Coronavirus – impacts on the tech sector

An overview of the impact of coronavirus on the international technology sector

June 29, 2020

Producers
Molly Newell
Christopher Johnson

Roadmap

- Overview
- Action to ensure technology access
- Tech applications in COVID-19 relief
- Public opinion

COVID-19 is disrupting the international technology sector

Given the important role that China plays in the international tech industry, the presence of COVID-19 in China is having a significant impact on the business relationships that generally driving the sector.

Supply chains

- **Product inventories are depleting** amid prolonged citywide shutdowns and factory closures in China
- China's Council for the Promotion of International Trade has issued 1,615 force majeure slips (as of 2/20) to protect companies from penalties for **not being able to meet contractual obligations** because of the outbreak
- These supply chain challenges are arising amidst the **larger US-China trade war**

Trade shows

- Leading sponsors, including Verizon, AT&T, and IBM pulled out of the **RSA Conference**, one of the year's biggest cybersecurity conferences
- **Mobile World Congress**—which typically draws over 100,000 attendees from 200 countries and planned to take place in Barcelona, Spain—was cancelled
- Cancelling trade shows **limits global economic activity** by closing channels for international partners seeking to network

Areas of growth

- As increased numbers of employees work remotely in response to coronavirus fears, digital platforms that support remote work are seeing spikes in usage
- Video conferencing platform **Zoom Video Communications** is one the fastest growing stocks, seeing its price rise 38% over the past month
- Other **"stay-at-home" stocks**, including Netflix, are expected to see increases

Sources Business Insider, Market Watch, Wall Street Journal, CNN, CNBC

Four issues facing the tech sector after COVID-19

1

Consumer privacy protections for health data

- Adopting policies to "track and trace" the spread of the disease has lead to an increased reliance on technology that raises concerns over privacy and surveillance
- Contact tracing technology in development from big tech companies such as Apple and Google has lead to a congressional response, with members of congress indenting to propose legislation that touches on consumer privacy

2

Concerns over the stability of the global supply chain

- In the midst of the coronavirus pandemic, tech supply chains have struggled to produce on the same levels as pre-pandemic, however have met less demand due to the global recession
- One of the hardest-hit nations, China, has slowed exports to the US by up to 50% in March

3

Job loss and automation

- Massive job loss caused by the coronavirus pandemic has raised questions around the intersection of automation and job replacement
- Robotics companies such as AMP Robotics have seen a "significant" increase in orders for its robots that replace recycling jobs by sorting through mass-scale recycling collections

4

Public response and the "tech-lash"

- Public opinion of tech companies could change after the pandemic, as actions they have taken that have placed them in the forefront of fighting the pandemic could lead to issues that are being discussed through congressional regulations, such as data privacy and automation

Sources: The New York Times, Verge, Fortune Mehlman Castagnetti

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Social distancing and quarantines are increasing demand for internet services

Coronavirus and the digital divide:

Calls to work from home and limit in-person interactions do not accommodate the 21 million Americans that do not have consistent access to high speed internet or that struggle to afford mobile services

Key areas of consideration during the COVID-19 emergency

Education

- As schools move to online classes, the roughly 1/5 of K-12 students that do not have at-home access to a computer or an adequate internet connection will struggle to complete work
- This gap disproportionately impacts low-income families and people of color

Remote work

- Even as state economies reopen, many workplaces are still encouraging employees to work from home
- Just 25% of US workers can do their jobs remotely, according to a recent study, and they are more likely to be in high-paid sectors

Health care

- Telehealth use has surged amidst the pandemic, with Congress and executive agencies working to increase access

FCC Keep Americans Connected Pledge:

This pledge expires on June 30

Over 800 tech companies and trade associations have signed the FCC's "Keep Americans Connected Pledge," which aims to protect US consumers during the pandemic by calling on private industry to voluntarily:

1. Not terminate service to residential or small business customers due to an inability to pay caused by pandemic-related disruptions
2. Waive late fees customers may incur
3. Open Wi-Fi hotspots to any American who may need them

Sources: Benton Institute, FCC, US News.

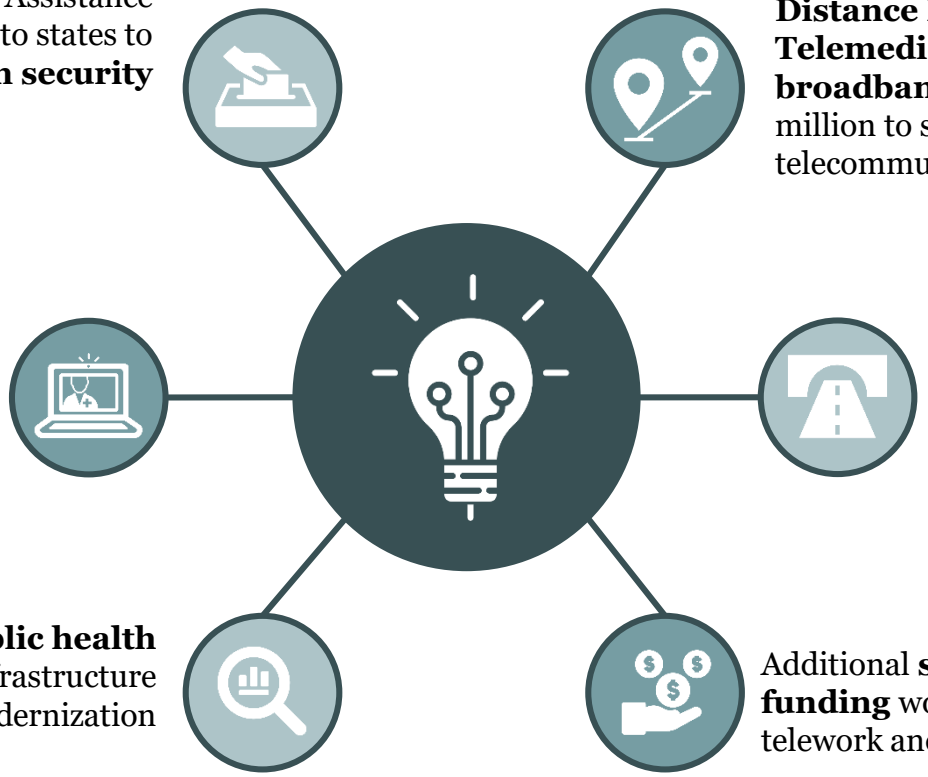
The CARES Act increased funding for various tech initiatives across government agencies

Key technology provisions

$400 million to the Election Assistance Commission to give grants to states to improve **election security**

Distance Learning and Telemedicine (DLT) and broadband program to receive $25 million to support rural telecommunications access

FCC to receive $200 million to enable the provision of **telehealth services**



DHS to receive $9.1 million to address interagency coordination for the **protection of critical infrastructure**

$500 million to improve **public health data surveillance** and infrastructure modernization

Additional **state- and local-led funding** would include expansion of telework and digital services

Sources: GovTech

The FCC has taken action to strengthen certain Universal Service Fund programs during the COVID-19 emergency

Social distancing due to COVID-19 has led to increased dependence on activities that require telecommunications and broadband network connectivity, including remote working, telemedicine, and education. FCC has taken steps to expand and modify three USF programs in response to the pandemic.

Lifeline

Overview: Lifeline is the only federal program focused on phone and broadband adoption for low-income families

FCC action:

- Usage requirements and de-enrollment procedures waived until May 29
- Temporary waiver on requirements that all enrollment representatives register with USAC

E-Rate

Overview: E-Rate is the largest government program addressing in-school broadband access

FCC Action:

- Waived gift rules until Sep. 30
- Extended the application deadline
- FCC has reiterated that closed schools and libraries may permit public use of E-Rate supported Wi-Fi networks while on school or library property

Rural health care

Overview: RHC provides subsidies to health care providers for connectivity services to enable telehealth

FCC Action:

- FCC fully funded the RHC program budget, extended the RHC application window and lifted gift rules until Sep. 30
- FCC is also piloting major telehealth programs, including the Connected Care Pilot Program, which will receive USF funds

Sources: Congressional Research Service, Benton Institute.

Many Washington leaders are calling for the FCC to do more to support its Lifeline program

Social distancing has driven the economic slowdowns that have resulted in economic hardship for many Americans while also reinforcing the importance of broadband connectivity. As the only federal program focused on phone and broadband adoption for low-income families, Lifeline is a key connectivity program during the pandemic.

Calls for Lifeline expansion and FCC response

Industry response: Following President Trump's declaration of a National Emergency, approximately 250 groups called for FCC to adapt Lifeline for the crisis by (1) Prohibiting disconnects of Lifeline for consumer; (2) Requiring Lifeline providers to offer unlimited voice minutes and texting and commensurate voice-only financial support; and (3) Creating an emergency Lifeline broadband benefit for low-income households

FCC action: On April 29, FCC temporarily waived the requirement that consumers must provide as least three consecutive months of income documentation and extended waivers intended to prevent the de-enrollment of subscribers who would have otherwise been required to certify their continued eligibility.

Hill support: Over 140 members of Congress urged the FCC to work with USDA and HHS to inform the millions of Americans newly eligible for SNAP or Medicaid that they are also eligible for Lifeline

FCC response: Commissioner Geoffrey Sparks noted that Lifeline enrollment has remained flat during the pandemic relative to SNAP applications

Sources: Congressional Research Service, Benton Institute.

FCC has taken steps to improve students' access to internet services during the COVID-19 pandemic

Highlight of FCC action to support education

1. FCC and Department of Education are **promoting the use of the $16 billion CARES Act Education Stabilization Fund** for remote learning.

2. FCC **waived gift rules in the E-Rate program** until September 30, allowing schools and libraries to accept improved capacity, Wi-Fi hotspots, or other equipment services from providers during the COVID-19 outbreak.

3. **Over 700 companies and associations have signed FCC's Keep Americans Connected Pledge**, which calls on companies not to terminate service due to an inability to pay, waive late fees, and open Wi-Fi hotspots to any American who needs them during the pandemic.

E-Rate overview

- E-Rate is the largest government program addressing in-school broadband access
- Advocates have called on FCC to loosen regulations so funding can be more easily spent on at-home devices to improve access for students
- 16 Democratic senators sent a letter to FCC calling upon the agency to determine how much of the E-Rate program can be used for one-time discounts to schools seeking to loan out Wi-Fi hotspots or enable internet access on other devices
- The $2 trillion Senate CARES package did not provide additional E-Rate funding

Sources: FCC, Education Week, Benton Institute, The Hill

The CARES Act authorized the $200 million FCC COVID-19 Telehealth Program

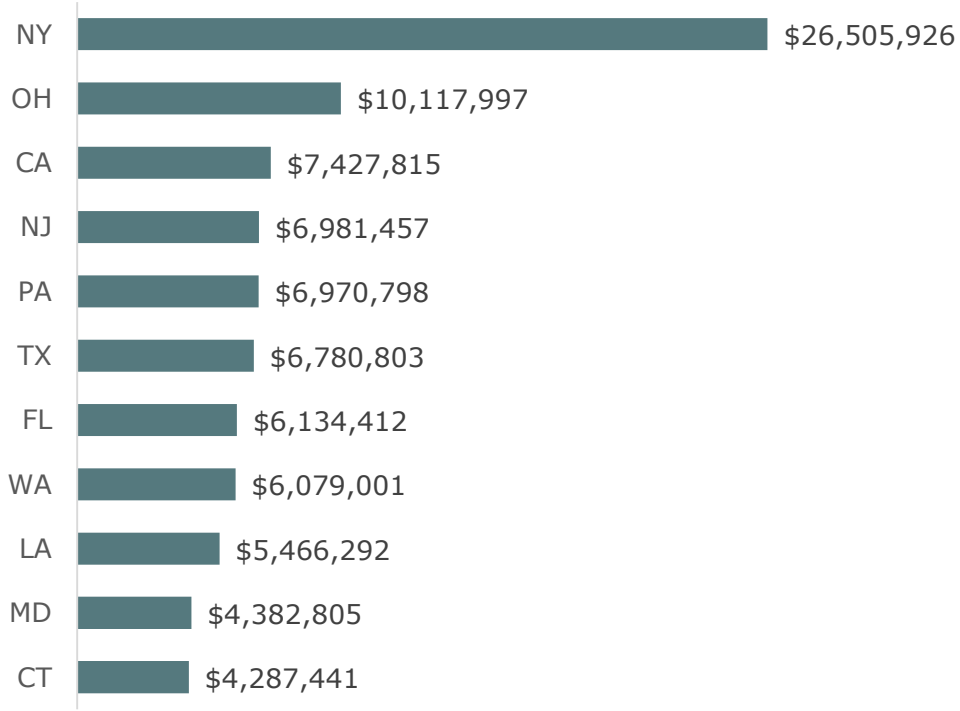
As of June 23, the FCC has granted over $150 million to 444 awardees in 46 states and Washington DC

Program overview

- Adopted by FCC on April 2, 2020
- The program is **limited to nonprofit and public health care providers**, including both rural and non-rural clinics
- Funds can be used to **purchase telecommunications, information services, and connected devices** integral to patient care
- COVID-19 Telehealth program is **not a grant program**, instead offering reimbursement for eligible expenses
- The FCC announced that it **had stopped accepting** new applications on June 25

States with highest amount of program awards

FCC, AS OF JUNE 23



Source: FCC.

Coronavirus threatens to delay action on ongoing investigations into antitrust action in the tech sector

Federal Trade Commission

- The FTC is currently investigating Facebook for instances of anti-competitive behavior, including examining Facebook's acquisitions of Instagram and WhatsApp in the early 2010's.
- A representative of FTC noted shifting priorities due to COVID-19, saying they are "looking at each case individually and will seek to adjust timing as needed."

Department of Justice

- The DOJ is also broadly investigating antitrust actions in the tech sector, including a probe into Google's online advertising practices.
- While the Department hasn't commented on specific cases like Google's, they have indicated that they are taking time to review cases via phone or video meetings.

Congressional Action

- In 2019 the House Judiciary Committee announced an investigation into competition specifically in digital markets, holding hearings with those in the industry.
- Antitrust subcommittee chairman Rep. David Cicilline (D-RI-1) stated that current investigations will be delayed, pushing back an initial timeline to produce a report by the end of the first quarter.

State Action

- Almost all US state attorneys general have joined investigations into Google and Facebook, lead by New York and Texas AGs.
- Both leads on these cases have made statements indicating that they have no plans to slow down these investigations.

Sources: Axios

Slide last updated on: March 30, 2020

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On April 10, Apple and Google announced a partnership to build contact tracing into smartphone software to track COVID-19

Contact Tracing: A method of **tracking the spread of infectious diseases** by monitoring contact of those infected to follow the disease to new patients and areas. The partnership between these two tech companies would use smartphones to notify users when someone has come in contact with an infected individual.

Overview and rollout

- The two companies plan to have the feature built into most iPhones and Androids by mid-May, allowing those devices to wirelessly exchange anonymous health information and notify individuals of contact
- In the first iteration of this technology, users would need to opt in via an app controlled by public health authorities
- Future plans for rollout include adding the software directly into operating systems, allowing a larger share of users to participate

Public response and privacy concerns

- Public official and regulators have criticized the technology in its sharing of sensitive health information alongside location information
- Members of the House Freedom Caucus in a letter to the president expressed concerns over data collection from these two companies
- The two companies have responded to these concerns by stressing that no location data is collected and all health data shared between phones is anonymous and unable to be accessed by Apple or Google

The partnership comes from two of the largest smartphone software manufacturers in the world, potentially reaching 3 billion users worldwide. These companies stress the **importance of contact tracing** in **containing a future outbreak** allowing authorities to track instances of contact.

Sources: Bloomberg

Lawmakers and privacy experts raise concerns over collection and applications of contact tracing data

Support and opposition to Google and Apple's partnership to develop contact tracing technology

Support: Former national security experts, major tech companies

- Stewart Baker, former assistant secretary of Homeland Security for George W. and former general counsel of the National Security Agency has called for the development of this technology and urged for further monitoring systems similar to Singapore to expand tracking of citizens' movements and contacts
- Baker believes that the intrusion of privacy associated with this technology is "trivial" compared to other sacrifices made to fight the virus
- Countries such as France and Germany are drafting proposals for contact tracing apps that step around existing, stricter, privacy laws, concerning experts

Opposition: Democratic lawmakers, privacy experts

- Lawmakers, including Sen. Mark Warner (D-VA) have expressed concerns that using this technology during a crisis will open the door for governments and corporations to easily access people's location and healthcare data even after the pandemic
- Some experts doubt that the technology can work if its entirely anonymous and voluntary or without a large surveillance database, leaving some privacy advocates worried that people will be pressured to use it
- Rep. Anna G. Eshoo (D-CA-18) took issue with the lack of guidelines from the Trump administration on the development of this technology, saying "Without a national privacy law, this is a black hole"

Non-Privacy related concerns over the partnership and development of contact tracing technology

- Opponents have argued that, on a global scale, the lack of smartphone ownership will hurt the technology; the Global System for Mobile Communications estimates only 49% of the global population has used an internet enabled smartphone
- The divide of those with devices that can take advantage of this technology is argued to play into a larger divide in digital literacy in certain regions of the world
- India has the world's second-largest smartphone market after China, yet only half of its population have signed on to participate in the nation's contact tracing app program

Sources: LA Times, CNN

Emerging technologies are playing a key role in tracking the spread of coronavirus

An international team is using **machine learning** to sort through social media posts, news reports, data from official public health channels, and physician information for **warning signs of the virus's foothold in countries outside of China**

How it works:

- Looks for posts that mention Coronavirus symptoms from geographic areas where doctors have reported potential cases
- Natural language processes determine whether a post is someone discussing the news or mentioning their own symptoms
- A similar approach was used by company BlueDot to identify the virus in late December—before Chinese officials acknowledged the emergency
- Identifying new instances of the virus from social media will be difficult because the characteristics of the new disease aren't entirely known

Potential uses:

- Identifying new cases
- Learning how the virus behaves
- Identifying the demographics most susceptible to the virus

Other activities: A group of researchers used data from Tencent—the Chinese company that operates WeChat—modeled the contagion and found that travel restrictions imposed by Chinese authorities may have slowed the spread of the disease for a few days

Sources: Wired

Various AI systems are currently being used to support hospitals, clinicians, and patients in the US

Systems to screen individuals who *might* be infected are one of the **earliest** and **most common** applications of artificial intelligence in response to the pandemic

- Nearly all built using CDC guidelines, though there is variations in the questions asked and the advice offered and are not an adequate substitute to a detailed conversation with a clinician
- The rapidly changing knowledge on the disease requires regular updates on the chatbots
- *Example:* CDC partnered with Microsoft to develop a self-checker that helps people who feel sick decide whether they should go to a hospital for treatment

Highlight of other applications currently in use:

Identify high-risk patients, allowing doctors to proactively reach out

Catch early symptoms in health care workers

Detect and distinguish COVID-19 from other respiratory illnesses, particularly methods that don't rely on the increasingly-short supply of testing kits

Remote temperature detection to prevent the sick from entering public spaces

Predict **which patients will fare the worst**

Track and forecast **hospital resources**

Monitor the conditions of patients with COVID-19 and certain chronic conditions outside of hospitals

Monitor outcomes of experimental treatments

Sources: Stat News

Alphabet subsidiary Verily has worked with the US Government to aid in COVID-19 testing

Nature of partnership

- On March 13, 2020 President Trump announced in a press conference a partnership between the US government and Google to develop a website aimed at providing information on local testing resources and other support
- On March 15th, Google and Alphabet CEO Sundar Pitchai provided more information on the nature of this partnership, saying they are partnering with the US government to develop "a website dedicated to COVID-19 education, prevention, and local resources nationwide"
- Google was a participant of a call on March 10th with other representatives from tech companies on coordinating responses to the virus

Details of pilot program

- Verily, a subsidiary of Alphabet launched Project Baseline, the website resulting from its partnership with the US government
- The website currently operates within California's Bay Area and allows users to take a screening test and "triage people who are concerned about their COVID-19 risk into testing sites based on guidance from public health officials and test availability"
- The site is able to provide preventative information as well as manage those who "meet eligibility and requirements for testing will be directed to mobile testing sites based on capacity… Once tested, individuals will be informed of their COVID-19 test results within a few days"

Sources: Google, BBC, Politico, Verily.

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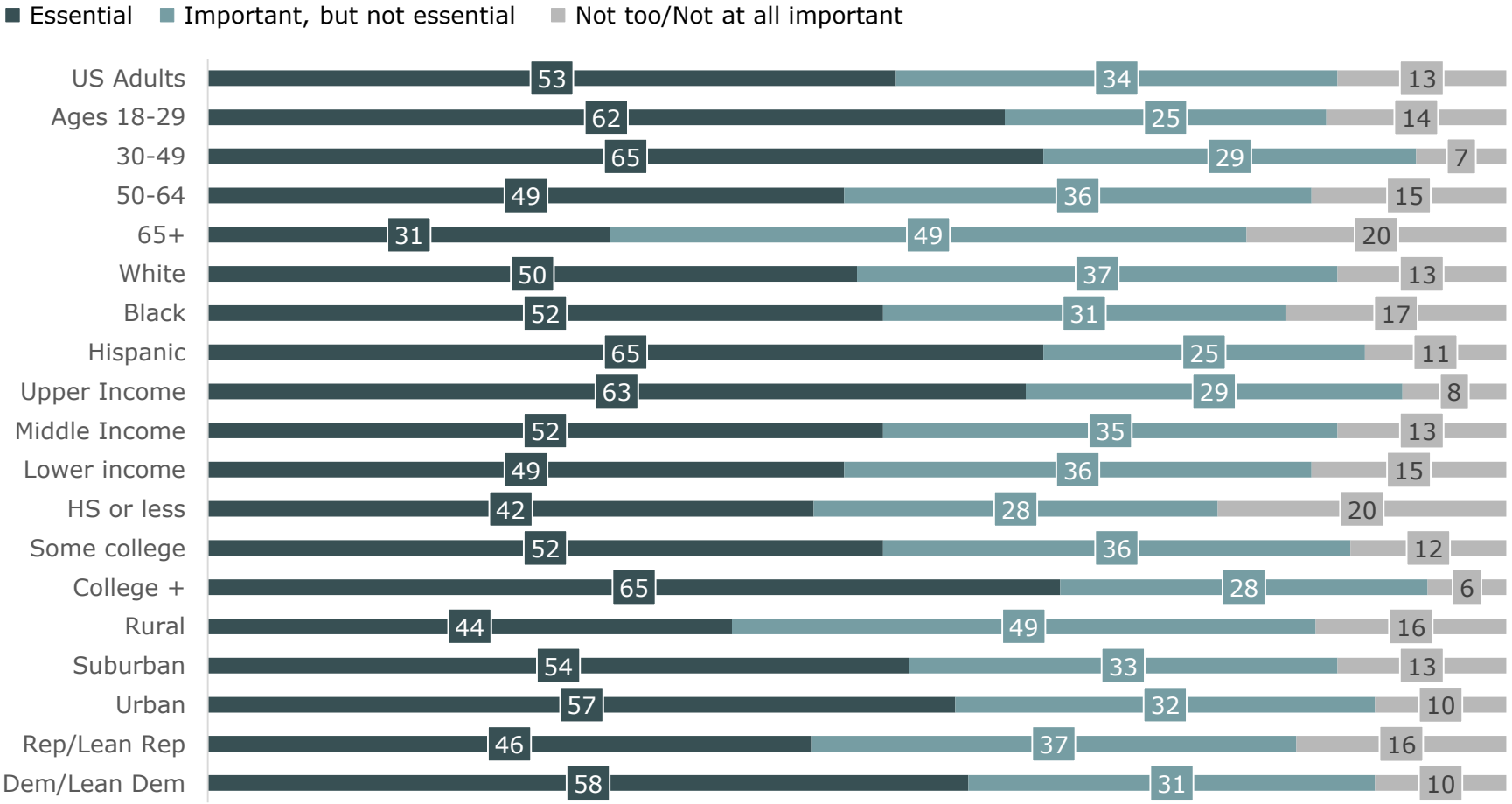
53% of US adults say that the internet has been essential during the coronavirus outbreak

Percent of American adults who say that the internet has been _____ for them during the outbreak

PEW, APRIL 7-12, 2020

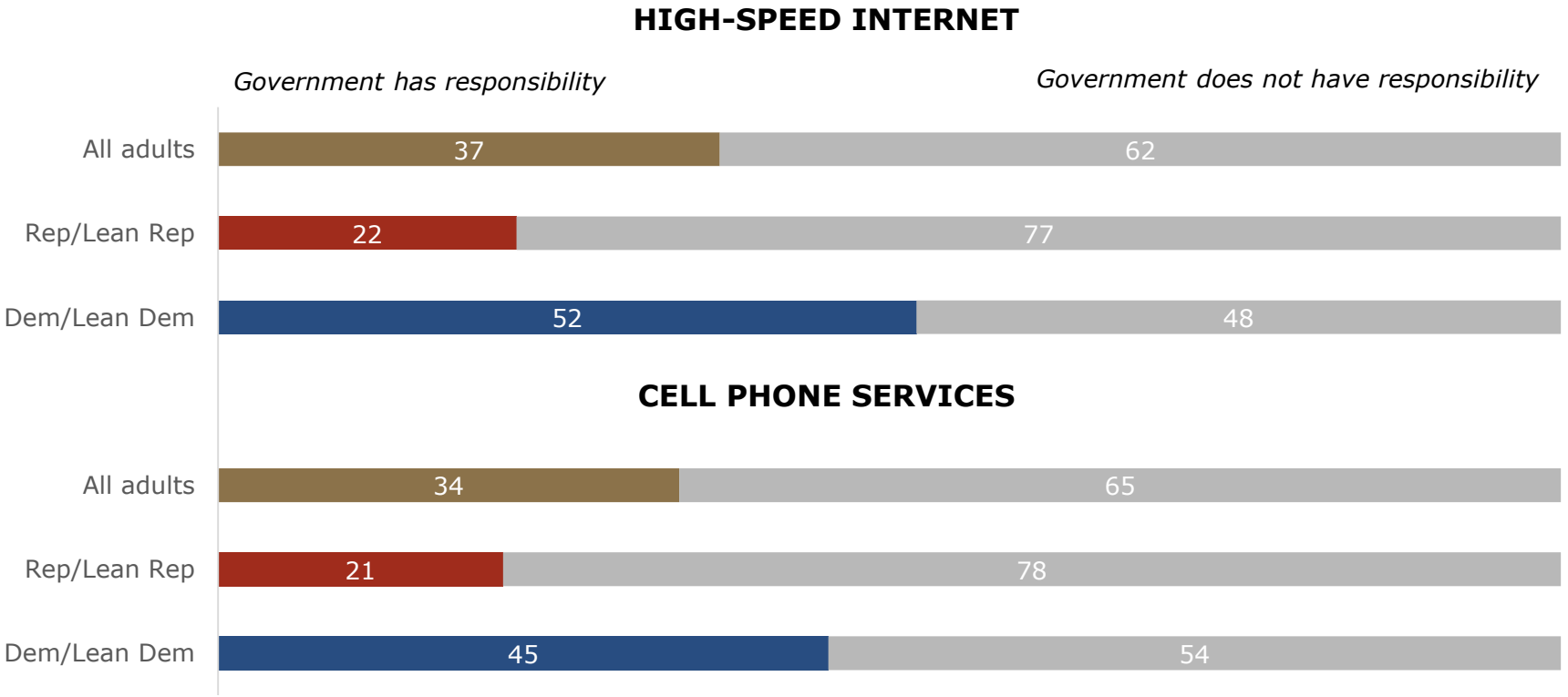


Sources: Pew

Democrats are more likely than Republicans to support government efforts to ensure at-home connectivity

Percent of American adults who say that the federal government is or isn't responsible to ensure that all Americans have _____ during the COVID-19 outbreak

PEW, APRIL 7-12, 2020

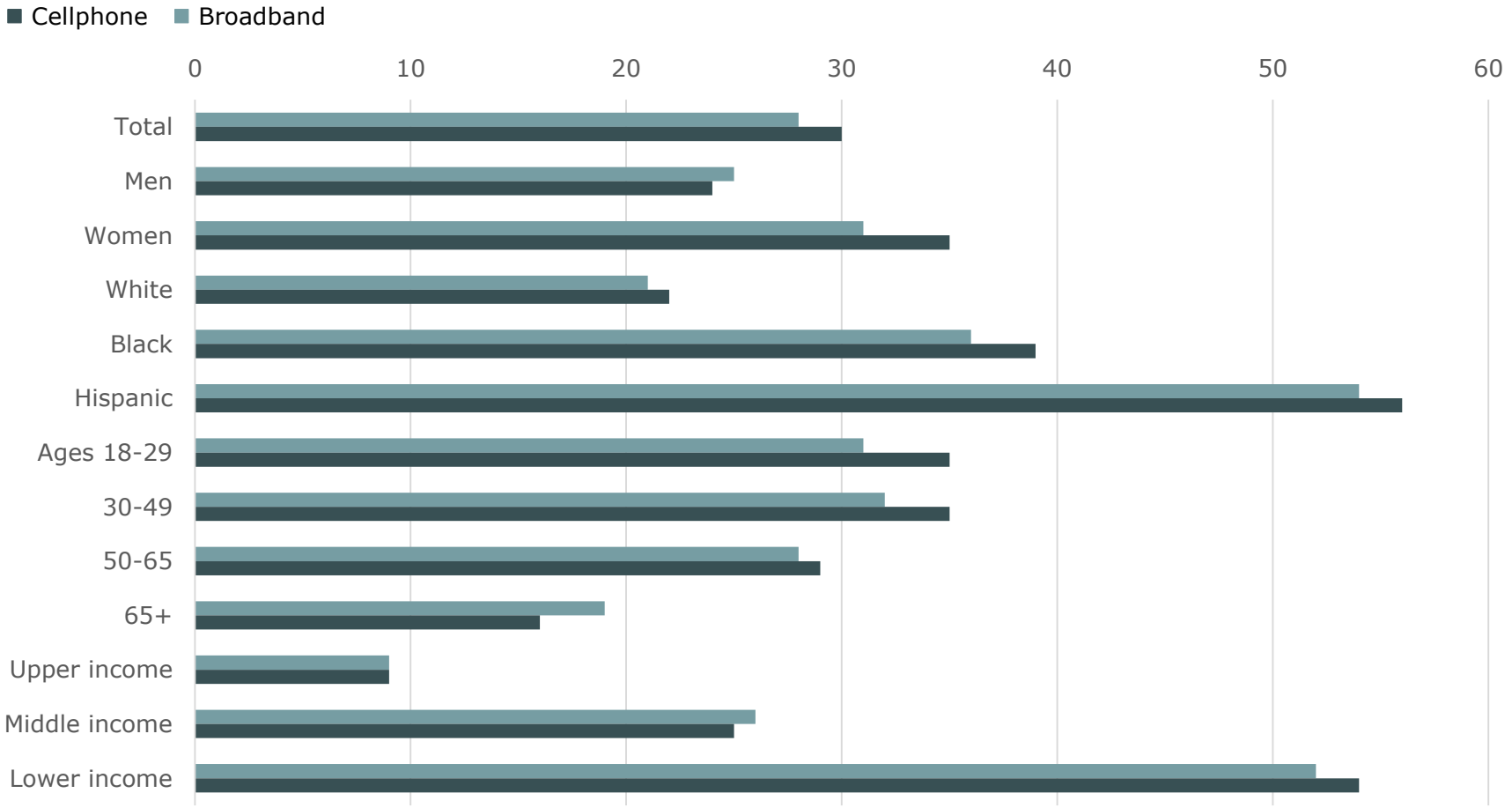


Sources: Pew

30% of US smartphone users worry about paying their cellphone over the next few months

Percent of users who worry a lot or some about paying their bills over the next few months

PEW, APRIL 7-12, 2020

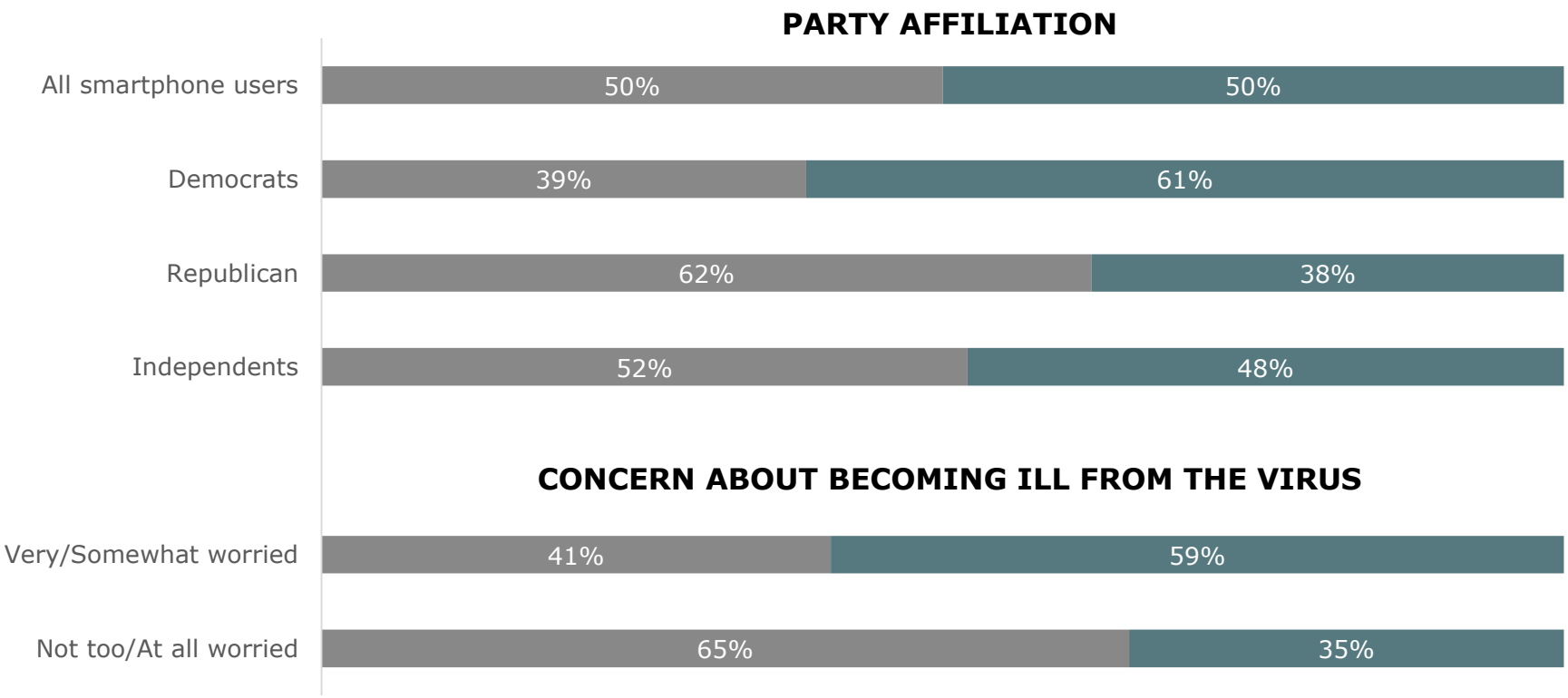


Sources: Pew

Americans are divided on if they would use a virus-tracking app

Percent of smartphone users on whether they would use an app that tells users whether they have been close to someone diagnosed with COVID-19

WASHINGTON POST-UNIVERSITY OF MARYLAND POLL

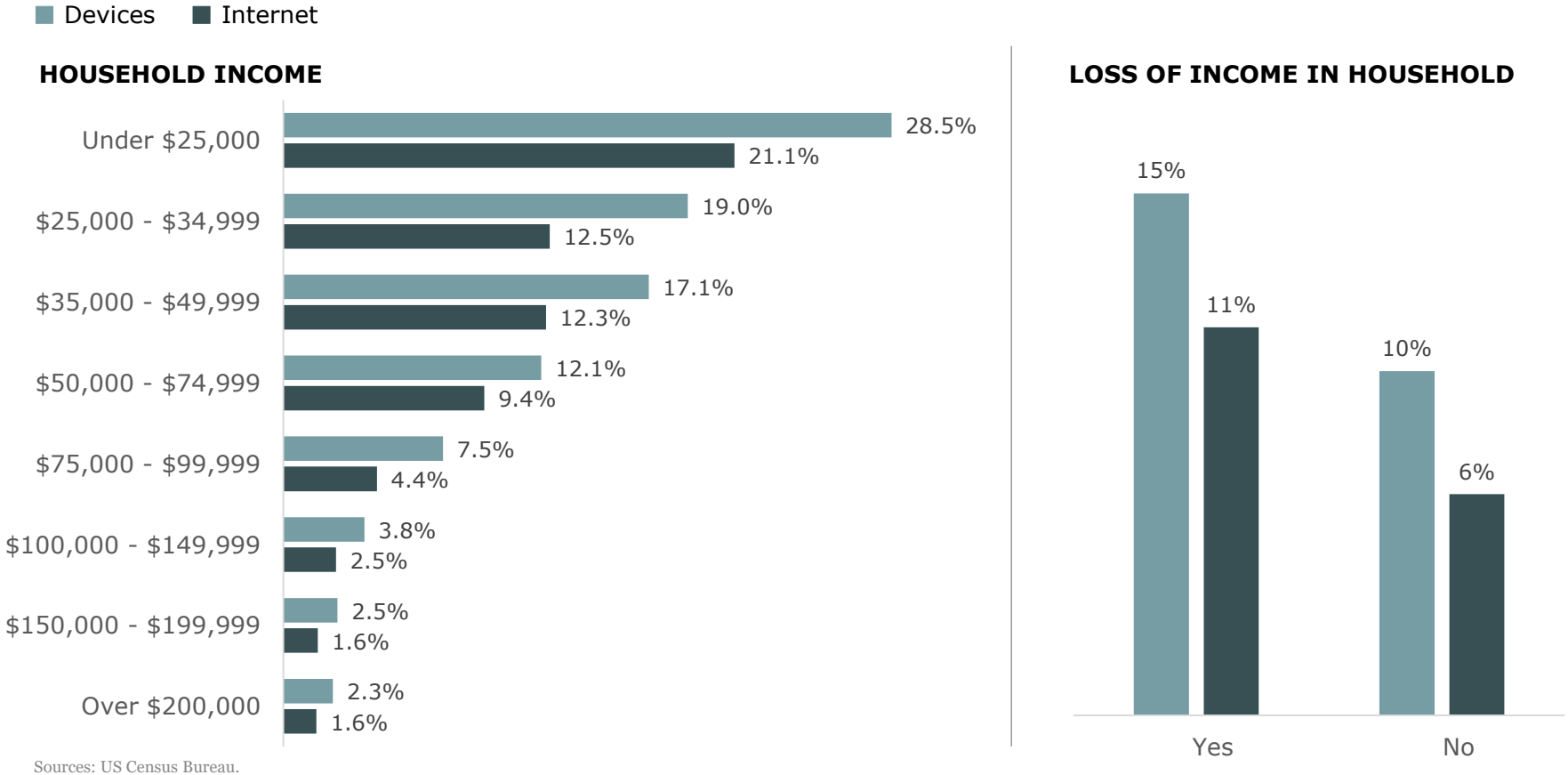


Sources: Washington Post.

Households with financial insecurity are more likely to report inconsistent technology availability

Share of total population 18 years and older in households with children in public or private schools who report having technology available for education sometimes, rarely, or never

U.S. CENSUS BUREAU HOUSEHOLD PULSE SURVEY, MAY 21-26



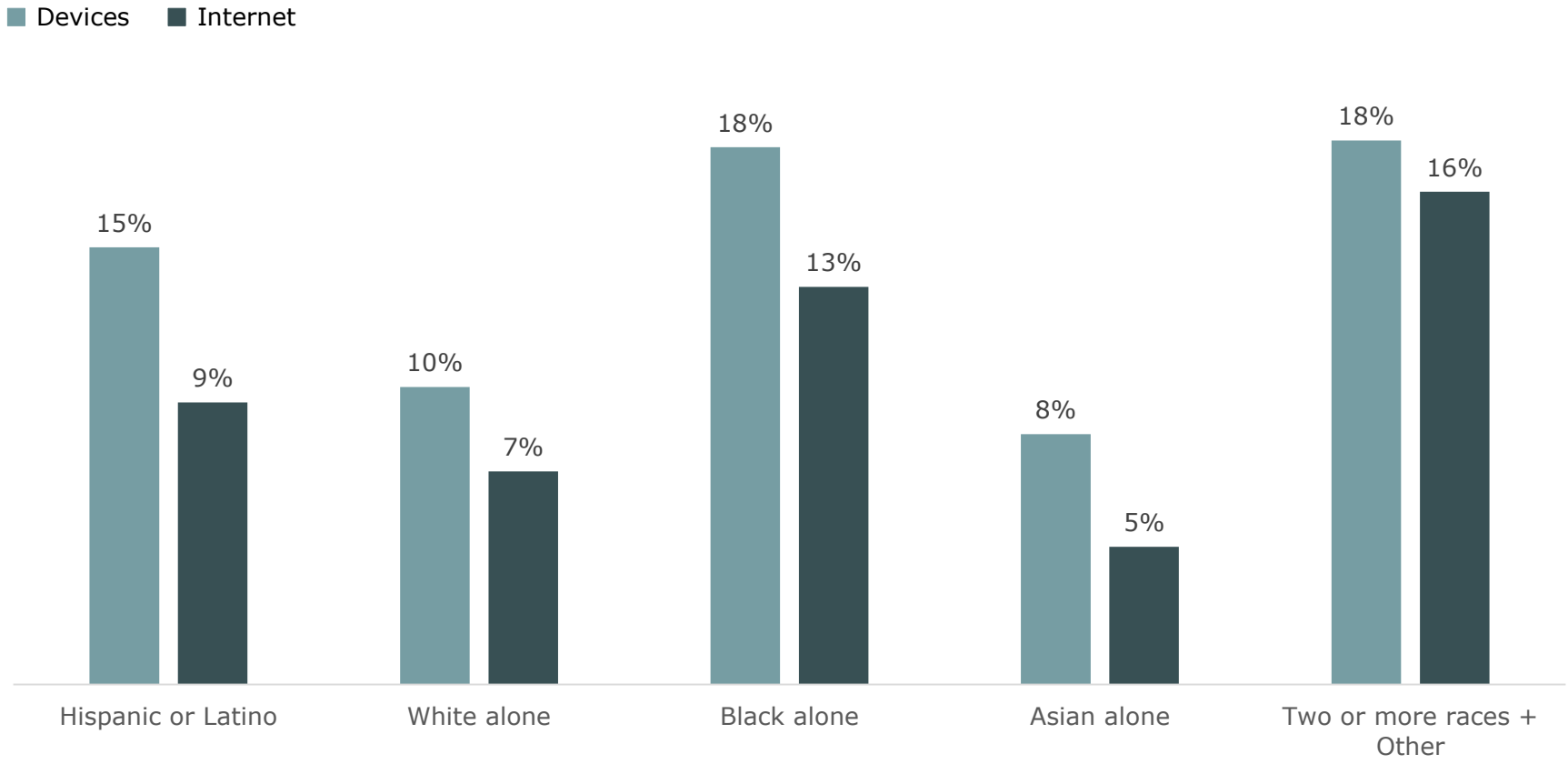
Sources: US Census Bureau.

Slide last updated on: June 4, 2020

Black and Hispanic households are less likely to report having consistent access to the tech needed for online learning

Share of total population 18 years and older in households with children in public or private schools who report having technology available for education sometimes, rarely, or never

U.S. CENSUS BUREAU HOUSEHOLD PULSE SURVEY, MAY 21-26.



Sources: US Census Bureau.

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