



ASSESSMENT OF AUDIENCE ESTIMATES DURING COVID-19

Nielsen Data Science Research Brief
April 2021

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EXECUTIVE SUMMARY

The COVID-19 pandemic brought unprecedented changes to every aspect of daily life, impacting overall consumer behavior and driving rapid changes in media consumption. As the media industry begins to look ahead to a new normal, it's important to step back and understand what the data tells us about audiences before, at the height of and in the present state of the pandemic.

As part of this research brief, we've taken a look at the drivers that have led to shifts in audiences during this time, both from the lens of consumer behavior as well as potential variability in the data resulting from necessary changes in how the Nielsen TV panel was managed during a time where in-person maintenance was modified.

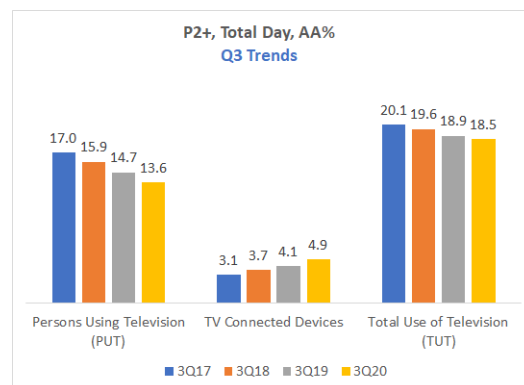
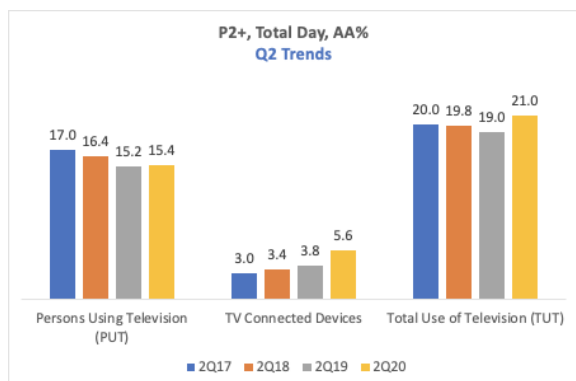
In short, our findings suggest that, while there was an increase in variability during this time period, the overall panel trends reflect valid viewing behavior. Our research suggests that many factors contribute to audience trends during this time, including changes in the amount of new content that was available to consumers during the pandemic, and shifts in the platforms on which content is being consumed.

As the industry plans ahead for the upcoming fall season, we recommend taking the unusual nature of 2020 into consideration, and we encourage the use of standard error as an input to analysis of historical estimates.

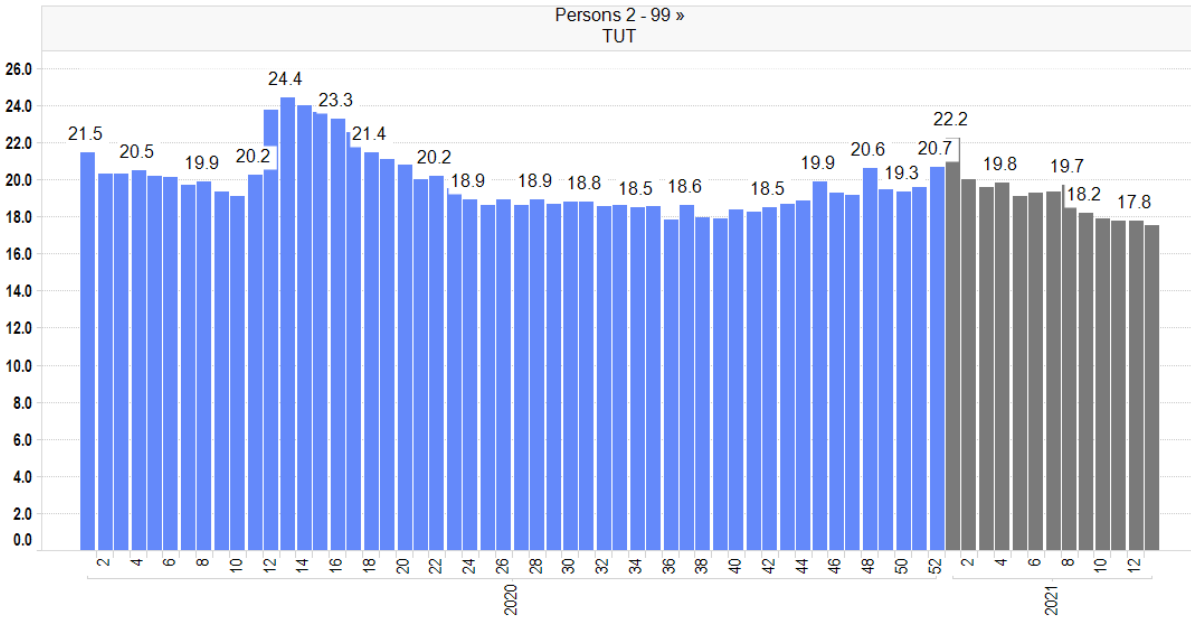
AUDIENCE TRENDS

Since the peak quarantine period at the start COVID in March 2020, both ratings and reach levels continued declining, a trend that was evident pre-COVID. An examination of PUT (Persons Using Television) and TUT (Total Usage of Television) can be used to understand overall consumption patterns.

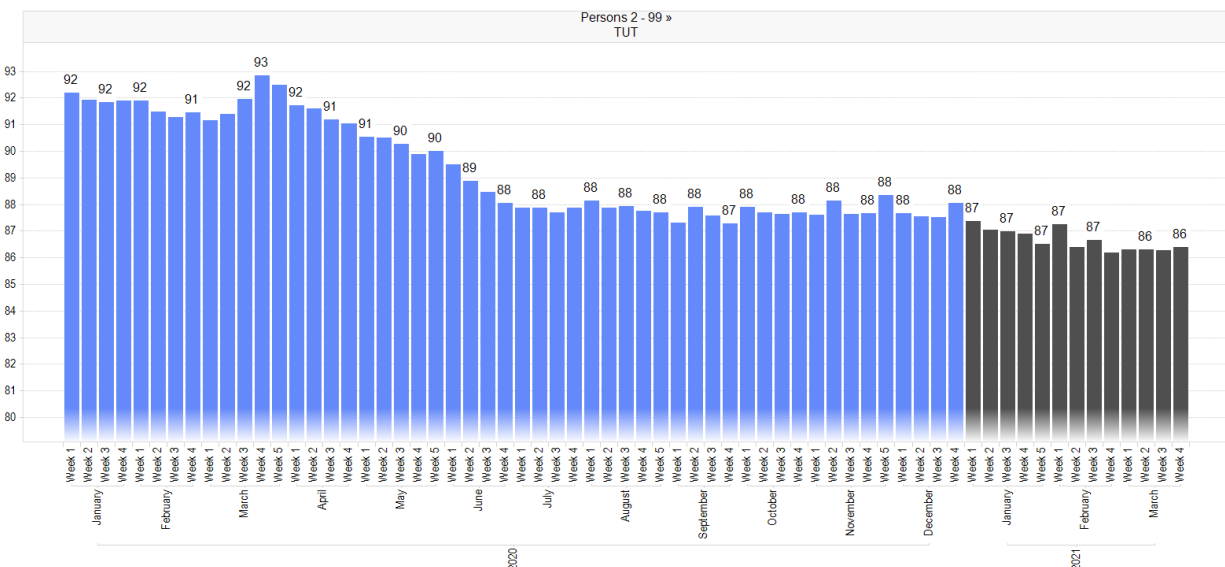
Over the last several years, we have generally observed a decline in TUT ratings, driven by declining PUT levels that were not compensated by an increase in TV connected device usage. In Q2 2020, this trend was disrupted due to spikes in television usage in the early quarantine period. In Q3 2020, the year-over-year trend decline seen in prior years resumed.



From a weekly perspective, from January 2020 through March 2021, there is a peak in TUT ratings for Persons 2+ in late March 2020. This trend flattens through the summer months and increases toward Election Day and the holidays. In Q1 2021, TUT is lower than the prior year, but with a similar trend curve.



Average weekly reach for TUT declined from an average of 92% of persons using a TV set for at least 1 minute during the week in January of 2020 to an average of 88% by year-end and then to 86% in late March 2021.



These changes in PUT and TUT have raised questions related to the drivers of these changes and what factors may be contributing to these results. We will explore macro changes around programming and consumer trends, as well as the Nielsen TV panel metrics to highlight factors that may be contributing to these trend changes.

NIelsen PANEL ASSESSMENT

COVID Procedures

The Nielsen National TV panel is a source of audience estimates that fuels the media industry. Nielsen panel homes are typically recruited, installed and maintained via in-home visits. In order to comply with state and federal guidelines, and ensure the safety of Nielsen associates and the families that participate in our panels, Nielsen paused all in-home activities at the onset of the pandemic. A series of revised procedures were put in place, aimed at protecting the overall fidelity of audience estimates and maintaining a robust sample size.

These revised procedures included remote installation and maintenance of panel homes, as well as an acceleration of the rollout of the Nano meter, which is more conducive to remote activities. In addition, the following changes were made to ensure sample size retention:

- Extending the tenure of panelists that were scheduled to leave the panel;
- Enhancing incentives to encourage homes to continue to participate in the panel;
- Modifying flag withhold, escalation and resolution procedures in order to maintain more homes in the reporting sample.

While many of our procedures can be and were performed adequately via remote or proximity methods, some conditions are usually resolved through in-home interactions with the panelists or with a field technician directly working with the meters and devices. The majority of the procedural changes above were reset to pre-COVID processes as of March 22, 2021, allowing the Nielsen field staff to return to in person activities.

Following the resumption of in-home work at scale, Nielsen also began a maintenance prioritization effort that focuses on overdue flags and other conditions that require an in-person visit to resolve. As of March 2021, Nielsen had identified approximately 9,400 homes to visit for outstanding priority work, and we have resolved approximately 2,058 of those cases as of April 8, 2021.

The pause in in-home work and the changes to our maintenance policies had an impact on our panel health, and we have therefore performed this assessment of how and whether these challenges affected our audience estimates.

Sample Size & Representation

At the start of the pandemic, Nielsen created benchmarks to monitor panel health over time. One such benchmark was the sample size before our National Panel Expansion (NPX), launched in September 2014, at which time our overall sample sizes were expanded, including the addition of homes from the 31 set-meter markets in the National reporting sample. While there has been increasing fragmentation since the NPX expansion, it does provide useful comparative metrics for understanding the magnitude of changes over time.

Recruitment, installation and maintenance constraints during the pandemic resulted in decreased panel counts compared to the pre-COVID time period. However, current panel sizes still represent a sizable increase over pre-expansion sample sizes—with an effective sample size still nearly double what it was pre-NPX expansion.

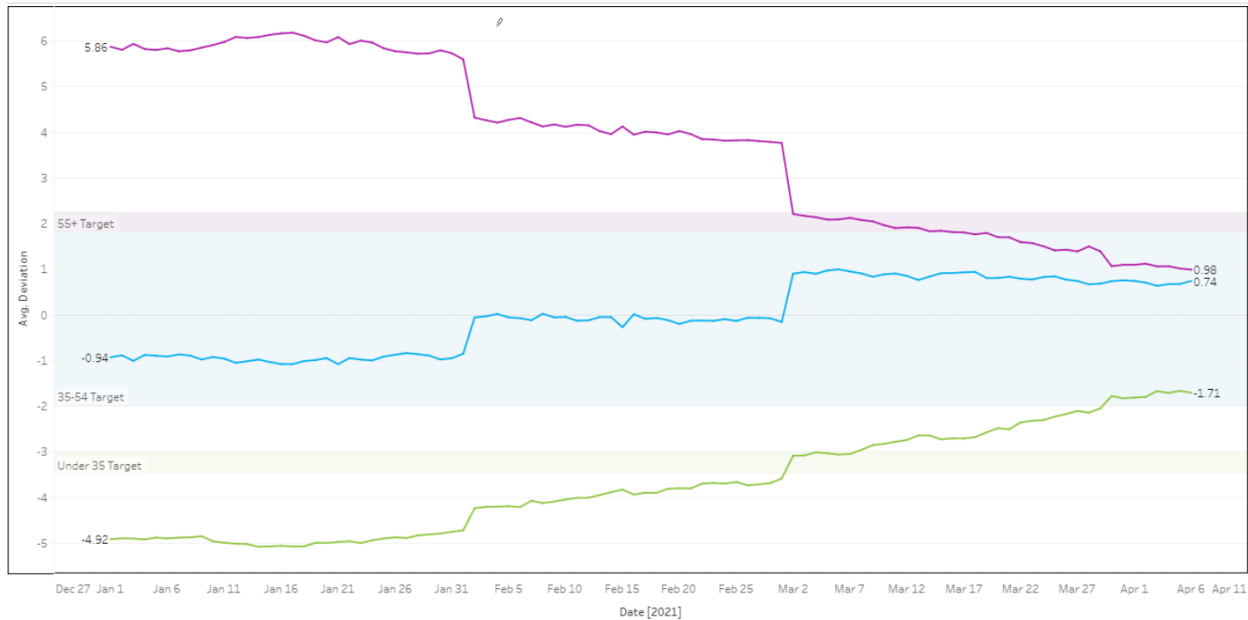
Household Counts	Pre-NPX (September 2014)	Pre-COVID (February 2020)	Current (March 2021)	Current vs. Pre-COVID	Current vs. Pre-NPX
Installed	21,081	47,169	37,639	-20%	+79%
Intab	19,852	44,471	35,510	-20%	+79%
Effective Sample Size	11,506	27,699	22,024	-20%	+91%

During the COVID-19 period, Nielsen transformed the way it manages its panel to leverage more remote techniques and address sample representation challenges. Specifically, Nielsen began to screen and re-order its alternate sample points to better target demographic needs. In Q1 2021, Nielsen also began to selectively remove households whose tenure had been extended, selecting homes to remove that would improve the overall representation of the panel. As Nielsen began adding new homes at scale and removing homes through the selective removal process in Q1 2021, the sample representation of the Nielsen panel improved significantly.

The below table represents the improvement to Age of Head representation in the panel in 2021. Age Head was one of the most challenged characteristics prior to COVID, with the National panel under-represented in Age of Head (AOH) <35 and over-represented in AOH 55+. It continued to be challenged throughout COVID as Nielsen extended the tenure of existing homes in the panel, as those who remained installed were more likely to be older, while younger householders are more likely to move or ask to leave the panel. This trend changed once Nielsen began deploying its transformation initiatives in Q4 2020 and began adding new homes to the panel at scale in Q1 2021.

As of April 8, 2021, the Age of Householder characteristics are all within 2 points for the National sample. While most of the decline in AOH 55+ has come from the forced turnover of homes with extended tenure, the increase in AOH <35 representation has been primarily a result of new homes coming into the sample and the focus on recruiting basics and the benefits gained from the new alternate reordering methodology.

National Panel: December 2020 to April 2021
Deviation from UE for Age of Householder Characteristics



Deviation for each AOH Break = Intab % of Total Homes - UE % of Total Homes), e.g. the AOH <35 characteristics in 1.71 points under the UE for AOH <35.

The TV panel sample size has declined over the course of the pandemic, however, the effective sample size remains much higher than the levels we saw pre-NPX expansion. Our recruitment innovations improved representation throughout Q1 2021. In the next section, we will cover the impact of the sample changes to panel projections as we weight the data to represent the U.S. TV household population.

Weighting and Projection

While sample counts are smaller than they were before the start of the COVID-19 pandemic, the National TV panel is still sampled to represent the Total U.S. TV population. As with any sample, differential cooperation rates can result in the installed/intab distribution of households to vary from published population distributions. As such, sample weighting is routinely employed to ensure the sample appropriately reflects the population. This is done in two primary ways: (1) ensuring sample distributions approximate population distributions, and (2) employing a technique that ensures that projected counts are on the same scale as population totals.

The weighted distributions for characteristics in the weighting design have continued to hit target distributions throughout 2020 and 2021. This means that each demographic characteristic continues to contribute to total audience estimates in the proper proportions, even if we have differential attrition in certain subgroups.

On average, panelist weights will be larger than they were a year ago simply because of the smaller sample sizes. This is expected, given that the TV Household universe largely remains flat across the two years. We have typically seen NPX weights increase by about 30% (LPM markets +28%, Set Meter markets +31%, and Remainder U.S. +23%).

Considered altogether, total audience estimates will be subject to increased standard error, but will still reflect a representative sample as those proportions are correctly addressed in the weighting process. Market breaks with differential attrition during the COVID period (such as Younger Age of Head) or networks that skew to these same subgroups will experience larger variance increases as compared to the variance increases of the panel as a whole, which can be quantified by calculating the standard error estimate of any given audience estimate, described below.

Standard Error

As noted above, temporary inability to conduct in-person recruitment and maintenance during the pandemic resulted in a reduction in sample size over the course of the past year. While the potential impact was lessened by changes in turnover policies and withhold procedures, from February 2020 to February 2021, the National TV panel sample size went from 47,169 gross installed households (15,310 scaled) to 37,016 gross installed households (12,507 scaled). This drop of approximately 18%-22% resulted in a smaller sample being used to produce audience estimates, which in turn leads to larger margins of error. The increase in resulting variation from this reduction in sample size averages between 10% and 25% on a relative basis for the total panel estimates. However, given the robust size of the National TV panel, the associated standard errors are relatively small to start with, so the increase in variance generally does not lead to a material change in the standard error itself. The following table illustrates the changes in approximate standard errors associated with the reduced sample size.

	Feb 2020 Sample Sizes				Feb 2021 Sample Sizes			Standard Error Point Difference	Standard Error % Change	RSE Point Difference
	Total US HUT/PUT	Total US Intab Sample Size	Standard Error	Relative Standard Error	Total US Intab Sample Size	Standard Error	Relative Standard Error			
<i>Total Month/Total Week/Total Day:</i>										
Households	29.39	44,471	0.103	0.35%	34,720	0.117	0.40%	0.014	14%	0.05%
P2+	15.38	112,560	0.064	0.42%	86,029	0.074	0.48%	0.010	16%	0.07%
P18+	17.86	88,431	0.073	0.41%	68,210	0.085	0.48%	0.012	16%	0.07%
P18-34	6.91	22,618	0.095	1.37%	15,759	0.117	1.69%	0.022	23%	0.32%
P25-54	13.14	42,810	0.088	0.67%	31,920	0.103	0.78%	0.015	17%	0.11%
<i>One Day/One Week/Total Day:</i>										
Households	29.56	44,282	0.130	0.44%	34,712	0.148	0.50%	0.018	14%	0.06%
P2+	15.13	112,048	0.081	0.54%	86,152	0.093	0.61%	0.012	15%	0.08%
P18+	17.70	88,008	0.092	0.52%	68,249	0.106	0.60%	0.014	15%	0.08%
P18-34	6.74	22,500	0.119	1.77%	15,710	0.146	2.17%	0.027	23%	0.40%
P25-54	12.67	42,715	0.110	0.87%	31,949	0.128	1.01%	0.018	16%	0.14%
<i>One Day/One Week/Prime Time</i>										
Households	48.67	44,282	0.229	0.47%	34,712	0.26	0.53%	0.031	14%	0.06%
P2+	27.61	112,048	0.162	0.59%	86,152	0.186	0.67%	0.024	15%	0.09%
P18+	32.26	88,008	0.182	0.56%	68,249	0.209	0.65%	0.027	15%	0.08%
P18-34	13.12	22,500	0.257	1.96%	15,710	0.317	2.42%	0.060	23%	0.46%
P25-54	24.56	42,715	0.228	0.93%	31,949	0.266	1.08%	0.038	17%	0.15%

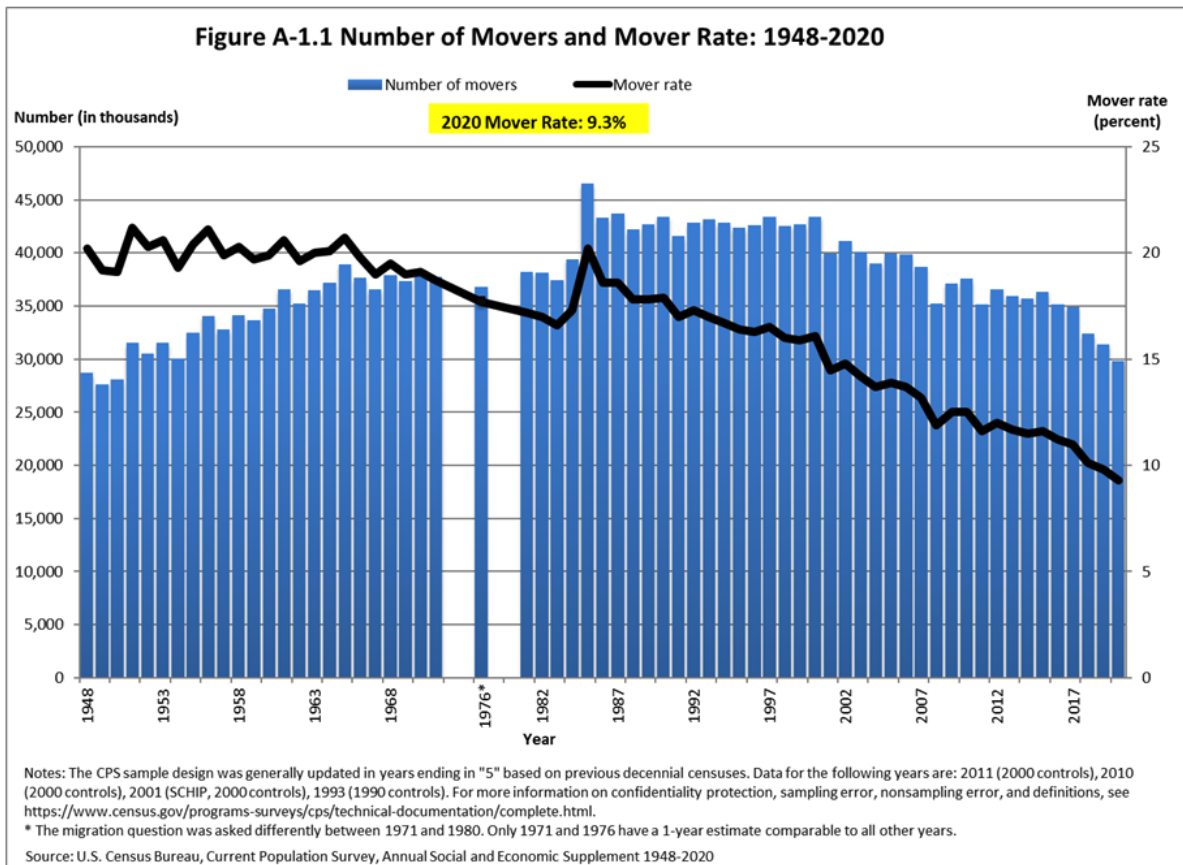
For example, in the above table, the Households, Prime Time HUT for a single day was 48.67. The February 2020 standard error is ± 0.229 , while for February 2021, it increased to ± 0.26 , or 14%. However, the relative error for this HUT estimate has only increased from 0.47% to 0.53%, making the change in variation negligible. Thus, while there is a larger margin of error with associated audience estimates for February 2021 as compared to February 2020, the magnitude of this increase is immaterial. Additional standard error data for Black and Hispanic market breaks, as well as a composite monthly trend of standard error between February 2020 and February 2021 can be found [here](#).

Standard error will vary based on sample size and ratings estimate. Nielsen publishes a Standard Error Calculator, available in the Calculations folder of the National Workspace on Nielsen Answers. This calculator can be used (in conjunction with WESE inputs from NPOWER), to calculate the standard error on any specific audience estimate. Nielsen recommends using the standard error calculator to evaluate the variance of audience estimates during the COVID-19 period.

Universe Estimates

Nielsen produces estimates of U.S. Television Households on an annual basis, at the start of the television season each August. These universe estimates are projected to reflect the population as of the following January. Calculating Nielsen's TV Households and Persons Universe Estimates is a two-step process that begins with projected estimates of total households and persons based on the U.S. Census and other data sources. Nielsen then applies television penetrations to those projections to estimate TV households and persons in TV Households for the Total U.S.

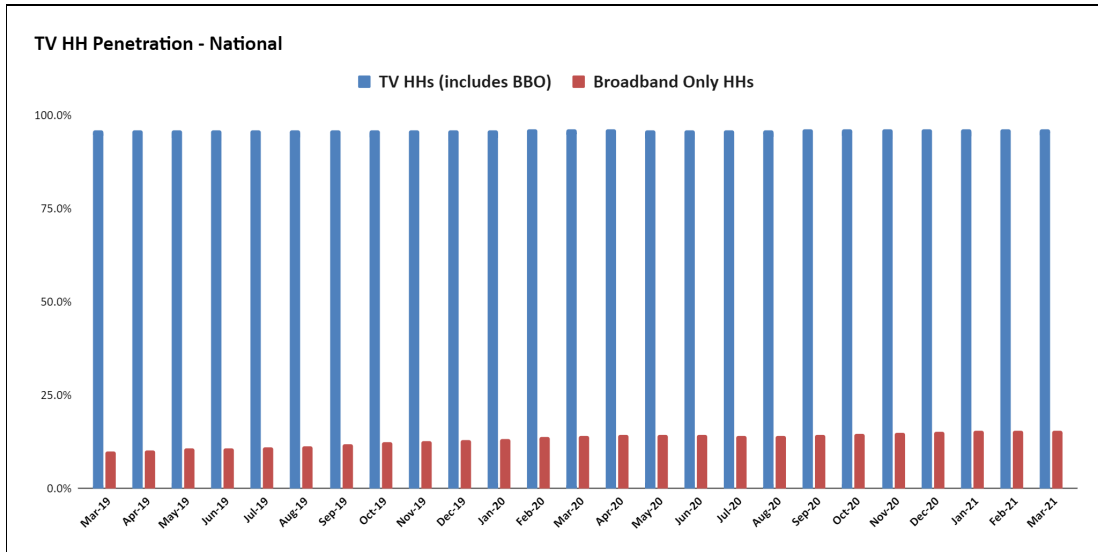
The geographic mobility and migration data reported by the U.S. Census indicates a historically low move rate of about 9.3% in 2020 compared to all the years dating back to 1948. We anticipate that the CDC stay-at-home restrictions due to COVID-19 played a role in this decline.



The U.S. Census and other partners are evaluating adjustments to the methodology used to produce the 2020 household and person population estimates. These adjustments account for impact from births, deaths and domestic and international migration in general, but also as a result of COVID-19. Nielsen will evaluate this adjusted population data, with the expectation that it will feed into the creation of the 2021/2022 TV Season Television Universe Estimates.

Based on our assessment of internal and external data sources, we do not see evidence to indicate that our current universe estimates should be changed at this time. Once we have the updated data for the upcoming TV season, we will evaluate if any changes should be considered for the next calendar year.

The March 2019-May 2021 TV household (HH) penetration data displayed below indicates a steady trend prior and during COVID-19 period (96.0%-96.2%). We did see broadband-only (BBO) growth before March 2020, but the numbers have held relatively stable since that time due to our COVID panel procedures. As we return to the field, we expect the BBO penetration to continue to grow and we will provide updates on the impact.



At this time, there are no plans to make any adjustments to the TV penetration methodology for the advance or final 2021/2022 TV HH and persons therein Universe Estimates.

The pandemic has required changes to Nielsen’s standard panel recruitment and maintenance processes to ensure compliance with state and federal guidelines and the health and safety of our field staff and panelists. These changes have affected several of our panel metrics, including sample size and representation. However, Nielsen’s extensive post-stratification weighting procedures continue to adjust the panel to account for differential cooperation rates. Thus, we see no evidence that would lead us to adjust our universe estimates. There is no evidence that the pandemic has caused any meaningful population shifts. While we have seen changes to our panel metrics, at this time we have not found any evidence of major quality issues within the panel that might influence any estimates the panel produces.

Validation Against Comparable Data Sources

Nielsen has compared the trends from our panel with data we have from other sources to determine if we are seeing divergent changes that would indicate any issues with our panel trends. The two main data sources Nielsen has evaluated are Nielsen Portable People Meter (PPM) data and Return Path Data (RPD) from set-top boxes.

Portable People Meter (PPM)

The portable people meter (PPM) panel can provide a useful comparison point for our traditional metered TV samples for several reasons:

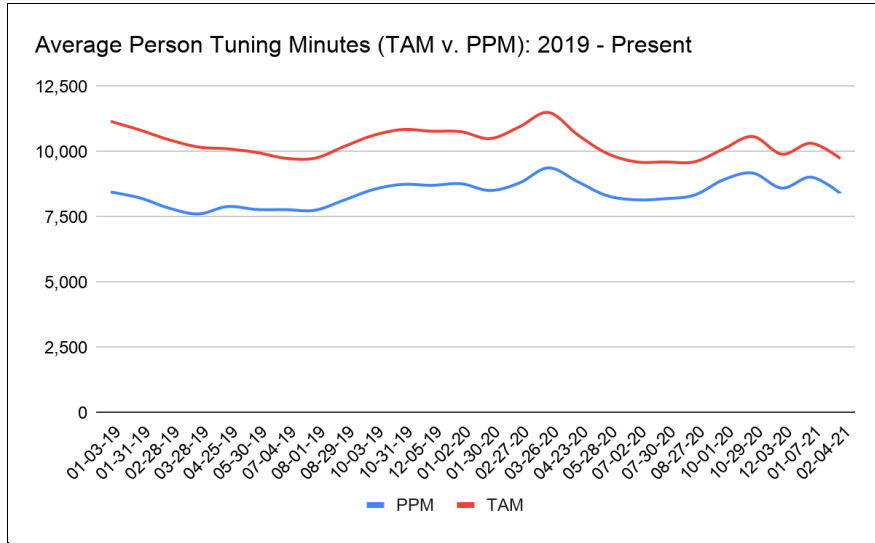
- The PPM panel is sampled, recruited and maintained independently from the TAM panel, but has the capability to capture in home TV viewing;

- PPM field work is primarily phone-based and does not rely on in-person recruitment, maintenance, or coaching. As such, the PPM samples were largely insulated from pandemic-related field challenges;
- PPM samples exist in subsets of forty-four of the largest local television markets. This accounts for a vast majority of the U.S. population, allowing for a large-sample comparison between the two panels.

Having said that, there are some limitations to any analyses that attempt to draw causal conclusions from a PPM to TAM comparison, including:

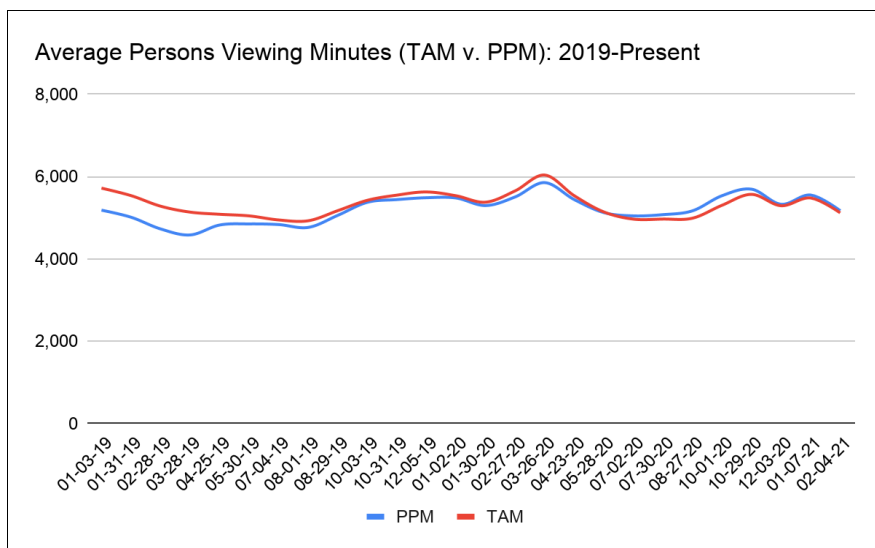
- The PPM does not cover the entirety of the television-owning population. The PPM is only available in 44 major cities and does not cover non-metro (rural) areas of the country;
- Television usage, tuning and viewing are measured differently in PPM homes versus LPM and Set-Meter homes;
 - PPM is persons-based. LPM and Set-Meter are household-based;
 - There is no directly comparable in-tab definition between the two samples. PPM panelists are considered in-tab based on carrying their meter. TAM households and persons are considered in-tab if they meet code capture and button-pushing requirements for each day;
 - The definitions of tuning and viewing are different between the two samples. PPM passively captures exposure to television (within audible range), while TAM meters collect television tuning. LPM viewing is actively collected from panelists and Set-Meter viewing is assigned through viewer assignment;
 - PPM does not measure streaming unless it is encoded so the comparisons below apply primarily to linear TV behavior.

With these caveats in mind, Nielsen has completed two separate analyses that compare tuning and viewing between PPM persons and TAM persons for the top 200 national sources from January 2019 to the end of February 2021. These comparisons are limited to counties where both services are available. Nielsen calculated the average monthly tuning minutes for each person 6+ in both the PPM and TAM samples. The results are shown in the following chart:



This data demonstrates that tuning in the two samples has trended similarly for the past two years, including during the most difficult periods of the COVID-19 pandemic. Tuning spikes were consistently observed during March 2020, October/November 2020, and January 2021 for both sources. These spikes coincided with large-scale events that captured national attention. It is important to note that TAM data does include tuning without viewing, while there is no such concept in a PPM home. This helps to explain why TAM is consistently higher.

Separately, to remove impact of tuning without viewing, Nielsen also examined the relationship between persons-level viewing for both samples. To do this, Nielsen calculated the average monthly viewing minutes for each person 6+ in both the PPM and TAM samples from the beginning of 2019 to present. The results for this analysis are available below:



Without the impact of tuning without viewing, the TAM and PPM samples trend nearly identically. In May 2019, the difference between the two samples was 5.4%. Throughout that year and through the pandemic, the difference between the two samples remained within five percentage points. While the PPM does become slightly higher than the TAM sample in July 2020 (1.6%), this difference is too small to be considered material.

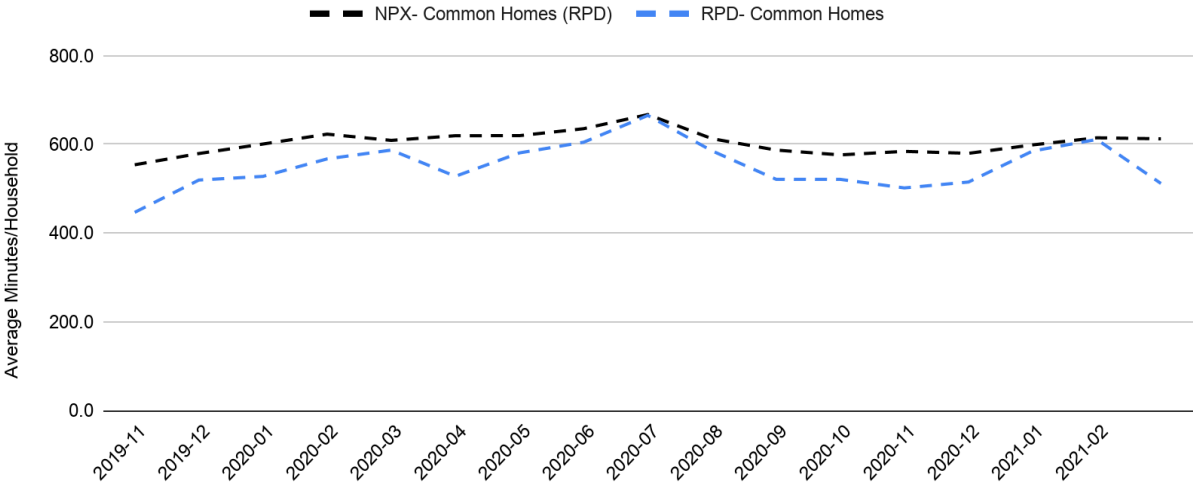
Return Path Data - Common Homes Analysis

Return path data (RPD) also provides a useful comparison point with our TV panel. Nielsen has access to return path data from over 10 million households across the U.S. As part of our processes to monitor and improve the quality of the return path data, Nielsen performs an analysis referred to as Common Homes.

Because there are homes within the Nielsen panel that have devices that are represented within the return path data sets, we can use these “common homes” to compare the tuning data collected by a given set-top box to the data captured from the corresponding metered TV in the panel in order to identify potential gaps or inconsistencies in the data.

For this analysis, we compare the average daily tuning minutes per household from the RPD tuning feed to the data from the same homes in the Nielsen panel. The results below are aggregated across data providers by month. First, we compared the results from the 5,000 identified common homes that contain a cable box and a Nielsen meter.

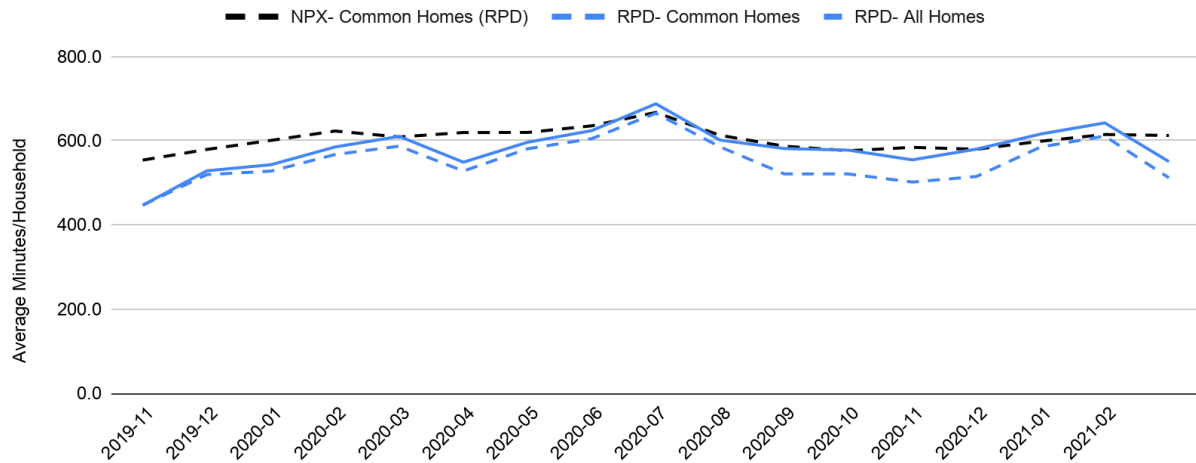
RPD- Common Homes vs. NPX- Common Homes



These data show a similar trend in tuning levels between the RPD and panel Common homes, with Nielsen panel trending higher. This is likely due to a) the inclusion of non-cable tuning being captured in the Nielsen panel, while the cable set top boxes only capture activity through the cable box, and b) the inclusion of non-RPD devices in the household tuning estimates for NPX.

Next we also added data from the full 10+ million RPD sample to determine if the 5,000 common homes showed different trends than the full cable providers' combined footprints.

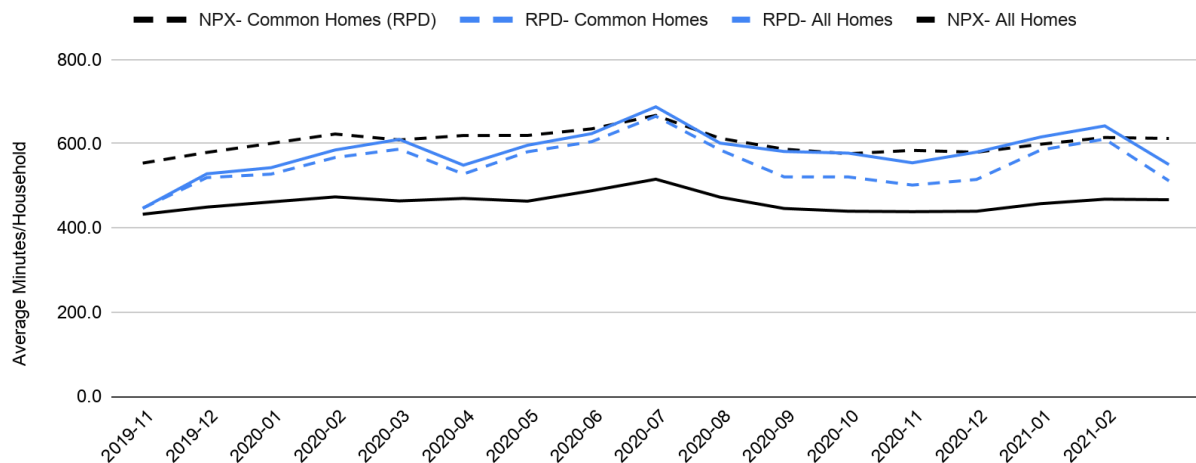
RPD- Common Homes vs. NPX- Common Homes



These data also show a similar trend in tuning levels between the Common homes and the full RPD footprint.

Lastly, we also added the data for the full National TV panel (NPX). We did this to provide a comparative view of the data and trends in the nationally representative NPX sample as it compares to the common homes and full RPD footprint.

RPD- Common Homes vs. NPX- Common Homes



Once again, we see similar tuning level trends between the NPX data and the RPD data, with lower levels for the NPX full sample data. This is to be expected, as the NPX full sample represents all types of homes, not just cable homes, which tend to tune at higher levels.

Summary

These analyses suggest that the viewing patterns that we see in our TAM panel look very similar to those in comparable data sets: the PPM panel and the viewing data collected from cable return path devices. Based on these comparisons, there does not appear to be any significant issue, or noticeable bias associated with the collection of National TV panel data over the course of the pandemic.

AUDIENCE BEHAVIOR ASSESSMENT

Pandemic Impact on Programming

The pandemic was hugely disruptive for programming and content creation and pandemic-era seasonal trends are not in-sync with long-established seasonal behavior.

During October 2020, a peak time for COVID contagion transmissions, as well as what is typically new content entering the traditional TV season, networks offered 13% fewer new episodes vs. the prior year, leading to 75% of programming being “repeats,” which was a six-point decline from the prior year. Additionally, an analysis of broadcast programming found the premiere dates during the 2020-2021 TV season aired nearly a month (29 days) later than the previous year¹.

Additionally, the delayed start and completion of the spring sports season to summer 2020 also may have led to shifting viewership not only in summer but into the fall as well. In Q3, the return of sporting events across the major leagues caused fragmentation in viewing, with a 141% increase in sporting event telecasts across the NFL, NBA, MLB and NHL during that time period. Audiences tuned into more telecasts but for less time per telecast. Persons 13-34 watched 14% more telecasts, but overall tuned in for 3% fewer minutes to sports programming compared with 2019. Persons 35+ watched 9% more sports telecasts, but tuned in for 10% fewer minutes.

Given the changes in sports and entertainment programming, the lack of a normal summer or holiday vacation season, and general fatigue, we would not expect the pandemic period to follow normal seasonal trends. As vaccines become more widely available and the country begins to open up on a broader scale, it will have an impact on the speed of content creation and will likely have some impact on viewership for the remainder of the year. We recommend taking these factors into account when forecasting trends for the 2021-2022 TV season.

¹ Analysis based on 50 programs across 4 major networks

Pandemic Impact on Consumer Behaviors

In addition to changes in content availability and release timing, consumers also changed the types of platforms and media they consumed.

Changes in the environment, as well as changes in overall media consumption behavior, are contributing to the changes observed in television viewing behavior. As the industry plans for the future, they should consider these trends. Nielsen will continue to monitor and release findings on programming and consumer behaviors to provide data on whether these changes are an artifact of the pandemic time period or represent a more permanent shift in behavior.

Streaming Video On Demand

Streaming video consumption continues to see growth, with total streaming minutes increasing from 117.7 billion in December 2019 to 132 billion in December 2020. Persons 35+ now make up the majority of the streaming audience. The uptick in demand translated to fast-rising subscriber totals at SVOD services like Netflix, which ended 2020 with more than 200 million subscribers - adding a record 37 million in 2020².

Disney+ also grew quickly during the pandemic, reaching 86.8 million subscribers only 13 months after its 2019 launch³. Ad-supported streaming services like Pluto TV, Tubi and NBCUniversal's recently launched Peacock also saw their user bases and engagement figures increase.

Nielsen Digital Content Ratings CTV data has also seen an overall increase in publishers enabling measurement via tagging and impression capture, leading to a 206% increase in time spent in February 2021 vs. February 2020.

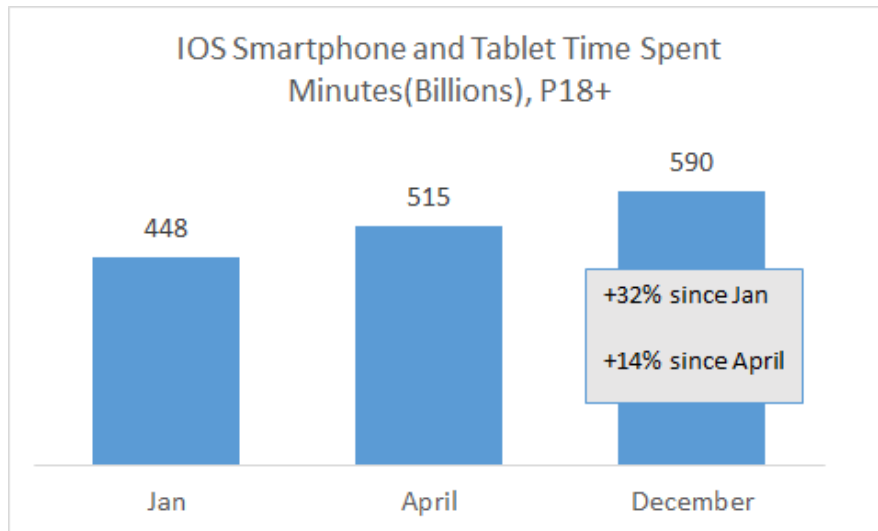
Computer/Mobile

Mobile and computer usage increased substantially in Q4 2020, as consumers shifted to viewing content on these devices. Laptop sales spiked during the pandemic, especially touchscreen models among those parents with younger children.

Adults 18+ increased the amount of time spent on their mobile devices over the course of 2020.

² <https://www.wsj.com/articles/netflix-tops-200-million-subscribers-for-the-first-time-11611090902>

³ <https://variety.com/2020/digital/news/disney-plus-hits-86-8-million-subscribers-1234850846/>



This increase in mobile and computer usage suggests a shift in viewer consumption from the big screen to other devices.

Streaming Audio/Podcasting

Increases in streaming audio suggest another source of diversion of consumers from the tv screen to other sources. Streaming audio consumption increased by 39% on computer/mobile between May 2020 and January 2021.

Podcast listenership also saw growth in 2020 vs. 2019 with 8 million more P18+ listening to podcasts. The most common place to listen to podcasts was at home during the evenings (7 pm - midnight) with P18-34 at home listenership +61% v. 2019 and P18-34 evening listenership +27% v. 2019. Persons 35+ podcast listening also grew by 26%. Podcast listening is also strong among kids: 89% of kids who listen to podcasts are under age 9 and among kids, half listen weekly, while one-third listen to podcasts daily.

In summary, this increased usage on non-television content is a likely contributing factor to the declines observed in television usage.

SUMMARY & RECOMMENDATIONS

The pandemic is an unprecedented event in our 70+ years of measuring TV viewing. Like the rest of the media industry, Nielsen has had to adapt to the challenges presented by the COVID-19 pandemic. Our priority has been to maintain panel quality while ensuring compliance with government regulations and the safety of our employees and the communities we serve. Throughout this period, we have collaborated with the industry as we've made changes to our standard procedures in the interest of protecting the measurement while prioritizing safety. At the same time, there have been changes both in how people consume media, and what content is available to them, all of which contribute to changes in audience measurement outcomes.

Recommendations

- While we have seen changes in our panel metrics, based on the sample size, representation and comparisons from additional validation sources, Nielsen remains confident in the quality of the estimates we produce. Nielsen continues to stand behind our audience estimates as representative of media consumption. Having said that, we acknowledge that there is an increase in variance in the panel due to smaller sample sizes during this time period, and therefore recommend evaluating the standard error associated with audience estimates;
- Nielsen will add a disclosure to reports from its NPOWER software regarding the above points, as follows:
 - *“Due to the unprecedented events of the COVID-19 pandemic, audience estimates during the period starting March 2020 reflect unusual tuning behavior and are subject to an increase in standard error as sample sizes declined. Users of this data should take this into consideration when using estimates during this period of time.”*
- Nielsen recommends taking into account the limited amount of new content and shifts in airing schedules in the 2020-2021 TV when forecasting audiences for future time periods;
- Consumers have changed their content consumption behavior with shifts to different devices (computer/mobile) and different mediums (podcasts, streaming audio and video). It will take some time to determine which of the circumstances described above will become more permanent aspects of audience behavior moving forward, and which will return to pre-pandemic patterns. As a result, we recommend taking these shifting consumer dynamics into consideration as you plan for the future.

Next Steps

- Nielsen is committed to monitoring and measuring the shifting media landscape and will release subsequent reports highlighting how consumer behavior and content availability continues to evolve.
- We have evolved our panel outreach solutions and are focused on monitoring and returning to the field to improve our panel estimates. In addition to recruiting new homes to the panel, we are taking additional measures to visit any homes that have been flagged for potential anomalies. We expect to address 2,400 priority homes by April 15, and we have resolved over 2,000 to date. Nielsen Field, Product and Data Science teams are monitoring these homes daily to understand any changes we discover as we get back into these homes in person. Nielsen will release subsequent research briefs on the findings of these analyses and provide regular updates on improvements around sample size and representation.

As we continue to restore processes and monitor the changing media landscape, we will keep the industry informed of what we learn and any further adjustments needed to interpret the pandemic period. We thank you for your continued collaboration.