

ANNUAL SURVEY ON INFOCOMM USAGE IN HOUSEHOLDS AND BY INDIVIDUALS FOR 2016



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PART I:
SURVEY OBJECTIVE AND METHODOLOGY

1. Survey Objective

The Annual Survey on Infocomm Usage in Households (“Survey”) has been conducted by IMDA since the 1990s. The objective of the Survey is to assess the extent of infocomm adoption in Singapore resident households¹ and residents.

2. Methodology

Data was collected from about 3,800 households and about 3,600 residents via face-to-face interviews. The sample of addresses for household was provided by the Singapore Department of Statistics based on a random selection using a two-stage stratified design by geographical location and housing type. The sample of individuals was provided by Ministry of Home Affairs based on stratified random sampling design by age and ethnicity group. Fieldwork for the survey was conducted between April to July 2016.

3. Concepts and Definitions

The definitions of the key terms used in this report are as follows:

Term	Definition
Household	Household refers to a group of two or more persons living together in the same house and sharing common food or other arrangements for essential living. It also includes a person living alone or a person living with others but having his own food arrangements. Although persons may be living in the same house, they may not be members of the same household.
Resident	Singapore Citizen or Permanent Resident.
Resident Household	Resident households are households with at least one resident (Singapore Citizen or Permanent Resident).
School-going children	School-going children refer to current students who are enrolled between primary education and pre-university / junior college education level.
Computer	Computer includes desktops, laptops, notebooks and tablets.
Computer access at home	Refers to having access to functional computers at home regardless of ownership (i.e. they may be owned by the household or employers and used at home).
Computer ownership	Computer ownership refers to computer owned by household.
Private housing	Private housing refers to landed properties, private condominiums and

¹ Only households with at least one resident (Singapore Citizen or Permanent Resident) were interviewed; households comprising wholly of foreigners were not interviewed.

Term	Definition
	apartments.
Public housing	Public housing refers to HDB flats.
Broadband	Internet connection speeds equal to, or greater than, 256 kbit/s, in one or both directions and includes connections using ADSL, cable modem, 3G, 3.5G/HSDPA and fibre broadband.
ADSL	Asymmetric Digital Subscriber Line (ADSL), a form of DSL is a data communications technology that enables data transmission over copper telephone lines.
Cable modem	A modem designed to operate over cable TV lines and enables Internet access.

4. Notes on Data

Past years' data are included for comparison purposes where available. Due to the rounding of figures to the nearest whole number, the sum of individual figures may not add up to the total or 100%.

PART II:

**SURVEY FINDINGS – INFOCOMM ACCESS IN
HOUSEHOLDS, AND INFOCOMM ADOPTION
AND USAGE BY INDIVIDUALS**

Summary

(A) Household

Continued growth of Household Internet and broadband access over the years and households were increasingly using Internet-enabled devices other than computer for Internet access

- Home computer, internet and broadband access rates were 87.0%, 88.2% and 87.9% respectively in 2016, about one percentage-point higher than that of 2014.
- For households with school-going children, Internet and broadband access rates were both 97% in 2016, relatively consistent with 2014 and 2015.
- Fibre broadband continued to replace ADSL and cable modem as the Internet connection choice by households with 76% of resident households using fibre broadband in 2016 (up from 47% in 2014), and 10% using cable modem in 2016 (down from 25% in 2014).
- Households showed trends of switching to using Internet-enabled mobile phones and other internet-enabled devices such as Smart TV to access the Internet with 93% and 47% of resident households doing so, a 39 and 41 percentage-point increases respectively since 2012.
- “No need to use” and “Lack of skills” remained as the main reasons for not having access to a computer or Internet.

(B) Individual

Computer, smartphone and Internet usage by senior citizens saw slight growth since 2014

- In 2016, about 70% of residents used the computer in the last three months (defined as computer users) with higher proportion of usage reported by younger residents aged 7-34 years old.
- Computer usage rate by senior citizens aged 60 & above rose to 25% in 2016, an increase of 3 percentage-points from 2014.

- In 2016, about 79% of residents used the Internet in the last three months (defined as Internet users) and almost all residents aged below 35 years old were internet users.
- Internet usage rate by senior citizens aged 50-59 and 60 & above rose to 73% and 30% respectively in 2016, an increase of 9 and 6 percentage-points from 2014 respectively.
- In 2016, about three-quarter and more than one-third of senior citizens aged 50 to 59 years, and 60 years and above respectively used a smartphone² in the past three months. This represented an increase of 8 and 10 percentage-points for the two age groups respectively from 2014.
- In 2016, among residents who had used portable infocomm equipment in the past three months, 71% and 47% of those aged 50 to 59 years, and 60 years and above, respectively, connected to the Internet wirelessly. This was more than two-fold and five-fold increases compared to 2012 where the proportions were 29% and 9% respectively.
- More than half of the senior citizens learnt their computer/Internet skills from family members, the most common source of knowledge.

Top three primary internet activities among Singapore residents were related to communication, leisure and getting information; Singapore residents preferred accessing the Internet wirelessly via mobile network

- The top three primary Internet activities³ of Internet users remained the same over the last three years, and were related to communication, leisure activities and getting information. The most commonly cited reason for not using the Internet remained as “*Lack of knowledge, skills or confidence*”.
- Residents preferred accessing the Internet wirelessly via mobile network as compared to public WiFi hotspots.
- Using instant messaging emerged as the top mobile online activity in 2016,

² A smartphone has more sophisticated functions than a feature phone. Examples of such functions are: i) able to open and read documents (e.g. pdf, office document) and ii) able to add / install applications on phone. These two categories are mutually exclusive, i.e. a mobile phone can only be a feature phone or a smartphone.

³ A primary Internet activity refers to an activity that is engaged in during all or most of the Internet sessions.

replacing staying connected on social networks which was the top mobile online activity in 2013 – 2015.

Online shopping was on the rise and online shoppers were mainly aged 15-49, and most popular items purchased were apparels, travel products and tickets for entertainment events

- The number of Singapore residents shopping online in 2016 was about 1.53 million, and increased by a compound annual growth rate of about 8% from 2014.
- Consistently over the last three years, online shoppers were mainly from the 15-49 age group.
- Seven in ten online shoppers paid for online purchases using credit cards and credit card payment was the most common among those aged 35 and above.
- The three most popular items purchased online were apparels, travel products and tickets for entertainment events.
- Majority of the online shoppers (about 7 in 10) spent at least \$100 on their online purchases.
- The most commonly cited reasons for not shopping online were “*Prefer to shop in person or deal personally with a service provider*” followed by “*Not interested*”.

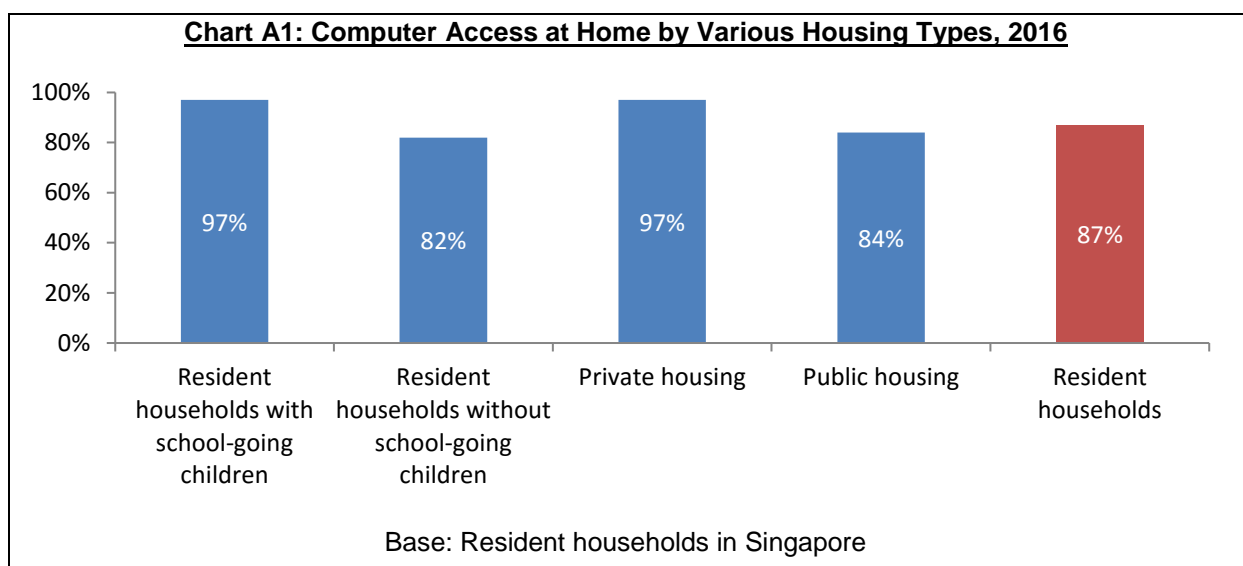
About 8 in 10 Singapore Residents installed anti-virus software and security updates on computer used to access the Internet at home and adoption rates of anti-virus software installation on smartphones saw significant growth

- Adoption rates of Internet security measures on home computer was similar to 2014 and 2015, with about 8 in 10 having installed anti-virus software and security updates on computer used to access the Internet at home.
- Among smartphone users who had connected to the internet in the past three months, more than 4 in 10 installed anti-virus software for smartphones, about 12 percentage-point growth from 2015.
- The main reason cited by non-adopters was “*Don't think that the protection is necessary*”, regardless of whether they accessed internet via computers or smartphones.

A. Computer, Internet and Broadband Access within Households

About 87% of resident households had computer access, and about 97% of households with school-going children had computer access at home.

Computer access in resident households was 87% in 2016. A higher proportion of households with school-going children had computer access at home as compared to households without school-going children (Chart A1).



“Lack of skills” and “no need to use” were the top two reasons for households not having access to a computer in the last three years.

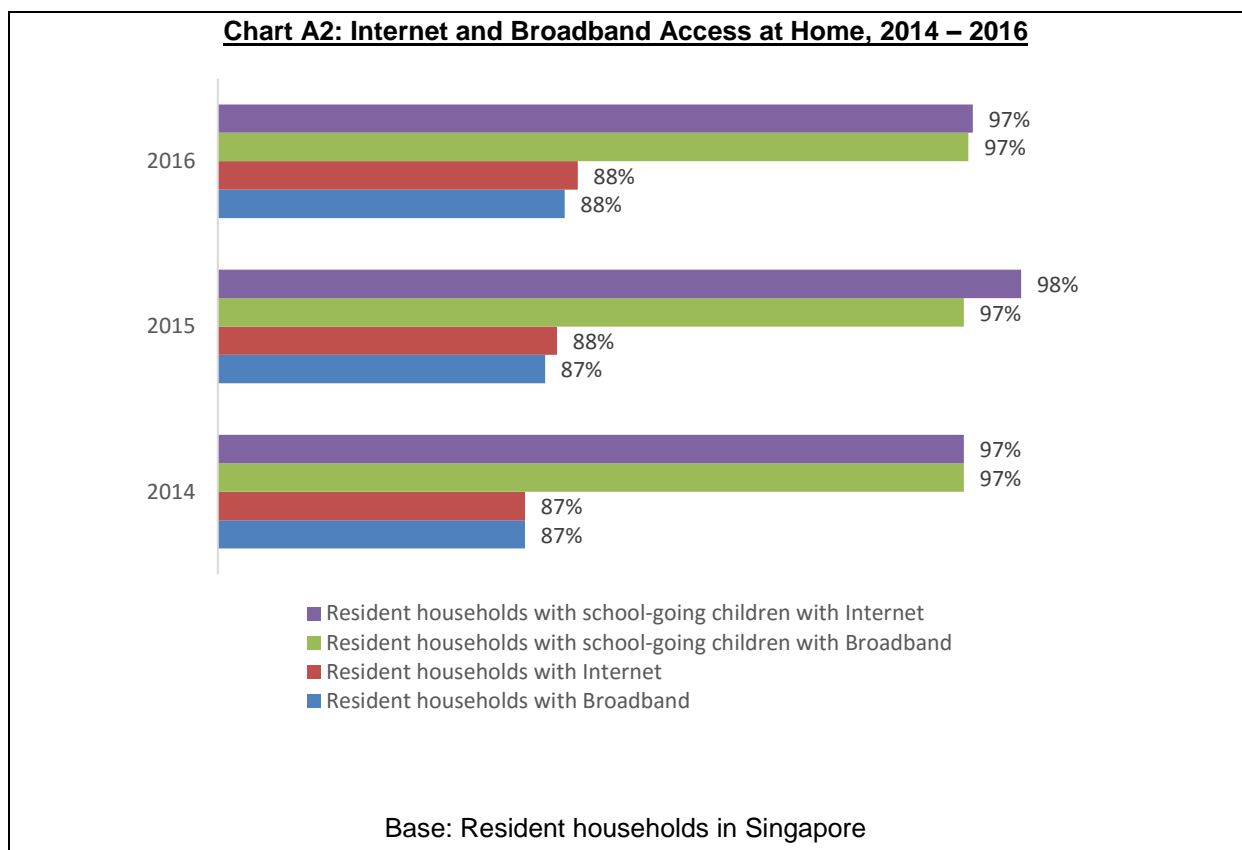
Table A1: Main Reason for not Having Access to a Computer at Home, 2014 – 2016

No.	Main Reason	2014	2015	2016
1	Lack of skills	31%	32%	45%
2	No need to use	41%	32%	26%
3	Old age is a barrier to learn computer skills	13%	18%	11%
4	Usually use mobile phone to access Internet	4%	8%	6%
5	Too costly to purchase a computer	10%	6%	8%

Base: Resident households that did not have access to a computer at home

Growing household internet and broadband access over the years

Home internet and Broadband access rates were 88.2% and 87.9% respectively in 2016, about one percentage-point higher than 2014. For households with school-going children, Internet and broadband access rates were both 97% in 2016, relatively consistent with 2014 and 2015. (Chart A2)

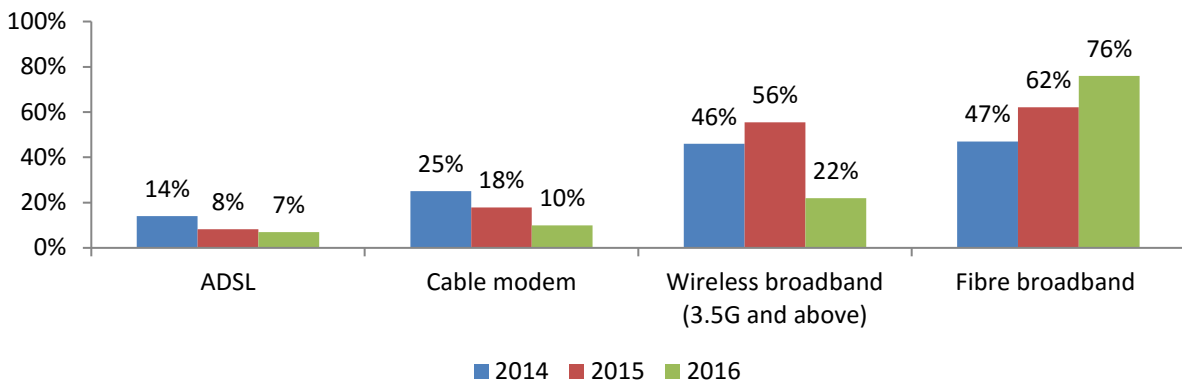


About 3 in 4 resident households had fibre broadband internet connection at home

Fibre broadband has grown to be the top Internet connection of choice used by 76% of resident households, about 29 percentage-points higher than 2014. The proportion of households using wireless broadband⁴ decreased by more than 30 percentage-points than 2015 to 22%, this decrease could be due to the switch to fibre broadband (Chart A3).

⁴ Wireless broadband comprises 3G, 3.5G/HSDPA; fixed broadband comprises ADSL, cable modem and fibre broadband.

Chart A3: Type of Internet Connection within Households⁵, 2014 – 2016

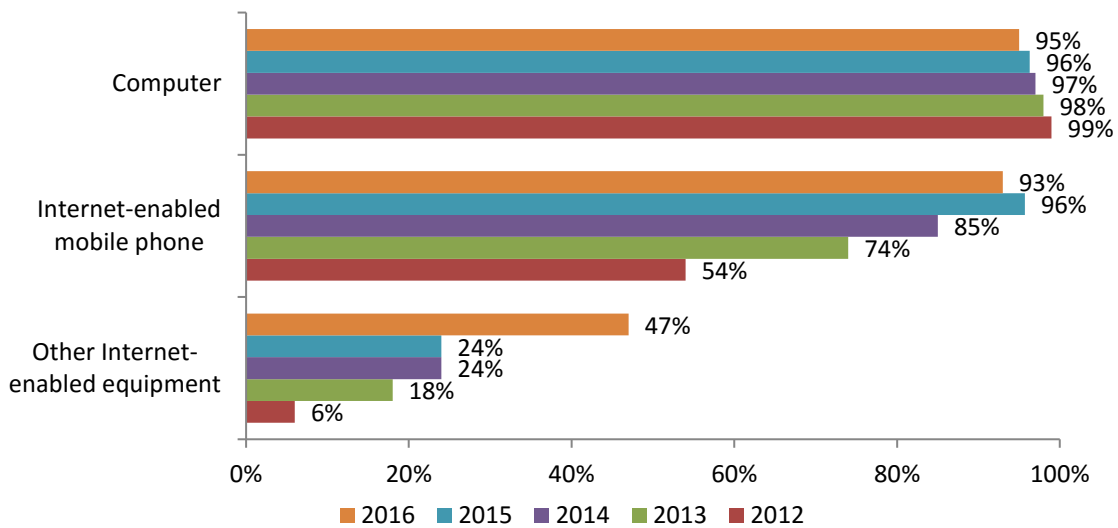


Base: Resident households with Internet access at home

Households show trends of switching to internet-enabled devices other than computer to access the internet

In 2016, about 93% and 47% resident households reported using an Internet-enabled mobile phone and other internet-enabled equipment (e.g. Game console with internet connection, Smart TV, internet-enabled MP3/MP4 and Network Attached Storage) to access the Internet at home respectively (Chart A4). Although the computer continued to be the dominant equipment of choice used for accessing the Internet at home over the past five years, the slight decrease might be due to the switch to using Internet-enabled phone and other Internet-enabled equipment.

Chart A4: Equipment Used to Access to the Internet at Home, 2012 – 2016



Base: Resident households with Internet access at home

⁵ Households with access to the Internet via both broadband and narrowband had been categorised as those with broadband Internet access. Please note that some households may have more than one type of broadband connection at home.

“Lack of interest/no need to use” and “lack of knowledge/skills/confidence” were the top two reasons for households without internet access over the last three years

Households without home Internet access continued to cite “*Lack of interest/no need to use*” and “*Lack of knowledge/skills/confidence*” as the top two reasons for not using the Internet in 2016. Similarly, they were the most commonly cited reasons by non-Internet users in 2014 and 2015. (Table A2).

Table A2: Main Reason for not Having Internet Access at Home, 2014 – 2016

No.	Main Reason	2014	2015	2016
1	Lack of interest/No need to use	51%	47%	65%
2	Lack of knowledge/skills/confidence	28%	37%	12%
3	Costly equipment costs	5%	3%	6%
4	Have access to Internet elsewhere	7%	7%	5%
5	Subscription to the Internet is too costly	3%	1%	1%

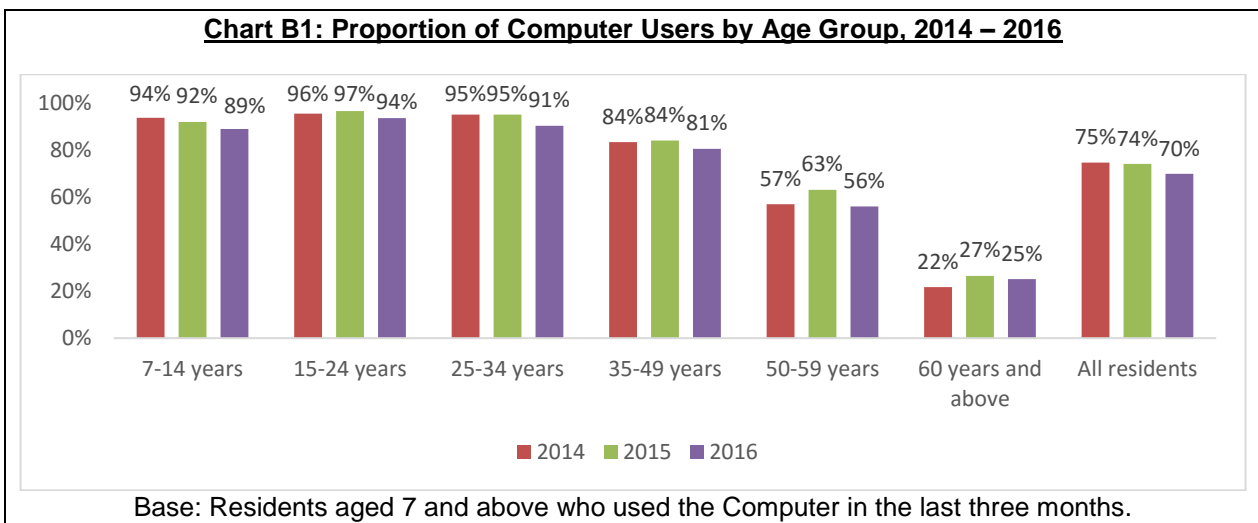
Base: Resident households that did not have access to internet at home

B. Recent Computer and Internet Usage by Individuals

Slight decrease in Computer usage rates by residents in the last three years

In 2016, about 70% of residents used the computer in the last three months (defined as computer users) with higher proportion of usage reported by younger residents aged 7-34 years old. (Chart B1).

Between 2014 and 2016, there was a noticeable 1-5 percentage-points decrease in computer usage by individuals.

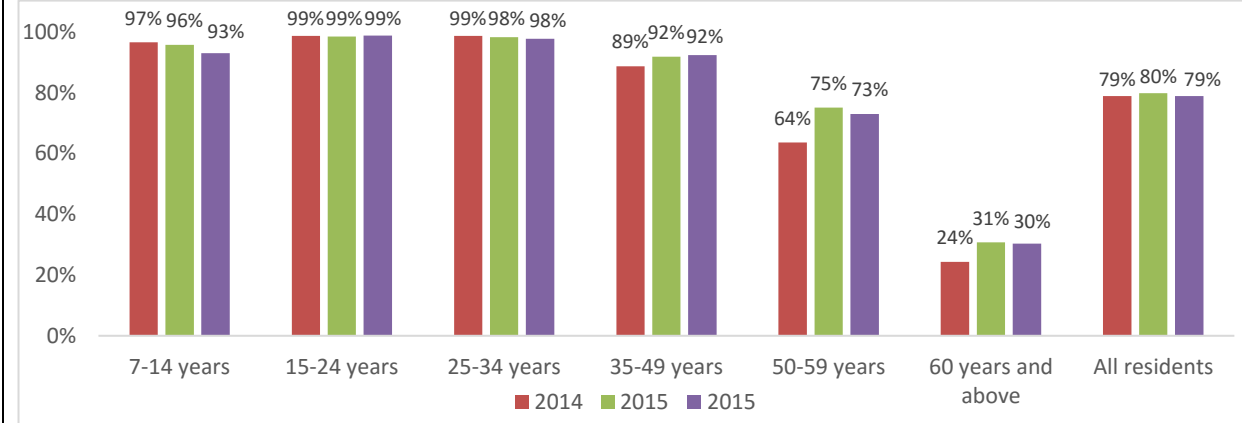


Highest proportion of Internet users found among residents under 35 years old and more than half of senior citizens learnt their computer/Internet skills from family members

In 2016, about 79% of residents used the Internet in the last three months (defined as Internet users) and almost all residents aged below 35 years old were internet users. The proportion of internet users across age groups in 2016 remained consistent (within 2 percentage-point difference), when compared to 2015.

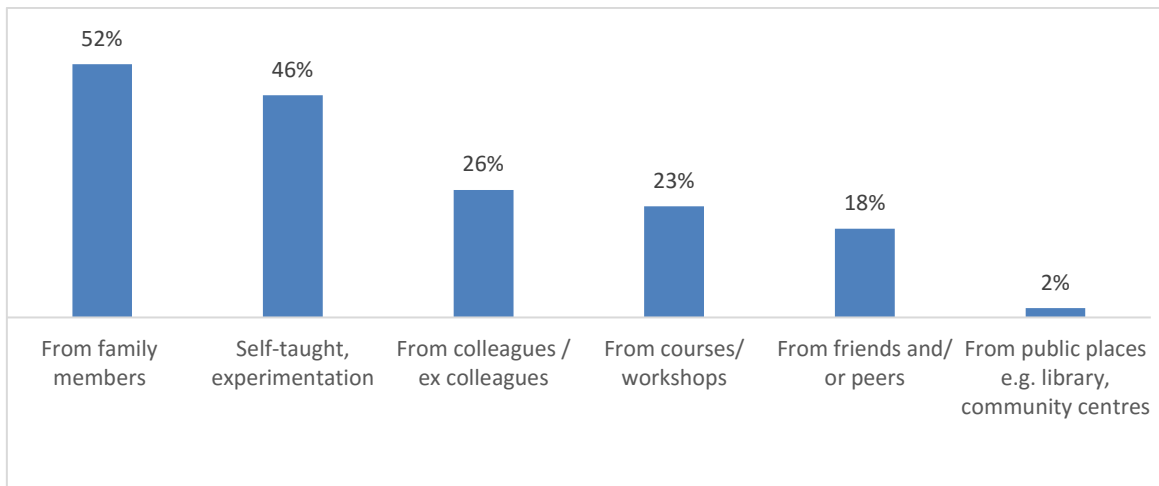
Between 2014 and 2016, 9 and 6 percentage-point increases in Internet usage were reported for those aged 50-59 and 60 & above to 73% and 30% respectively (Charts B2). More than half of the senior citizens learnt their computer/Internet skills from family members, the most common source of knowledge (Chart B3)

Chart B2: Proportion of Internet Users by Age Group, 2014 – 2016



Base: Residents aged 7 and above who used the Internet in the last 3 months.

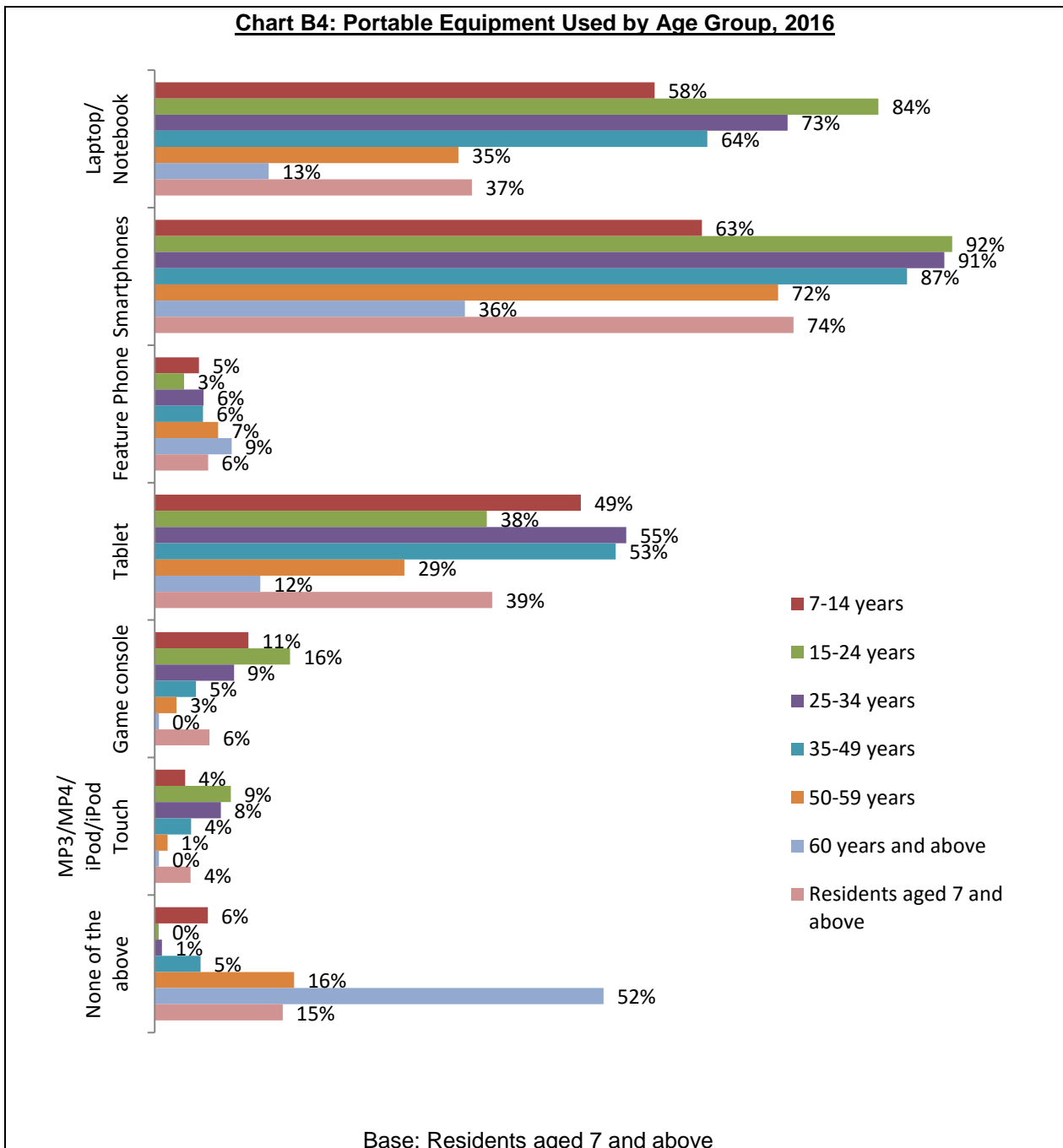
Chart B3: Where senior citizens learnt their computer/Internet skills, 2016



Base: Residents aged 50 and above who used the computer or internet in the last 3 months

Continued growth in senior citizens using smartphone to access the Internet since 2014

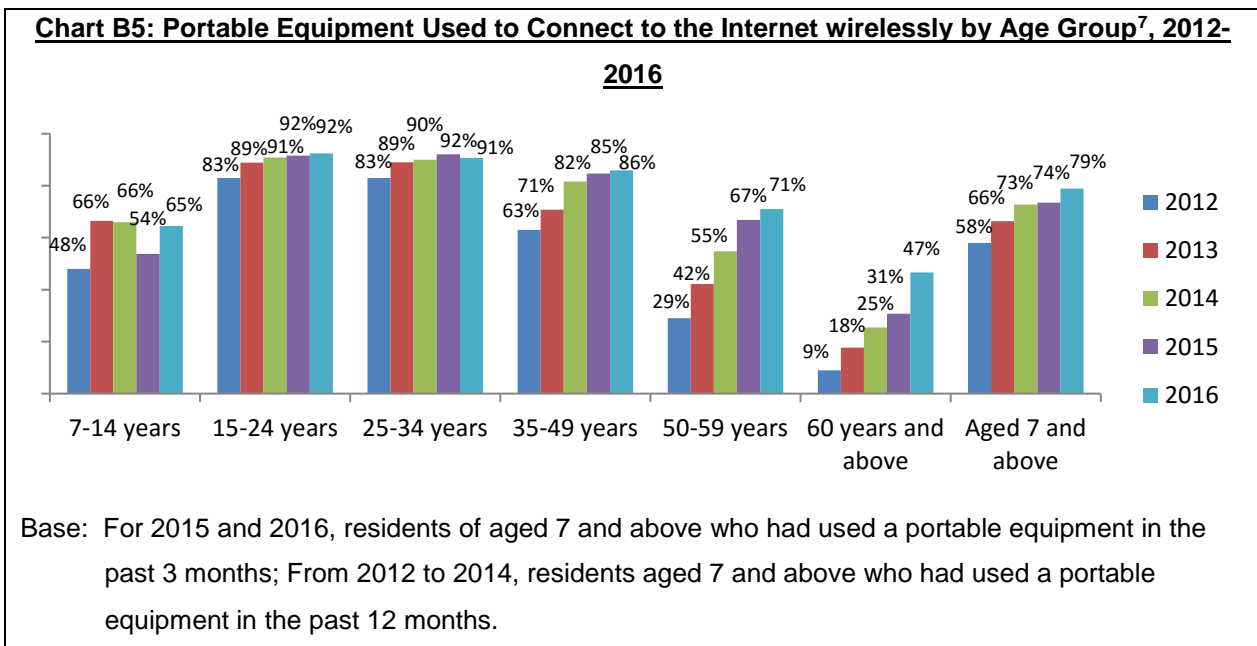
In 2016, about three-quarter and more than one-third of senior citizens aged 50 to 59 years, and 60 years and above respectively used a smartphone⁶ in the past three months. This represented an increase of 8 and 10 percentage-points for the two age groups respectively from 2014 (Chart B4). The highest smartphone usage was among residents aged 15 to 34 years old (91%).



⁶ A smartphone has more sophisticated functions than a feature phone. Examples of such functions are: i) able to open and read documents (e.g. pdf, office document) and ii) able to add / install applications on phone. These two categories are mutually exclusive, i.e. a mobile phone can only be a feature phone or a smartphone.

Significant growth in senior citizens using portable infocomm equipment to connect to the Internet wirelessly in 2016, when compared to 2012

In 2016, among residents who had used portable infocomm equipment in the past three months, 71% and 47% of those aged 50 to 59 years, and 60 years and above, respectively, connected to the Internet wirelessly (Chart B5). This was more than two-fold and five-fold increases compared to 2012 where the proportions were 29% and 9% respectively.



Lack of knowledge, skills or confidence was still the top reason cited by non-internet users in 2016 (Table B1)

Table B1: Main Reason for not using Internet, 2014 – 2016

No.	Main Reason	2014	2015	2016
1	Lack of knowledge /skills / confidence	60%	76%	71%
	Do not know how to use computer, internet-enabled feature phone	-	26%	39%
	Do not know how to use the internet	-	24%	26%
	Lack of confidence	-	19%	2%
	Language skills are inadequate	-	7%	4%
2	Too old to learn	-	12%	14%
3	Not interested / No need to use	36%	10%	16%

Base: Residents who had never used the internet before

Top three primary internet activities among Singapore residents were communication, leisure and getting information

⁷ Wireless connection excludes connection through a wireless router. It includes connection via public WiFi hotspots, 3G, GSM/GPRS and wireless broadband (e.g.3.5G/HSDPA, 4G/LTE).

The top three primary Internet activities⁸ of Internet users, consistently over the last three years, were related to communication, leisure activities and getting information (Table B2)

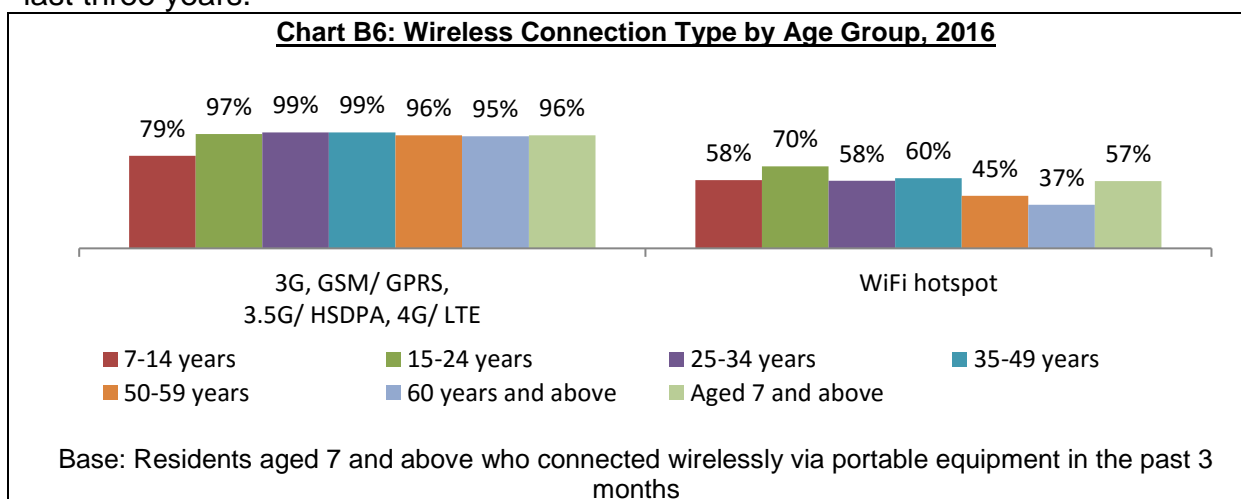
Table B2: Primary Internet Activity Groups of Internet Users, 2014 – 2016

Primary Internet Activity Group	Residents aged 7 and above		
	2014	2015	2016
Communication	84%	83%	91%
Leisure Activities	73%	77%	84%
Getting Information	65%	63%	79%
Online Banking	35%	31%	51%
Purchasing or ordering goods or services	41%	27%	37%
Education or learning activities	23%	17%	21%
Dealing with government organisations / public authorities	16%	16%	34%
Creating Content	8%	8%	23%

Base: Internet users aged 7 and above who had used the internet in the past 3 months

Singapore residents favour accessing the Internet wirelessly via mobile network over WiFi hotspots

Overall, users preferred to use their mobile network as compared to public WiFi hotspots when connecting to the Internet wirelessly (Chart B6), similarly observed in the last three years.



Using instant messaging emerged as the top mobile online activity in 2016

⁸ A primary Internet activity refers to an activity that is engaged in during all or most of the Internet sessions.

In 2016, among online activities on mobile equipment⁹, communication (using instant messaging , and using social networks, and sending or receiving email) made up the top three activities (Table B3), similar to 2015.

Looking for directions and transferring of funds were new additions to the list of Top Ten Internet activities on mobile equipment in 2016, when compared to 2015.

Table B3: Top Ten Internet Activities on Mobile Equipment by Age Group, 2016

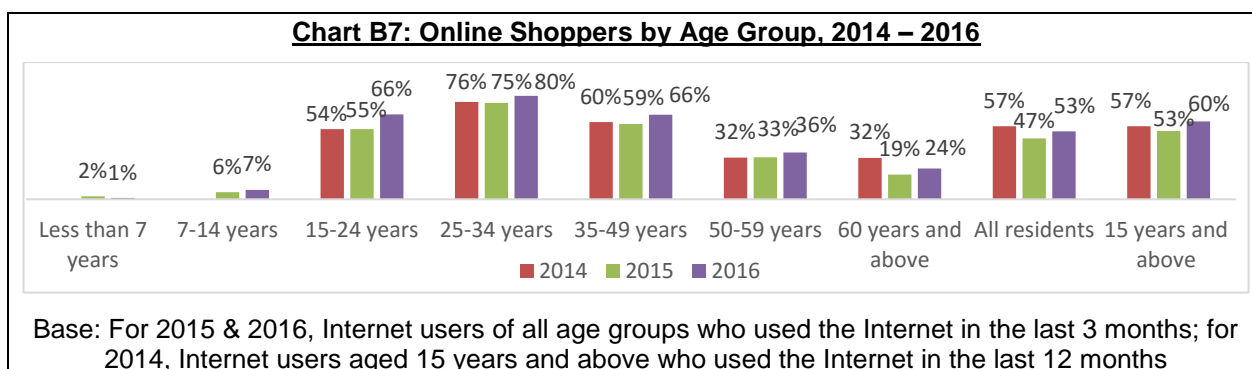
Activity	7-14 years	15-24 years	25-34 years	35-49 years	50-59 years	60 years & above	All age groups
Using instant messaging	55%	89%	87%	81%	65%	43%	74%
Using social networks	47%	90%	87%	79%	54%	31%	70%
Sending or receiving emails	32%	85%	85%	77%	49%	36%	66%
Getting information or general Web browsing	42%	72%	72%	67%	44%	29%	58%
Looking for directions	13%	64%	67%	60%	38%	22%	50%
Reading online news	18%	58%	65%	61%	37%	22%	49%
Downloading or watching movies, short films or images	53%	65%	54%	43%	32%	19%	45%
Getting information about goods or services	9%	55%	70%	57%	29%	16%	45%
Checking account information	1%	48%	69%	56%	27%	13%	42%
Transferring of funds	0%	43%	64%	55%	24%	11%	39%

Base: Residents aged 7 and above who had used mobile equipment in the past 3 months

⁹ Mobile equipment is defined as portable equipment excluding laptop/notebook.

Online shopping was on the rise and online shoppers were mainly from the 15-49 age group

In 2016, about six in ten Internet users aged 15 and above who used the Internet in the past three months had made an online purchase before (defined as online shoppers). The number of online shoppers in 2016 was about 1.53 million, and increased by a compound annual growth rate of about 8% from 2014. In the last three years, the highest proportions of online shoppers came from Internet users in the age groups 25-34 years, followed by 35-49 years, and 15-24 years (Chart B7).



Apparel, travel products and tickets for entertainment events were the three most popular items purchased online in the last three years

The three most popular items bought online for private purposes in the past three months were clothing, footwear, sporting goods or accessories (63%) followed by travel products (30%) and tickets for entertainment events (28%) (Table B4). These three items were also ranked the top three for the last three years. Booking(s) for sports facilities (9%) had emerged as a new popular item in 2016, when compared to 2015.

Table B4: Top Ten Goods or Services Purchased Online by Age Group, 2016

Items	7-14 years	15-24 years	25-34 years	35-49 years	50-59 years	60 years & above	15 years & above	All age groups
Clothing, footwear, sporting goods or accessories	28%	75%	69%	59%	52%	21%	64%	63%
Travel product(s) (e.g. air ticket, accommodation, vehicle hire)	31%	17%	36%	33%	30%	37%	30%	30%
Ticket(s) for entertainment event(s) (e.g. cinema, theatre, concert, sports game)	0%	29%	31%	31%	17%	12%	29%	28%
Food or groceries	0%	12%	25%	30%	21%	14%	23%	23%
Household or electronic items (e.g. air cleaner, vacuum cleaner, speakers)	0%	9%	17%	15%	19%	2%	14%	14%
Computer or video games (in digital form)	16%	17%	15%	7%	2%	2%	11%	11%
Computer equipment or parts (including peripheral equipment, such as harddrive, mouse, screen/monitor)	16%	8%	11%	10%	6%	5%	9%	9%
Books, magazines, newspaper (in physical form)	9%	9%	11%	8%	8%	5%	9%	9%
Booking(s) for sports facility (e.g. sports hall, football field, tennis court)	0%	7%	9%	7%	3%	0%	7%	7%
Computer software, mobile applications (in digital form)	0%	8%	8%	7%	7%	2%	7%	7%

Base: Online shoppers aged 7 and above who had made at least one online purchase in the past 3 months

Seven in ten online shoppers paid for online purchases using credit cards

Credit card payment remained as the most common mode of payment for goods or services purchased online, consistently over the last few years ([Table B5](#)).

Table B5: Payment Methods for Goods or Services Purchased Online by Age Group, 2016

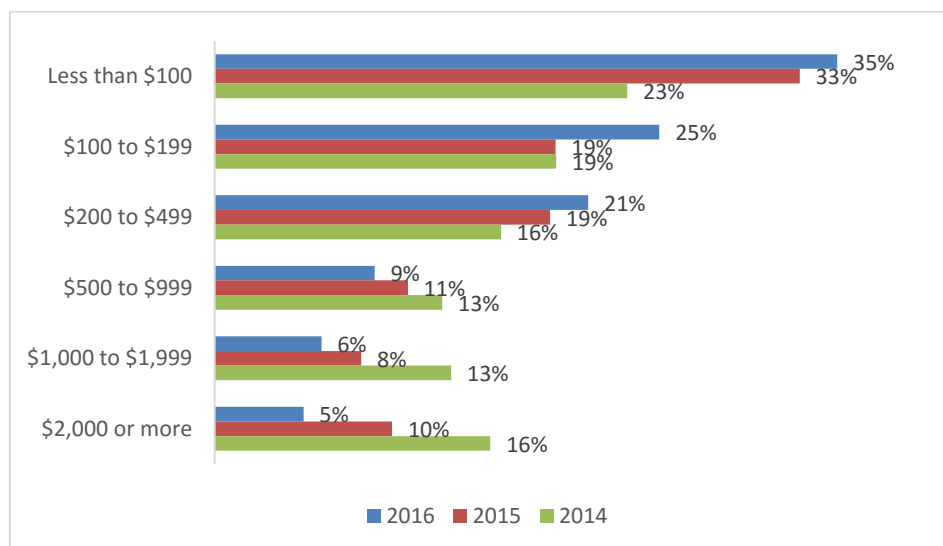
Payment Method	7-14 years	15-24 years	25-34 years	35-49 years	50-59 years	60 years & above	15 years & above	All age groups
Credit cards	100%	31%	37%	76%	86%	76%	71%	71%
Direct debit / Pay using bank account	0%	25%	60%	33%	24%	21%	34%	34%
Cash on delivery	0%	59%	23%	18%	11%	8%	15%	15%
Internet fund transfer	0%	0%	19%	19%	18%	12%	18%	18%
eNETS virtual account	0%	0%	7%	11%	13%	6%	10%	10%
Mobile Wallet (e.g., PayPal, Starhub's SmartWallet, DBS' Paylah)	0%	0%	5%	10%	7%	7%	7%	7%

Base: Online shoppers aged 7 and above who had made at least one online purchase in the past 3 months

Majority of online shoppers spent at least \$100 on online purchases over the last three years

About 7 in 10 online shoppers spent at least \$100 on their online purchases over the last three years ([Chart B8](#)).

Chart B8: Value of Online Purchases, 2014 – 2016

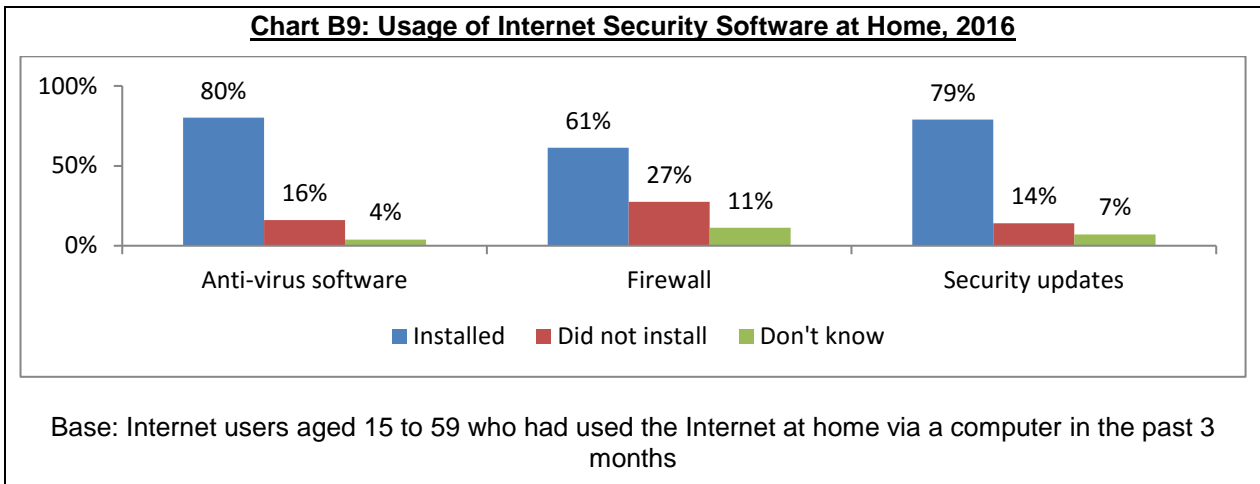


Base: For 2015 & 2016, online shoppers aged 15 years and above who had made at least one online purchase in the past 3 months; reference period was past 12 months for 2014.

Among Internet users who have never shopped online over the last three years, the most commonly cited reasons for not doing so was consistently “*Prefer to shop in person or deal personally with a service provider*” followed by “*Not interested*”.

Adoption rates of Internet security measures on home computer was similar to 2014 and 2015, with about 8 in 10 having installed anti-virus software and security updates on computer used to access the Internet at home

In 2016, anti-virus software and security updates were the top two Internet security measures adopted on computer used to access the Internet at home by about 80% of Internet users connected to the Internet at home via a computer in the past three months. (Chart B9).



More than half cited 'Don't think that the protection is necessary' as the main reason for not using Internet security software in 2016

Among users who accessed the Internet at home via a computer and did not install any one of the Internet security software (anti-virus, firewall, security updates), 58% cited that they did not think that there was a necessity to install anti-virus software, 53% cited the same for firewall, and 55% for security updates. About 26%-32% did not know that the protection was necessary (Table B6).

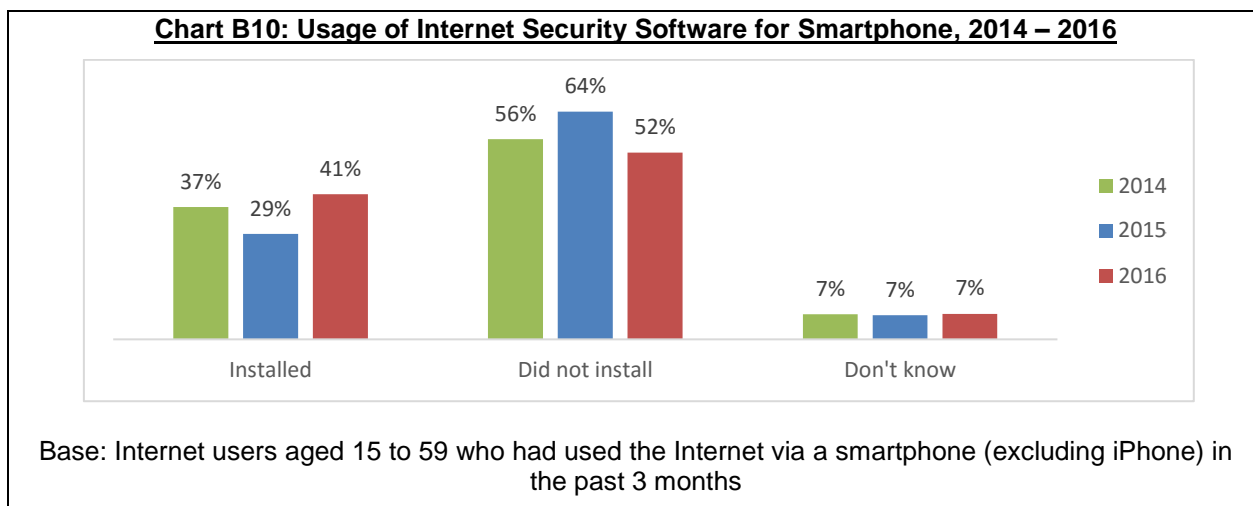
Table B6: Reasons for Not Using Internet Security at Home, 2016

No.	Reason for not using anti-virus, firewall or security updates at home	Anti-virus software	Firewall	Security updates
1	Don't think the protection is necessary	58%	53%	55%
2	Don't know that the protection is necessary	26%	33%	32%
3	Costly software or subscription	11%	5%	7%
4	Lack of knowledge, skills or confidence	5%	9%	6%

Base: Internet users aged 15 to 59 who had used the Internet at home via a computer (excluding iPad) in the past 3 months that was not protected by any one of the Internet security software (anti-virus, firewall, security updates).

About 4 in 10 installed anti-virus software for smartphones

About 40% of smartphone users who had connected to the Internet in the past three months¹⁰ had anti-virus software installed on smartphones in 2016, about 12 percentage-point growth from 2015. (Chart B10).



‘Don't think that the protection is necessary’ was still the leading reason for not using anti-virus software for smartphone in 2016, when compared to 2014 and 2015

Among users who accessed the Internet via a smartphone and did not install anti-virus software in 2016, 43% cited that they did not think that there was a necessity to install anti-virus software, with 15% and 17% did not know that protection was necessary, and available, respectively (Table B7).

Table B7: Reasons for Not Using Anti-virus Software for Smartphone, 2014 – 2016

No	Reason for not using anti-virus software for smartphone	2014	2015	2016
1	Don't think that protection is necessary (i.e., think that the phones will have a small chance of getting virus)	49%	53%	43%
2	Don't know that protection is necessary (i.e., don't know that phones can have viruses)	23%	19%	15%
3	Don't know that protection is available	14%	16%	17%
4	Cost of software/subscription is too high	5%	6%	7%
5	Lack of knowledge, skills or confidence	6%	4%	7%
6	Not enough space on mobile phone	2%	1%	5%

Base: Internet users aged 15 to 59 who had used the Internet via a smartphone (excluding iPhone) in the past 3 months that was not protected by anti-virus software.

¹⁰ In 2015 and 2016, a question on installation of anti-virus software was separately posed to smartphone users.