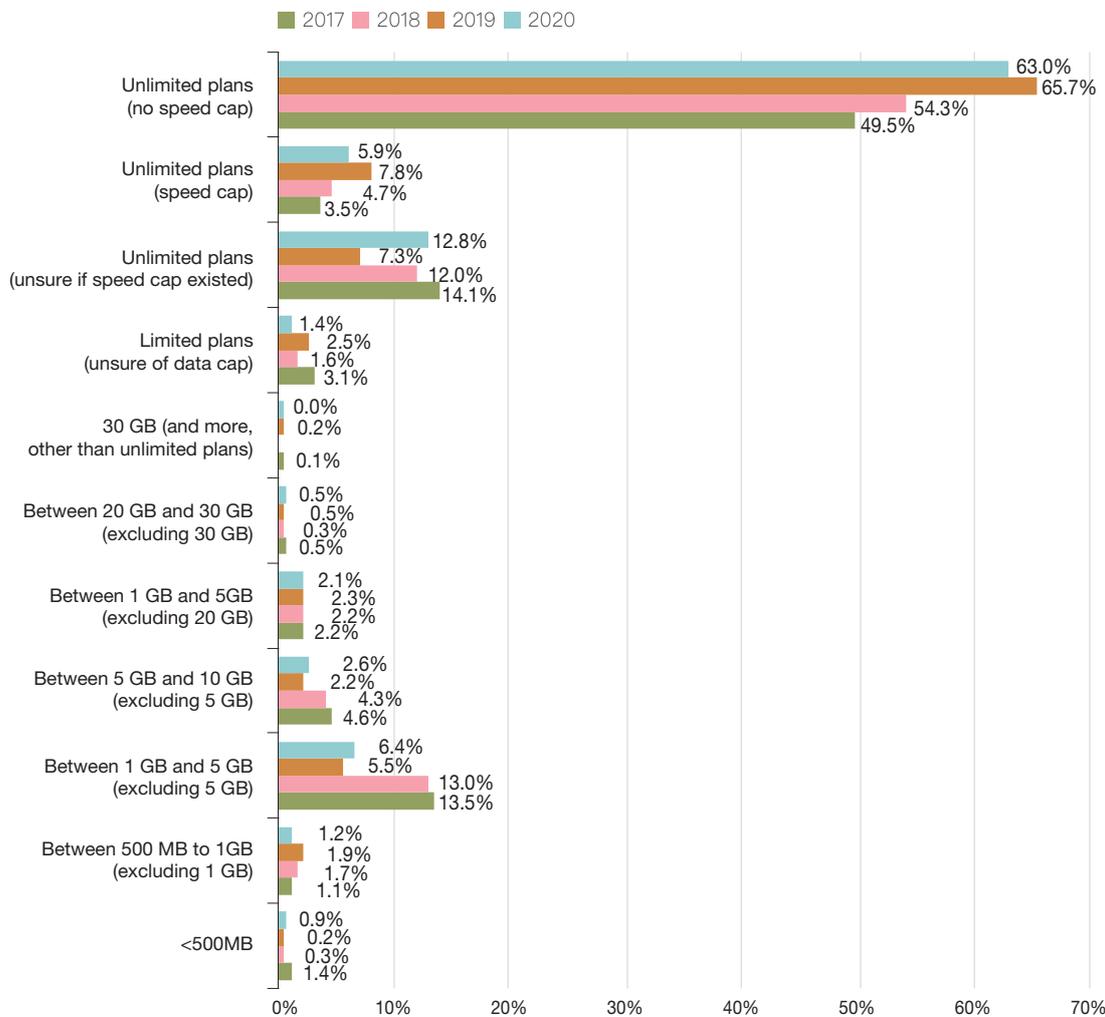


Figure 8 2017 - 2020 Mobile Data Plans

Base: N = 899 in 2017; N = 838 in 2018; N = 930 in 2019; N = 886 in 2020 (Those who used a mobile phone with a mobile data plan)

Note 1: Those who answered "Others" and "I don't know" accounted for 0.7% and 5.6% respectively in 2017; those who answered "I don't know" accounted for 5.3% with 0.2% refusing to answer in 2018; while "I don't know" answers accounted for 3.1% in 2019.

Note 2: If an item of the chart does not show data, it means that no respondent chose that option that year.

Fixed Home Broadband Ratio Reduces Year on Year

Most of the surveyed had a fixed home broadband, but the ratio has decreased year on year from 75.9% in 2017 to 65.8% in 2020 (Figure 10).

4G Mobile Broadband Internet Service Most Used at Home

When asked about internet access at home, 66.3% of the respondents replied that they use their mobile broadband service, rising from 50% in 2017; on the other hand, the ratio of those who replied with either “Telecom operator’s ADSL modem router with Wi-Fi extender” or “Cable TV provider’s ADSL modem router with Wi-Fi extender” has dropped fairly dramatically since 2019 (Figure 11).

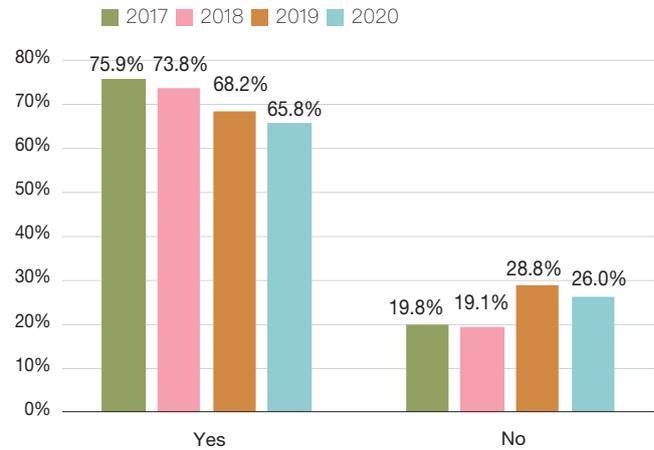


Figure 10 2017 - 2020 Fixed Broadband at Home

Base: N = 1,017 in 2017; N = 950 in 2018; N = 961 in 2019; N = 980 in 2020 (Those who might access the internet at home)
 Note: Those who answered “I don’t know” accounted for 4% with 0.4% refusing to answer in 2017; “I don’t know” answers accounted for 6.8%, with 0.3% refusing to answer in 2018; “I don’t know” answers accounted for 3% in 2019; and “I don’t know” answers accounted for 8.2% in 2020.

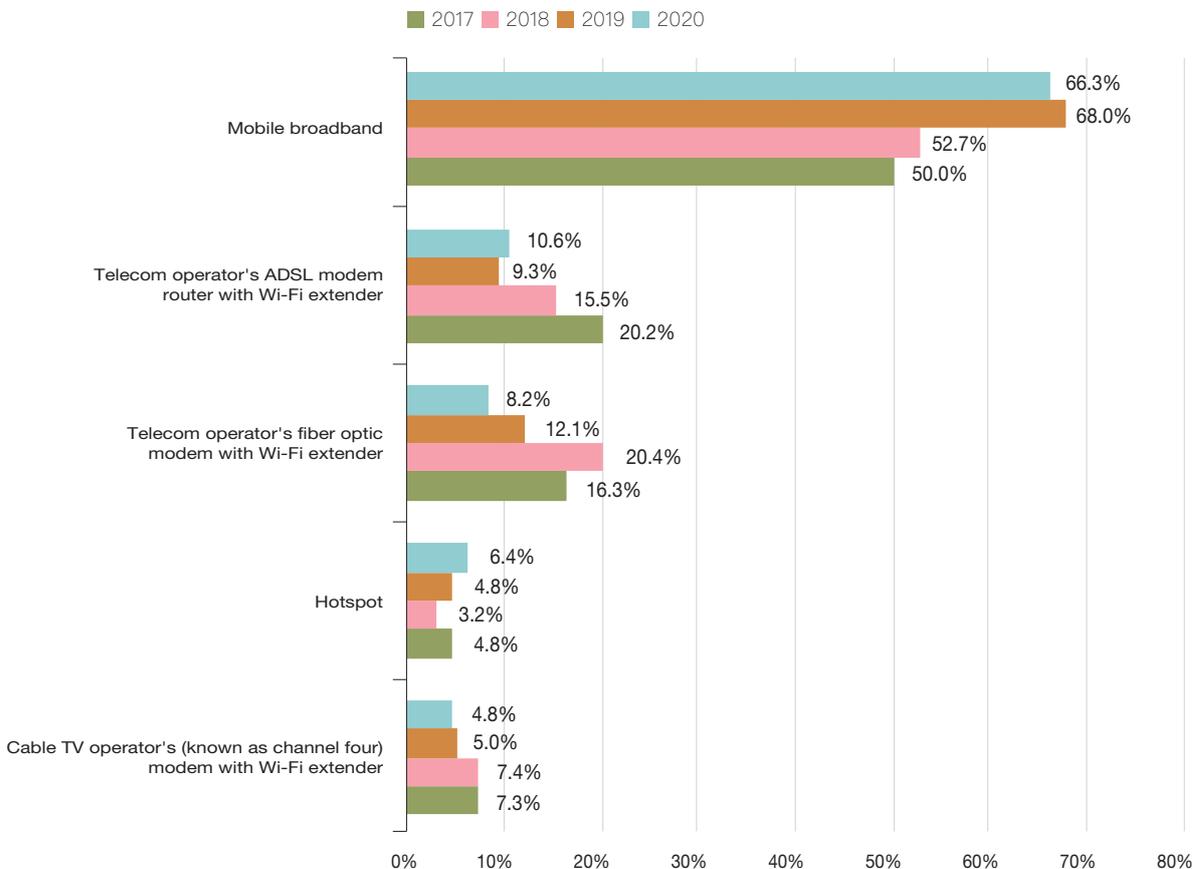


Figure 11 2017 - 2020 Most Common Form of Internet Access at Home

Base: N = 951 in 2017; N = 669 in 2018; N = 912 in 2019; N = 940 in 2020 (Those who had fixed broadband and knew which form of Internet access was used)
 Note: Those who answered “Others” and “I don’t know” accounted for 0.5% and 1% respectively in 2017; “Others” answers accounted for 0.3% with 0.2% answering “I don’t know” in 2018; while “Others” and “I don’t know” answers accounted for 0.7% and 2.9% respectively in 2019.

Broadcasting Market

Over 90% Watch Television, But Only 35% Listen to Radio

When asked about whether they watched television or listened to radio, more than half respondents said they only watched TV, but the ratio slightly decreased to 59.3% in 2020 after rising from 54.6% in 2017 to 63.3% in 2019. Those who both watched television and listened to radio was the second most common response, with the percentage rising to 34.8% in 2020 after reducing from 34.8% in 2017 to 27.3% in 2019 (Figure 12).

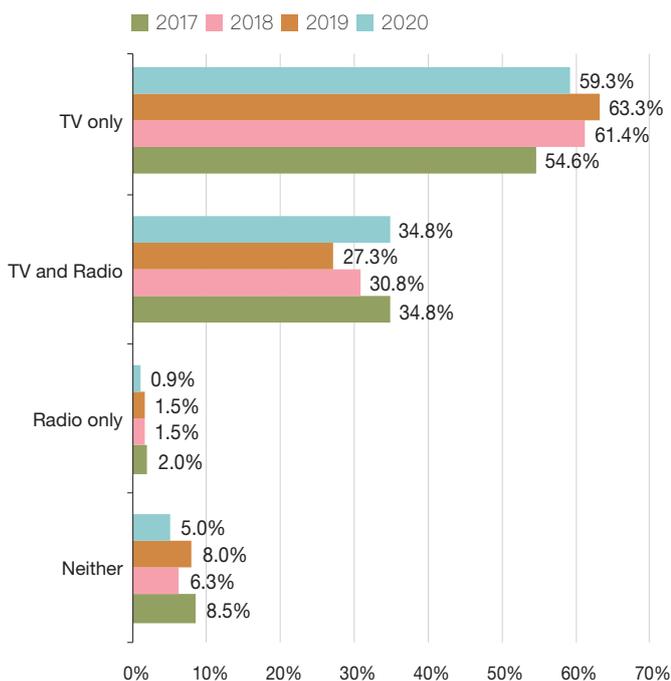


Figure 12 2017 - 2020 Television and Radio
 Base: N = 1,126 in 2017; N = 1,078 in 2018; N = 1,105 in 2019; N = 1,104 in 2020 (All interviewees)
 Note: Those refusing to answer accounted for 0.1% in 2017.

Although Cable TV Remains the Most Common Means to Watch Television, Penetration of OTT TV Exceeds 10%

When asked about the main source of viewing television, most respondents answered cable TV, with the ratio rising from 56.1% in 2019 to 64.3% in 2020. Although the percentage of those replying “Chunghwa Telecom’s MOD” has decreased slightly, from 14.3% in 2019 to 13.1% in 2020, it still outnumbers the ratio of those who answered terrestrial TV. The proportion of OTT TV answers surged to 10.5% in 2019 and rose to 11.4% in 2020 to become the third most common; terrestrial TV answers, once the second most common with the rate of 16.7% in 2019, have shrunk to just 9.4% during 2020 (Figure 13).

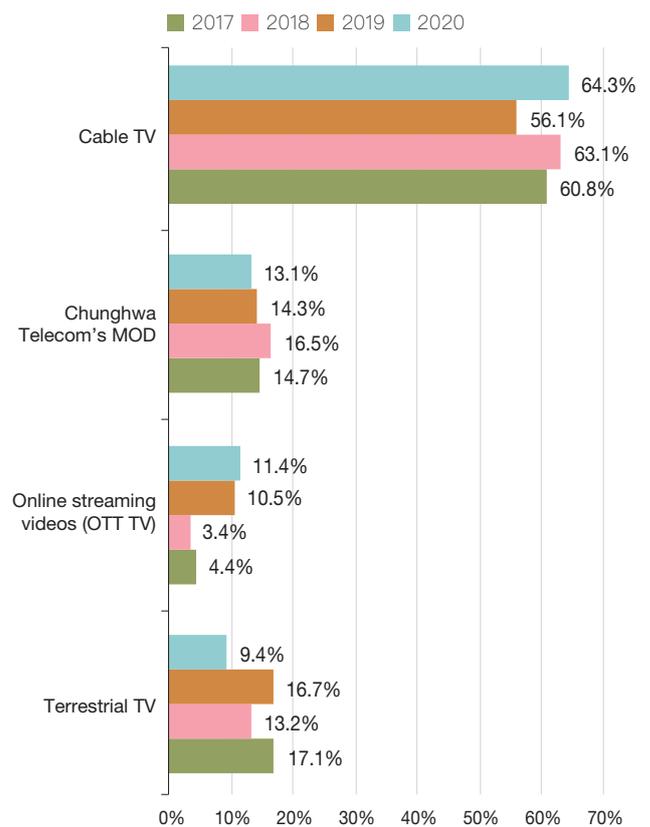


Figure 13 2017 - 2020 Main Source of Viewing Television
 Base: N = 1,105 in 2017; N = 1,041 in 2018; N = 1,025 in 2019; N = 1,032 in 2020 (excluding those who did not know which TV system was used)
 Note: Those who answered “Others” and “I don’t know” accounted for 1.4% and 1.5% respectively with 0.1% refusing to answer in 2017; those who answered “Others” and “I don’t know” accounted for 0.6% and 2.9% respectively with 0.3% refusing to answer in 2018; while “Others” and “I don’t know” answers both accounted for 0.9% in 2019.

People Pay Increasing Attention to International News

When it comes to which television programs are watched most often, local news broadcasts topped the list for the fourth consecutive year, but the ratio slightly decreased to 68.1% in 2020 after growing from 65.9% in 2017 to 70.9% in 2019. International news broadcasts became the second most common answer by outnumbering weather broadcasts, with the proportion increasing from 45.1% in 2019 to 52.9% in 2020. Dramas was the fourth most common response, outnumbering variety shows, with the ratio growing from 39.5% in 2019 to 45.3% in 2020 (Figure 14).

Overly Repetitive News Broadcasts Are Disliked the Most

Over 30% of those surveyed replied they had watched annoying or offensive content on television during the past 12 months, but the proportion slightly reduced from 39.8% in 2019 to 36% in 2020 (Figure 15). When it comes

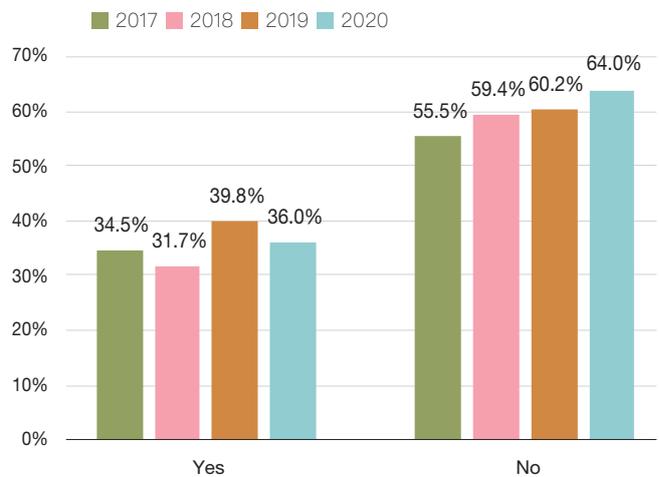


Figure 15 2017 - 2020 Annoying or Offensive Content on Television over the Past 12 Months

Base: N = 1,007 in 2017; N = 994 in 2018; N = 1,000 in 2019; N = 1,038 in 2020 (TV viewers)

Note: Those who answered "I don't know" accounted for 9.6% with 0.4% refusing to answer in 2017; those who answered "I don't know" accounted for 8.8% with 0.1% refusing to answer in 2018.

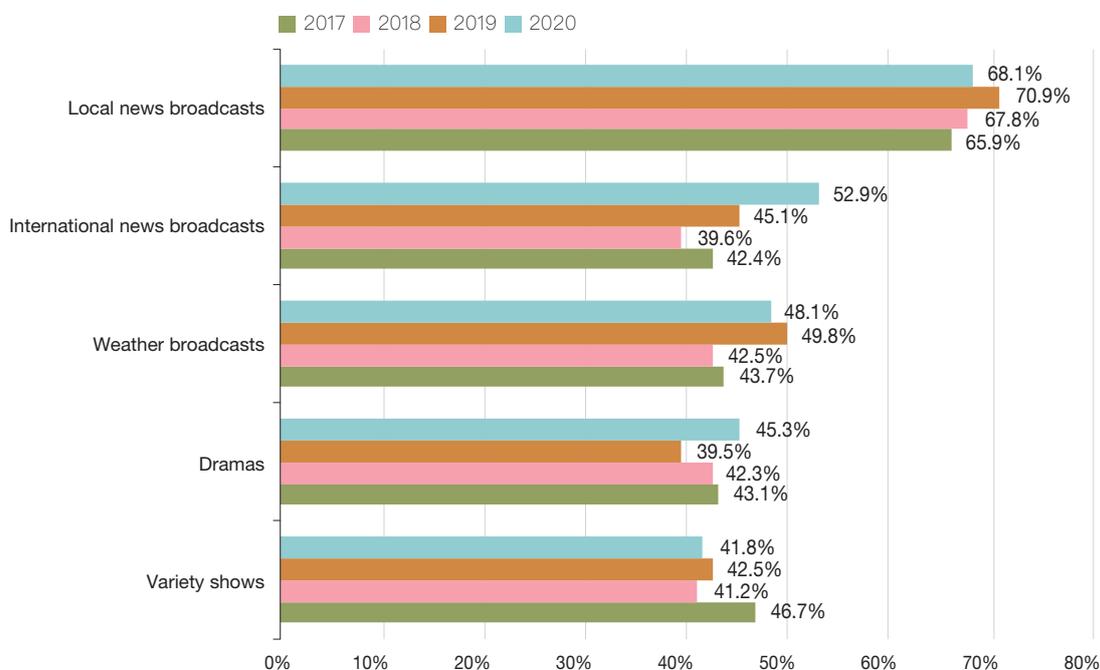


Figure 14 2017 - 2020 Types of TV Programs Commonly Watched (Top 5)

Base: N = 1,007 in 2017; N = 994 in 2018; N = 1,000 in 2019; N = 1,038 in 2020 (Multiple answers allowed; TV viewers)

Note: Those who answered "Others" and "I don't know" accounted for 0.1% and 0.2% respectively with 0.1% refusing to answer in 2017; those who answered "Others" and "I don't know" accounted for 0.2% and 1.2% respectively with 0.2% refusing to answer in 2018; while "Others" and "I don't know" answers accounted for 0.8% and 2% respectively in 2019; while "Others" and "I don't know" answers accounted for 1% and 1.1% respectively in 2020.

to what was the annoying or offensive content, violence made up the bulk of the replies in both 2017 and 2018, followed by overly repetitive news broadcasts, but the ratios of overly repetitive news broadcasts, biased political news broadcasts and political campaign propaganda answers have all significantly increased since 2019 and ranked among the top three most common responses in 2019 and 2020 (Figure 16).

Nearly 20% Recognizes Improvement in Quality of TV Programs Over the Past 12 Months

When asked if TV programs had improved in quality during the past 12 months, 58.4% answered that they had remained the same, but that ratio is less than the 61.4% who answered the same in 2019. Meanwhile, the ratio of respondents who answered they have improved rose 19.1% in 2020 after having dropped from 18.6% in 2017 to 14.2% in 2018; consequently, the percentage of those who answered they have become worse has dipped from 13.2% in 2019 to 11% in 2020 (Figure 17).

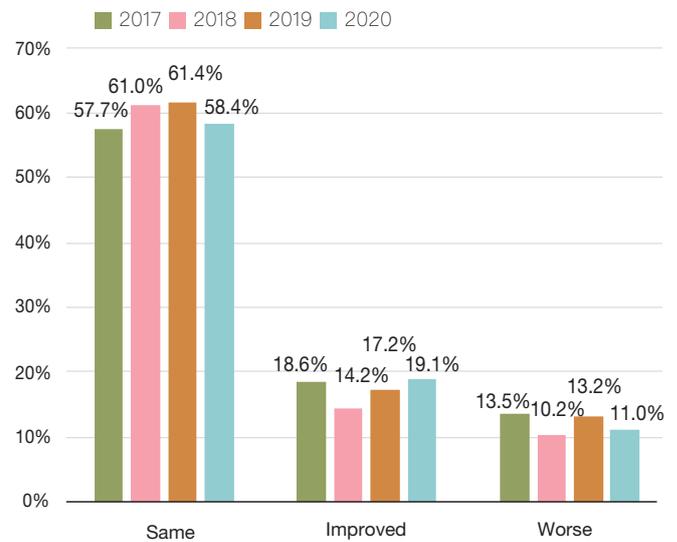


Figure 17 2017 - 2020 Improvement in Quality of TV Programs over the Past 12 Months

Base: N = 1,007 in 2017; N = 994 in 2018; N = 1,000 in 2019; N = 1,038 in 2020 (TV viewers)

Note: Those who answered "I don't know" accounted for 10.2% in 2017; those who answered "I don't know" accounted for 14.6% in 2018; "I don't know" answers accounted for 8.2% in 2019; while those who answered "I don't know" accounted for 11.5% in 2020.

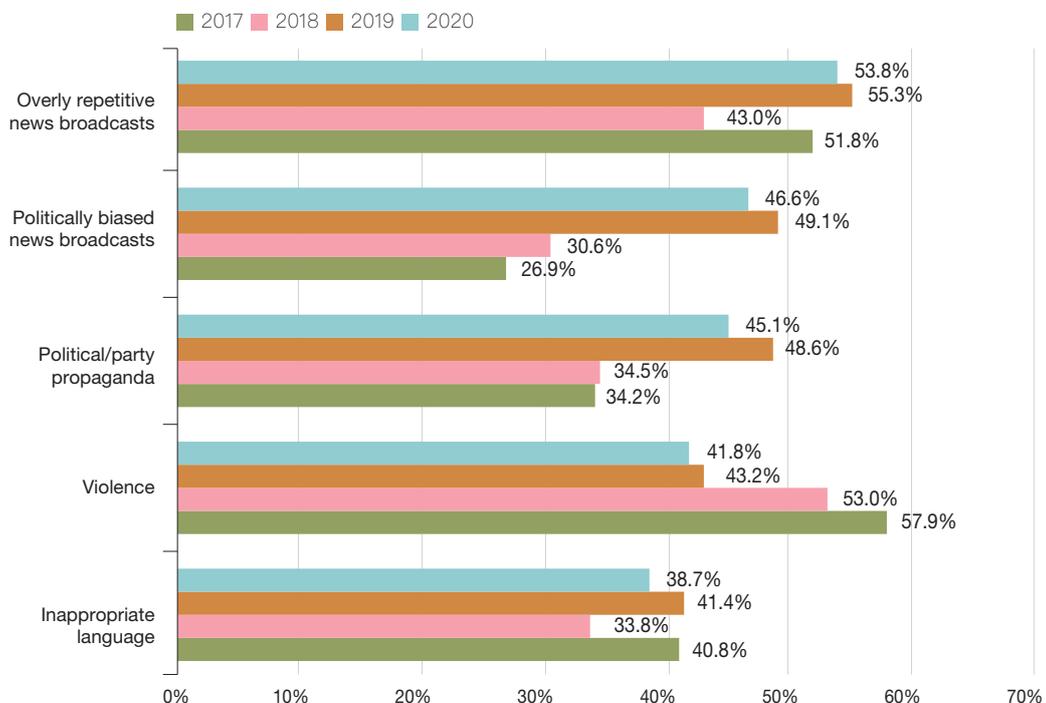


Figure 16 2017 - 2020 Most Offensive Content (Top 5)

Base: N = 348 in 2017; N = 316 in 2018; N = 398 in 2019; N = 374 in 2020 (Multiple answers allowed; those who had watched annoying or offensive content on TV in the past 12 months)

Note: Those who answered "I don't know" accounted for 1.2% with 0.2% refusing to answer in 2017; "I don't know" answers accounted for 1.3% in 2018; "I don't know" answers accounted for 0.8% in 2019; and "I don't know" answers accounted for 0.3% in 2020.

Awareness of Regulations for Radio and TV Broadcasting Increasing Year by Year

When it comes to the awareness of regulations for television broadcasting, the ratio of those with a positive answer to this question is increasing year by year from 43.9% in 2017 to 60% in 2020 (Figure 18). The proportion of those aware of regulations for radio broadcasting is slightly lower than that of television broadcasting, but has also grown from 36.1% in 2017 to 52.9% in 2020 (Figure 19).

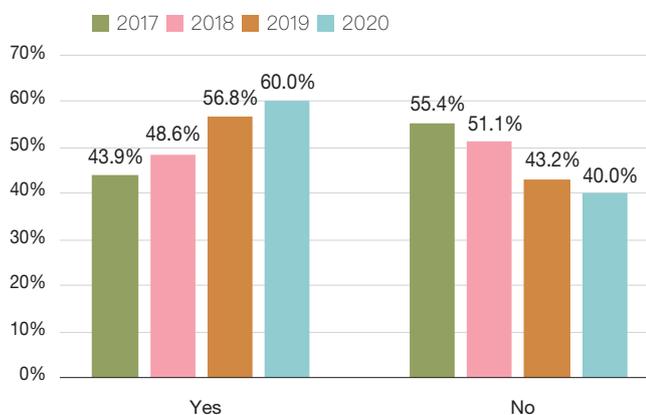


Figure 18 2017 - 2020 Awareness of Regulations for TV Broadcasting

Base: N = 1,126 in 2017; N = 1,078 in 2018; N = 1,105 in 2019; N = 1,104 in 2020 (All interviewees)
 Note: Those refusing to answer accounted for 0.7% in 2017; those refusing to answer accounted for 0.3% in 2018.

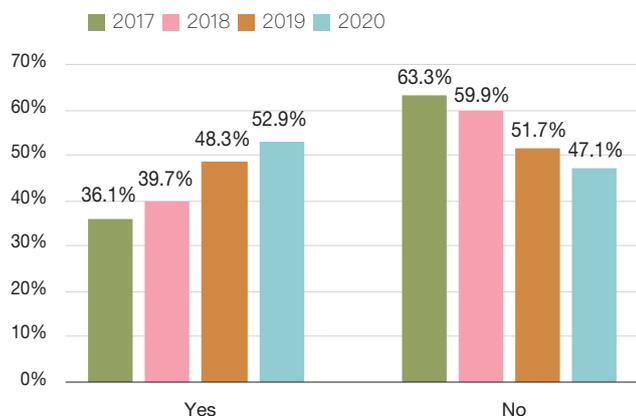


Figure 19 2017 - 2020 Awareness of Regulations for Radio Broadcasting

Base: N = 1,126 in 2017; N = 1,078 in 2018; N = 1,105 in 2019; N = 1,104 in 2020 (All interviewees)
 Note: Those refusing to answer accounted for 0.5% in 2017; those refusing to answer accounted for 0.3% in 2018.

Broadband Usage

Time Spent Online at Home Dramatically Increases

When it comes to the average time spent online at home, the average time grew from 19.53 hours in 2017 to 20.61 hours in 2018, and remained at around 20 hours in 2019, but has jumped to 27.17 hours in 2020. The average time spent online at the workplace or school decreased from 22.12 hours in 2017 to 20.52 hours in 2019 and then slightly increased to 20.79 hours in 2020; while the average time spent online at other places has been falling from 13.97 hours in 2017 to 11.39 hours in 2020 (Figure 20).

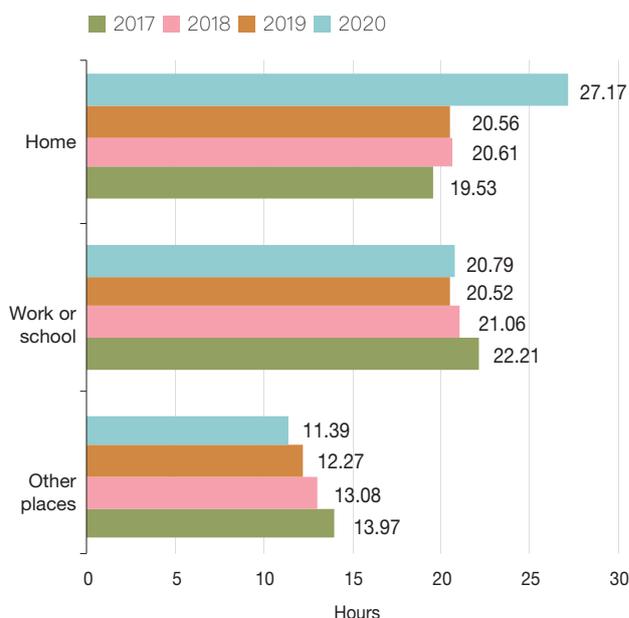


Figure 20 2017 - 2020 Average Time Online at Various Places During the Week

For average time spent online at home per week: Base: N = 1,067 in 2017; N = 937 in 2018; N = 888 in 2019; N = 924 in 2020 (Those who knew how long they stayed on the internet at home)
 For average time spent online at work or school per week: Base: N = 865 in 2017; N = 827 in 2018; N = 785 in 2019; N = 855 in 2020 (Those who accessed the internet at places other than home)
 For average time spent online at places other than home per week: Base: N = 865 in 2017; N = 827 in 2018; N = 785 in 2019; N = 855 in 2020 (Those who accessed the internet at places other than home)

Personal Information Leaks Is the Top Concern About Going Online

When it comes to whether internet users had concerns about going online, the percentage of positive answers has fluctuated between 2017 and 2020, with the ratio rising from 42.3% in 2017 to 50.5% in 2018, and shrinking to 41.5% in 2019, and then rising again to 45.1% in 2020 (Figure 21).

Furthermore, when it comes to what their concerns about going online were, leaking personal information accounted for the largest portion, followed by fraud. Nonetheless, the percentage of leaking personal information responses in 2020 (77.2%) was slightly lower than in 2019 (82.4%); while the percentage of those concerning fraud rose slightly to 63.9% in 2020 (Figure 22).

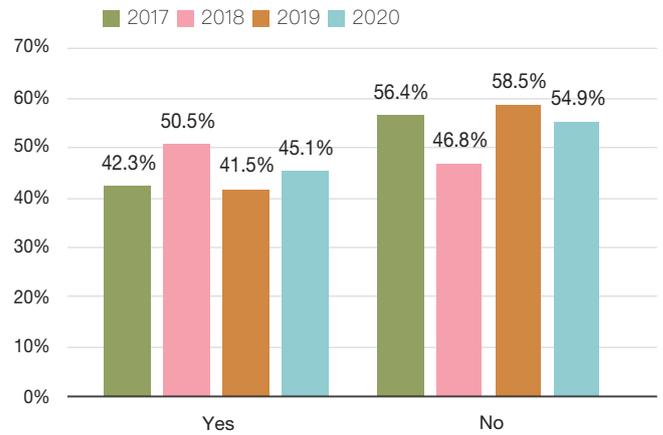


Figure 21 2017 - 2020 Concerns About Going Online
 Base: N = 1,131 in 2017; N = 1,072 in 2018; N = 1,129 in 2019; N = 1,105 in 2020 (All interviewees)
 Note: Those refusing to answer accounted for 1.3% in 2017; those refusing to answer accounted for 2.7% in 2018.

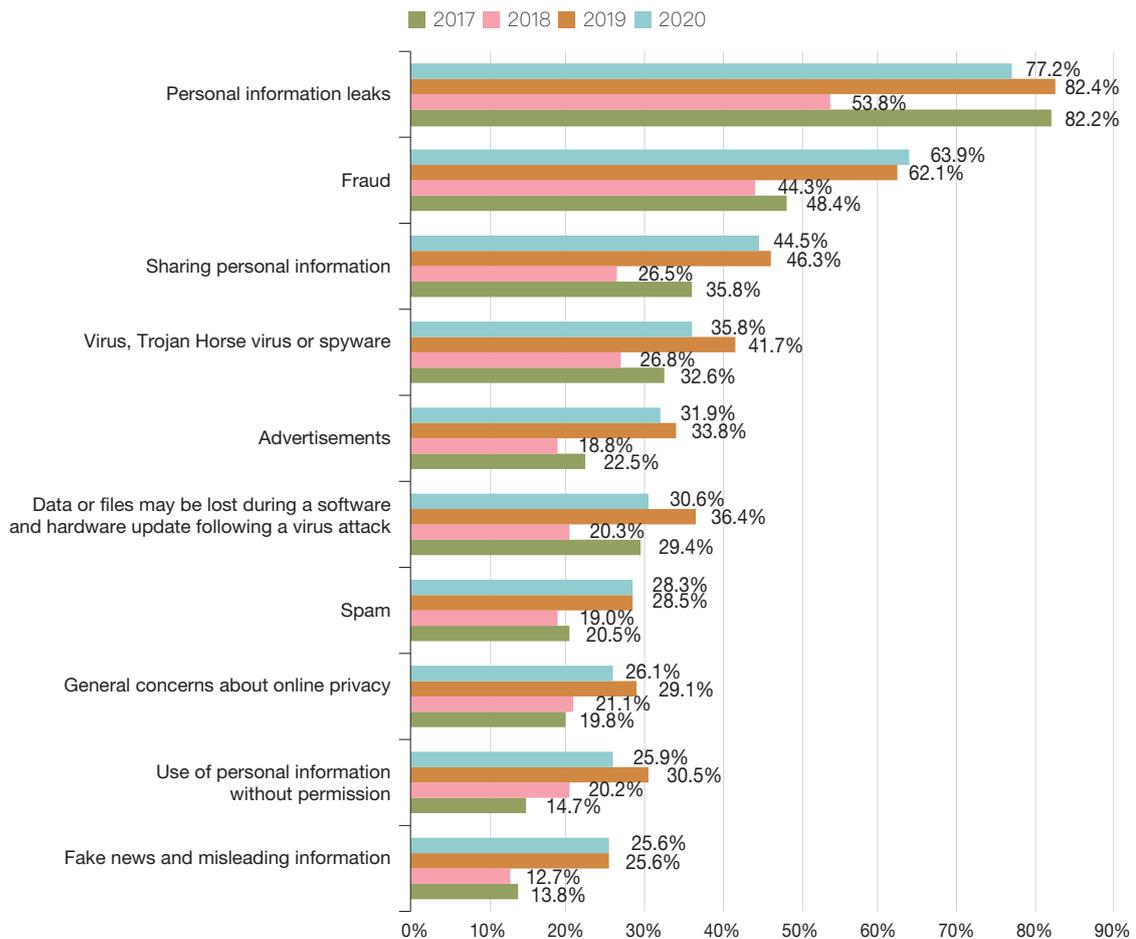


Figure 22 2017 - 2020 Reasons for Concerns About Going Online (Top 10)
 Base: N = 478 in 2017; N = 542 in 2018; N = 468 in 2019; N = 499 in 2020 (Multiple answers allowed, those who had concerns about internet use)
 Note: Those who answered "I don't know" accounted for 0.8% in 2017; those who answered "Others" and "I don't know" accounted for 0.5% and 2.6% with 0.3% refusing to answer in 2018; while "Others" and "I don't know" answers accounted for 1.4% and 1.3% respectively in 2019; while "Others" and "I don't know" answers accounted for 0.2% and 1.2% respectively in 2020.

Most Respondents Have a Social Media or Instant Messaging Account

The ratio of those surveyed who had any social media or messenger account has grown year on year from 83.6% in 2017 to 97.4% in 2020 (Figure 23). When it comes to the most commonly used social media or messenger app for the interviewees, the answer LINE has been the most common over the four consecutive years, followed by Facebook. However, the proportion of LINE answers decreased to 72.4% in 2020 after growing from 65.6% in 2017 to 76.9% in 2019; while in contrast, the proportion of Facebook answers rose slightly to 14.2% in 2020 after shrinking from 25.7% in 2017 to 11.7% in 2019 (Figure 24).

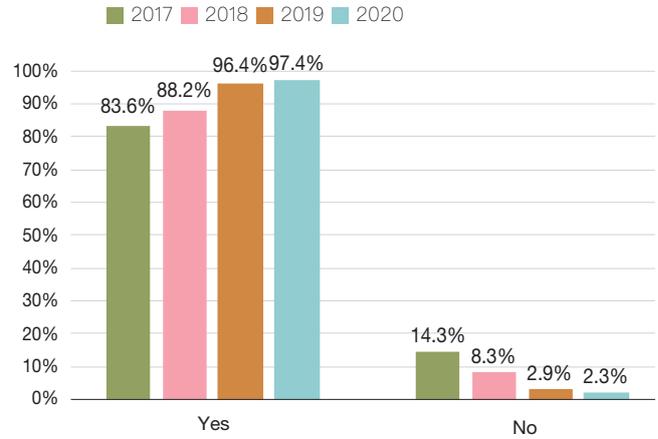


Figure 23 2017 - 2020 Social Media and Instant Messaging Use

Base: N = 1,079 in 2017; N = 959 in 2018; N = 899 in 2019; N = 932 in 2020 (Those who was online)

Note: Those who answered "I don't know" accounted for 1.6% with 0.6% refusing to answer in 2017; "I don't know" answers accounted for 1.9%, with 1.6% refusing to answer in 2018; "I don't know" answers accounted for 0.7% in 2019; and "I don't know" answers accounted for 0.3% in 2020.

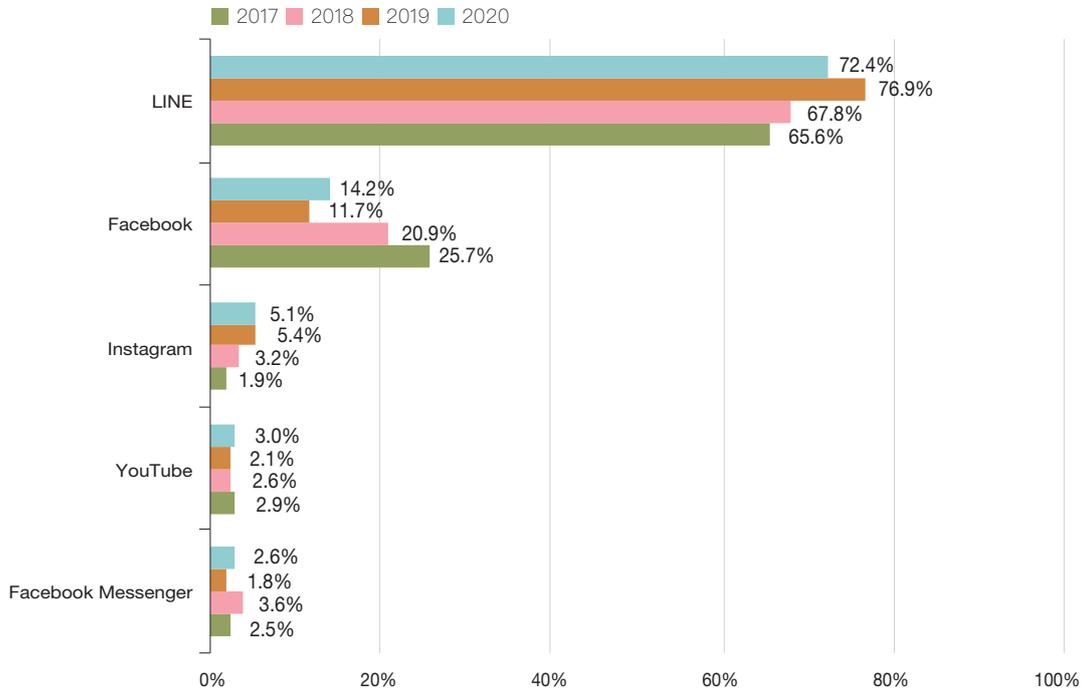


Figure 24 2017 - 2020 Most Commonly Used Social Media or Messenger Services (Top 5)

Base: N = 897 in 2017; N = 841 in 2018; N = 866 in 2019; N = 907 in 2020 (Those who answered they had used social media or instant messaging accounts)

Note: Those who answered "I don't know" accounted for 0.9% in 2017; "I don't know" answers accounted for 0.2%, with 0.1% refusing to answer in 2018; "I don't know" answers accounted for 0.1% in 2019; and "I don't know" answers accounted for 0.6% in 2020.

Most People Are Skeptical About Authenticity of Information from Social Media

More than seventy percent said they had thought about the authenticity of the information published on social media websites and apps when using these media, with the percentage slightly rising from 72.4% in 2019 to 73.1% in 2020 (Figure 25). When asked about the authenticity of the information from the websites or apps, more than half answered that they thought it to be partly true, but the ratio has dropped from 58% in 2019 to 51.3% in 2020; while the percentage of those who answered mostly true has grown from 39% in 2019 to 43.1% in 2020 (Figure 26).

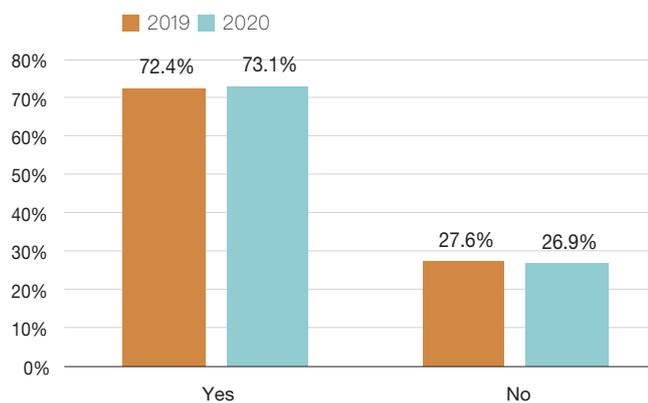


Figure 25 2019 - 2020 Consideration of Authenticity of Information on Social Media Websites or Apps

Base: N = 867 in 2019; N = 908 in 2020 (Those who used social media or instant messaging accounts)

Note: This question was added in 2019.

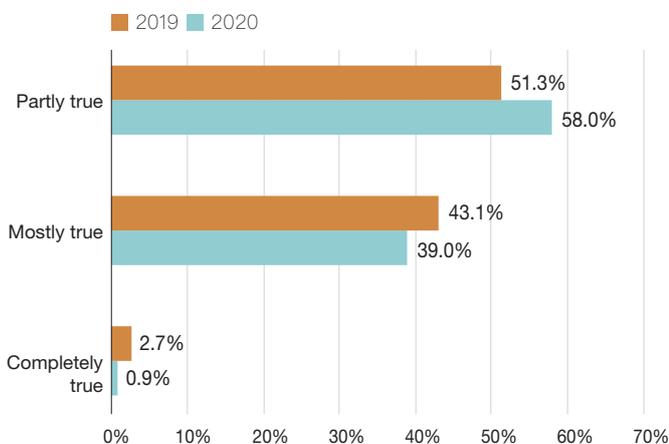


Figure 26 2019 - 2020 Level of Factual Information Published on Social Media Websites or Apps

Base: N = 628 in 2019; N = 663 in 2020 (Those who had thought about the authenticity of the information published on social media websites or apps when using these media)

Note: This question was added in 2019.

Over Half of Respondents Search for Information on YouTube and Social Media

When it comes to how to search for information on the internet, search engines has been the most popular for four consecutive years with the ratio exceeding 80% in 2017, 2019 and 2020. Meanwhile, the number of those who replied YouTube or social media websites has been increasing, both accounting for more than 50% in 2020 to be the second and the third most commonly used respectively (Figure 27).

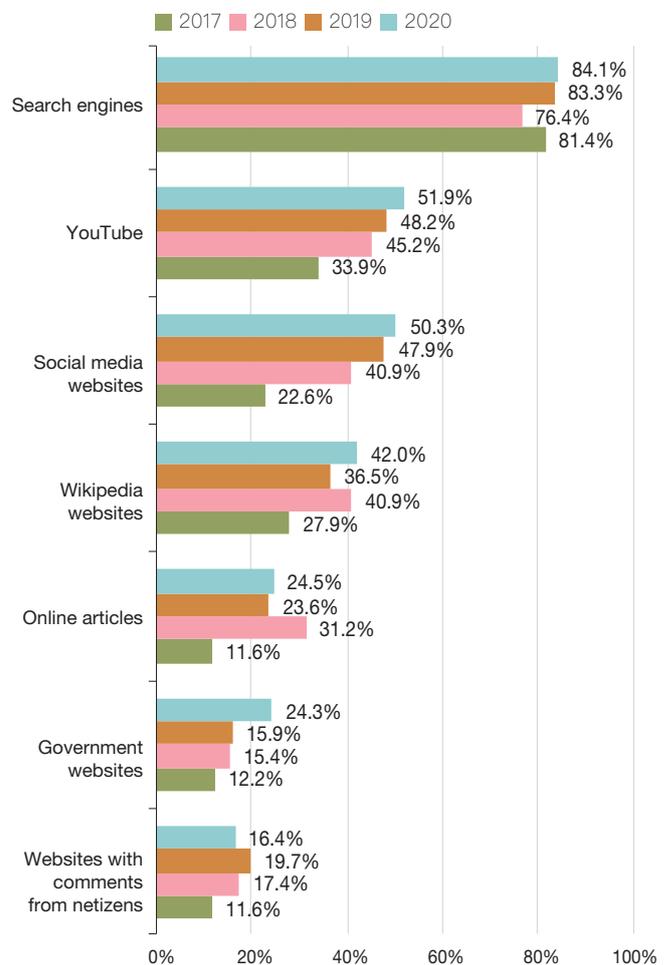


Figure 27 2017 - 2020 Searching for Information Online

Base: N = 1,024 in 2017; N = 560 in 2018; N = 899 in 2019; N = 932 in 2020 (Multiple answers allowed, those who were online)

Note: Those who answered "Others" and "I don't know" accounted for 0.1% and 6.1% respectively with 0.7% refusing to answer in 2017; those who answered "Others" and "I don't know" accounted for 0.3% and 2.8% respectively in 2018; "Others" and "I don't know" answers accounted for 3.3% and 1% respectively in 2019; while "Others" and "I don't know" answers accounted for 1.5% and 1.7% respectively in 2020.

Digital Convergence

The Most Watched Videos on Smart Phones

The most commonly used device for watching video was a smart phone, with the proportion rising dramatically from 27.4% in 2017 to 40.5% in 2018 to become the most common, outnumbering general TV (non-connected) answers and then rising to 54.5% in 2020. The proportion of general TV (non-connected) answers decreased from 34.1% in 2017 to 25.2% in 2020, and has ranked second since 2018 (Figure 28).

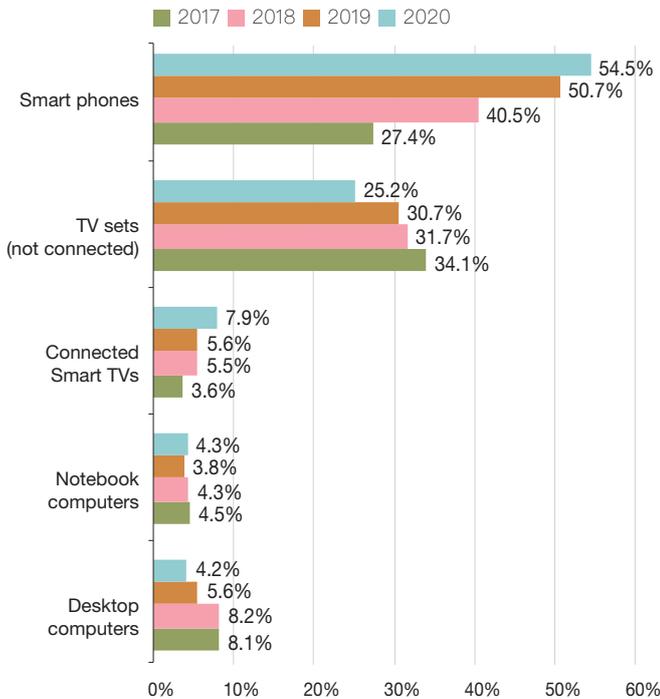


Figure 28 2017 - 2020 Most Commonly Used Device for Watching Videos (Top 5)

Base: N = 1,088 in 2017; N = 1,069 in 2018; N = 1,092 in 2019; N = 1,040 in 2020 (Those who answered they had devices for video watching)

Note: People who answered "I don't know" accounted for 0.7%, with 0.2% refusing to answer in 2018; people who answered "I don't know" accounted for 0.6% in 2019; while people who answered "I don't know" accounted for 0.9% in 2020

Over 40% Watch OTT TV and Over 30% Pay for Streaming Videos

The proportion of those who had watched streaming videos (OTT TV) rose from 30.8% in 2017 to 45.1% in 2019 and fell slightly to 41.5% in 2020 (Figure 29). The ratio of OTT TV-viewing households and individuals who had paid for a subscription to online streaming video services stayed at around 20% between 2017 and 2019, but jumped fairly dramatically to 35.4% in 2020 (Figure 30).

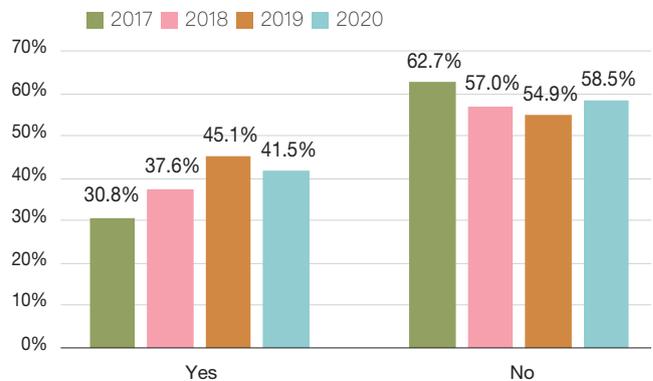


Figure 29 2017 - 2020 Experience with Viewing Streaming Videos

Base: N = 1,137 in 2017; N = 1,069 in 2018; N = 1,115 in 2019; N = 1,103 in 2020 (All interviewees)

Note: Those who answered "I don't know" accounted for 5.9% with 0.6% refusing to answer in 2017; those who answered "I don't know" accounted for 4.9% with 0.4% refusing to answer in 2018.

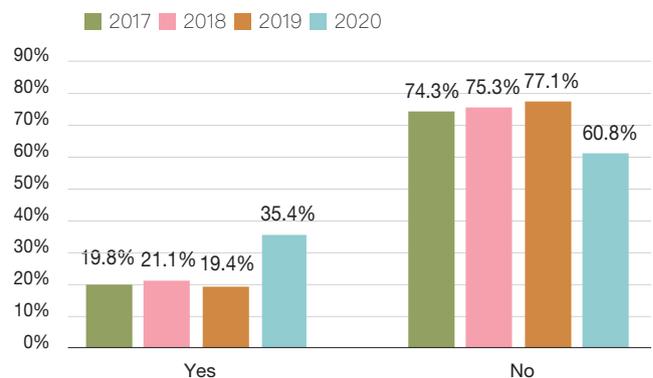


Figure 30 2017 - 2020 Payments for a Subscription to Online Streaming Videos

Base: N = 350 in 2017; N = 402 in 2018; N = 502 in 2019; N = 458 in 2020 (Streaming video viewers)

Note: Those who answered "I don't know" accounted for 5.6% with 0.3% refusing to answer in 2017; "I don't know" answers accounted for 3.2%, with 0.4% refusing to answer in 2018; "I don't know" answers accounted for 3.6% in 2019; and "I don't know" answers accounted for 3.9% in 2020.

Collective Viewing of Videos Online on the Rise

Over seventy percent had viewed collective videos online with the ratio growing from 70.7% in 2017 to 76.1% in 2020 (Figure 31). Among the videos watched by those surveyed, dramas and movies (clips or excerpts) has been the most popular for four consecutive years, with the ratio decreasing from 69.3% in 2019 to 62.4% in 2020; while dramas and movies (full length) was the second highest in 2017 and 2018, but became the third highest in 2019 falling behind funny short videos (Figure 32).

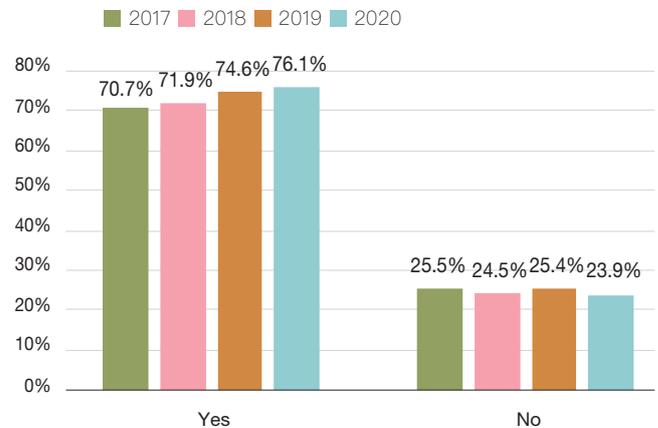


Figure 31 2017 - 2020 Experience with Viewing Collective Videos Online

Base: N = 1,140 in 2017; N = 1,069 in 2018; N = 1,115 in 2019; N = 1,103 in 2020 (All interviewees)

Note: Those who answered "I don't know" accounted for 3.4% with 0.4% refusing to answer in 2017; those who answered "I don't know" accounted for 3.0% with 0.6% refusing to answer in 2018.

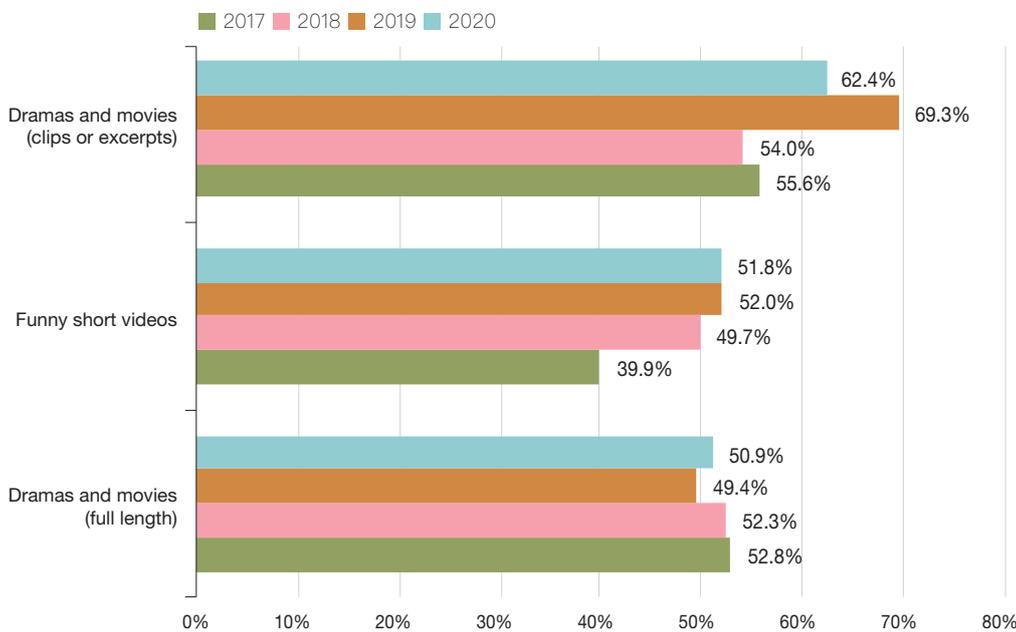


Figure 32 2017 - 2020 Types of Collective Videos Viewed Online (Top 3)

Base: N = 807 in 2017; N = 769 in 2018; N = 831 in 2019; N = 839 in 2020 (multiple answers allowed, online collective videos viewers)

Note: Those who answered "Others" and "I don't know" accounted for 1% and 2.1% respectively with 0.3% refusing to answer in 2017; those who answered "Others" and "I don't know" accounted for 2.3% and 0.5% respectively with 0.5% refusing to answer in 2018; while "Others" and "I don't know" answers accounted for 3% and 0.5% respectively in 2019; while "Others" and "I don't know" answers accounted for 2.4% and 2.5% respectively in 2020.

Over 30% Use Mobile Payment

The ratio of those surveyed who used mobile payment has grown from 17.8% in 2017 to 32.4% in 2020 (Figure 33).

More than Half Rely on TV for News

When it comes to the main source of news, television has been the most common answer over the past four years, with the rate reducing year on year from 63.7% in 2017 to 54.6% in 2019 and rising to 56.2% in 2020. This is followed by emerging media, with the ratio moving up from 23.7% in 2017 to 34.1% in 2019 and then going back to 31.1% in 2020 (Figure 34).

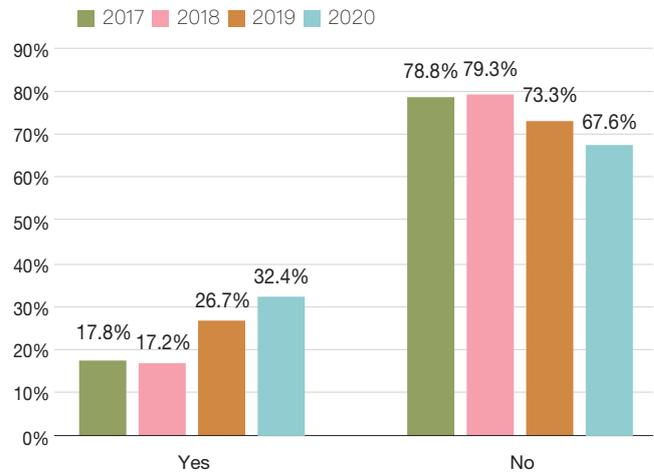


Figure 33 2017 - 2020 Use of Mobile Payments

Base: N = 1,140 in 2017; N = 1,069 in 2018; N = 1,115 in 2019; N = 1,103 in 2020 (All interviewees)

Note: Those who answered "I don't know" accounted for 2.8% with 0.6% refusing to answer in 2017; those who answered "I don't know" accounted for 2.7% with 0.8% refusing to answer in 2018.

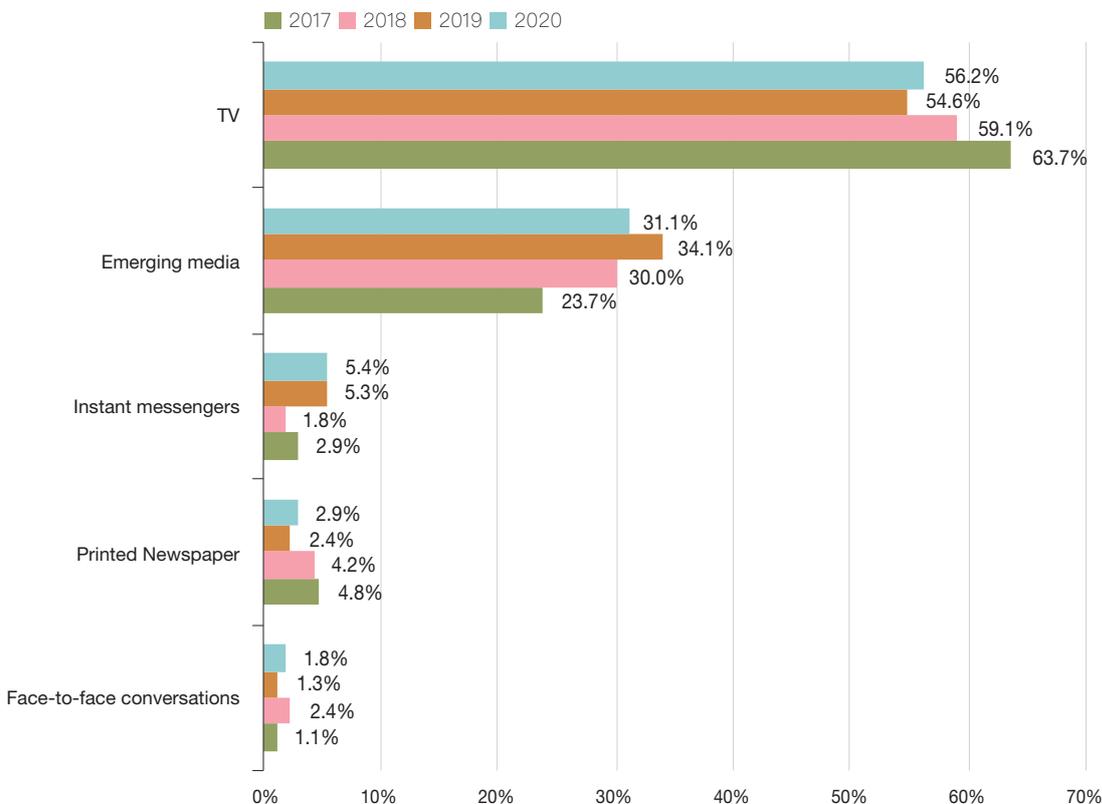


Figure 34 2017 - 2020 Main Source of News (Top 5)

Base: N = 1,123 in 2017; N = 1,040 in 2018; N = 1,081 in 2019; N = 1,050 in 2020 (News watchers/readers)

Note 1: Those who answered "I don't know" accounted for 0.6% with 0.2% refusing to answer in 2017; those who answered "Others" and "I don't know" accounted for 0.2% and 0.2% with 0.1% refusing to answer in 2018; "I don't know" answers accounted for 0.6% in 2019; while "Others" and "I don't know" answers accounted for 0.1% and 1.3% respectively in 2020.

Note 2: Emerging media refers to "Radio Station Websites/Apps," "internet Portals/Apps," "internet Websites/Apps operated by internet News Media," "Social Media/Forums" and "Other internet Websites/Apps."

03

Domestic and International Trends of Digital Convergence



Landline Penetration

When comparing landline penetration in various nations between 2011 and 2019, it can be noted that in most nations it declined, besides from Japan, where it remained stable. In contrast, penetration in both Taiwan

and the US has declined significantly. Once a nation with the highest landline penetration, Taiwan was surpassed by Hong Kong when the penetration dropped significantly in 2014 (Figure 35).

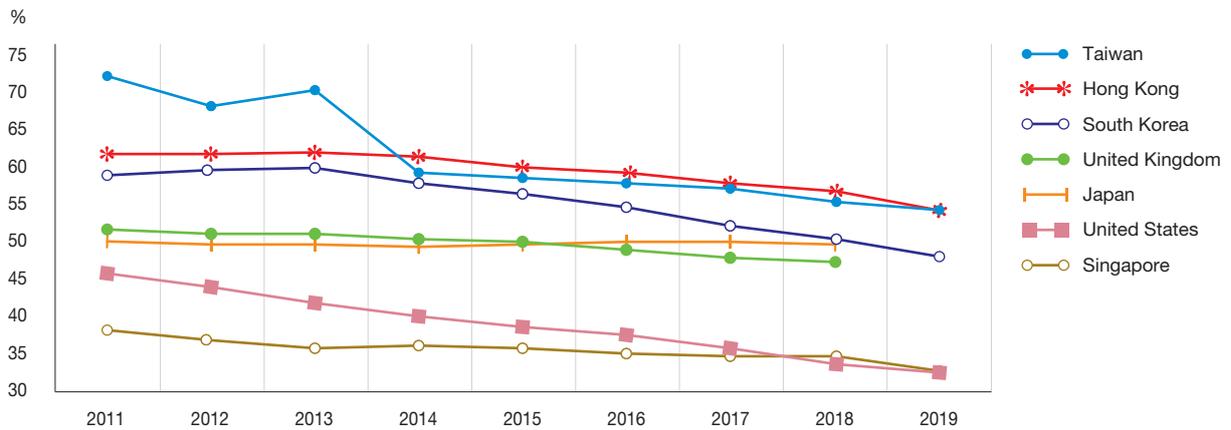


Figure 35 Landline Penetration in Various Nations

Source: ITU's Telecom/Information & Communications Database.

Note: The ITU database contains data on the landline penetration of Japan and United Kingdom no later than 2018.

Fixed Broadband Penetration

When comparing fixed broadband penetration in various nations between 2011 and 2019, we see that the penetration in most nations rose, except in Taiwan, where the penetration remained stable, and Singapore,

where the penetration fluctuated a little. Fixed broadband penetration in Hong Kong declined first but then rose. Meanwhile, South Korea showed the highest fixed broadband penetration, followed by the UK (Figure 36).

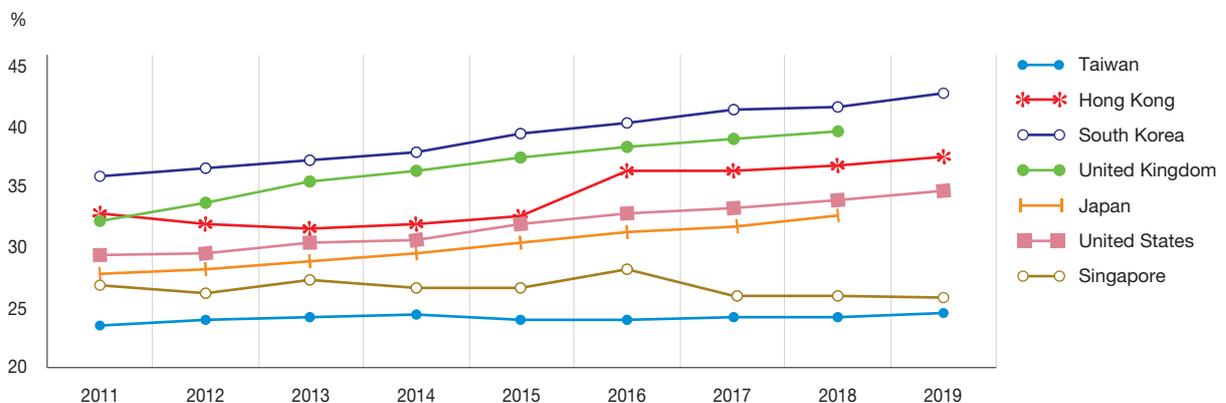


Figure 36 Fixed Broadband Penetration in Various Nations

Source: ITU's Telecom/Information & Communications Database.

Note 1: Since the 2011-2014 Taiwan figures from the ITU database contains the number of Wi-Fi subscribers, the figures used in the report are based on the 2017 NCC's communications statistics.

Note 2: The ITU database contains data on the fixed broadband penetration of Japan and United Kingdom no later than 2018.

Mobile Phone Penetration

When comparing mobile phone penetration in various nations between 2011 and 2019, it can be seen that the penetration in Taiwan, Singapore and the UK fluctuated slightly, while in Japan, South Korea and the US, it rose. Meanwhile, penetration in Hong Kong fluctuated during

this time, rising before declining and then moving up again. With the highest landline penetration, Hong Kong was the only area with a penetration rate of over 200%, indicating a significant difference from other nations (Figure 37).

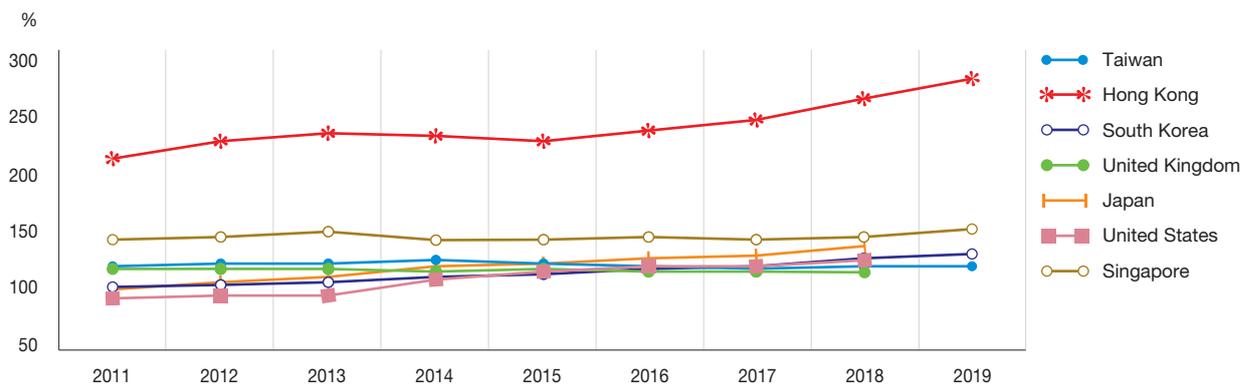


Figure 37 Mobile Phone Penetration in Various Nations

Source: ITU's Telecom/Information & Communications Database.

Note: The ITU database contains data on the mobile phone penetration of Japan, United Kingdom and United States no later than 2018.

Penetration of Mobile Broadband Internet

When comparing mobile broadband penetration in various nations between 2011 and 2019, it can be noted that in most nations it had generally risen, except in Hong Kong and the UK, where the penetration fluctuated significantly. In Japan, it rose sharply in 2017

and surpassed Singapore to become the nation with the highest penetration, while the penetration in Taiwan grew at a steady pace catching up with South Korea after surpassing the UK in 2016 (Figure 38).

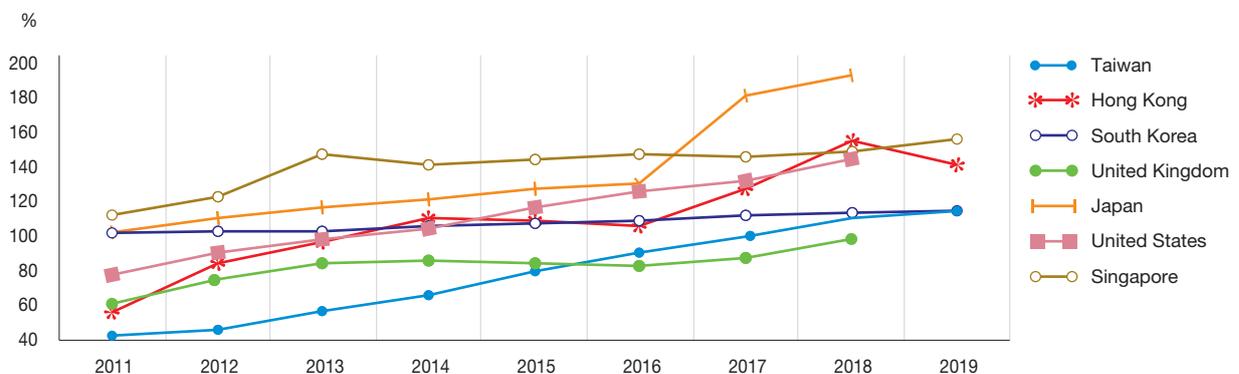


Figure 38 Mobile broadband Internet Penetration in Various Nations

Source: ITU's Telecom/Information & Communications Database.

Note: The ITU database contains data on the mobile broadband internet penetration of Japan, United Kingdom and United States no later than 2018.

Cable TV Penetration

When comparing the penetration of cable TV in various nations between 2011 and 2018, although it can be seen that South Korea had the highest, it has nevertheless been decreasing in recent years; meanwhile, penetration in Taiwan fluctuated a little while in Japan it grew steadily;

in the US, it started to decrease in 2012 and dropped dramatically in 2014 while in the UK, it fluctuated slightly with no major changes; as for Hong Kong and Singapore, only data of three years are available, but both dropped from the year previous (Figure 39).

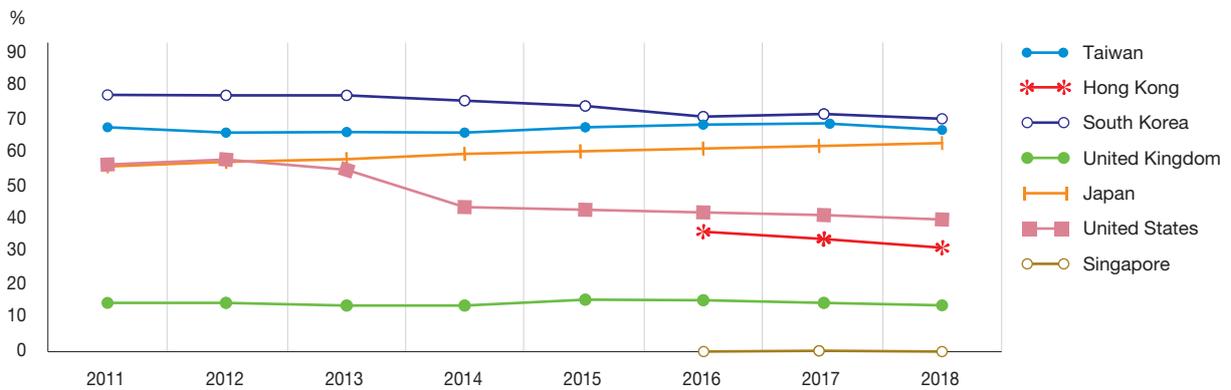


Figure 39 Cable TV Penetration in Various Nations

Source: ITU's Telecom/Information & Communications Database, National Communications Commission (NCC).

Note 1: The cable TV household penetration is calculated by dividing the number of cable TV subscribers by the number of households.

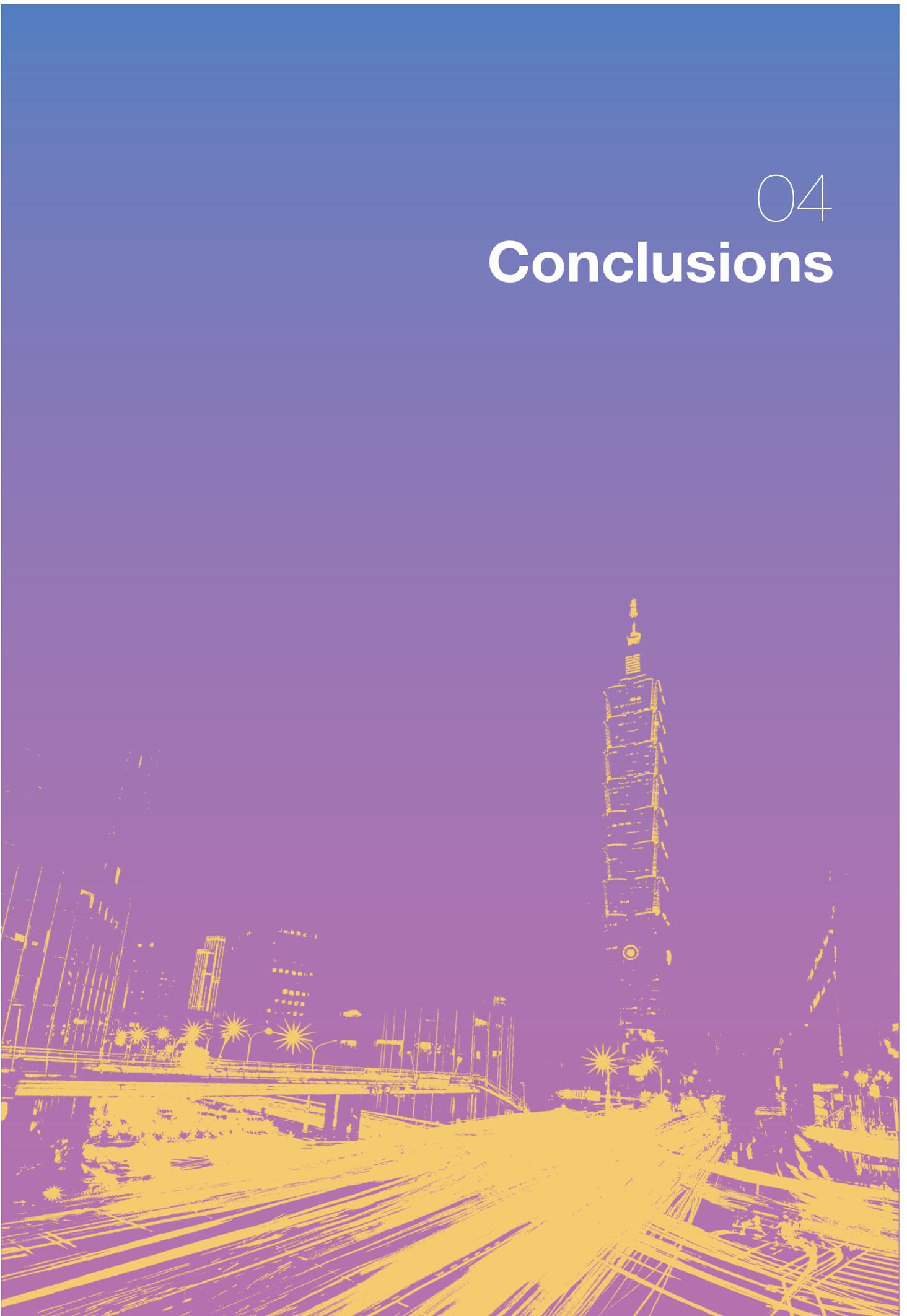
Note 2: The ITU database contains data on the number of cable TV subscribers in various nations no later than 2018.

Note 3: The 2011 and 2012 figures on the number of cable TV subscribers in Taiwan are taken from the statistics of NCC.

Note 4: The ITU database contains only data on the number of cable TV subscribers in Hong Kong and Singapore in 2016, 2017 and 2018.

04

Conclusions



Telecommunications Market

According to the 2020 telecommunications market survey, a majority of those surveyed used both a landline and a mobile phone (64.3%), but over 30% (31.8%) only used mobile. Among them, up to 73.2% might not or would not have a landline installed in the coming 12 months. When it comes to why they would not have a landline, 72.8% of respondents replied that the landline could be substituted with a mobile phone, and 36.7% answered that it was unneeded. Moreover, up to 92.4% of respondents replied that they or their family members had made voice calls. The survey shows that with greater ubiquity of internet communications, people have been moving away from landlines.

Up to 92.4% used a smart phone that could connect to the internet, the most commonly used mobile network service outside home being 4G (95.1%). In terms of mobile data plans, the percentage of those who subscribed to unlimited data plans has grown from 67.1% in 2017 to 81.7% in 2020. Among them, 63% were on an unlimited data plan without a speed cap; it can be noted that mobile phone charges have decreased year on year from NT825 in 2017 to NT727 in 2020 due to fierce market competition. As for the most common place to access the internet with a mobile phone, it was home where 50.4% of respondents accessed the internet with a mobile phone the most often, followed by at the workplace (32%).

When asked about the willingness to transfer from 4G to 5G since 5G licenses were released in Taiwan, 62.5% gave a positive answer whereas 20.1% answered negatively, with 17.4% stating that they didn't know. And when asked about the willingness to transfer to 5G if it costs more than 4G in Taiwan, 70.7% replied positively.

In Taiwan, 88.9% said they had access to the internet at home. Among them, the percentage of those with a fixed broadband at home has decreased from 75.9% in 2017 to 65.8% in 2020. As for the most commonly used internet access method, up to 72.7% of respondents replied that

they use mobile broadband (sharing 4G connection with others.) The percentage was much higher than that of the fixed broadband (including ADSL, fiber-optic and cable users). After multi-regional operations were permitted for cable TV, the ratio of those surveyed who shifted to any newly-added TV operator (if any) in their area has increased from 17.2% in 2018 to 31.4% in 2020.

As for the quality of various telecommunications services, respondents were the most satisfied with the quality of landline calls (7.81 points), followed by that of mobile phone calls (7.49 points) and that of mobile phone connection (7.25 points). The fixed internet connection showed the lowest satisfaction (7.21 points). When taking a further look, one finds that the satisfaction with the landline call quality and the satisfaction with fixed broadband connection have fluctuated; satisfaction with the quality of mobile phone calls and internet connection has risen year by year.

Broadcasting Market

Up to 94.1% of those surveyed watched TV and up to 94.4% had at least one television set at home. But only 21.5% owned a smart TV. When it comes to the main source of viewing for the surveyed, cable TV answers (64.3%) made up the largest proportion, with a percentage higher than in 2019 (56.1%). They were followed by Chunghwa Telecom's MOD (13.1%), online streaming video (OTT TV) (11.4%), which rose to the third spot, with terrestrial television (9.4%) dropping to the last. Among those who subscribed to cable TV and Chunghwa Telecom's MOD, 4.9% and 10.8% respectively said they would consider discontinuing the subscription in the coming 12 months. Both ratios were higher than in

2019. The predominant reason for cable TV subscribers being that charges were too high (34.5%); while the predominant for Chunghwa Telecom's MOD subscribers being lack of interesting contents (47.6%).

In terms of time slots, most of those surveyed watched television during 20:00-21:00 (51.5%), followed by 19:00-20:00 (47%) and 21:00-22:00 (38.7%). Among the television programs watched, local news broadcasts (68.1%) were the most popular; while international news broadcasts accounted for the second most common answer outnumbering weather broadcasts (48.1%) with the ratio rising from 45.1% in 2019 to 52.9% in 2020.

When asked about the quality of television programs during the past 12 months, 58.4% said the quality remained the same, 19.1% said the quality had improved, while 11% said it had deteriorated. The ratio of who said they has improved answers has risen from 14.2% in 2018. Those who thought that quality of television programs had improved contributed the improvement to the diversity of programs (70.5%) and high-quality dramas (43.4%). Those who said the quality of television programs had deteriorated contributed that to overly frequent reruns (72.8%), followed by too many political talk shows (49.8%), biased political news broadcasts (48.4%), and lack of variety (48.1%). It can be noted that the percentage of those who answered overly frequent reruns dropped from 73.4% in 2017 to 48.6% in 2018 but started to rise year on year to 72.8% in 2020.

36% of those surveyed said they had viewed television content that they found annoying or offensive during the past 12 months. The most common complaint was overly repetitive news broadcasts (53.8%), followed by biased political news broadcasts (46.6%), political campaign propaganda (45.1%) with these ratios all lower than in 2018. The most disliked programs were political talk shows (48.1%), soap operas (33.1%) and news broadcasts (30.1%).

With regards to radio, the proportion of those who listened to the radio decreased from 36.8% in 2017 to 28.8% in 2019 and grew to 35.7% in 2020. Of these, 57%

listened in their cars. The proportion of those who listened to the radio on a mobile phone increased from 25.9% in 2017 to 37.3% in 2020, ranking second by outnumbering that of the radio set. In terms of time slots, most of those surveyed listened to the radio during 7:00-8:00 (26.2%), followed by 17:00-18:00 (18.1%), 8:00-9:00 (17.5%), and 9:00-10:00 (17.3%). Among the most listened to content, those surveyed depended on the radio the most for music (6.07 points), followed by news (5.09 points), travel and weather broadcasts (4.83 points), disaster broadcasts (4.8 points), other daily information (4.69 points) and product marketing (3.41 points).

Sixty percent of the surveyed were aware of laws regulating television programs, while 52.9% were aware of laws regulating radio programs. Although the surveyed were less familiar with radio programs, the familiarity with both laws has increased at a steady pace.

In terms of privacy protection, respondents did not think the privacy of public figures (66%) and individuals (76.6%) should be exposed without permission. And television was considered by more than 30% of the surveyed as the main media to expose individual's privacy without permission. However, in an era of digital convergence, privacy breaches by emerging media are also worthy of attention. According to the results of this survey, 17.3% of the surveyed believed that emerging media, including news websites and apps, websites and apps of television stations, as well as other websites and apps, were one of the main sources to expose public figures' privacy without permission, only second to television (39.2%), but 18.9% said it was common in all media. As for the media to expose individuals' privacy without permission, emerging media (23.2%) ranked second, but 16.3% thought it was common in all media.

Broadband Usage

On average, those surveyed have had 12.55 years' experience on the internet. Nearly 70% (67.9%) of them have never encountered any issue online. Among the issues that were encountered during the past 12 months, viruses (11.9%) and fraud (11.4%) were more common than others. Among social networking activities, use of social media made up the highest percentage (86.2%), followed by general web surfing (83.6%) and viewing videos on open video platforms (72.9%). The average confidence level of those surveyed when using the internet was 6.51, and over 40% (45.1%) had concerns. Among these concerns, leaks of personal information (77.2%) and fraud (63.9%) were the two most common.

The percentage of those with at least one social media or instant messenger account has grown from 83.6% in 2017 to 97.4% in 2020. Most of these users (61.9%) registered with real names, but 13.2% used pseudonyms while 24.8% used a combination of both. LINE (72.4%) was the most commonly used social media or instant messenger, with a ratio much higher than that of the second most common, Facebook (14.2%). The total average time spent on browsing/reading/leaving messages, liking and posting posts on social media per week by the surveyed was 17.1 hours. And, during the past 12 months, 80.2% of respondents had viewed social media content they found inappropriate or offensive, but 46% did not take any action for it, while 33.1% blocked the user who shared or published content they found inappropriate or offensive, and 27.3% reported it through the report or block function.

When viewing information on social media, 73.1% questioned the authenticity of the messages published on these websites or apps, over half (51.3%) thought they were only partly true, and 43.1% considered them mostly true; while more than 60% (64.8%) tended to believe what they read and saw. Moreover, 66.7% of Facebook users saw something they found inappropriate on Facebook, but only 40.6% reported it to Facebook. The reasons for not

reporting were mostly that it did not concern them too much (38.5%) or that they did not want to get involved or noticed by reporting (31.8%).

In terms of information security, most people provided incorrect or false information on the internet to protect their personal identity, and the percentage has risen year by year from 49.8% in 2017 to 56.3% in 2020. In contrast, 42.9% were willing to provide their personal information on the internet to get what they want. When looking for particular information online, 84.1% of those surveyed visited search engines, followed by YouTube (51.9%), and social media (50.3%). As for how to verify the authenticity of information, comparing with information from other sites made up the bulk of the replies (45.1%), followed by searching for credibility of the source (42.6%). However, approximately 20% never verified authenticity.

As a result of the booming digital economy and thriving e-commerce in Taiwan, the proportion of those with experience in online shopping has increased from 55.5% in 2017 to 73.4% in 2020. The average number of purchase over the previous 12 months reached 20.64, but only 16.4% had experience in online selling. In terms of the products purchased online, kitchenware, daily necessities and stationery accounted for the largest share (39.8%), followed by food (32.3%) and mobile phones and communications (28.3%); as for the products sold online, boutiques, bags and apparel accessories (21%) and toys (17.6%) made up the largest proportion. Moreover, prior to purchasing a product or service, 69.1% of respondents read relevant reviews written or published online by others; while only 24.9% wrote reviews online after purchasing a product or using a service. However, both ratios have grown year on year.

Among the perceived benefits of internet use for either work or daily life, ease of finding information accounted for the largest share of answers with a ratio of 75.4%, followed by being informed of the latest events and social issues (58.4%), and being prompted to try new things, like travel, new restaurants, entertainment, etc. (57.4%). As for the disadvantages, concerns over visual impairment and

shoulder or neck pain (67.7%) made up the largest share, followed by general tiredness (39.8%). Nonetheless, 16.7% said the internet use had not caused any disadvantages. Among the statements about the internet, online life is never mundane (6.63) was the most agreed by those surveyed while those who agreed with the statement “life without the internet becomes more mundane” (6.03), “it’s difficult to avoid the internet” (5.59), “I don’t know how to search for particular information without the internet” (5.49), “I don’t know what’s happening out there without the internet” (5.45) all surpassed 5.

Digital Convergence

The most commonly used devices to watch video were smart phones (73.6%) and general television sets (non-connected) (49.3%). Smart phones accounted for the largest percentage, with the proportion rising year on year from 27.4% in 2017 to 54.5% in 2020; while the proportion for general television sets has decreased from 34.1% in 2017 to 25.2% in 2020.

With the increasing prevalence of the OTT TV services, 41.5% had watched OTT TV, with the proportion falling with seniority. As for why those surveyed watched streaming videos, flexible viewing time (60.8%) made up the largest portion of responses, followed by recommendation from family or friends (40.4%) and recommended by social media (39.5%). And the average time spent on viewing OTT TV was 11.86 hours per week. Most respondents watched free content on OTT TV, but the proportion of those who or whose family had paid for a subscription to online streaming video services has significantly risen from around 20% in 2017 to 35.4% in 2020. Among the pay streaming video services, Netflix was the most popular, growing year on year from 19.4% in 2017 to 61.9% in 2020, outweighing iQiyi (42.4%). The rest of them accounted for less than 10% each.

When asked about whether OTT TV should be properly regulated to protect consumer rights or ensure appropriate competition for Taiwanese media, nearly 70% (69.2%) replied positively. As for what regulatory measures should be taken by the government, managing platform content (e.g. child and youth protection and content rating) (76.7%), consumer rights and cyber security protection (74.2%), and disclosing public information (e.g. service terms and personal information protection statement) (70.1%) answers accounted for the majority of the replies.

In terms of the communications activities, using a telephone (82%) remained the most common, while instant messenger services (75.5%) and social media (69.8%) were the second and third most common respectively, both of which had a higher ratio than television (63.5%). And, 86.7% used a smart phone to connect to the internet.

Over 76% of respondents had viewed collective videos online and up to 99.5% had viewed YouTube. The most popular videos were dramas or movies and funny short clips, with ratios both higher than 50%. Among YouTube viewers, 42.4% said they had viewed YouTube content that they found inappropriate, but only 34.5% indicated they had reported it to the platform.

In terms of live radio, almost 58.1% of those surveyed were aware that live radio could be accessed through mobile phones, and 26.7% were aware that live radio could be accessed through connected computers, but 35.3% were not aware of either. When listening to live radio, 48.5% of those surveyed listened on mobile phones, 15.3% on computers, with 41.7% as non-radio listeners.

In terms of mobile phone apps, a majority (86.1%) were aware how to download them, and most (66.7%) of the apps they downloaded were free of charge. And, the most popular ones were games (48.1%), social apps (46.6%) and music-related apps (33.6%).

Over 32.4% of respondents had used mobile payment, with a ratio significantly higher than two years ago.

Among them, the young and highly-educated people accounted for a higher percentage. In terms of mobile payment services, LINE Pay (48.3%) accounted for the largest share, followed by Apple Pay (35%). The rest accounted for less than 20% each. When it comes to the main reasons for using mobile payments, the predominant reasons were convenience (77.6%) and special offers (12.3%); in contrast, the main reasons for not using it were that it was unneeded (43%) and concern about security (20.9%).

Television remained the main source of news and information, with the proportion decreasing from 63.7% in 2017 to 54.6% in 2019 and rising to 56.2% in 2020. The percentage of the second main source, emerging media, grew from 23.6% in 2017 to 34.1% in 2019 and decreased to 31.1% in 2020. It is clear that in an age of information convergence, although online media provide diverse news sources, traditional media still play an important role. With regard to the accuracy of news source, television is deemed the most accurate news source, with the percentage increasing dramatically from 39.1% in 2019 to 49.6% in 2020. The percentage of those who considered television impartial has also increased from 55.1% in 2019 to 63.9% in 2020: television and printed newspapers (63.9%) answers tied for first place.

When it comes to online video and games, 79.7% watched online videos. Of them, 25.8% said they had recently watched inappropriate content that raised concerns. These videos are mainly short clips on YouTube and Facebook (60.3%). The videos found inappropriate by the surveyed mainly contained bad language (50.4%), pornography/nudity/sex-related content (44.4%) and violence (43.3%). Besides, 35% of the interviewees said they often played online games and 27.5% had seen content that raised concerns.

Development Trend of Digital Convergence in Taiwan

Supply and Demand Analysis

According to the statistics on the supply in Taiwan's communications industry, one finds that after a sharp drop to 59.78% in 2014, the landline penetration decreased year on year to 54.56% in 2019. As for the mobile communication services, penetration of mobile phone fluctuated between 2011 and 2019 and reached 123.21% in 2019 while the penetration of mobile broadband grew steadily between 2011 and 2019, reaching 110.96% in 2018, and growing further to 114.76% in 2019. With the development of the mobile broadband network, the traditional landlines are being replaced by the mobile phone. People no longer depend on landline phones for communication, but use voice calls and messages instead. According to the results of this survey, the ratio of those only using mobile phones surpassed 30% (31.8%); while the ratio of those with both a landline and a mobile phone has dropped year on year to 64.3%.

In addition, with the advent of the 5G era, all the major telecommunications operators are vying to provide 5G operations to gain the upper hand and obtain a share in Taiwan's 5G market. According to an analysis of the statistics on mobile broadband users released by NCC on October 2020, as of September 2020, all telecom operators, have seen an increase in number of users except Asia Pacific Telecom, which has yet to launch its 5G operations. In addition to users' anticipation of 5G, promotional offers by all these telecom operators have attracted consumers and helped increase the number of users.

In order to provide insights on the demand side, this survey questionnaire also asked about the willingness to

purchase 5G services. Over 62% answered that they were willing to migrate from 4G to 5G when 5G plans were available. And, 70.7% responded that they would transfer to 5G even if 5G data plans cost more than 4G data plans as a result of the costly investment on 5G network, indicating that the 5G network is very much anticipated.

Those surveyed preferred to be on unlimited mobile data plans with the percentage of those on unlimited data plans growing year on year from 67.1% in 2017 to 81.7% in 2020 (including those on an unlimited data plan with or without a speed cap and those who did not know if there was a speed cap). And according to the data on mobile broadband usage published by NCC, the average data traffic per user per month in the first half of 2020 was 21.41 GB, a significant increase from 18.06 GB in 2019 and 16.11 GB in 2018. In contrast, the average mobile phone charge per month has decreased year on year from NT825 in 2017 to NT727 in 2020.

Technological innovation has driven the rise of emerging services and changes in choosing mass media. The main source of viewing television remained cable TV, but according to NCC statistics, the number of cable TV subscribers in Taiwan dropped year on year from 5.248 million the highest in 2017 to less than 5 million

in 2019. As of the third quarter of 2020, the number of cable TV subscribers in Taiwan was 4.897 million the lowest in ten years (Figure 40). The percentage of those using Chunghwa Telecom's MOD as the main source of TV viewing has dropped slightly from 14.3% in 2019 to 13.1%, but it still hit the second spot by outweighing terrestrial television. In recent years, in order to expand the market share of MOD services, Chunghwa Telecom has not only launched a promotional deal that combines HiNet with MOD, but also collaborated with the global streaming video giant Netflix to offer a special offer with no subscription fee for the first month. And according to its statistics, the number of subscribers has surged by over 2 million since Chunghwa Telecom launched a la carte pricing for their media-on-demand platform in the third quarter of 2019, driving the annual growth rate of MOD revenue to 10.6%, the first profit in 14 years.

With regards to OTT TV, due to the increased public awareness of the new technology and the impact of the COVID-19 pandemic, OTT TV has become a more popular choice. The proportion of those who watched OTT TV on their home television set has grown year on year from 3.4% in 2017 to 15.3% in 2020. And, after the percentage of those who took OTT TV as their

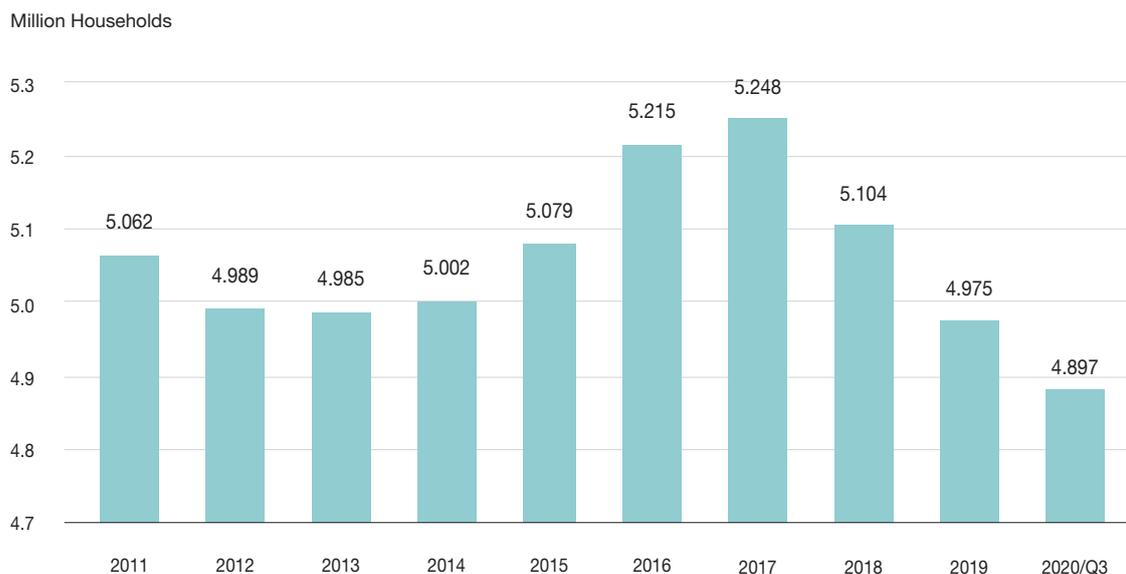


Figure 40 Cable TV Subscribers

Source: NCC, 2020. The number of subscribers (by area)

main source of viewing surged to 10.5% in 2019, it rose dramatically again to 11.4% in 2020 to hit the third spot by outnumbering Terrestrial TV. Among them, young interviewees aged 16-25 accounted for 24.5%. In contrast, the percentage of those who watched Terrestrial TV on their home television set has dropped from 35.2% in 2019 to 28.2% in 2020. When it comes to the main source of for watching television, terrestrial television was the least popular with a ratio significantly dropping to 9.4% in 2020 from 16.7% in 2019. It can be seen that under the threat of the pandemic, people have drastically reduced their outdoor activities and relied more on film and television for information and entertainment than before. Therefore, they tend to seek more diversified and flexible film and television services, making it hard for traditional television stations to stay competitive.

As the internet plays an increasingly important role in people's daily life, more are gradually turning to the internet for news and information, but the survey showed that television was still the main source of news and information. Although the proportion dropped from 63.7% in 2017 to 54.6% in 2019, it rose to 56.2% in 2020. The second most popular source was emerging media, of which the ratio grew gradually from 23.7% in 2017 to 34.1% in 2019, but decreased to 31.1% in 2020. Television was also the most accurate source of news for those surveyed, with a ratio surging from 39.1% in 2019 to 49.6% in 2020, which was followed by emerging media, with a ratio growing from 15% in 2017 to 19% and then decreasing to 11.7% in 2020. The percentage of those who considered there was no accurate news source dropped from 31% in 2019 to 22.9% in 2020.

In recent years, the issue of 'fake news' has attracted the attention of governments around the world, partly due to the spread of COVID-19. Many countries have taken measures to curb the spread of disinformation. Since the outbreak of the pandemic, Taiwan's National Health Command Center (NHCC) has held regular press conferences to explain the latest situation and clarify the false information circulating on the internet. On the other hand, the information on the internet is so intriguing

that although the information can be verified by agencies like Taiwan Fact Check Center, false information still spreads. It is possible that those surveyed gained increased confidence in TV news when they were informed of the pandemic updates and prevention measures. Despite this, over the past four years, television has been regarded as the media most likely to expose the privacy of public figures without permission. Balancing the ethical baseline, privacy protection, and the pursuit for truth is an issue that all media should pay attention to.

International Comparison

Comparing Taiwan with the development of communications and communications industries globally, undoubtedly, the next-generation mobile communications technology has brought about industrial innovation in all areas, and 5G is being actively deployed around the world. In Taiwan, in order to keep up with the international developments, mobile communications services completely shifted to 4G after the termination of 3G services in Taiwan at the end of December 2018; the first 5G licenses were granted by NCC on February 21, 2020. Competing for key frequencies with sky-high bidding prices, major telecom operators were keen to plan the timeline for 5G and roll out commercial services, which began to happen in July the same year.

When it comes to the development of mobile communications services in major areas around the world, one finds that according to the research report² released by Ericsson in June 2020, as of the end of 2020, there will be an estimated 190 million 5G users across the globe and the number will grow to 280 million by 2025, equivalent to 30% of all mobile device users. With the accelerated deployment of 5G in various countries, Ericsson predicts that the 5G adoption rate in various countries will increase significantly over the next five years; the 5G adoption rate in North America is expected to reach 74%, and reach more than 50% in Northeast Asia (60%) and Western Europe (55%) by 2025.

² Ericsson, 2020. Ericsson Mobility Report June 2020.

In contrast, all the mobile broadband services in Taiwan have shifted to 4G networks since 2019 and the mobile network population coverage has reached 99.9% since 2018. The comprehensive quality communications services available to the public have been reflected on the increasing satisfaction with mobile internet service over the past years, and are also conducive to enhancing users to experience 5G services. According to the report released by the market analysis agency Opensignal on August 26, 2020, which is its first analysis on user experience in the world's 12 leading 5G markets, the average 5G download speed in Taiwan ranked the fourth fastest, and 5G availability ranked the sixth. In an updated survey report released by Opensignal on October 13 of the same year with the leading 5G markets increased to 15, although Taiwan's average 5G download speed remained at No. 4, the 5G availability dropped slightly to No. 7.³

In terms of communications convergence, OTT has become a global trend over recent years. Online streaming videos have had a substantial impact on the film and television industry and with the outbreak of the COVID-19 pandemic in early 2020, people have been encouraged to stay home as much as possible, thus accelerating changes in viewing habits and consumption behaviors. According to the *Global Entertainment & Media Outlook 2020-2024*⁴ released by PwC on September 7, 2020, the impact of COVID-19 pandemic is not evenly shared by all sectors under the umbrella of the global entertainment and media industry. The resulting pain is most acute in segment that have literally been shut down (such as live concerts, movies, trade shows and other physical events). On the contrary, the market size of video-on-demand services is expected to surpass movie box office revenue in 2020 and double in 2024. In addition, thanks to the substantial increase in home hours, the global OTT video revenue has grown 26% in 2020; and Taiwan's OTT video revenue is going to reach

US\$745 million at an annual growth rate of 26%, which will surpass the physical home video market revenue -- \$540 million dollars.

When taking a look at the consumer behaviors in Taiwan, it can be seen that more than 60% of the in-home television platforms or systems are based on cable TV. The proportion has grown slightly from 64.6% in 2019 to 70% in 2020 and is followed by terrestrial television and Chunghwa Telecom's MOD, but the share of both have fallen from 2019; while the ratio of OTT TV has increased from 3.4% in 2017 to 15.3% in 2020. When it comes to actually viewing, most of the surveyed considered cable TV their main viewing source, with a ratio increasing from 64.6% in 2019 to 70% in 2020; while the ratio of OTT TV viewing was less than 5% in both 2017 and 2018, but after a substantial increase to 10.5% in 2019, it rose again to 11.4% in 2020 and came in third by outweighing terrestrial television.

Turning to viewing OTT TV, more 41% had watched OTT TV, and the ratio of households and individuals paying for a subscription to OTT TV services remained at around 20% between 2017 and 2019, but jumped to 35.4% in 2020. Based on the above results, it can be noted that foreign major companies are actively expanding the OTT TV market in Taiwan, an example of which is the cooperation between Netflix and Chunghwa Telecom's MOD, and the collaboration between LINE TV and Taiwan Optical Platform (TOP). One also finds that the average weekly online hours at home have dramatically increased from 20.56 hours in 2019 to 27.17 hours in 2020 due to the impact of the COVID-19 pandemic. This trend is driving the development of e-commerce and streaming video services. Therefore, although cable TV remains the main source for viewing television, the COVID-19 pandemic has accelerated the digital transformation in various industries, and Taiwan's film and television landscape may change dramatically.

³ OPENSIGNAL, 2020. Benchmarking the global 5G user experience. (Oct. 2020)

⁴ PwC, 2020. PwC Taiwan releases "PwC Global Entertainment & Media Outlook 2020-2024" Pulling the future forward: The entertainment and media industry reconfigures amid recovery. <https://www.pwc.tw/zh/news/press-release/press-20200907.html>

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