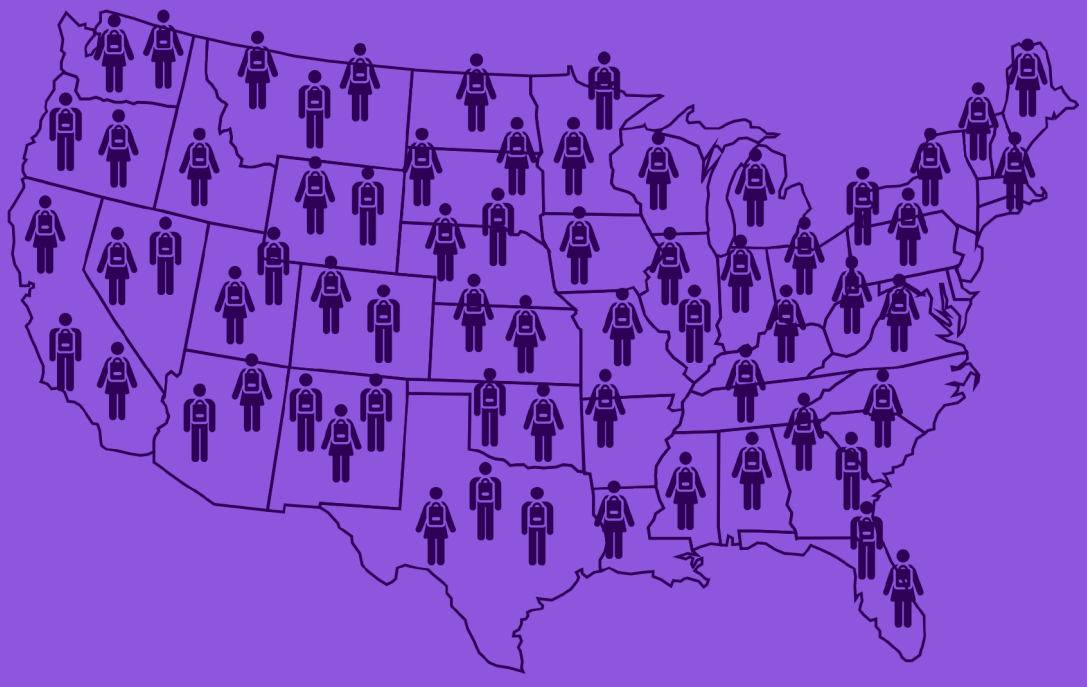
2022 K-12 EdTech Benchmark Findings Report 3:
Demographic Analysis of App Safety, Website Safety, and School Technology Behaviors in US K-12 Schools

February 6, 2024



INTERNET SAFETY LABS

Acknowledgements

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1 Executive Summary

In 2022 Internet Safety Labs (ISL), a US non-profit technology product safety organization, conducted a nationwide safety benchmark for edtech apps used in K-12 schools across the US, collecting over 120,000 datapoints on over 1700 EdTech apps recommended or required by schools across the US. This is the third report taking a closer look at the data, this time analyzing App Safety, School Website Safety, and School Technology Practices across five demographic lenses: (1) Grade Level, (2) School Locale, (3) School Income Level, (4) School Majority Race, and (5) School Size.

1.1 Key Findings

1. **Nearly all (91.1% of) school websites contain trackers[1] and a larger than expected percentage (20.3%) contain advertising.** These behaviors are of course reflective of current website development and digital marketing technology norms, but taxpayers should not be supporting surveillance advertising and trackers on public school websites.
   - **Public schools were nearly twice as likely as private schools to include digital advertising on school websites.**
   - 91.1% of school websites contain trackers, with an average of 6.5 trackers and 1.5 red trackers per website.
   - 79.3% of school websites contain red trackers.
   - 20.3% of school websites include digital ads.
2. **Privacy or digital divide? There is a significant disparity in technology support for the lowest income schools and American Indian/Alaska Native majority schools in the US.**
   One of the most striking findings from the demographic analysis regards the lowest income strata ($20K-$39K). Schools in this segment had the lowest percentage of technology vetting (0.0%, none of the schools were observed to be performing systemic tech vetting), and the highest percentage of unsafe apps with digital ads, and apps with behavioral ads[2]. These schools also had one of the lowest rates of providing computing devices to students at only 50% of schools. On the plus side, these schools recommended and required

[1] Trackers are identified by the Electronic Frontier Foundation's (EFF's) Privacy Badger. Trackers are defined here https://www.eff.org/wp/behind-the-one-way-mirror

[2] This should not be construed as a causal relationship. See point 4 below. Intuitively one might think that technology vetting would result in safer technology. The data, however, shows no correlation.

the smallest number of technologies on average (13.2), which ISL views as a positive since most of the apps have high privacy risks.

A similar pattern appears for American Indian/Alaska Native majority race schools which scored lowest on providing technology notice, allowing consent, and providing devices (at 41.7%). This segment also scored high on the percentage of apps with behavioral ads. Like the $20K segment, the American Indian/Alaska Native schools recommend/require one of the lowest number of apps on average (13.4), but even so, the students are more likely than other segments to encounter behavioral ads.

It appears that these schools have inadequate resources for technology management, which simultaneously keeps students somewhat safer by limiting exposure to technology, while at the same time having greater risk in the technology that is recommended/required for students. And there's a larger question here: are these students missing out on learning technologies that will be important later in their education and lives? Will they be disadvantaged with respect to key skills and know-how compared to students in schools provisioning more technology for students? Additional research is required to answer these questions.

3. **One third of Black majority race school websites had ads.** This was the highest (by far) across all demographic segments, 64.0% higher than the national average and 76.2% higher than white majority race schools. 100% of Black majority race school websites had trackers, and they had among the highest average number of trackers at 7.7 per website.
4. **Technology vetting in schools appears to have positive effect on the percentage of apps with ads and behavioral ads in school portfolios.** The causal relationship needs further analysis.
    - Schools with vetting have a 20.5% reduction in the average percentage of apps with ads in the school portfolio.
    - Schools with vetting have a sizable 48.4% reduction in the average percentage of apps with behavioral ads.
    - Vetting isn't having an effect on the percentage of Very High Risk apps in the portfolio.
    - Tech vetting isn't always a guarantee that a school's app portfolio will be safer. Schools in the $120K and above income segment had the highest rate of tech vetting, but also one of the highest rates of apps with digital ads.

- ISL hypothesizes that technology vetting is a somewhat nascent practice (only 28.7% of all schools performed systemic vetting of technology) and schools need more guidance, funding, and rigor in technology vetting and software vendor management practices.

2 Report Overview

This report studies demographic trends related to three classes of school technology metrics: App Safety (Table 2.1.1), Website Safety (Table 2.1.2), and School Technology Practices (Table 2.1.3).

App Safety considers the volume of technology being recommended, required, and approved, the school composite scores, the proportion of Very High Risk apps in the school's portfolio, and the percentage of apps with ads or behavioral ads.

Website Safety reflects the presence of trackers, the type of trackers, and the presence of ads on the school's website.

School Technology Practices, presented in the second findings report[3], reflect the school's performance of technology notice, technology consent, and systemic technology vetting, and also whether the school provides individual computing devices to students.

These metrics are analyzed through the following demographic lenses[4]:

- Grade level,
- Income level,
- School locale,
- School majority race, and
- School size (number of students).

The key research questions this report intends to elucidate are:

1. How representative of the US was ISL's sampling methodology?
2. Are there notable demographic intersections in the ISL national sample of schools?
3. Are there differences in app safety based on the five demographic lenses?

[3] https://internetsafetylabs.org/wp-content/uploads/2023/06/2022-K12-Edtech-Safety-Benchmark-Findings-Report-2.pdf

[4] obtained from the National Center for Education Statistics Search for Public Schools (ed.gov)

4. Are there differences in risky website behaviors based on the five demographic lenses?
5. Are there differences in school technology related practices (e.g. technology notice, consent, vetting, and providing of individual computing devices) based on the five demographic lenses?
6. ISL's earlier analysis denies a correlation between technology vetting and the safety of the apps. What does this analysis show regarding a potential relationship between tech vetting and presence of ads and behavioral ads in apps?

3 Sampling Overview

3.1 Sampling Methodology

As described in Findings Report 1[5], the 2022 K12 EdTech Safety Benchmark covered 13 schools in every state and the District of Columbia using a stratified random sampling method. The sampling was stratified to ensure an evenly distributed mix of grade level, and weighted by geography category: rural, town, suburban, and city[6]. The sample also included one private school in each state, resulting in 7.8% of the sample being private schools, closely approximating the 9% of students enrolled in private schools in the US[7], though not resulting in enough data to represent private school behavior within a state. The identification of schools based on the stratification was random.

ISL felt this sampling methodology was a viable reflection of the entire nation and as such, the benchmark findings could be extrapolated across the US public schools with reasonable confidence. (See Appendix A for more details on the sampling methodology.)

Table 3.1.1 All Schools in Benchmark Sample by Grade and Public/Private

Elementary School	Middle School	High School	Private School (any grades)
204	204	204	51

Table 3.1.2 Public Schools in Benchmark Sample by Geography

Rural	Town	Suburban	City	TOTAL
154	99	195	164	612

Table 3.1.3 Private Schools in Benchmark Sample by Geography

Rural	Town	Suburb	City	TOTAL
5	3	18	25	51

[5] https://internetsafetylabs.org/wp-content/uploads/2022/12/2022-k12-edtech-safety-benchmark-national-findings-part-1.pdf

[6] obtained from the National Center for Education Statistics Search for Public Schools (ed.gov)

[7] https://nces.ed.gov/fastfacts/display.asp?id=55 Accessed on 11/26/22.

3.2 Studied Apps

From the analysis of the 663 schools, 1722 unique apps were identified as either recommended or required by the school or the district[8]. Of those 1722 apps, ISL was able to score 1357.

Table 3.1.4 Sample Summary

Total # of Schools	Total # Apps Recommended or Required by Schools	Total # of Apps Scored
663	1722	1357

As noted in Findings Report 1, many of the apps recommended to students were not EdTech apps: 875 (50.8%) of the apps were EdTech apps, 49.2% of the apps were Non-Education Specific or Other.

3.3 Analysis

3.3.1 App Portfolio Safety

Each school's app portfolio was a subset of apps from the 1722 unique apps; thus, the same app can be found in many school app portfolios. ISL characterized the safety of the school's portfolio by examining multiple data points relating to the school's app portfolio (Table 3.1.6). One of the key measures used was the app's Safety Score. Table 3.1.5 summarizes the key safety risks and assessment methods in assigning app Safety Scores.

Table 3.1.5

App Safety Risk Behavior	Method / Tools Used
The number and riskiness of the Software Development Kits (SDKs) in the app	AppFigures (commercial app analytics tool); ISL SDK Risk Dictionary; California and Vermont Data Broker Databases
Presence of digital advertisements (ads) in app.	Manual testing/usage of app to recognize presence of ads.
Presence of behavioral ads in ap.	Manual testing/usage of app to recognize presence of behavioral ads based on tester's personal history or other attributes.

[8] ISL looked at the district websites in addition to the school websites since the district commonly chose (and licensed) technology for use by all schools in the district.

App Safety Risk Behavior	Method / Tools Used
Presence of large platforms with data monetization businesses: Adobe, Amazon, Apple, Facebook, Google, Twitter	Analysis of SDKs and network traffic to identify SDKs or domains owned by the six platform companies.
App usage of WebView APIs.	Manual testing/usage of app to recognize use of WebView within the app.

Table 3.1.6 summarizes the key metrics studied to assess safety of the school app portfolio. ISL quickly recognized that, since the school composite score calculation multiplies the weighted average of app Safety Scores by the total number of recommended/required apps, those two metrics were redundant.

Table 3.1.6

App Portfolio Safety Risk Metric	Method / Tools Used
Average number of Recommended/Required apps.	Manually found on school and district websites.
Average percentage of Very High Risk* apps in school portfolio.	Calculated from school's app Safety Scores.
Average percentage of apps with digital advertising.	Calculated from app advertising presence data.
Average percentage of apps with behavioral advertising.	Calculated from app behavioral advertising presence data.

* Note that when ISL launched App Microscope (https://appmicroscope.org), the highest risk (i.e. worst) safety score was renamed from "Do Not Use" to "Very High Risk". ISL continues to analyze the integrity of the Safety Scores and will address them again in a future report.

3.3.2 Website Safety

Website safety was measured by the presence of trackers and advertisements on school websites.

Table 3.1.7

Website Safety Risk Metric	Method / Tools Used
The average number of trackers on the schools' websites.	The Electronic Frontier Foundation's (EFF's) Privacy Badger browser extension[9].
The average number of red trackers[10] on the schools' websites.	The EFF's Privacy Badger browser extension.
The percentage of school websites containing digital advertising.	Manual testing/usage of app to recognize presence of ads.

3.3.3 School Technology Practices

School Technology Practices were measured by the percentage of schools performing the practice (Table 3.1.8).

Table 3.1.8

School Technology Practice Metric	Method / Tools Used
Presence of a complete technology notice (i.e. a list of all technologies either recommended or required for students).	Manual review of school and district websites. The Student Data Privacy Consortium Resource Registry[11]
Presence of a consent or opt out form for technology use	Manual review of school and district websites.
Evidence of system app/tech vetting for student use, covering both recommended and required technology.	Manual review of school and district websites. Manual review of School Board policies.
Evidence of school-provided personal computing devices.	Manual review of school and district websites. Manual review of School Board policies.

[9] https://privacybadger.org/

[10] https://privacybadger.org/#What-do-the-red%2c-yellow-and-green-sliders-in-the-Privacy-Badger-menu-mean

[11] http://sdpc.a4l.org

3.4 Data Collection & Analysis Notes

This section highlights potential issues with the ISL methodology revealed through this demographic analysis of the data.

1. A high average number of recommended/approved apps often appears to be a strong indicator of a high composite score. The ISL composite score calculation may be giving too much weight to the number of apps. Thus, the average percentage of Very High Risk apps found in schools was also added to the metrics for understanding app safety.
2. Average number of recommended/required apps may not exclusively be an indication of safety. ISL originally regarded a low average number of apps to be safer for students, given the high rate of Very High Risk and High Risk EdTech apps. Thus, it is true that less technology will likely keep students safer. As will be discussed in this report, however, it can also be an indication that students are being disadvantaged by not being exposed to the same technologies as their peers. While the report indicates that a lower number is "better", ISL believes more research is required.
3. Private Schools: private school websites were relatively opaque when it came to providing details on technology usage and behaviors. Thus, the only reliable data from the private school metrics is the Website Safety data.
4. Schools that are approving apps approve very long lists of apps. As noted in earlier reports, the approval process itself seems to invite more technology usage in schools.

4 Comparison of ISL Sample to United States' Demographics

This section explores the question of how closely the demographics of the 663 sampled schools reflect the demographics of the US. As will be shown, the benchmark sample closely mirrors the demographics of the overall US, with these exceptions:

1. The ISL sample includes a higher proportion of high-income schools (section 4.1.2).
2. The ISL sample includes a lower proportion of Hispanic schools, though the sample size is large (86) and thus an accurate measure of these schools' behaviors (section 4.1.4).
3. The proportions of larger schools in the ISL sample was higher than the national reality. This doesn't appear to be a deficit, in that it allowed for greater sample sizes for larger schools, which gives greater confidence in the findings for those schools (section 4.1.5).

Any demographic segment that included fewer than 30 schools requires additional study before being deemed conclusive. Thus, the key findings in this report for the $20K income segment and the American Indian/Native Alaska schools, while striking, require additional research. In retrospect, for this kind of analysis, the ISL sample should have been somewhat larger to ensure at least 30 schools in each demographic category.

4.1.1 Schools by Grade Level

ISL Source of Grade Level Data: National Center for Education Statistics (NCES) database, accessed in 2022.

National Source of Grade Level Data: NCES database, accessed in 2023.

For both the ISL sample and the national chart (Figure 4.1.1 through 4.1.3), the grade level information was obtained from the NCES database, thus, there should be no distortion or "noise" due to different measurement methods or sources.

As noted earlier, the sample was roughly evenly distributed by grade level, as the sample was stratified to include an equal number of Elementary, Middle, and High schools. Did this introduce distortion, or was it in fact reasonably representative? As can be seen from Figure 4.1.3, the national distribution of Pre-K through 8th grade schools is 68.8% of schools, and 31.2% of schools are grade 9-12. The benchmark sample (Figure 4.2.2) was 66.7% Pre-K through grade 8 and 33.3% grades 9-12. Thus, the sample does closely mirror the proportionality of actual US public schools by grade level.

Assessment: The ISL sample is reflective of the US with respect to grade level.

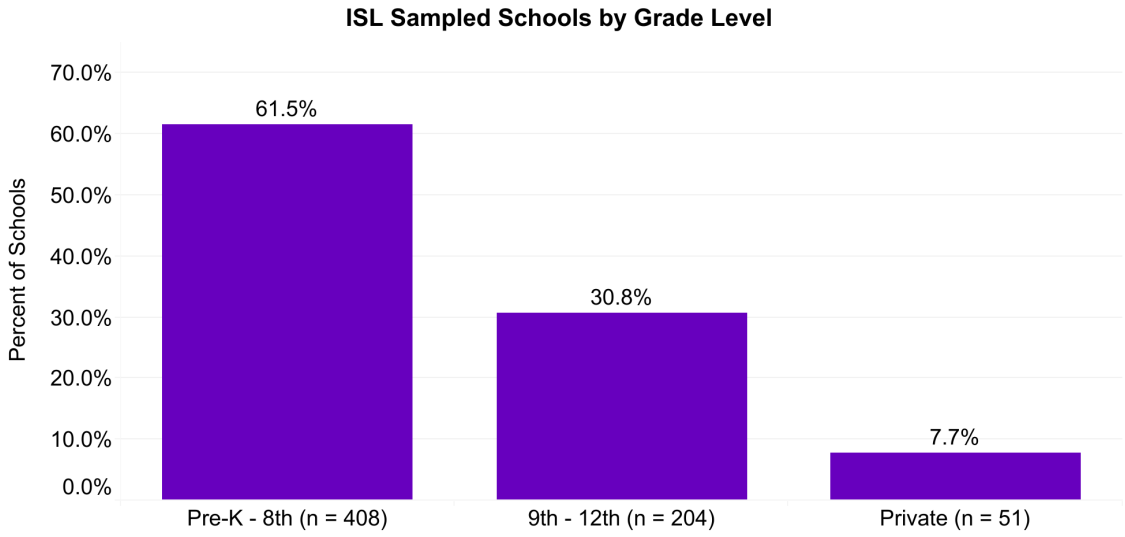


Figure 4.1.1

Since the national data only includes public schools, Figure 4.1.2 shows the percentages of just the public schools in the ISL sample.

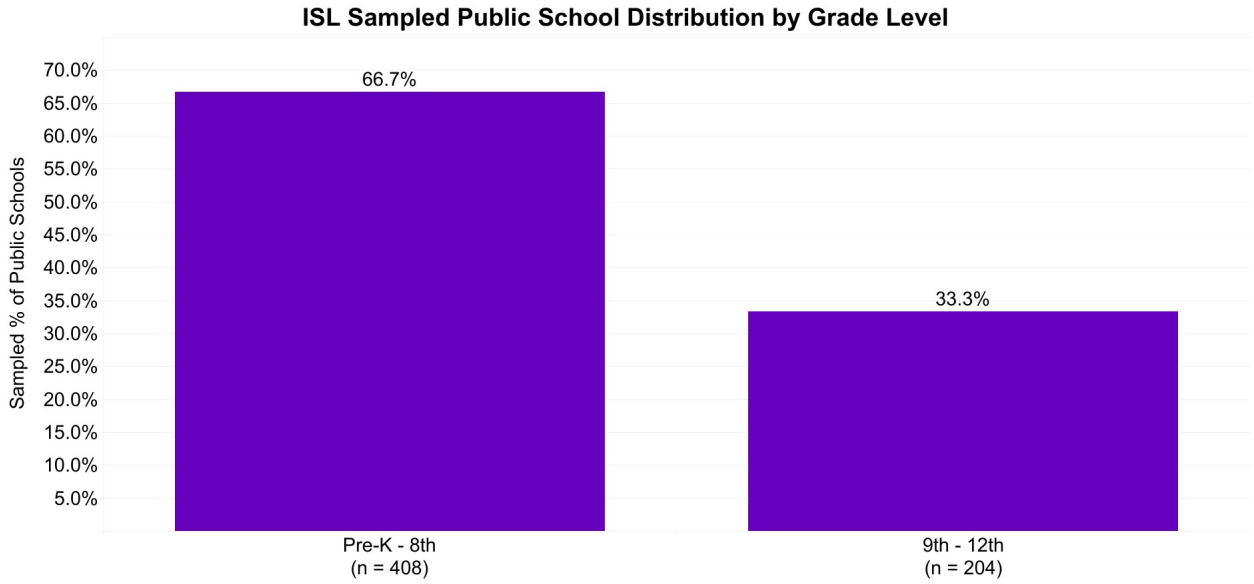
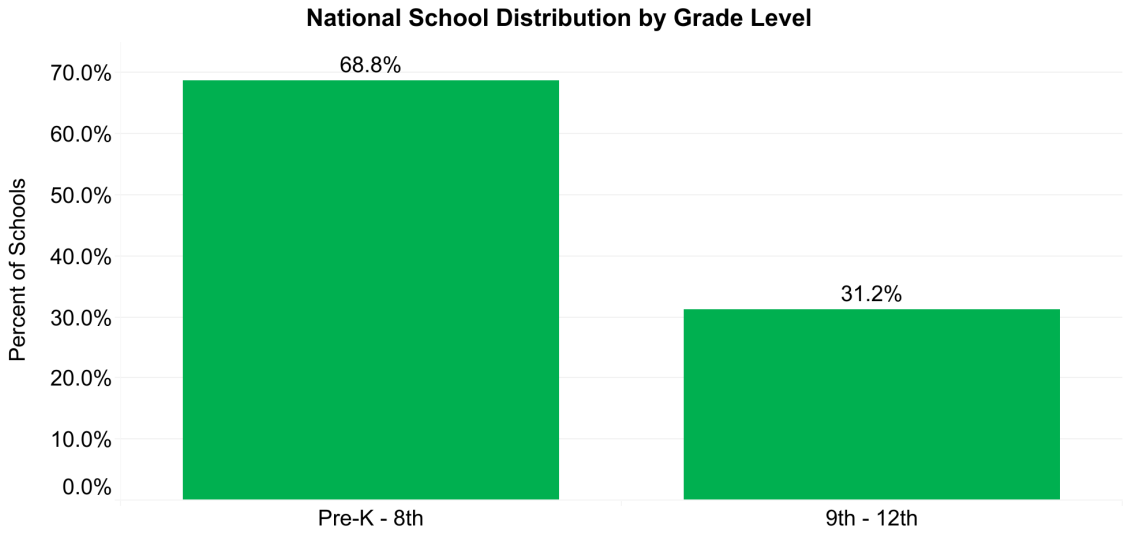


Figure 4.1.2



Source: https://nces.ed.gov/programs/digest/d22/tables/dt22_203.65.asp

Figure 4.1.3

4.1.2 Schools by Income

ISL Source of Income Data: NCES database, district-based income information, accessed in 2022.

National Source of Income Data: NCES database, district-based income information, accessed in 2023, https://data-nces.opendata.arcgis.com/datasets/nces::acs-ed-2013-2017-total-population-economic-characteristics-dp03/explore?location=32.984211%2C-95.461204%2C4.88&showTable=true

Median Income – ISL Sample: $75,246.50

Median Income – National Sample: $53,184

For both the ISL sample and the national chart (Figures 4.1.4 and 4.1.5) the income information was mainly obtained from the NCES database. There were, however, 85 schools (51 Private and 34 public) that didn't have income data from NCES and ISL derived income for those schools by using the median income for either the city or district in which the school was located [from the NCES database]. Since the national data reflects public schools, there should be minimal distortion or "noise" due to different measurement methods or sources.

Figure 4.1.4 shows the ISL sample distribution by income. When compared to the national distribution, one can see an important difference: the ISL sample is "flatter", with proportionally more schools in both the lower and higher income ranges, but a lower percentage of schools in the median range.

The median of the ISL sample is substantially higher than the national median.

Also, the national sample indicates no schools in the $240K range, but the ISL sample includes three. This is due to rounding in the national chart; ISL confirmed that the national sample did include districts in the highest income ranges but were too small a portion of the over 13,000 districts to appear on the chart.

Assessment: The ISL sample has proportionally more higher income schools than the national reality.

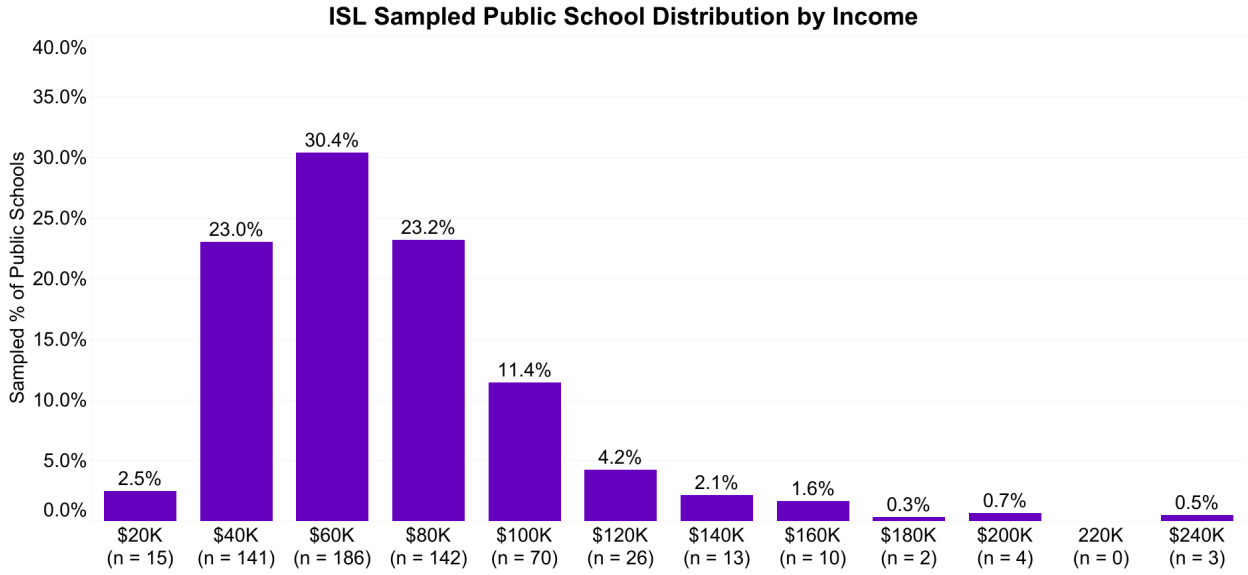
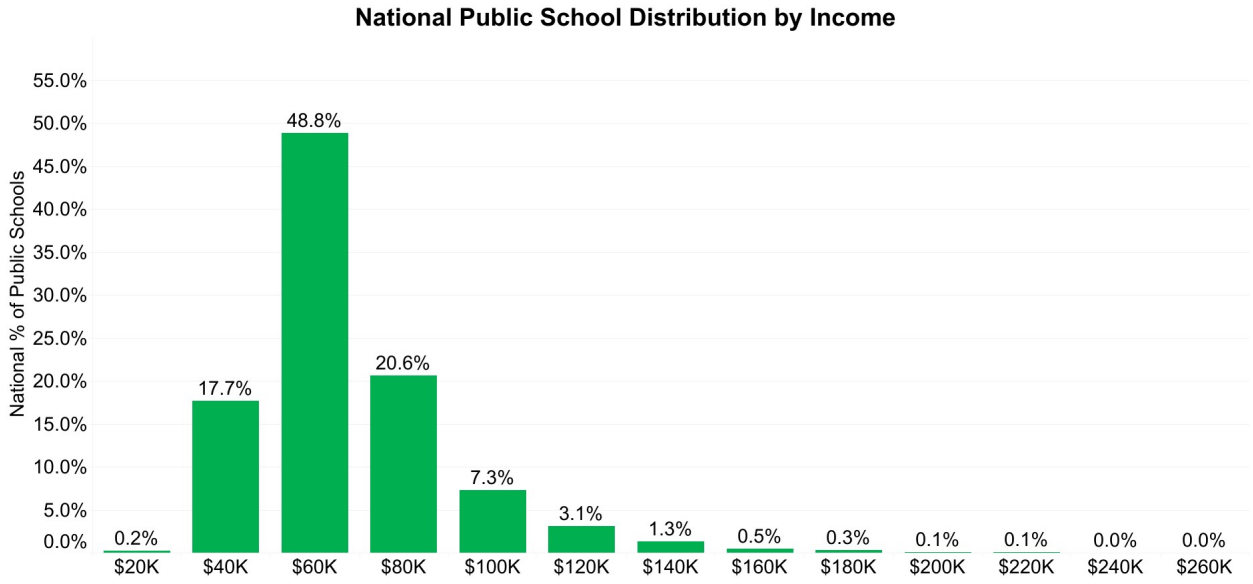


Figure 4.1.4



Source: NCES Database

Figure 4.1.5

4.1.3 Schools by Locale

ISL Source of Schools by Locale: NCES Database, accessed in 2022.

National Source of Schools by Locale: NCES Database, accessed in 2023, https://nces.ed.gov/pubs2018/2018052.pdf

For both the ISL sample and the national chart (Figures 4.1.6 and 4.1.7), the schools by locale information was obtained from the NCES database, thus, there should be no distortion or "noise" due to different measurement methods or sources.

As expected, since ISL optimized the sampling methodology to represent the US locale distribution, the ISL sample closely mirrors the national data.

Assessment: The ISL sample is reflective of the US with respect to locale.

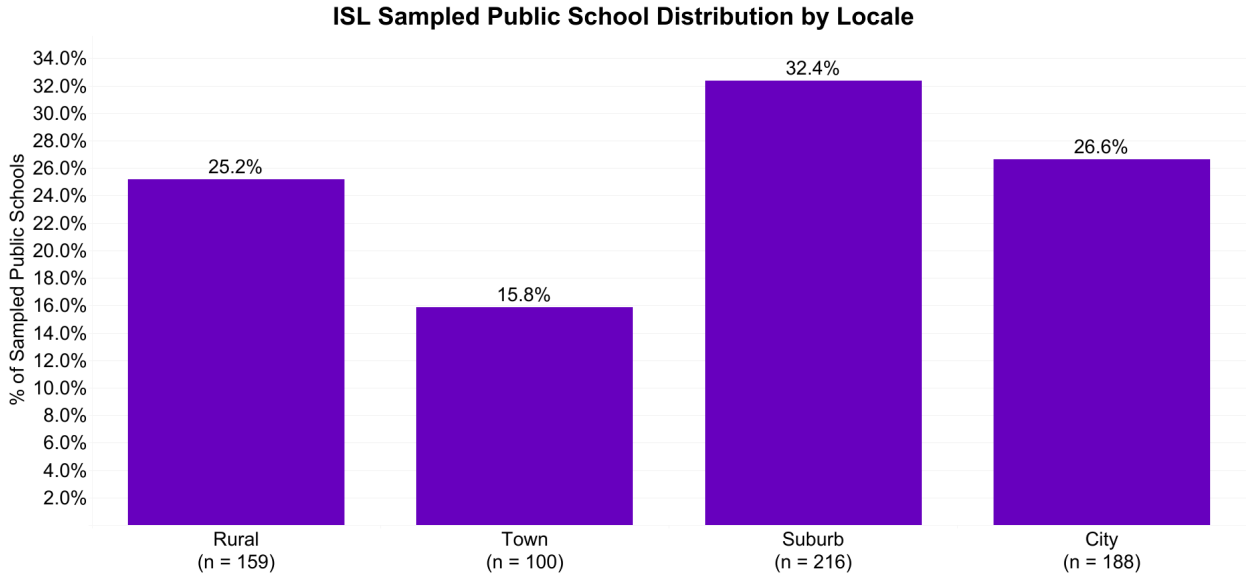
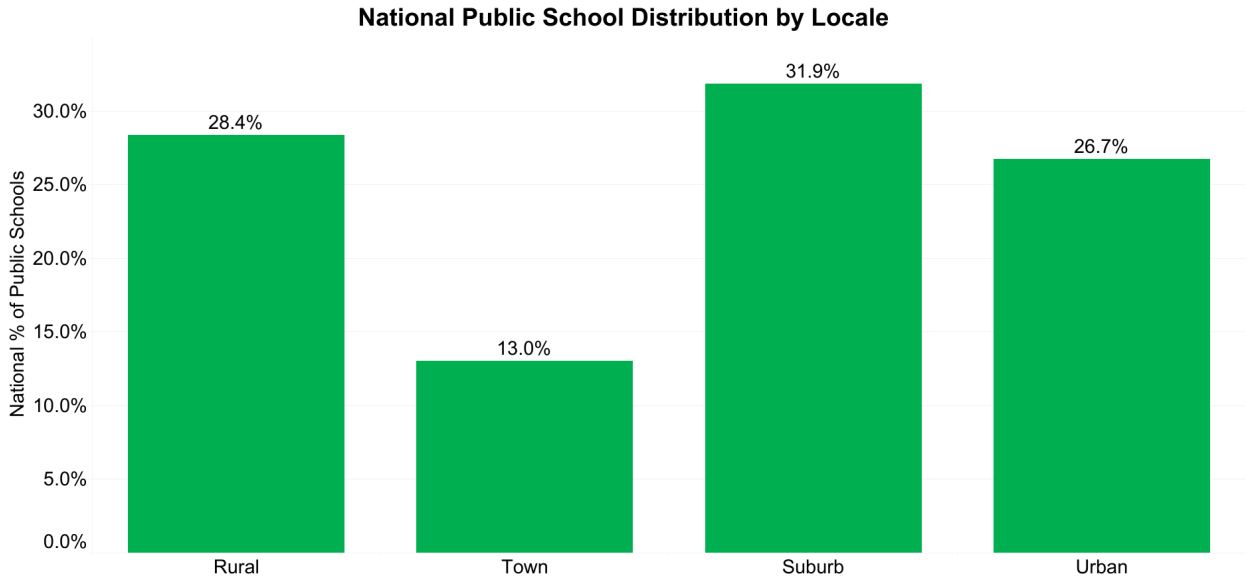


Figure 4.1.6



Source: https://nces.ed.gov/pubs2018/2018052.pdf

Figure 4.1.7

4.1.4 Schools by Majority Race

ISL Source of Schools by Majority Race: NCES database accessed in 2022

National Source of Schools by Majority Race: NCES database, accessed in 2023, https://nces.ed.gov/programs/digest/d22/tables/dt22_203.65.asp

As can be seen in Figures 4.1.8 and 4.1.9, the ISL sample has a significantly higher percentage of white schools than the national sample, 70.9% compared to 59.5% in the national sample. The percentage of Hispanic schools in the ISL sample (14.1%) is substantially lower than the national distribution of Hispanic schools at 24.7%. Since the sample was randomized, this is just a result of the sampling.

Assessment: The ISL sample does not fully mirror US schools with respect to majority race. In particular, Hispanic majority race schools are under-represented. But the sample size is large (86) and thus is regarded as an accurate reflection of Hispanic schools in the US.

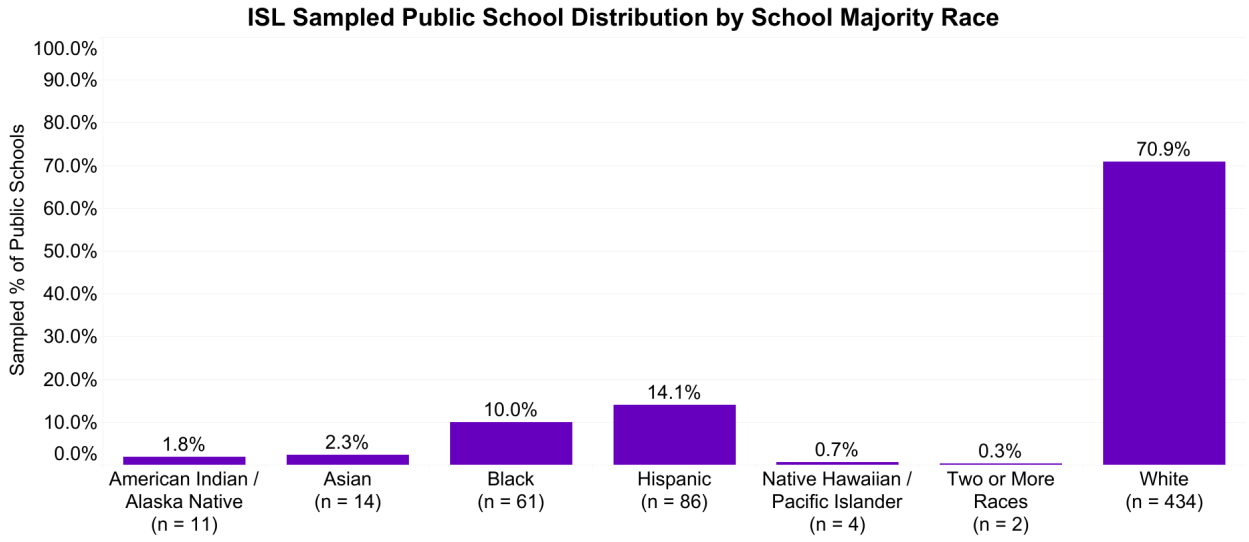
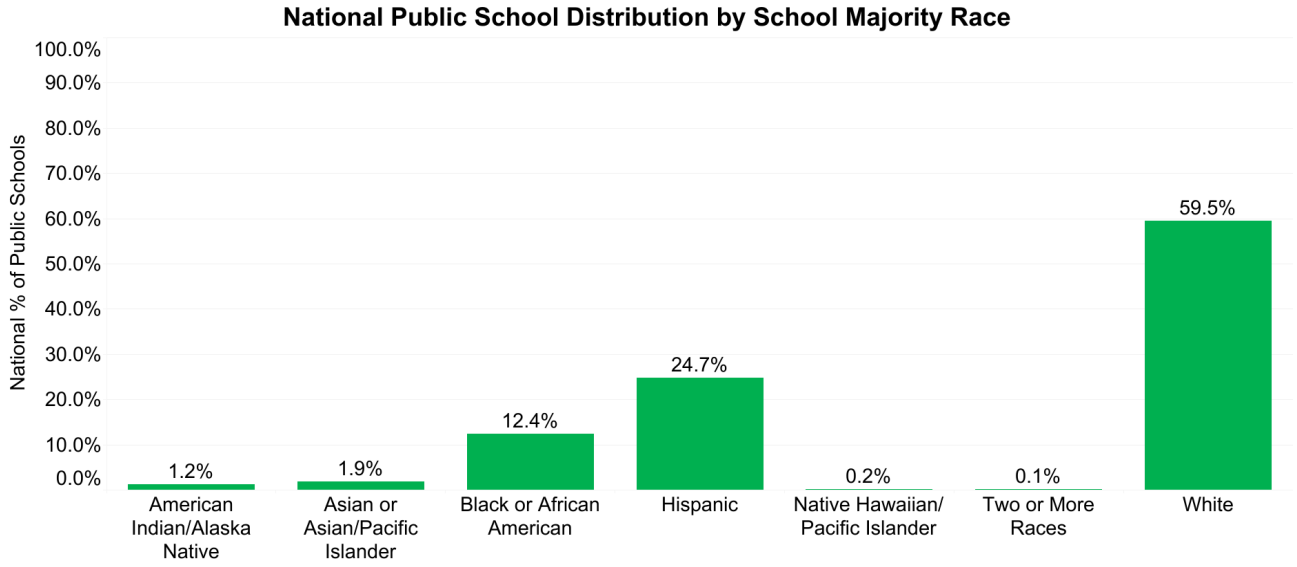


Figure 4.1.8



Source: https://nces.ed.gov/programs/digest/d22/tables/dt22_203.65.asp

Figure 4.1.9

4.1.4.1 Two or More Races

As will be seen, the two schools identified as “Two or More Races” exhibit outlier behavior in several of the measurements. While the sample size of two is too small to be representative, we wanted to better understand these schools better. First, it’s important to understand what the NCES means by schools with “Two or More Races”. Per the US Census Bureau:

> *"Two or more races. People may choose to provide two or more races either by checking two or more race response check boxes, by providing multiple responses, or by some combination of check boxes and other responses. The race response categories shown on the questionnaire are collapsed into the five minimum race groups identified by OMB, and the Census Bureau's "Some Other Race" category. For data product purposes, "**Two or More Races" refers to combinations of two or more of the following race categories: White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, or Some Other Race.** "*
>
> Source: https://www.census.gov/quickfacts/fact/note/US/RHI625222

According to NCES documentation, the data is self-reported by parents/students, and the guidance for selecting Two or More Races are as follows:

> *Two or more races*
> *(This category includes any combination of two or more races and not Hispanic/Latino ethnicity.)*
>
> Source: https://nces.ed.gov/statprog/2002/std1_5.asp

Secondly, the two schools in the ISL sample are:

- Wendler Middle School in Anchorage Alaska
  - Locale: City
  - School Size: 435 students
  - Income: $101,156
- Mililani Uka Elementary School in Mililani, Hawaii
  - Locale: Suburb
  - School Size: 736 students
  - Income: $95,840

Based on the noted demographics, the schools are only clustered together when examining data by Majority Race.

4.1.5 Schools by School Size

ISL Source of School Size: NCES Database

National Source of Schools by School Size: NCES database, https://nces.ed.gov/ccd/elsi/tableGenerator.aspx?savedTableID=646282

Median School Size – ISL Sample: 500

Median School Size – National Sample: 415

Assessment: As can be seen from Figures 4.1.10 and 4.1.11, the shape of the ISL sample distribution for school size is the same as the shape of the national chart, however, the proportions differ. Most schools in the US have less than 500 students (62.9% of schools), whereas the ISL sample had only 47.2% schools with less than 500 students.

This disparity may be due to the deliberate selecting of schools across an even mix of locales. The ISL sample had proportionately *more* schools with 1000-1499 students, and proportionately *fewer* schools with 1500-1999 students.

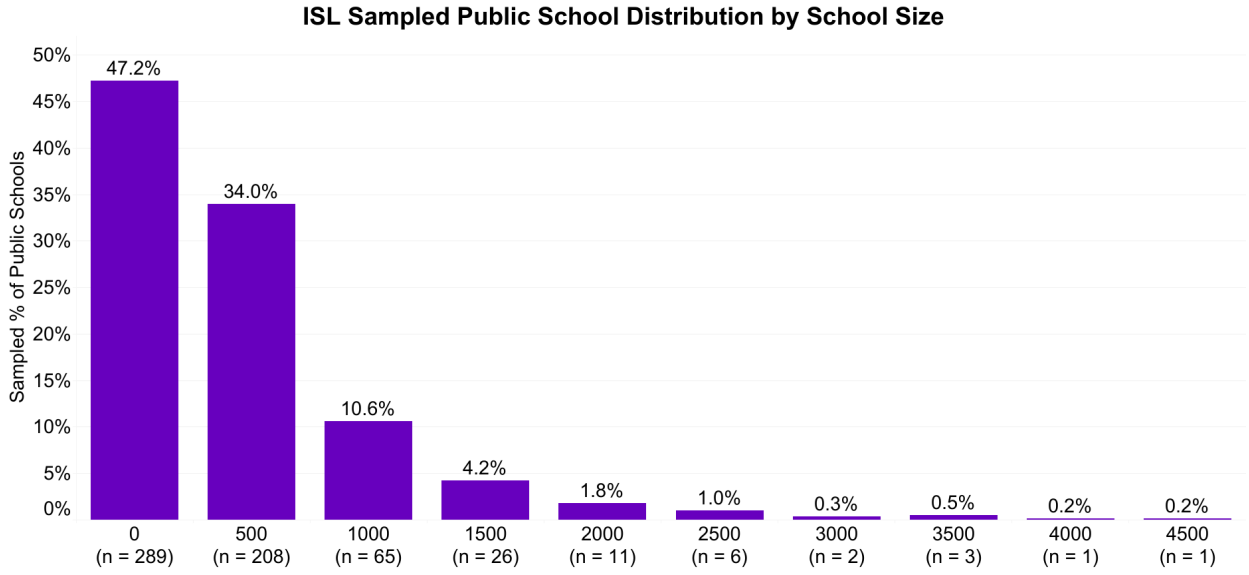
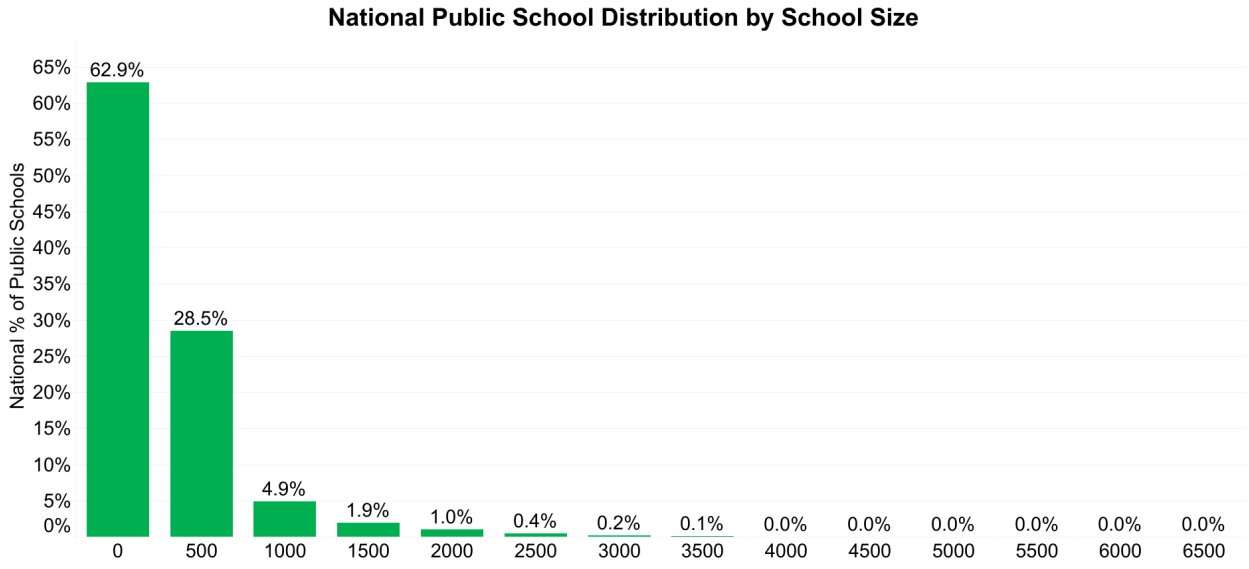


Figure 4.1.10



Source: https://nces.ed.gov/ccd/elsi/tableGenerator.aspx?savedTableID=646282

Figure 4.1.11

4.1.6 Demographic Intersectionality Analysis

4.1.6.1 School Size and Locale

Figure 4.1.12 displays the ISL sample distribution of schools by school size by locale.

- Rural, Town, and City schools mirror closely the shape and percents in the national chart (4.1.7).
    - Rural schools have the highest percentage of schools under 500 students (58.5%).
- Suburban schools, however, skew somewhat larger in size, with 38.0% of schools having between 500 and 999 students.
    - 63.4% of Suburban schools have 500 or more students. Whereas only 41.5%, 42.0%, and 46.3% of Rural, Town, and City schools, respectively, have 500 or more students.

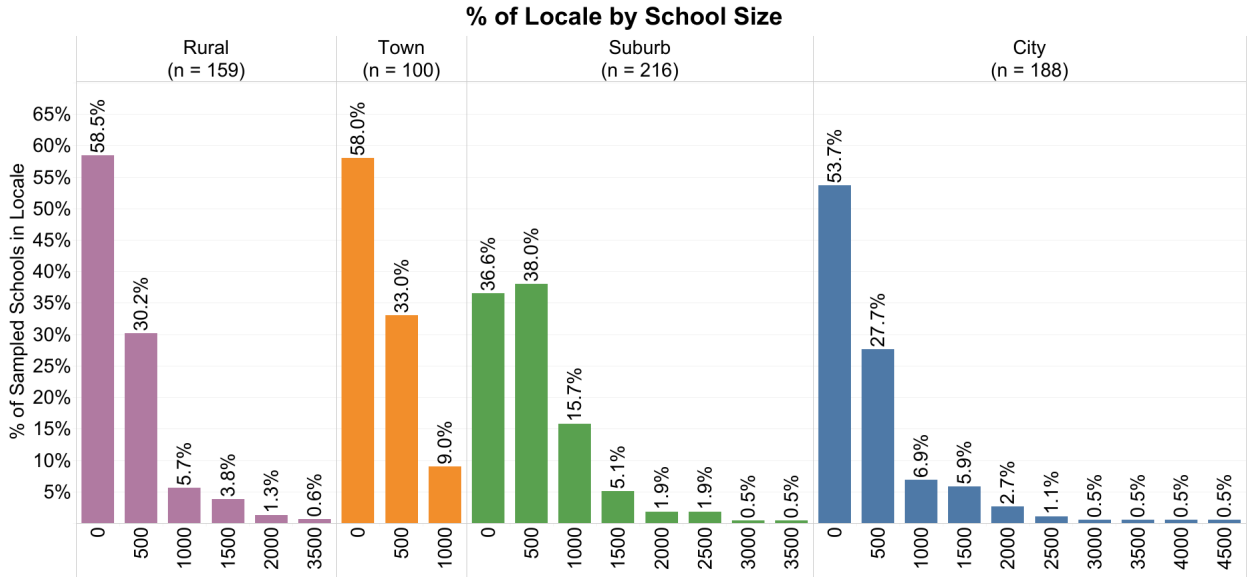


Figure 4.1.12

The largest schools in the sample were found mainly in cities and suburbs.

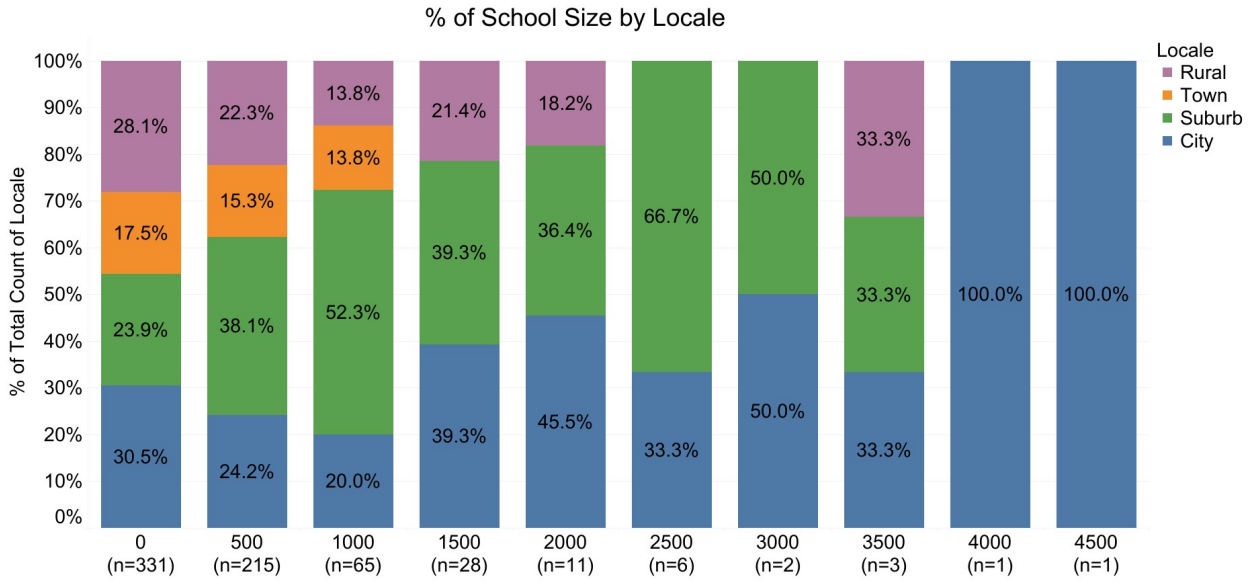


Figure 4.1.13

4.1.6.2 Grade Level and Locale

Figure 4.1.14 shows the distribution of Locale for each grade level/type of school.

- Most Elementary (35.8%) and Middle Schools (35.8%) in the ISL sample are in Suburban locales.
- Most High Schools are in Rural locales (31.4%).
- Most Private Schools in the ISL sample are in City locales (49.0%), followed by Suburban locales (35.3%).

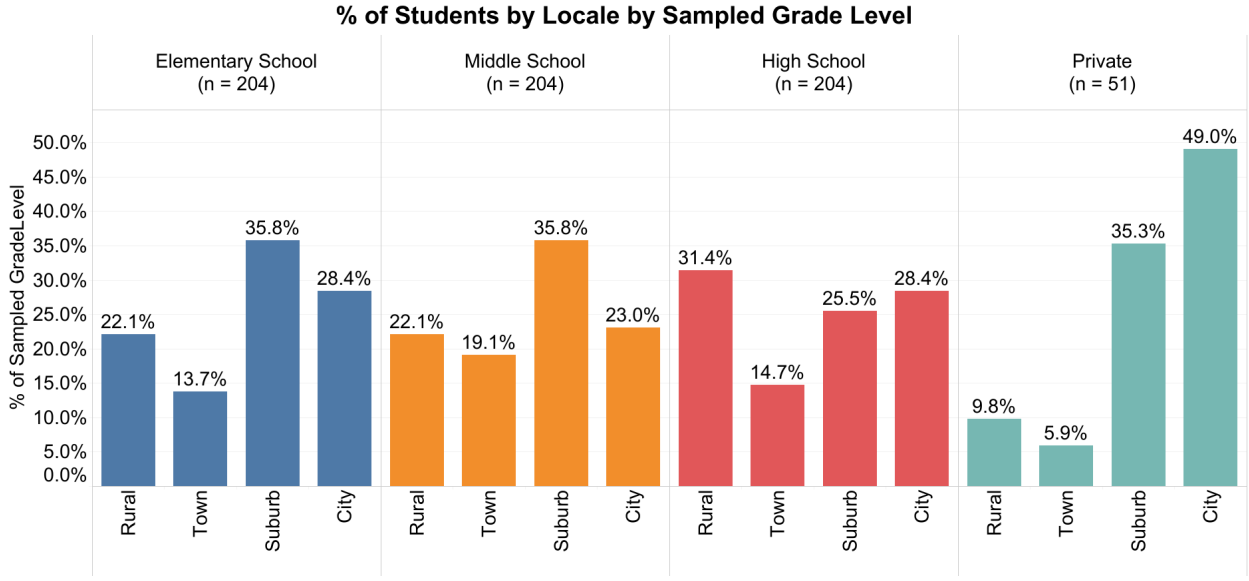


Figure 4.1.14

4.1.6.3 Income and Locale

Figure 4.1.15 displays the distribution of schools by income for each locale category.

- Suburban schools had a higher median income than the national and ISL overall sample, $80K-$99K.
    - Suburban schools had the highest percentage of schools $80K or higher (63.4%).
    - Combined with the analysis in section 4.1.6.1, Suburbs have more larger schools than other locales, with 25.4% of Suburban schools having 1000 or more students. The second highest percentage of larger schools was Cities, with 18.6% having 1000 or more students.
        - **Hypothesis**: There may be a combined impact of more students plus generally higher income in Suburban schools resulting in more resources for technology oversight.
- 72.4% of City schools were $79K or lower annual income. For reference, 66.7% of the schools in the national sample were $79K or lower annual income, and only 55.9% of schools in the ISL sample were $79K or lower.
    - **Hypothesis**: This *may* indicate lower funding for City schools, which may correlate to poorer performance in the collected data for City schools.
- Rural and Town school distribution by income was very similar, except that Rural schools had nearly twice as many $100K or higher schools than Town schools (13.3% versus 7%).

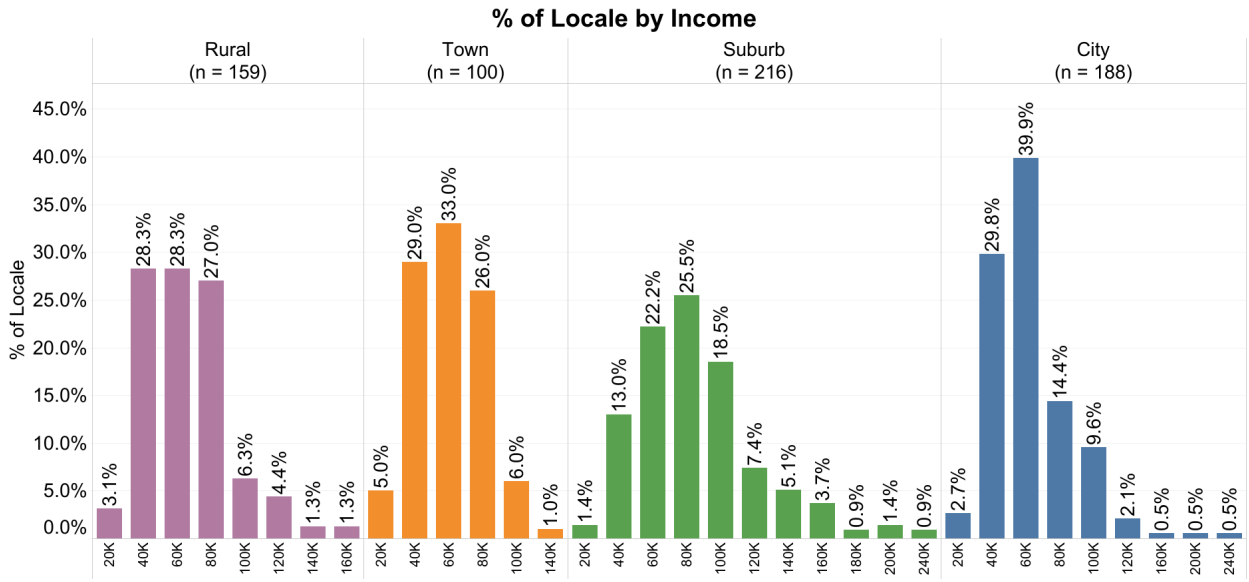


Figure 4.1.15

Higher income schools ($120K and above) skewed largely to cities and suburbs. While the lowest income ($79K and below) schools were more evenly split across locales.

Figure 4.1.16 makes clearer the income trends by locale.

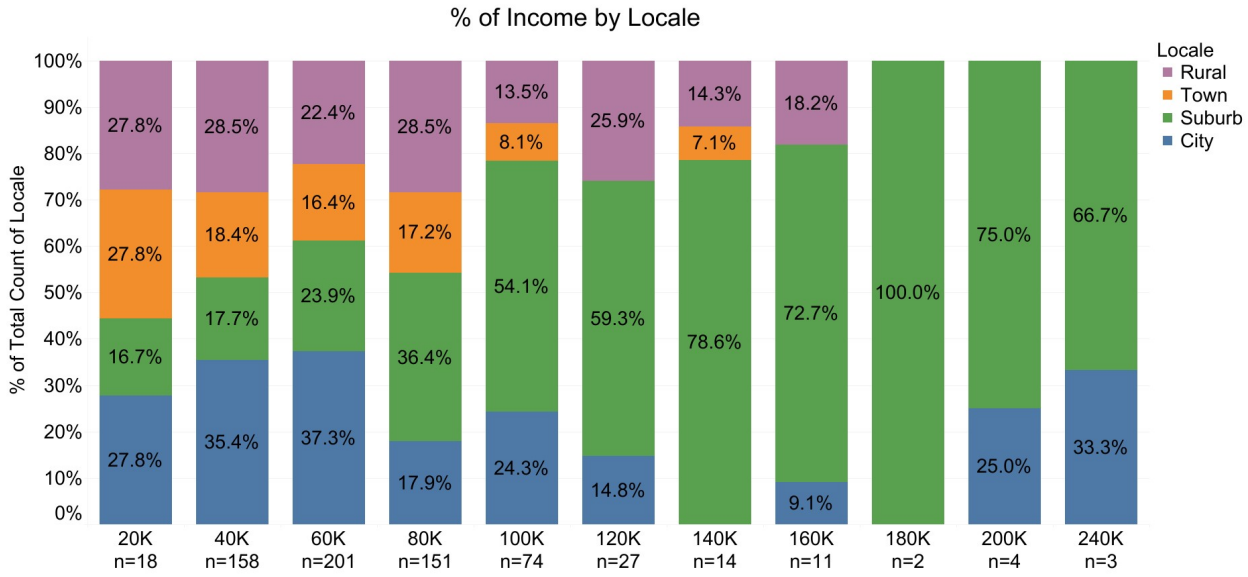


Figure 4.1.16

4.1.6.4 Majority Race and Locale

Figure 4.1.17 displays the distribution of schools by Majority Race and Locale.

- 50% or more of the indigenous majority race schools (American Indian/Alaska Native and Native Hawaiian/Pacific Islander) were in Town or Rural locales.
    - 91.7% of American Indian/Alaska Native schools were either Town or Rural locales.
    - 50% of Native Hawaiian/Pacific Islander were Town locales.
- 50% or more Asian and Black majority race schools were in City locales.
    - 50% Asian majority schools were in City locales.
    - 52.% Black majority schools were in City locales.
    - Perhaps if more Hispanic majority race schools were sampled, there would be a similar pattern. However in the current sample, most Hispanic majority race schools were in City locales, comprising 44.6% of Hispanic majority race schools.
- White schools were somewhat evenly distributed across locales. Most white majority race schools were Suburban locales (33.0%) and the lowest percentage was Town (16.6%).

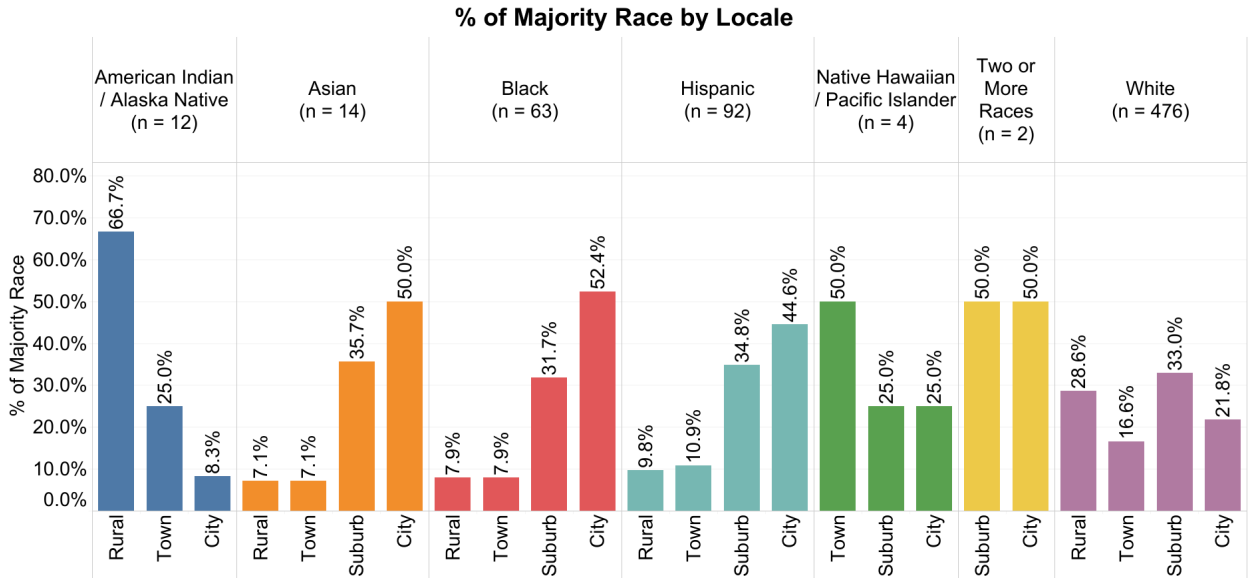


Figure 4.1.17

From Figure 4.1.18, one can see that the percentage of minority races increases from Rural to City schools.

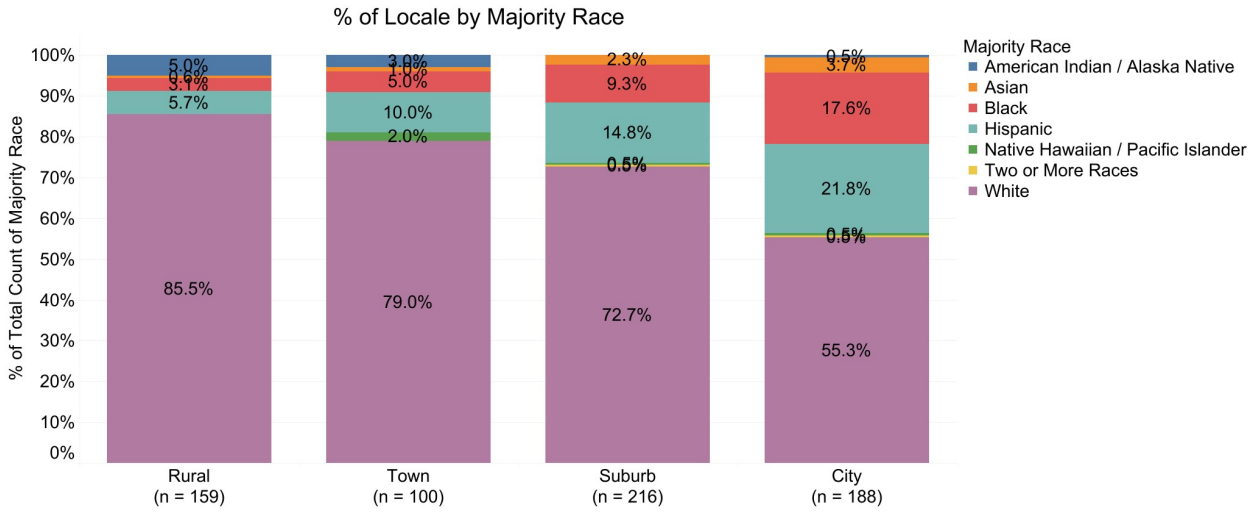


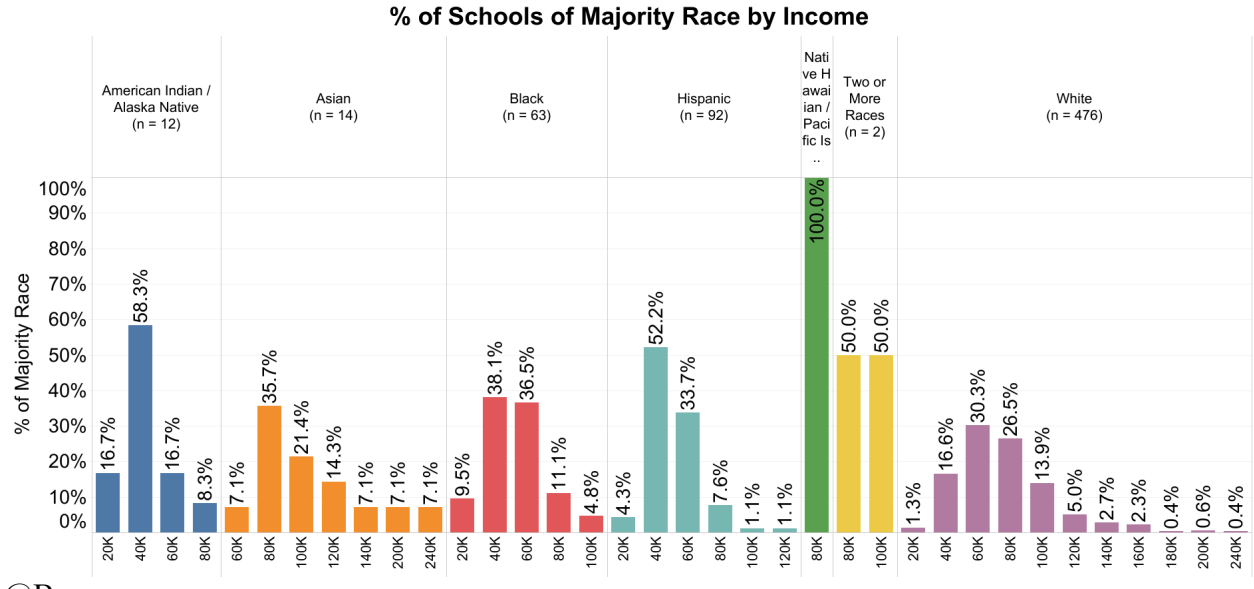
Figure 4.1.18

4.1.6.5 Majority Race and Income

Figure 4.1.19 displays the distributions of schools by income for each majority race.

- American Indian/Alaska Native, Black and Hispanic schools have the lowest income distributions.

    - 75% of American Indian/Alaska Native majority race schools are $59K or lower annual income.
    - 56.5% of Hispanic majority race schools are $59K or lower annual income.
    - 47.6% of Black majority race schools are $59K or lower annual income.
    - **Hypothesis**: American Indian/Alaska Native, Black, and Hispanic majority race schools receive fewer resources for technology oversight and as a result score worse than schools in higher income levels.
- Asian, Native Hawaiian/Pacific Islander, and Two or More Races have the highest annual distributions.
    - 100% of Native Hawaiian/Pacific Islander majority race schools are in the $80K-$99K income range. (Note that the sample size is small at only 4 schools.)
    - 100% of Two or More Races schools (only 2 schools), are $80K or over annual income.
    - 92.9% of Asian majority race schools are $80K or higher annual income.
    - Asian, Native Hawaiian/Pacific Islander, and Two or More Races schools may have more resources for technology oversight and may perform better than schools in lower income levels.
- White majority race schools closely resemble the overall national distribution, with 48.2% of schools at $79K or lower annual income, and 51.8% at $80K or higher



@Bryce

Figure 4.1.19

From Figure 4.1.20, there is a clear trend in the sample of decreasing diversity as income increases. The highest income schools ($120K and above) were primarily

white and Asian majority race. There were no Black American majority race schools higher than $119K income. There were no American Indian/Alaska Native majority race schools above $99K income.

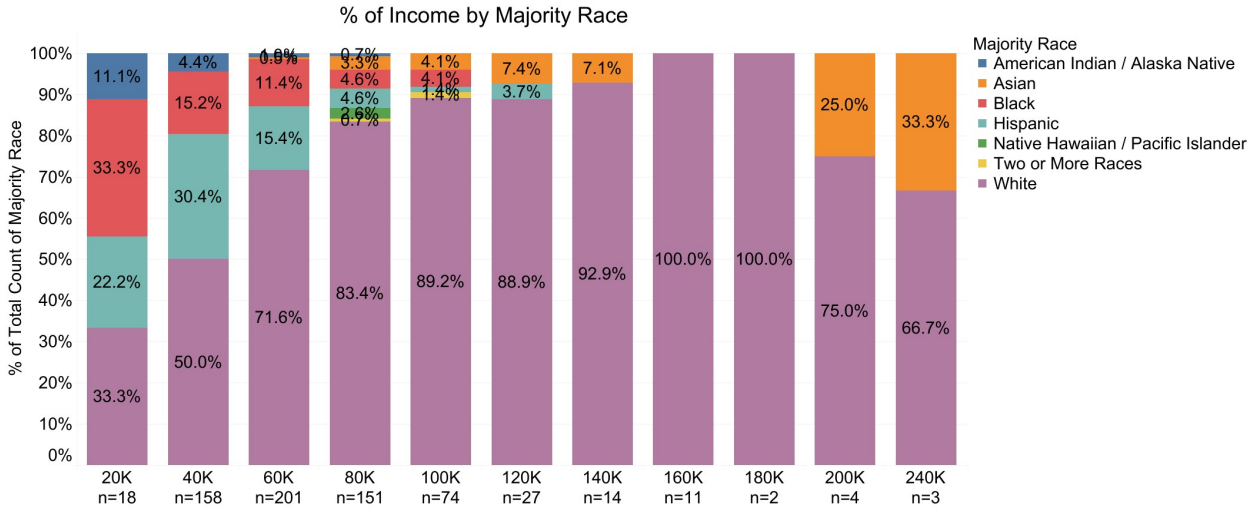


Figure 4.1.20

4.1.6.6 School Size and Majority Race

The largest schools (3000+ students were comprised mainly of white and Hispanic students (Figure 4.1.21).

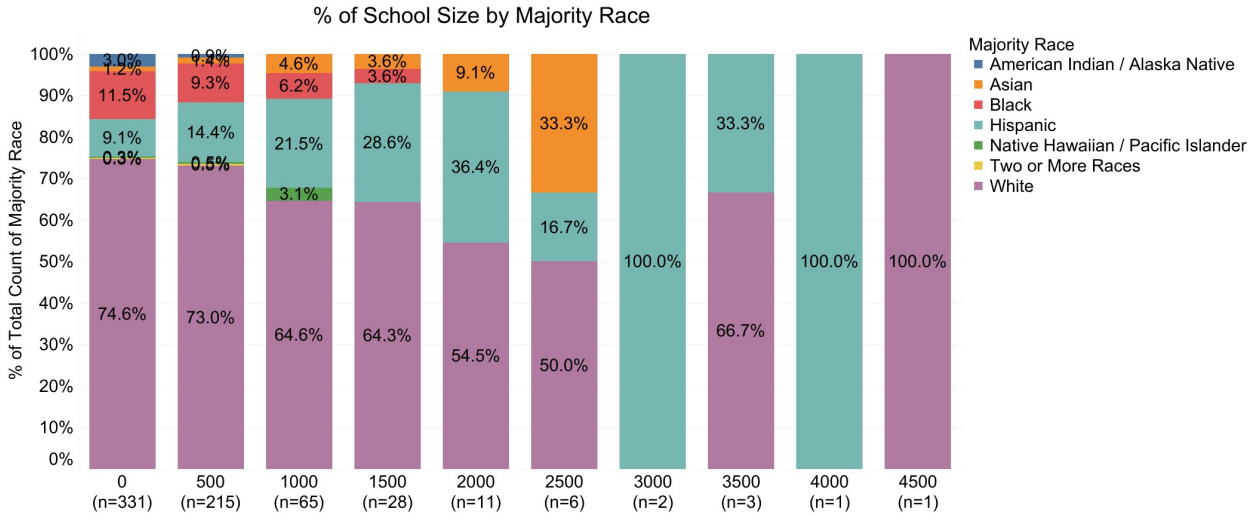


Figure 4.1.21

5 Summary Demographic Analysis of Technology Safety

5.1 General Findings and Notes

- Private Schools: private school websites were relatively opaque when it came to providing details on technology usage and behaviors. Thus, the most reliable data from the private school metrics is the Website Safety data. This report excludes private school metrics from the App Safety and School Technology Practices analyses.
- Schools that perform tech vetting approve very long lists of apps. As noted in earlier reports, the approval process itself seems to invite more technology usage in schools.

5.2 Key Findings – by Demographic Segment Performance

5.2.1 Strongest Findings

- **Elementary schools (n=204):**
    - *App Safety*: These schools recommend a lot of technology to students. One of the most positive findings from this analysis though is that this segment had the lowest average percentage of apps including behavioral ads (2.1%).
    - *School Technology Practices*: Elementary schools also have one of the lowest percentages of providing devices to students, though still sizable at 70.1%.
- **$20K-$39K income (n=18):**
    - *App Safety:* Schools in this segment exhibit a pattern seen in multiple demographic segments: these schools have a very low average number of recommended/required technologies, and correspondingly low average school composite score. However, they have the highest average percentage of apps with ads and behavioral ads.
    - *School Technology Practices*: None of the measured schools appear to be performing technology vetting, making this segment the lowest of all segments on this metric. However, as noted later in this report, there is no observed correlation between current technology vetting and App Safety.

      This segment also had among the lowest percentage of schools providing technology notice and schools providing devices. All of these findings together may be an indication of a digital divide for schools in the lowest income category.

- **American Indian/Alaska Native Majority Race Schools (n=12):** This segment mirrors some of the behaviors of the $20K-$39K income range schools (n=18). American Indian/Alaska Native schools represents just 11.1% of the $20K-$39K schools, so the overlap is not significant.
    - *App Safety:* American Indian/Alaska Native schools were the "best" with respect to average school composite score and average number of approved apps. And they were among the best with respect to average number of recommended/required apps and average percentage of apps with ads. However, they were among the highest average percentage of apps with behavioral ads.
    - *Website Safety:* School websites in this segment scored high on safety. They had the lowest average number of website trackers (3.9) and the lowest percentage of school websites with trackers (still too high at 83.3%).
    - *School Technology Practices:* American Indian/Alaska Native schools were the most poorly performing schools with respect to school technology practices. They had the lowest percentage of schools providing technology notice (16.7%), allowing consent (0.0%), and providing computing devices to students (41.7%). They were also among the lowest in performing tech vetting at 8.3%.
- **Black Majority Race Schools (n=63):**
    - *Website Safety:* Black school websites were among the least safe for students. 100% of Black school websites had trackers. They also had among the highest average number of website trackers at 7.7. This segment also had the highest percentage of websites with ads at 33.3%.
    - *School Technology Practices:* Black schools were among the highest to provide computing devices at 87.3%.
- **2000+ Students (n=24):** This segment had some of the worst and best measurements by demographic.
    - *App Safety:* Schools with 2000 or more students had the highest average number of recommended/required apps, the highest average school composite score, and the highest average percentage of Very High Risk apps (73.2%).
    - *Website Safety:* All of the school websites in this segment had trackers, and 95.8% of them had red trackers, among the top three highest.
    - *School Technology Practices:* Schools in this segment exhibited some of the best school technology practices. They had the highest percentage of schools allowing consent at 29.2%, and 100% of schools provided

devices to students. They were also among the highest in providing tech notice (58.3%) and performing tech vetting (45.8%). This suggests that perhaps the higher number of students, the greater rigor is needed around managing technology.

5.2.2 Other Findings

- **$120K or Above income (n=24):**
  - *App Safety:* Schools in this income category were among the highest for average number of recommended/required apps, average school composite score, and average percentage of apps with ads. They were unremarkable on the more important app safety measures of percentage of Very High Risk apps, and percentage of apps with ads or behavioral ads.
  - *School Technology Practices*: These schools scored well on technology practices with the highest percentage of schools providing notice (65.6%) and the highest percentage of schools performing technology vetting (60.6%).
- **Rural Schools (n=159):**
  - *App Safety:* Schools in this segment had one of the highest average percentage of apps with behavioral ads.
  - *Website Safety:* Rural school websites had the lowest percentage of websites with red trackers, but it was still high at 71.7%. They also had one of the lowest percentages of school websites with trackers (again, still quite high at 85.5%).
  - *School Technology Practices*: Only 19.5% of Rural schools were observed to perform tech vetting.
- **Town Schools (n=100):**
  - *App Safety:* Schools in towns—the second least populous locale-- had one of the lowest average percentages of apps with behavioral ads (2.2%), and also one of the lowest average numbers of LEA approved apps (66.9).
  - *Website Safety:* Schools in Towns had among the [relatively] safest school websites, with the lowest average number of red trackers, and among the lowest average number of trackers, lowest percentage of websites with trackers (still a very high 86.0%) and websites with red trackers (75.0%).
- **Native Hawaiian/Pacific Islander Majority Race Schools (n=4):** The sample is small, but the findings are noteworthy nonetheless.

    - *App Safety:* Native Hawaiian/Pacific Islander schools had the lowest percentage of Very High Risk apps at 56.1%. They also had the lowest average percentage of apps with ads at 3.3%.
    - *Website Safety:* This segment's websites have safety concerns. Native Hawaiian/Pacific Islander school websites had the highest average number of trackers (7.8), 100% of the school websites had trackers, and 100% of the school websites had red trackers. None of the school websites, however, had digital ads, making this the best performing segment for that metric.
- **Private Schools (n=51):** ISL's data collection methodology relied on information available on school websites. Private school websites were especially opaque. As a result, ISL has low confidence that the App Safety and School Technology Practices metrics are accurate.
    - *Website Safety:* Private schools had the highest average number of red trackers on school websites (1.9). But they had one of the lowest average numbers of website trackers. Only 11.8% of private school websites had ads, compared to 21.1% of public-school websites.

6 App Safety

The EdTech benchmark examined the following app safety attributes:

1. The number of recommended or required apps, i.e. apps that were actively promoted on schools'/districts' websites[12]; more is riskier for students given current software development norms and app scores.
2. How many apps the school/LEA approved for use by students (having more apps exposes students to more risk), as above, more is riskier.
3. The school composite score[13].
4. The average percentage of Very High Risk apps.
5. The presence of digital ads.
6. The presence of retargeting ads.

This section examines each of the above metrics through the five demographic lenses.

6.1 Number of Recommended or Required Apps

An average of 16.6 apps were recommended or required per school across the total sample set. How are we to assess the number of recommended or required apps in each demographic category? On one hand, more technology exposure can be helpful to students. It is beyond the scope of this analysis to examine the net effects of software usage by students. However, based on the amount of data sharing happening as is the current software norm (as reflected in the ISL safety scores[14]), this report regards a higher number of recommended/required apps as a risk to students, as it may correlate to the amount of student personally identifiable information being shared with third parties and the number of long-lived marketing profiles created for children.

In general, Private schools published the least information about the technology used in their schools which can be seen in Figure 6.1.1 (below), where Private schools had the fewest number of recommended/required apps. ***By school grade level,***

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[12] "2022 K-12 EdTech Safety Benchmark: National Findings – Part 1", pg. 17, Internet Safety Labs, December 13, 2022. https://internetsafetylabs.org/wp-content/uploads/2022/12/2022-k12-edtech-safety-benchmark-national-findings-part-1.pdf

[13] A school's composite score is the weighted average of the scores of all apps recommended or required by the school, multiplied by the total number of apps. A higher score, the greater the risk.

[14] "2022 K-12 EdTech Safety Benchmark: National Findings – Part 1", pp. 38-41, Internet Safety Labs, December 13, 2022. https://internetsafetylabs.org/wp-content/uploads/2022/12/2022-k12-edtech-safety-benchmark-national-findings-part-1.pdf

elementary schools had the highest number of recommended/required apps, which is disturbing given the safety scores of apps in the ISL benchmark.

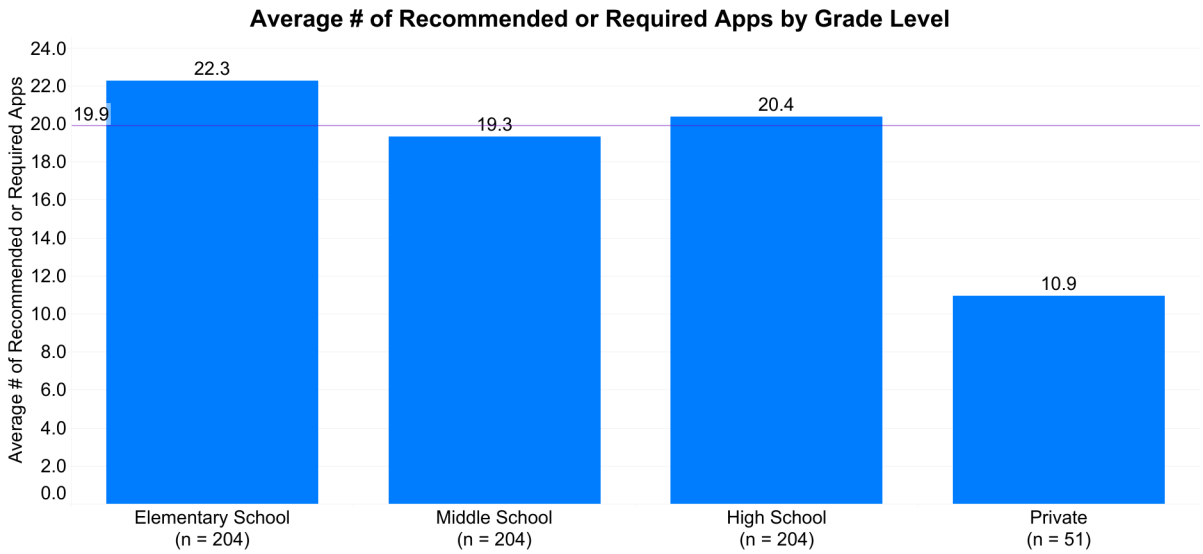


Figure 6.1.1

The distribution of the number of recommended/required apps by income (Figure 6.1.2) suggests that the higher the income, the more apps are recommended or required. ISL believes that schools in the lower income districts may have less financial support for technology, and it's possible that this may have the counter-intuitive effect of keeping students in lower income districts somewhat safer.

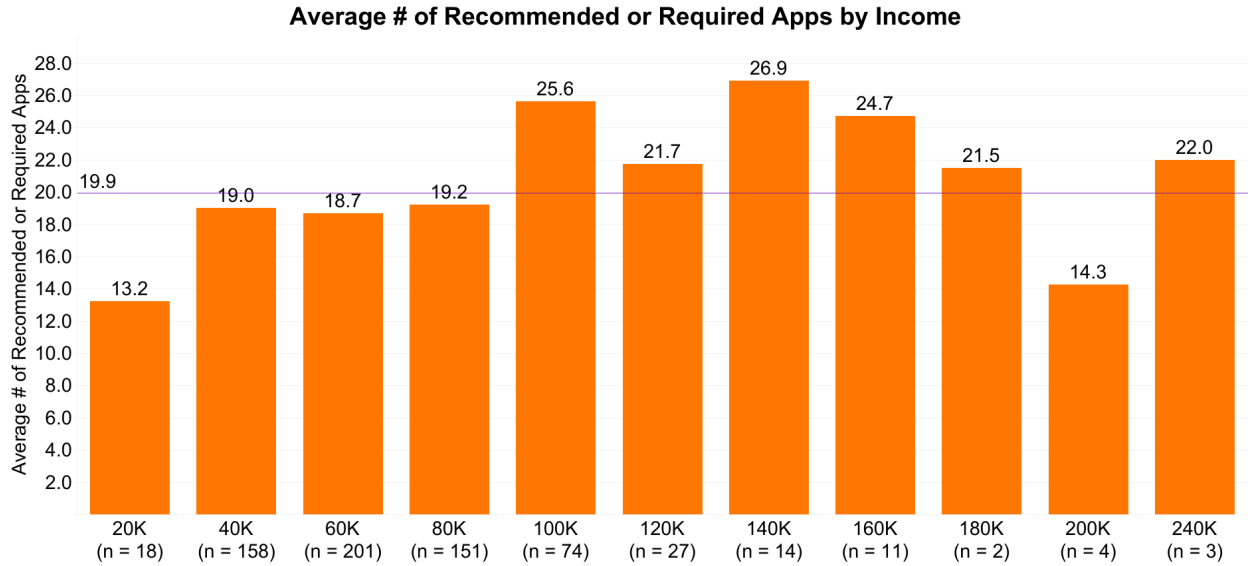


Figure 6.1.2

Figure 6.1.3 displays the average number of recommended/required apps by school locale. Suburban schools had the highest number of recommended/required apps, while schools in Towns had the fewest. This may be in support of the earlier

hypothesis that Suburban schools may have more support for technology than other locales.

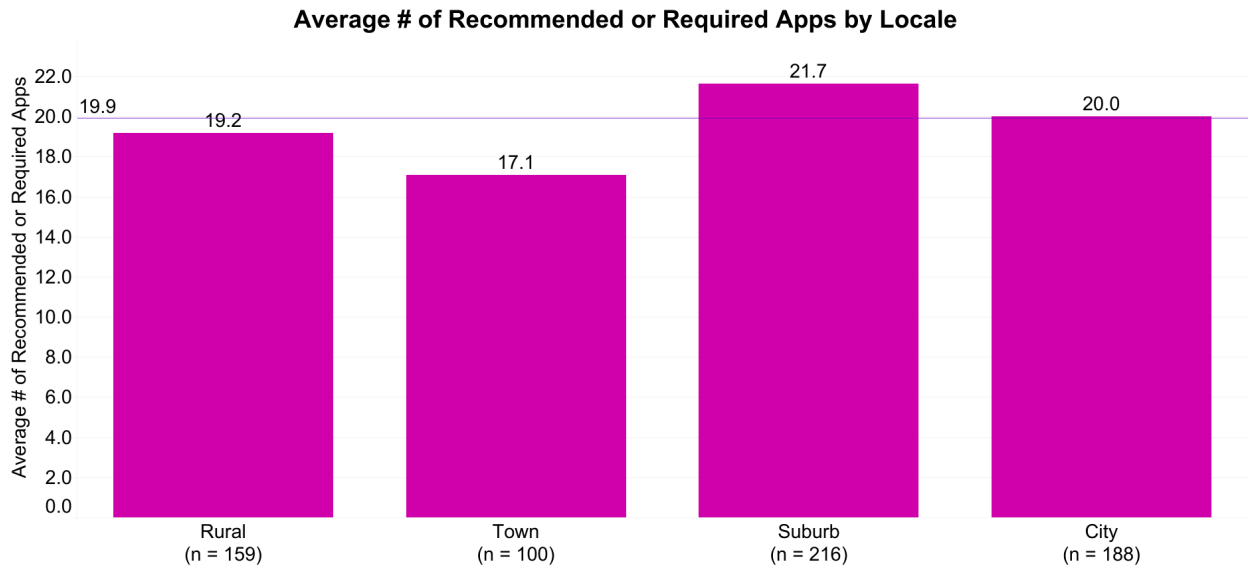


Figure 6.1.3

Looking at the number of recommended/required apps by School Majority Race (Figure 6.1.4), it can be seen that Two or More Races had the highest average number of apps. As noted earlier, these schools *do* exhibit notable behavior in several of the measurements, but the sample is too small to be representative or meaningful. Thus, the most noteworthy finding in Figure 6.1.4 is that schools with Black majority race had the highest number of recommended/required apps (n>2).

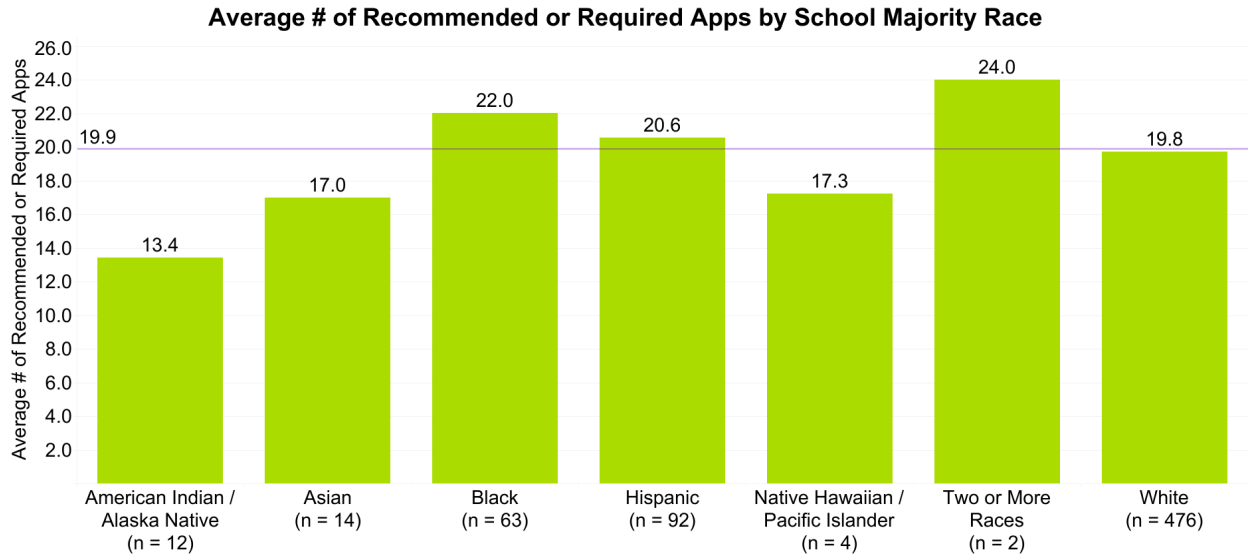


Figure 6.1.4

Figure 6.1.5 shows the distribution of recommended/required apps by school size. There appears to be a trend that the larger the school, the more technology is

recommended or required. This is most strongly evidenced by the fact that the largest segment (0-499 students) had the lowest number of recommended/required apps at 14.3, and the next largest segment (500-999 students) increases to 18.1 apps.

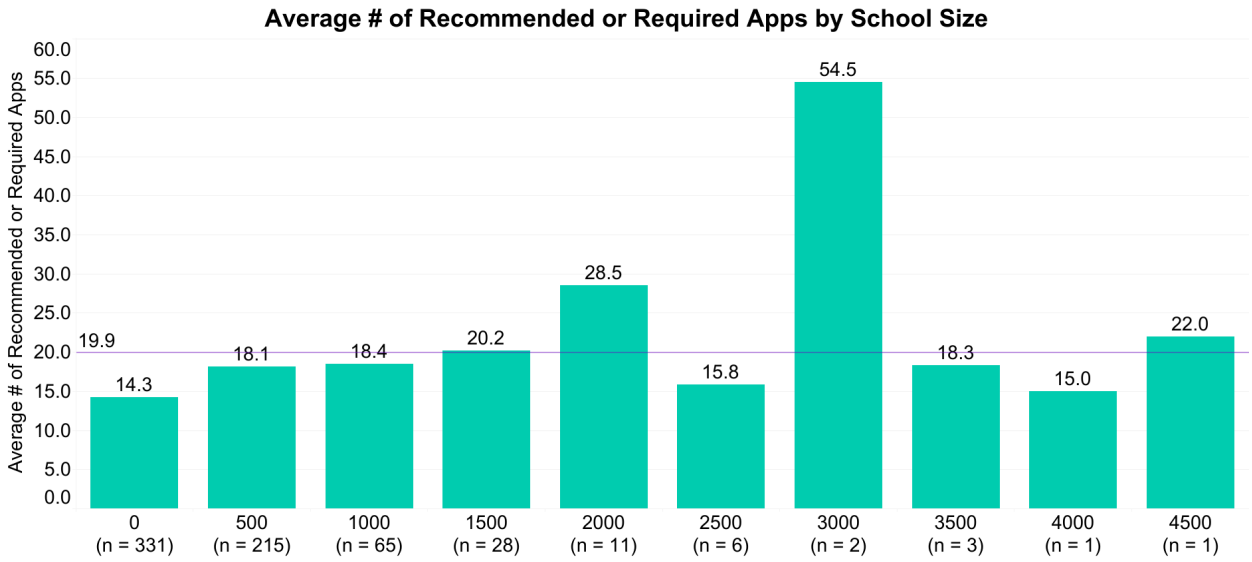


Figure 6.1.5

6.2 Local Educational Agency (LEA) Approved Apps

The average number of LEA approved apps in the ISL sample was 186.3. Note that this reflects *only* the 177 schools that have a screening process to approve or reject apps so the sample sizes (n) shown in the charts are smaller than in other sections of this report.

Figure 6.2.1 displays the average number of LEA approved apps by school grade level. Similar to the previous section, elementary schools had the highest average number of LEA approved apps (200.4, 7.6% higher than the national average) among three grade levels.

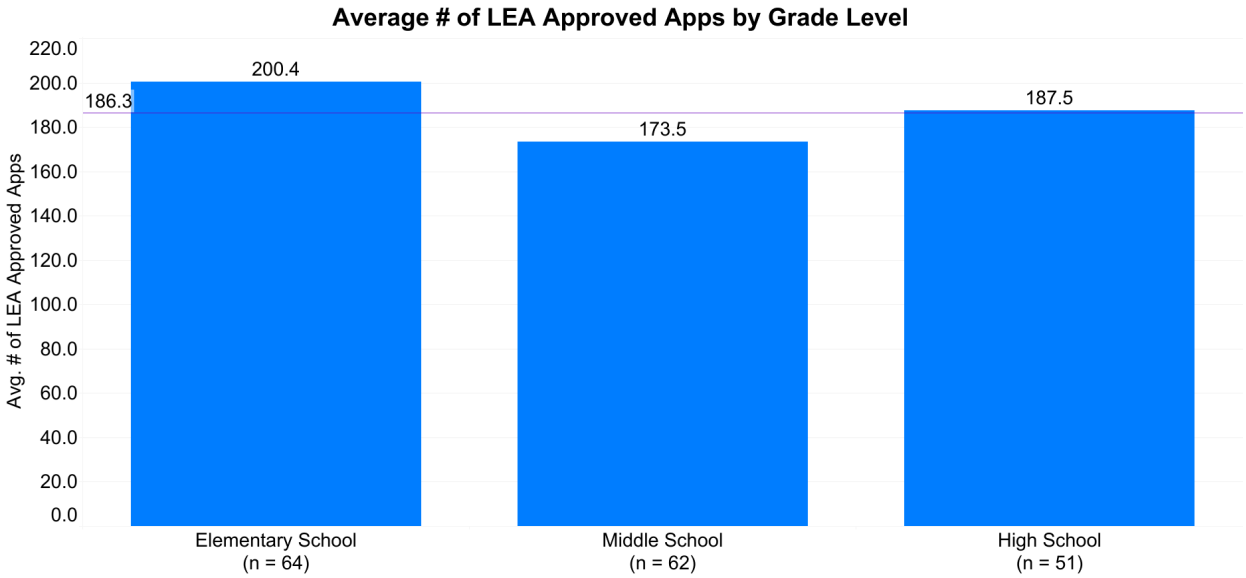


Figure 6.2.1

Figure 6.2.2 displays the average number of LEA approved apps by income. The median point is $65,542. As can be seen from the chart, schools on both the lower and higher ends of the income range saw lower numbers of approved apps (making them both "safer" with respect to this metric).

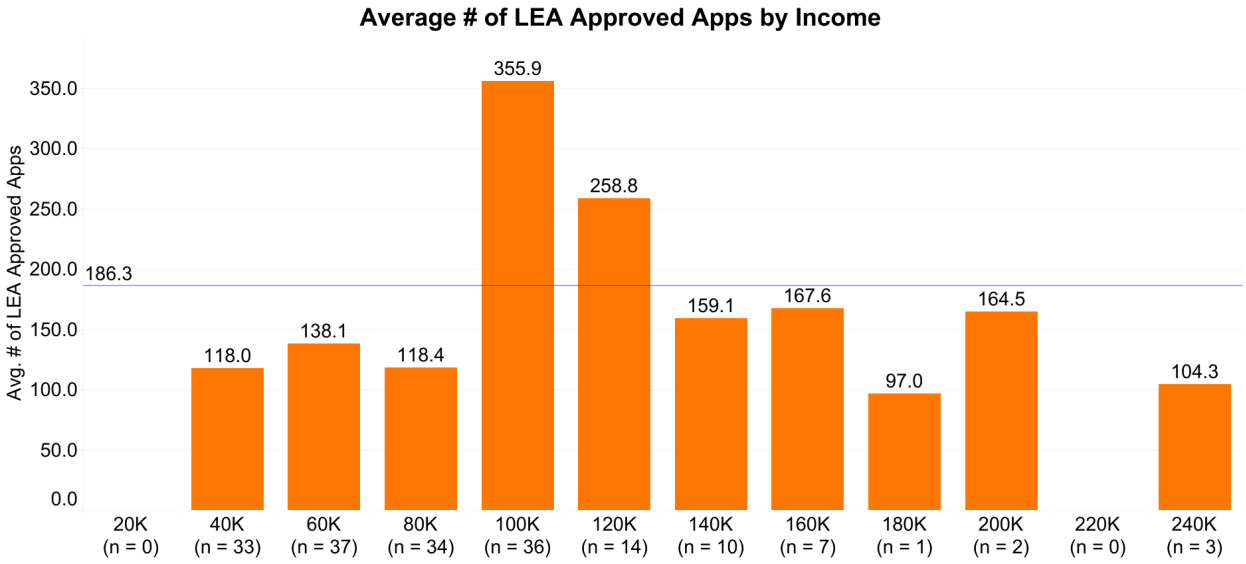


Figure 6.2.2

Figure 6.2.3 shows the number of LEA approved apps by locale. Suburban and City schools had significantly higher numbers of approved apps than Rural and Town schools. Town schools have the lowest number of approved apps, and as will be shown in section 8, they also have the lowest percentage of schools vetting apps

(Figure 8.3.3). From the perspective of average number of LEA approved apps, City schools were riskiest, having 32.4% more LEA approved apps than the national sample set. As will be seen later (section 8.3), City schools are more likely to perform technology vetting than other locales. As ISL observed in the second findings report[15], systemic vetting practices appear to be providing a false sense of confidence, causing schools that perform such vetting to approve a larger number of technologies.

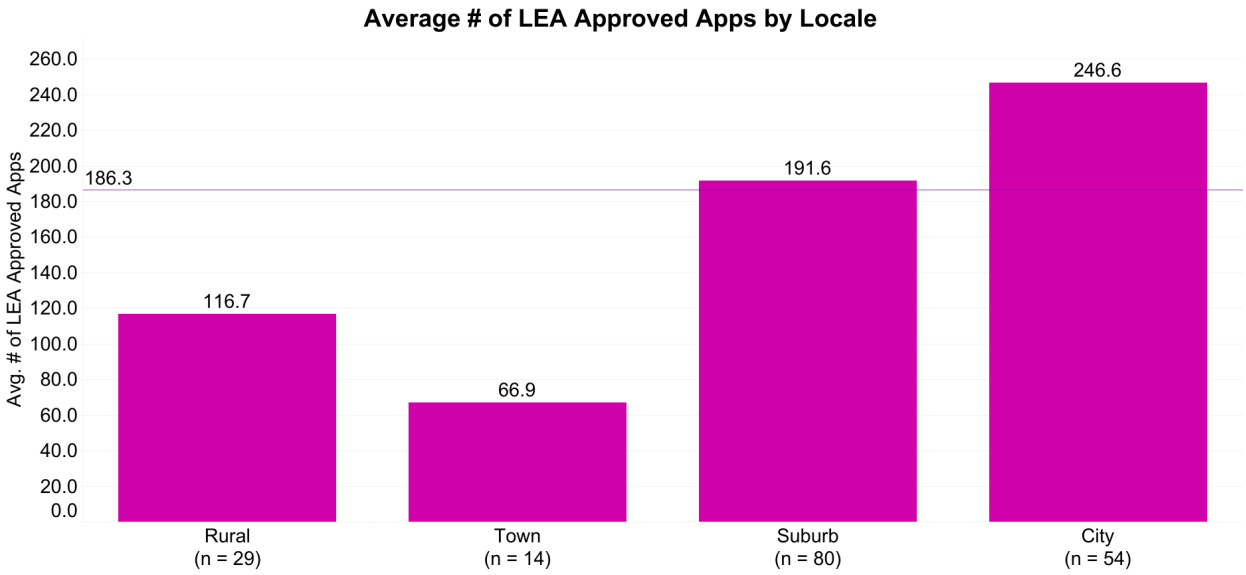


Figure 6.2.3

Figure 6.2.4 shows the average number of LEA approved apps by school majority race. What's most striking from the chart is that the Black, Hispanic, American Indian/Alaska Native, and Native Hawaiian/Pacific Islander majority race schools all had relatively low percentage of technology vetting. The sample sizes are too small, however, to draw conclusions.

[15] Section 6.3.2.2, pp. 32-37, https://internetsafetylabs.org/wp-content/uploads/2023/06/2022-K12-Edtech-Safety-Benchmark-Findings-Report-2.pdf

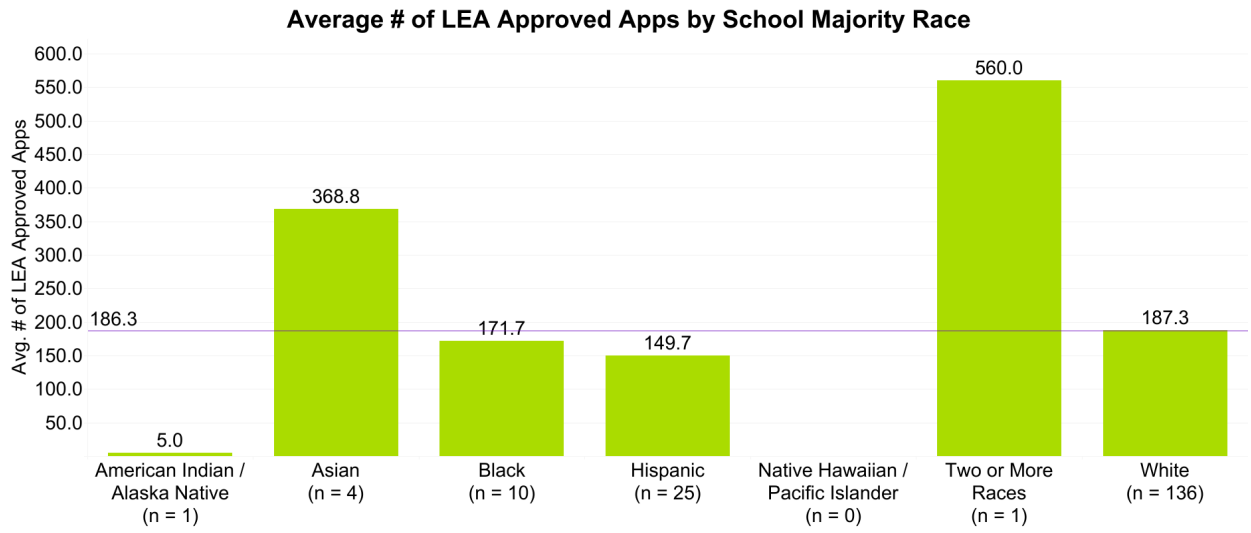


Figure 6.2.4

Figure 6.2.5 shows the average number of LEA approved apps by school size. Ignoring school size 2500-2999 students (n=1), the smallest schools (0-499 students) had the lowest average number of LEA approved apps (148.4, 20.3% lower than the national sample). The sample sizes of schools with 1500 or more students are too small to draw definitive conclusions.

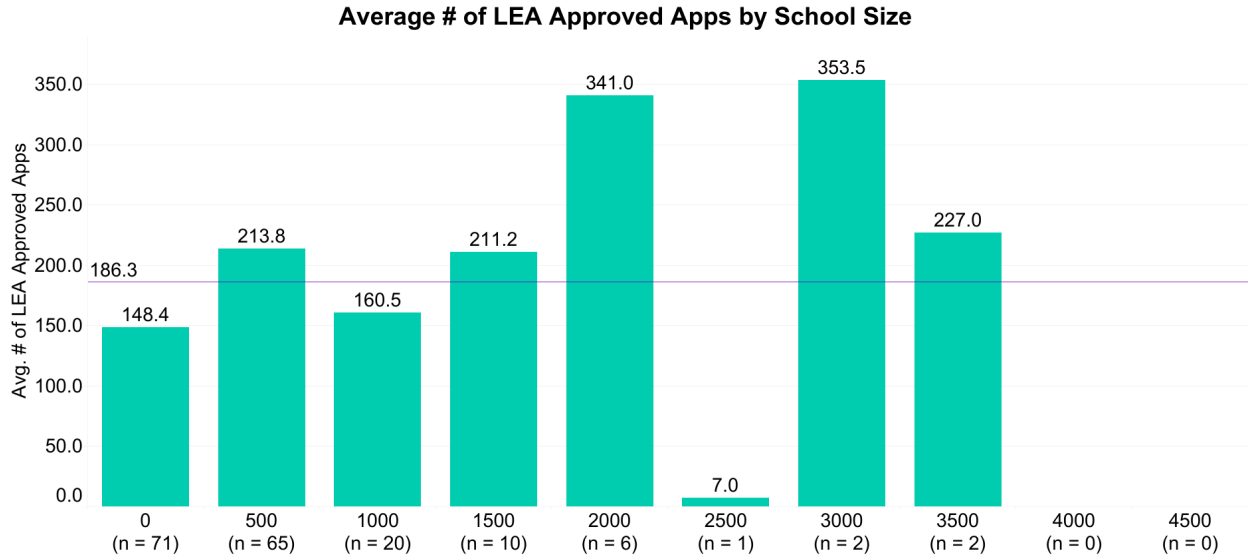


Figure 6.2.5

6.3 Composite Score

The average school composite score across the national sample was 54.0 (Figure 6.3.1). Note that the higher the score, the riskier the technology in use at the school.

Disturbingly, Elementary Schools had the highest average composite score of 59.2, 9.6% higher than the national average and 14.3% higher than Middle Schools. This is likely due to the trend of more apps being recommended to elementary students (see also section 6.1).

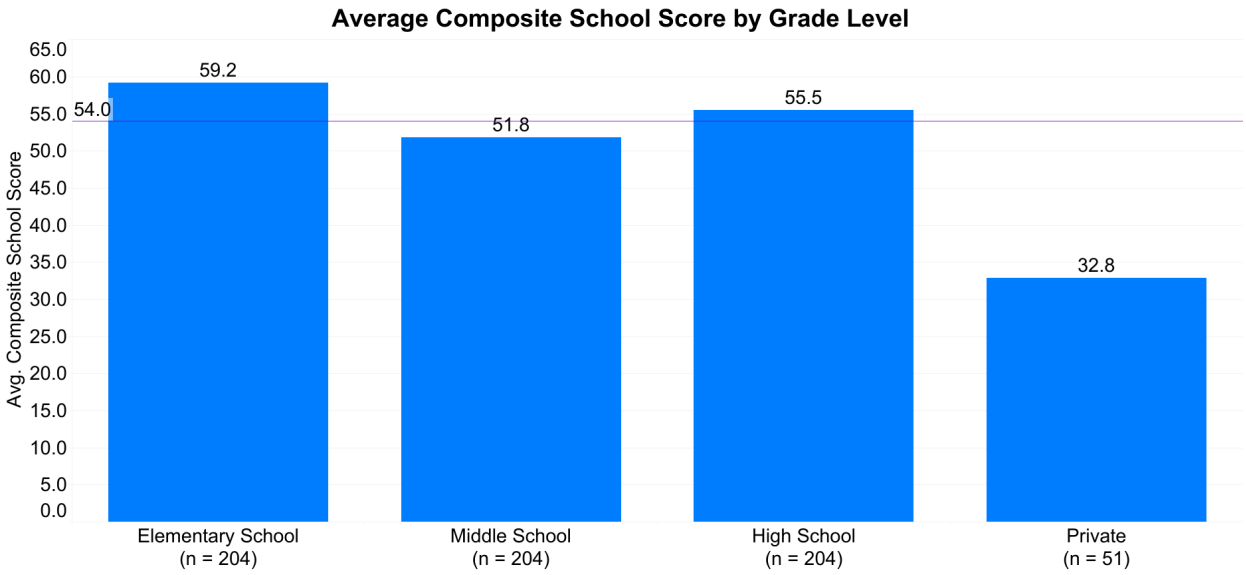


Figure 6.3.1

There is a subtle upward trend in the average composite score of schools by income (Figure 6.3.2). Schools in the lowest income level ($20K) had one of the lowest (best) average composite scores at 37.5. Coupling this with the data from sections 6.1 and 6.2 we start to see what may be more of a reflection of a type of "digital divide"; the lowest income level schools have the least amount of technology being recommended and required, which is a positive from a safety perspective [given the current levels of privacy risks in apps], but could also mean these students may not have access to technologies that their peers in higher income schools have. This finding warrants greater analysis, left for future study.

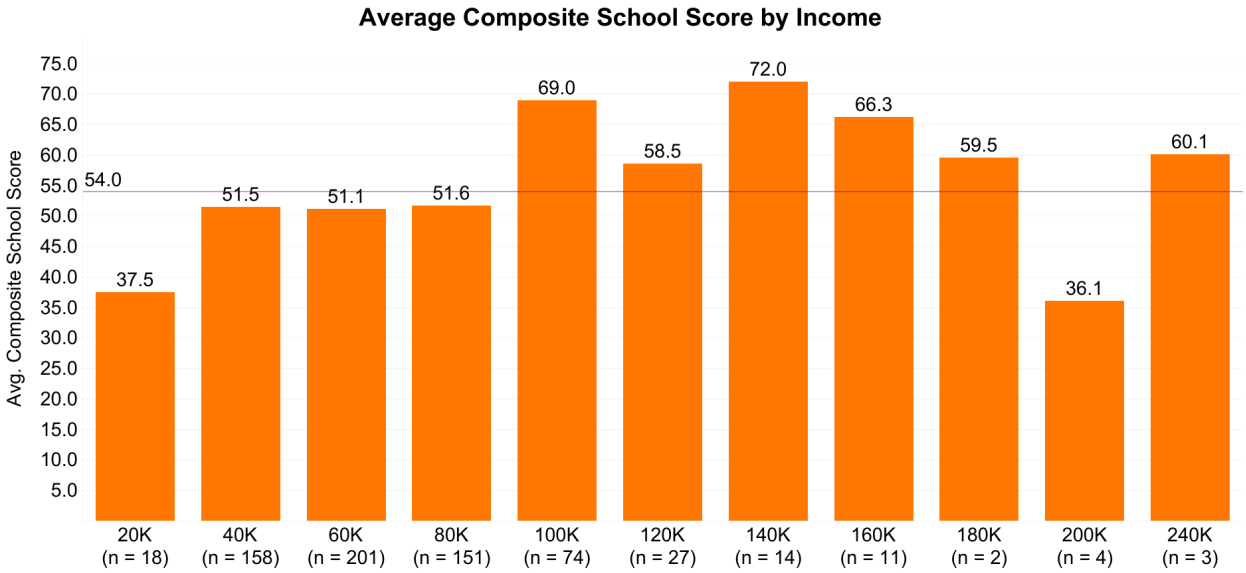


Figure 6.3.2

From a locale lens (Figure 6.3.3), schools in Towns have a 15.0% lower average composite score than the national average, while Suburban schools have a 9.1% higher average composite score than the national average. Since Suburban schools had the highest average number of recommended/required apps, the composite score finding is not surprising.

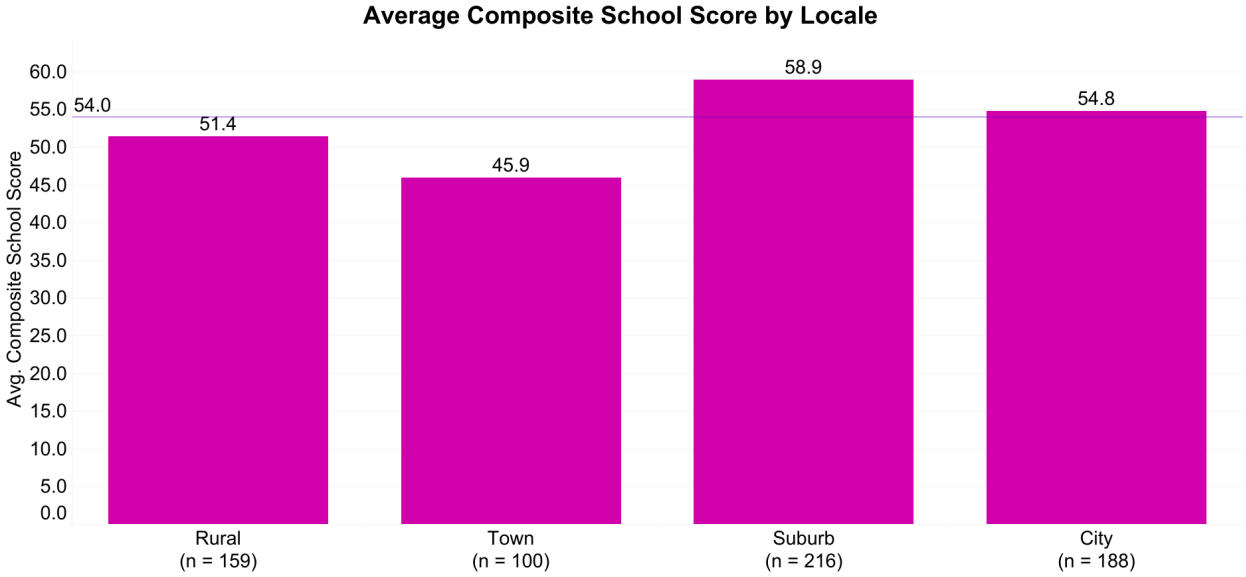


Figure 6.3.3

Ignoring the schools with Two or More Races due to the small sample set [see notes in section 4.1.4.1], schools with Black Majority Race have the highest (worst) average composite score (Figure 6.3.4), 9.6% higher than the national average. American Indian/Alaska Native Majority Race schools have the lowest (best) composite score, 32.6% lower than the national composite score average. As noted above, this is likely

due to the lower number technologies used in these schools, and potentially a sign of a digital divide.

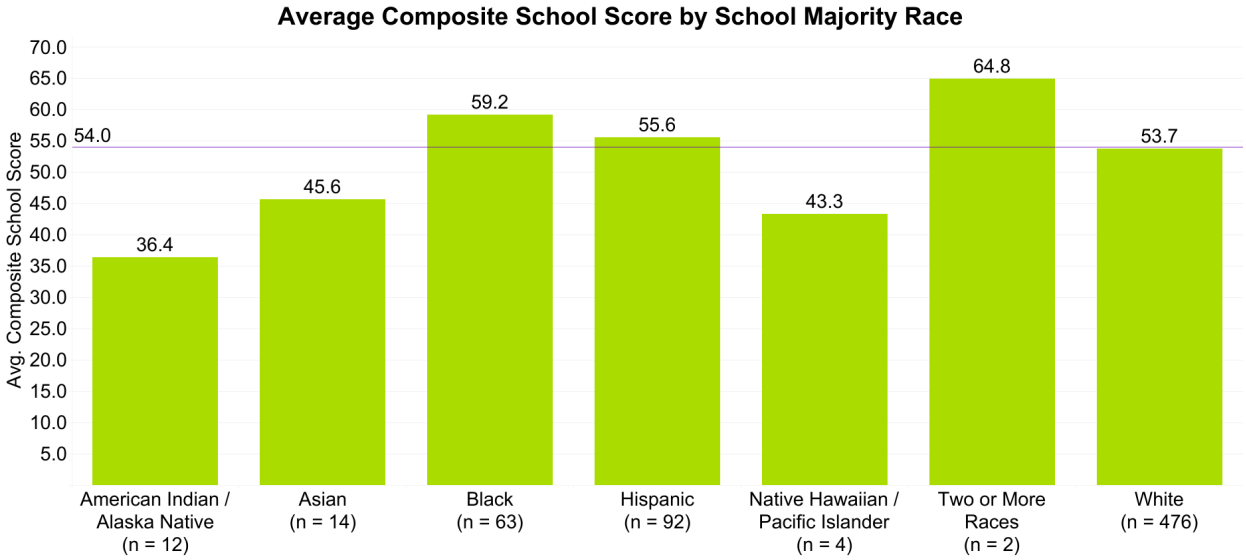


Figure 6.3.4

Figure 6.3.5 shows an upward trend in average composite school score by school size. Of note, schools in the 2000-2499 size range (n=11) have an average composite score 64.8% higher than the national average.

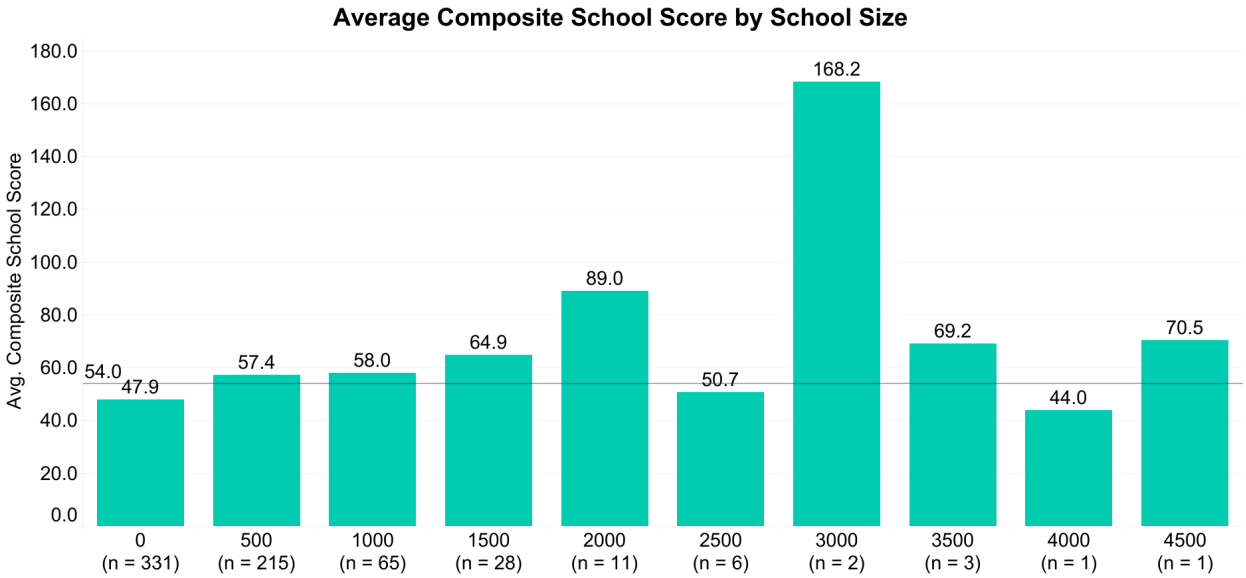


Figure 6.3.5

6.4 Presence of Ads

Digital ads are risky because they always share small amounts of data with a dynamic and large network of AdTech entities; and quite often, advertising entities use a persistent, globally unique identifier for each user (children, in this case). 7.8% of the apps in schools across the US included digital ads. Figure 6.4.1 shows that High School apps were most likely to include digital ads with an 8.5% average (9.0% higher than the national average). Private schools had the lowest average percentage of apps with digital ads at 5.6% (28.2% lower than the national average). This may be related to the low number of apps discovered and tested for Private schools.

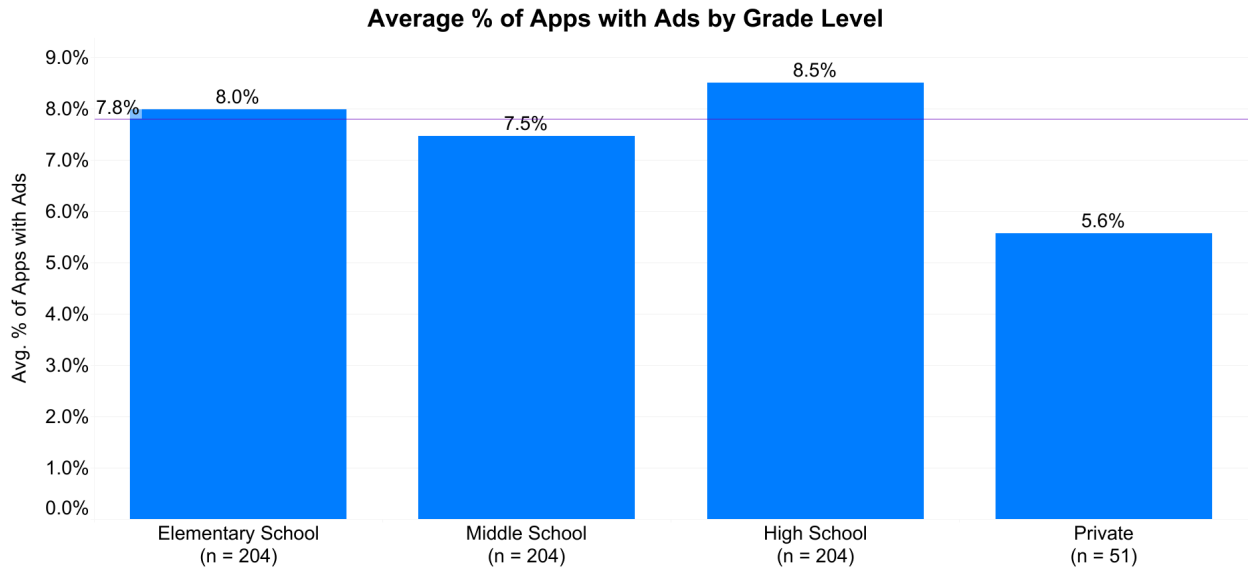


Figure 6.4.1

As can be seen in Figure 6.4.2, the average percentage of apps with ads by income appears to have a slight bimodal distribution, dipping to the lowest percentage at the $100K segment.

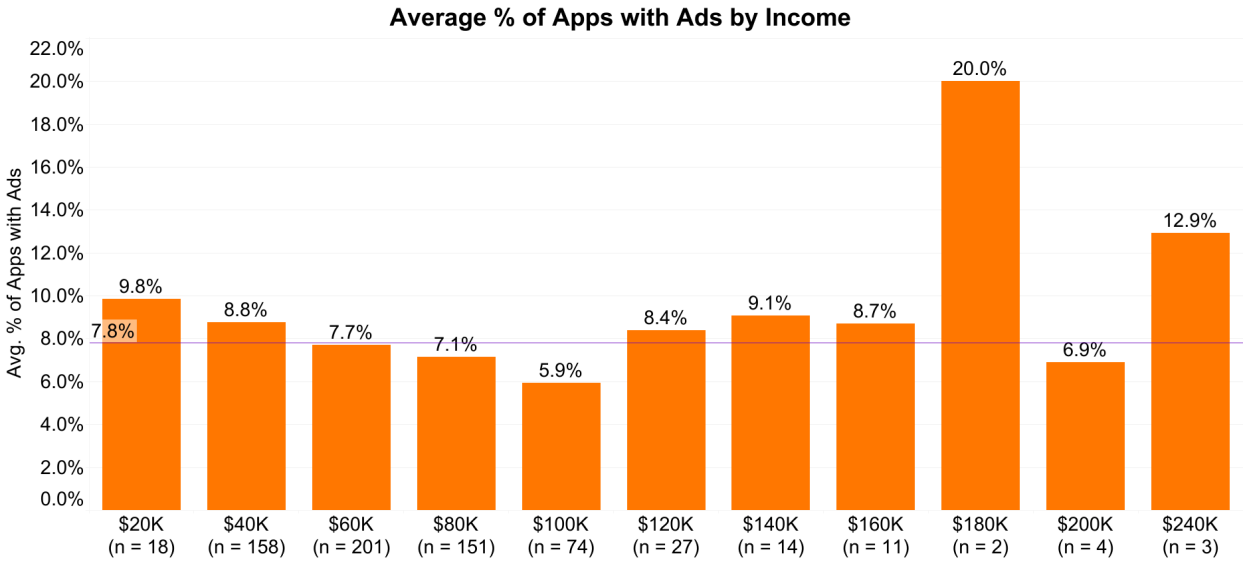


Figure 6.4.2

Rural schools had the highest average percentage of apps with digital ads at 9.0% (15.4% higher than the national average) (Figure 6.4.3). City schools had the lowest average percentage of apps with ads at 6.7% of apps, 14.1% fewer than the national average. ISL believes these somewhat surprising findings are because the denominator increases from left to right, by locale, with Suburban and City schools average more apps than their Rural and Town counterparts.

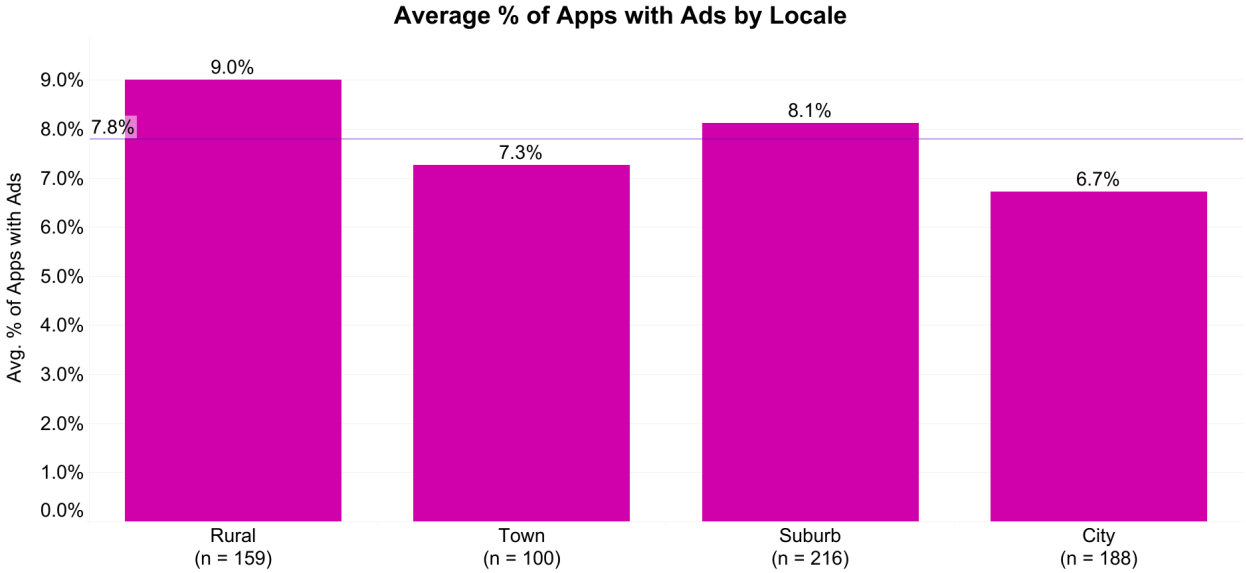


Figure 6.4.3

From a majority race perspective, Indigenous and Asian Majority Race schools fared best with the lowest average percent of apps with ads (Figure 6.4.4). These groups had the lowest numbers of recommended/required apps.

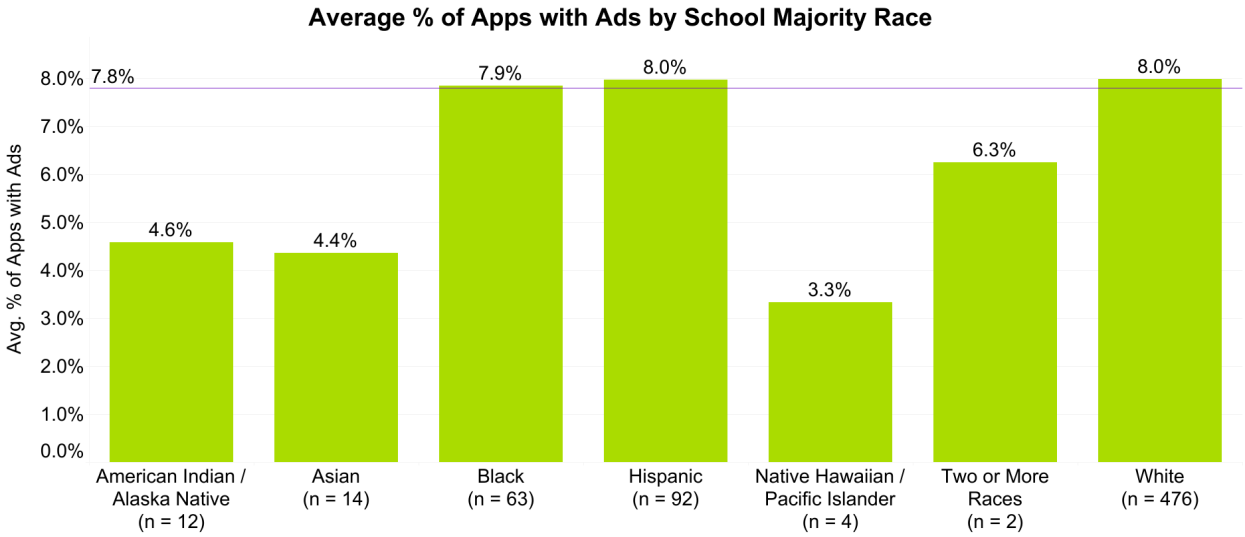


Figure 6.4.4

The average percentage of apps with ads by school size shows a slight upward trend, barring the "long tail" of schools with 2500 or more students (Figure 6.4.5). No conclusions can be drawn from this.

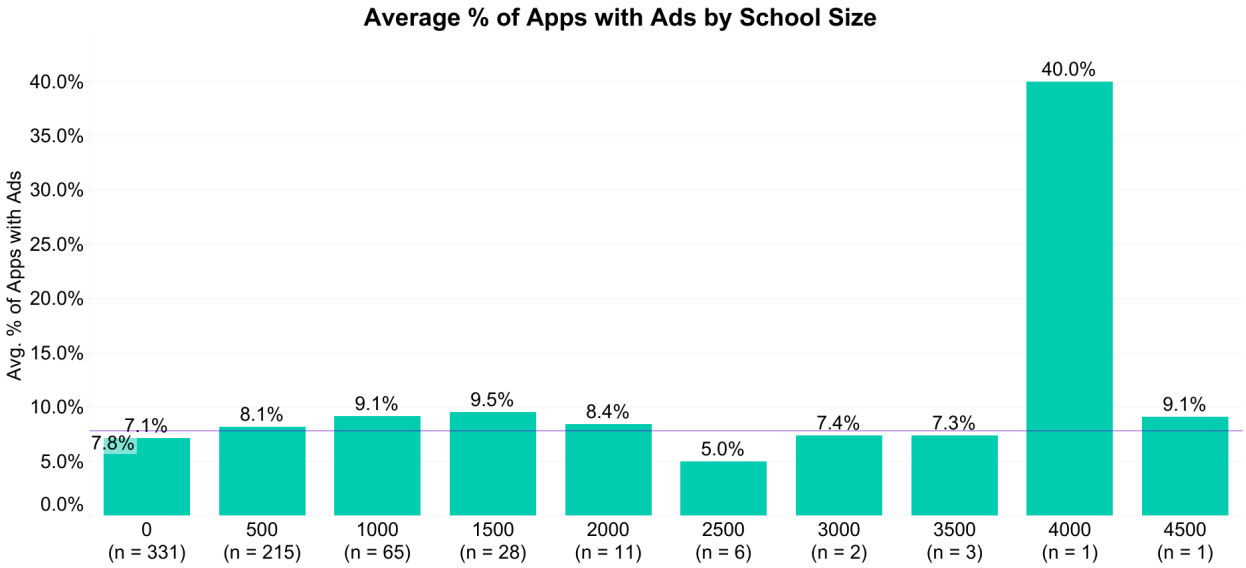


Figure 6.4.5

6.5 Behavioral Ads

Behavioral ads are a key safety measure in K12 EdTech apps, especially since this type of advertising is prohibited by the US Child Online Privacy Protection Act (COPPA). As noted in earlier findings reports, ISL's observation of behavioral ads should not be considered as a perfect indication. It's possible (and perhaps even likely) that more apps had behavioral ads that simply weren't discovered in testing.

The national school average percentage of apps with behavioral ads is 2.7% (Figure 6.5.1). As can be seen, Private schools had the highest average percent of apps with behavioral ads. Though as noted earlier, the Private school data is not high confidence for App Safety metrics due to the data collection method of using only information available on the schools' websites.

Encouragingly Elementary Schools had the lowest average percentage of apps including behavioral advertising at 2.1% (22.2% lower than the national average).

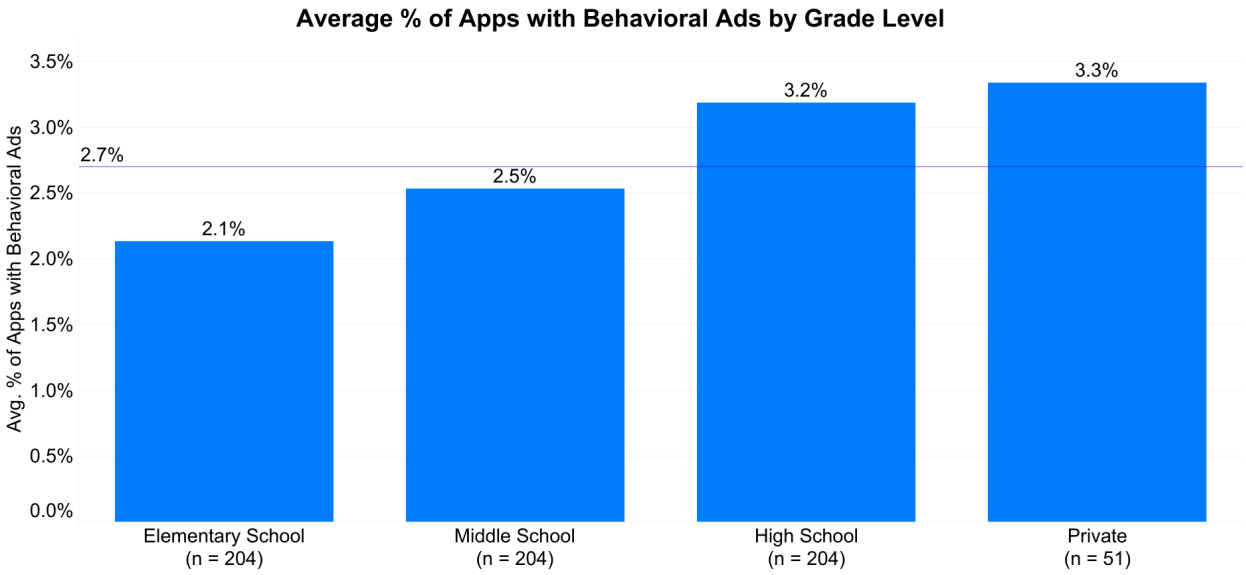


Figure 6.5.1

Examining the average percentage of apps with behavioral ads by income (Figure 6.5.2) shows a somewhat bi- or multi-modal distribution. ***The lowest income level schools had the highest average percentage of apps with behavioral ads at 9.5%-- 4.5 times higher than the national average.***

Schools in the $100K and $200K segments saw the lowest average percentage of apps with behavioral ads at 1.8% and 1.7% respectively (33.3% and 37.0% lower than the national average, respectively).

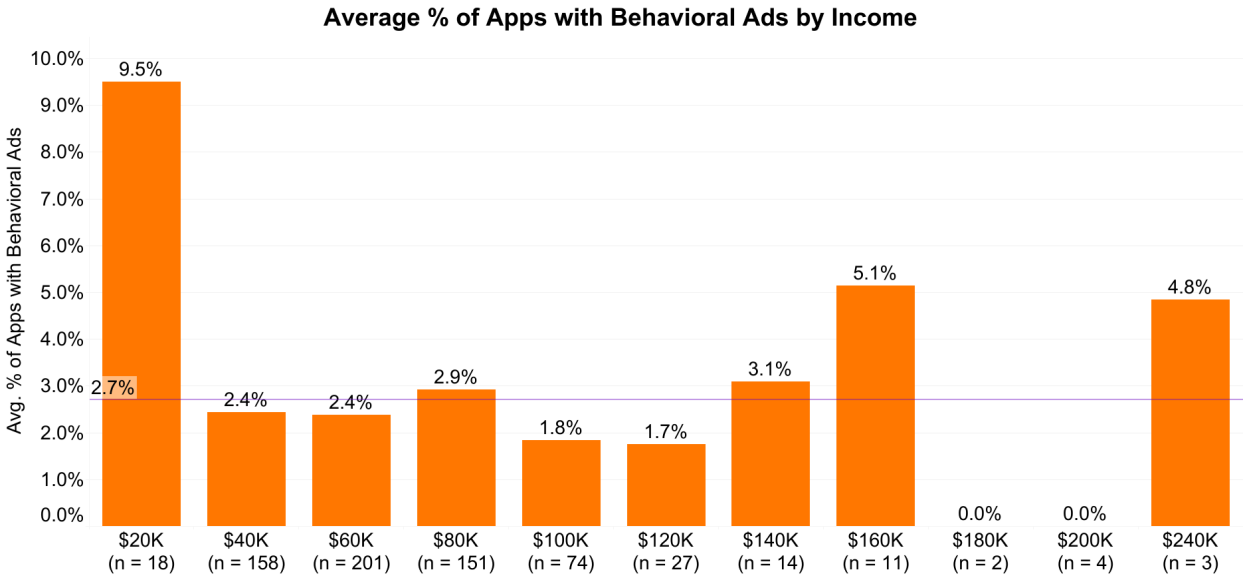


Figure 6.5.2

Rural schools had the highest average percentage of apps with behavioral ads (Figure 6.5.3) at 3.6%, 33.3% higher than the national school average. Town and Suburban schools were tied with the lowest average percentage of behavioral ads at 2.2%, 18.5% lower than the national school average.

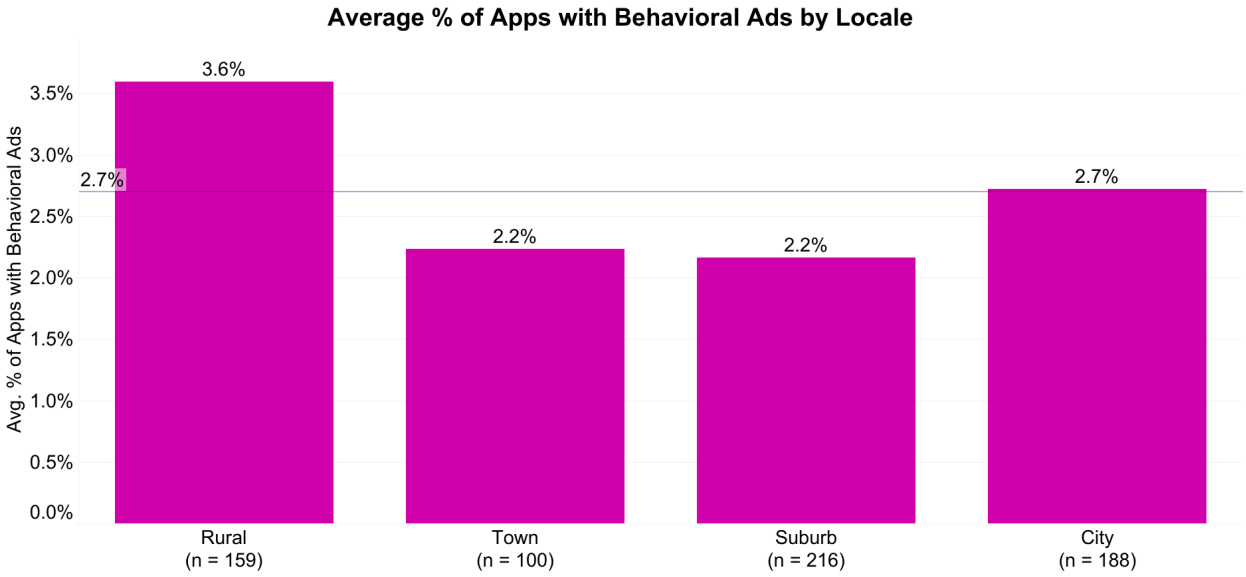


Figure 6.5.3

Figure 6.5.4 shows the average percentage of behavioral ads per school by Majority Race. ***Disturbingly, American Indian/Alaska Native Majority Race schools saw the highest percentage at 4.3%, 59.3% higher than the national school average.*** Asian Majority Race schools had the lowest average percentage of behavioral ads per school at 2.4%, 11.1% lower than the national average.

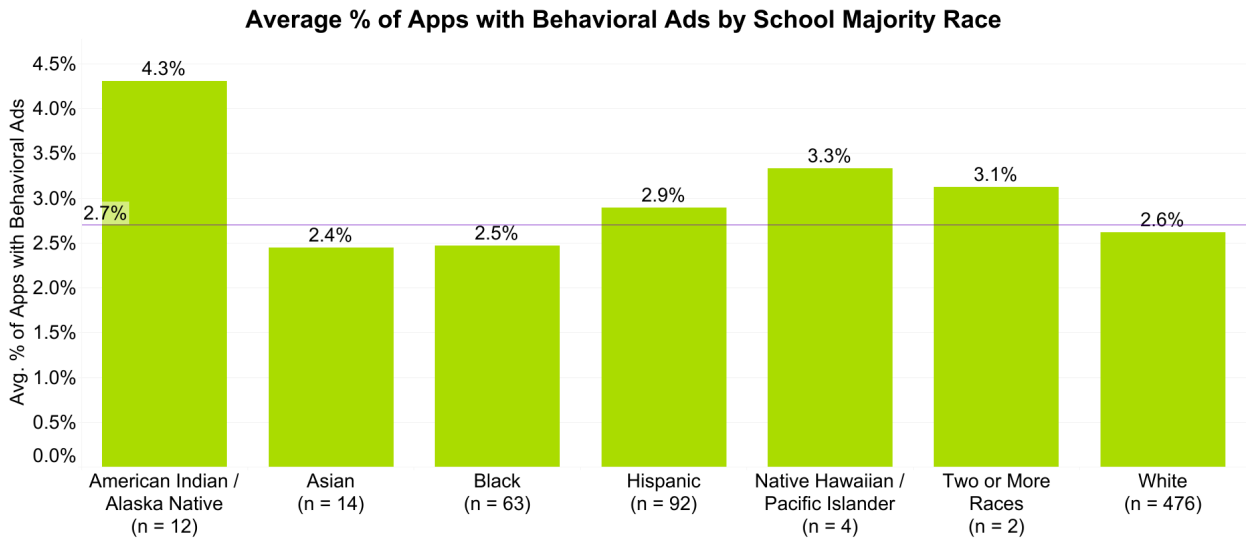


Figure 6.5.4

No significant trends can be observed from the average percentage of apps with retargeting ads by school size (Figure 6.5.5).

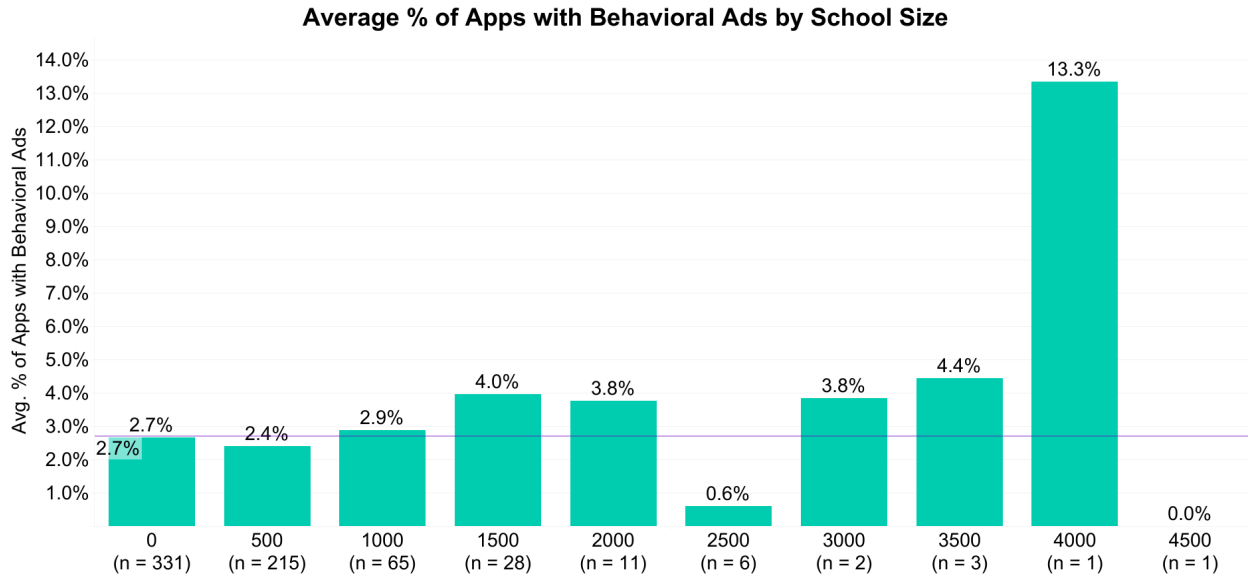


Figure 6.5.5

7 Website Behavior

The purpose of the EdTech benchmark was not heavily oriented on school website safety, but did collect some website safety data, namely:

1. The total number of trackers, as reported by the Electronic Frontier Foundation's Privacy Badger tool[16].
2. The number of red trackers (i.e. highest risk trackers) reported by Privacy Badger.
3. The presence of ads on the website.

7.1 Website Trackers

School websites averaged 6.5 total trackers in the national sample (Figure 7.1.1). There was no appreciable difference between the average number of trackers by grade of school for public schools. Private schools had the lowest average number of website trackers at 5.2 per website, 20% fewer trackers than the national average.

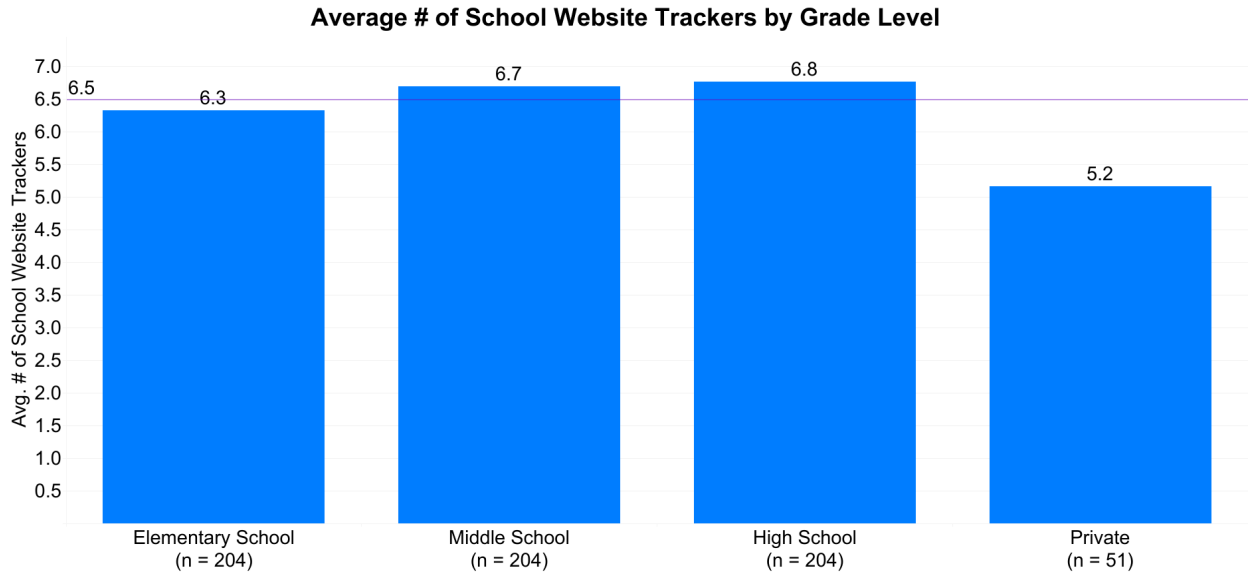


Figure 7.1.1

The lowest income level schools had the second lowest average number of website trackers (Figure 7.1.2). Schools with income levels lower than $100K were more likely to be right on or below the average number of website trackers. Higher income level schools were more likely to have a higher number of website trackers.

[16] "2022 K-12 EdTech Safety Benchmark: National Findings – Part 1", pg. 90, Internet Safety Labs, December 13, 2022. https://internetsafetylabs.org/wp-content/uploads/2022/12/2022-k12-edtech-safety-benchmark-national-findings-part-1.pdf

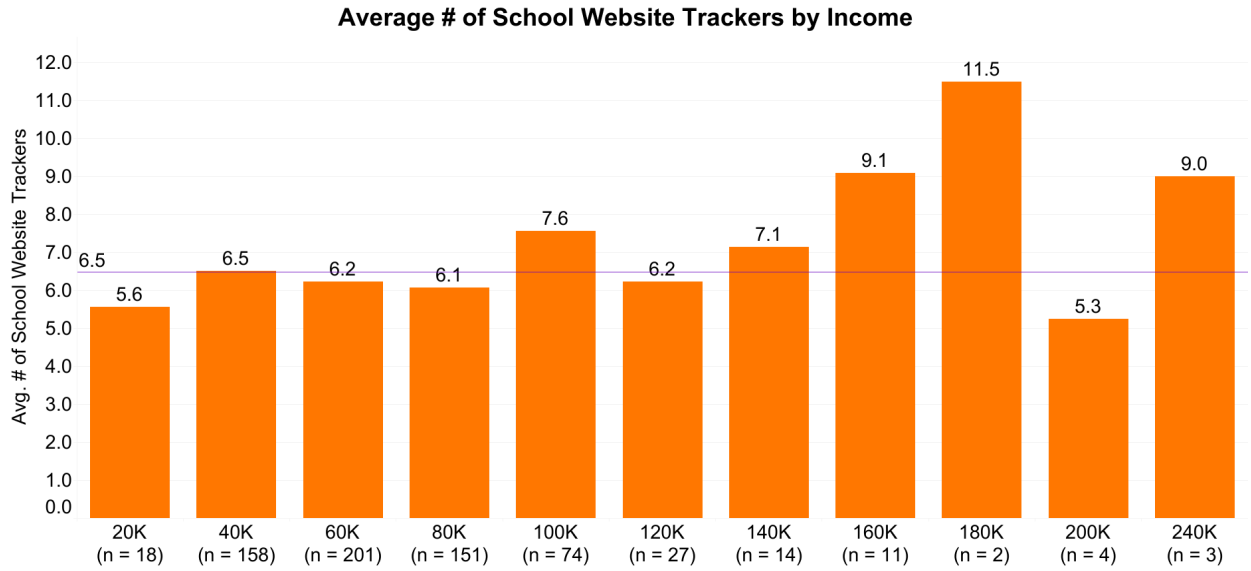


Figure 7.1.2

Figure 7.1.3 shows an upward trend of average number of website trackers for schools in more populus locales, with City schools showing the greatest average number of website trackers at 7.4 (13.8% higher than the national average). **Hypothesis**: Higher income begets more technology use, and thus more exposure to digital advertising, and more data sharing risk.

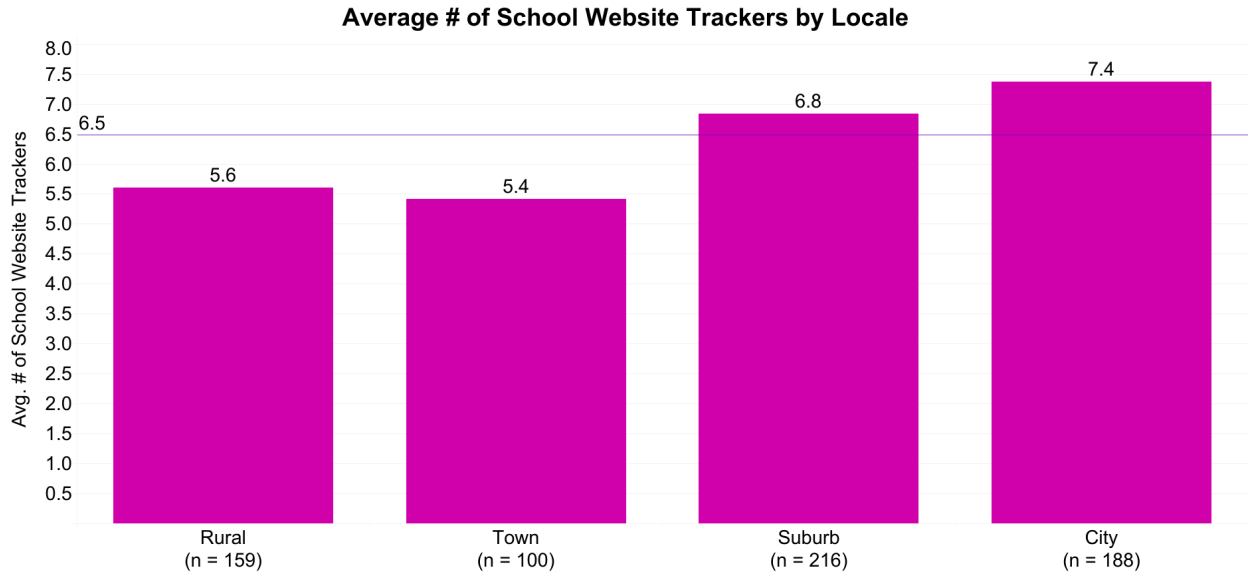


Figure 7.1.3

Looking at the average number of website trackers by the School Majority Race yields a disturbing finding that ***Black, Hispanic, Native Hawaiian/Pacific Islander and Two or More Races school websites had the highest average number of trackers*** (Figure 7.1.4). Schools with a Black majority race averaged 18.5% more trackers than the national average and 24.2% more trackers than schools with a

White majority race. Hispanic schools were in a similar situation averaging 13.9% more trackers than the national average, and 19.4% more trackers than schools with a White majority race.

Also of note, schools with an American Indian/Alaska Native majority race had a substantially lower average number of website trackers: 40% lower than the national average.

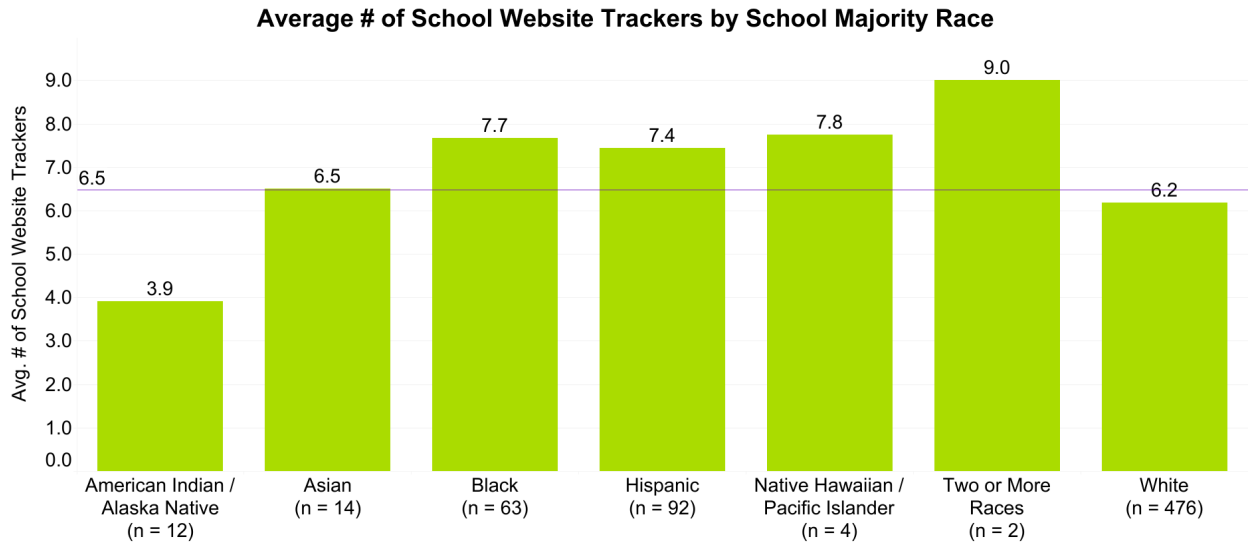


Figure 7.1.4

Ignoring the somewhat "long tail" of the school size distribution due to the small sample size (Figure 7.1.5), one can see a distinct upward trend in the average number of trackers. Smaller schools (with less than 500 students) had a 9.2% smaller average number of trackers than the national average.

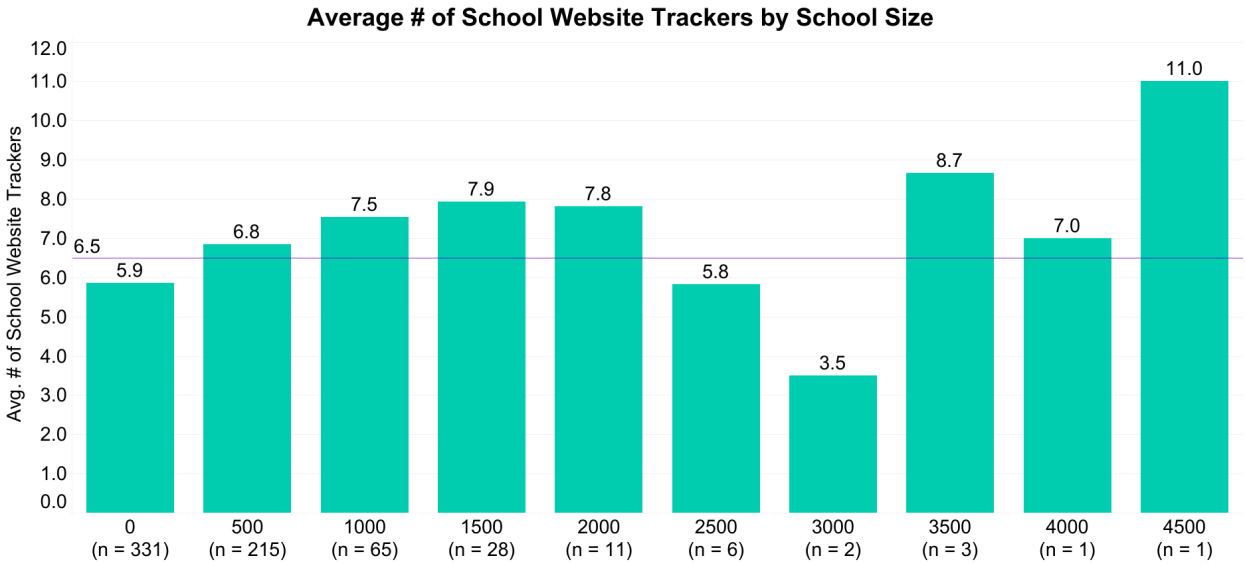


Figure 7.1.5

7.2 Red Trackers

School websites averaged 1.5 red trackers in the national sample (Figure 7.2.1).

Interestingly, Private school websites contained the greatest average number of red trackers per site, 1.9 compared to the national average of 1.5 (a 26.7% increase).

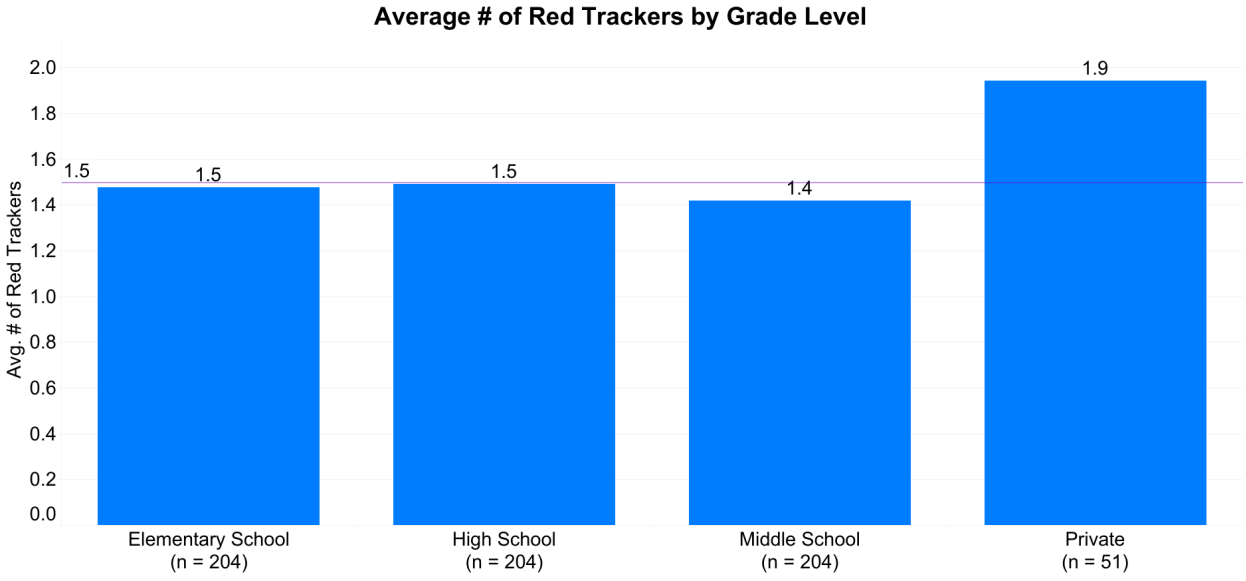


Figure 7.2.1

Figure 7.2.2 shows the average number of website red trackers by income. Schools with $100K or above annual income (20.4% of schools) are more likely to have red trackers in their websites than schools below $100K (79.6% of schools).

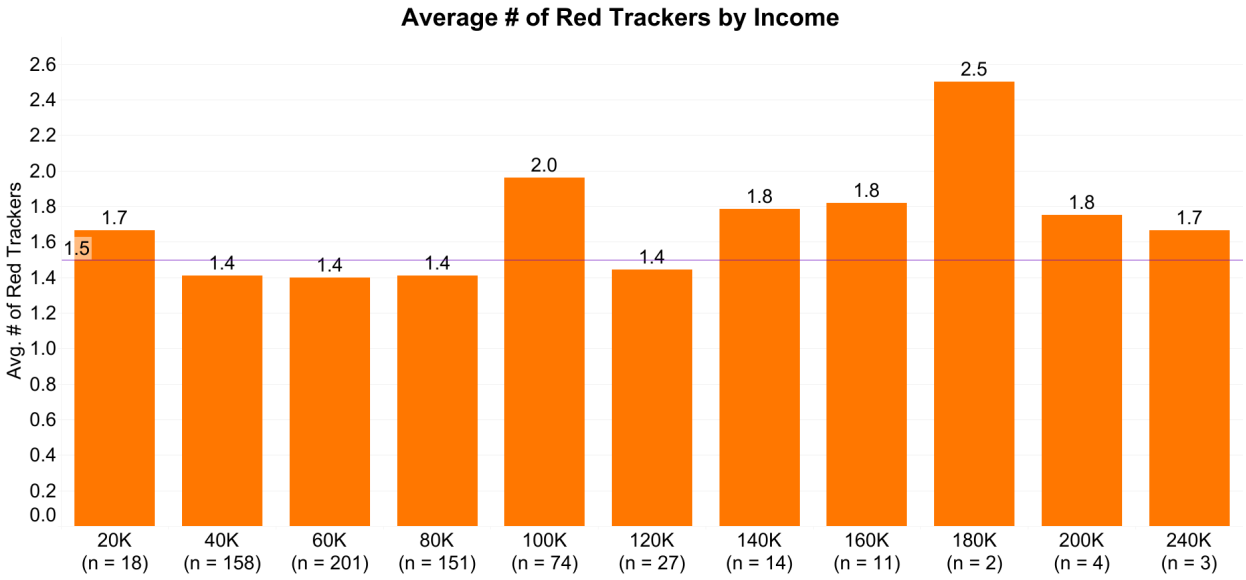


Figure 7.2.2

In the analysis of red website trackers by locale (Figure 7.2.3), schools in Cities averaged the highest at 1.8 red website trackers, 20% higher than the 1.5 average.

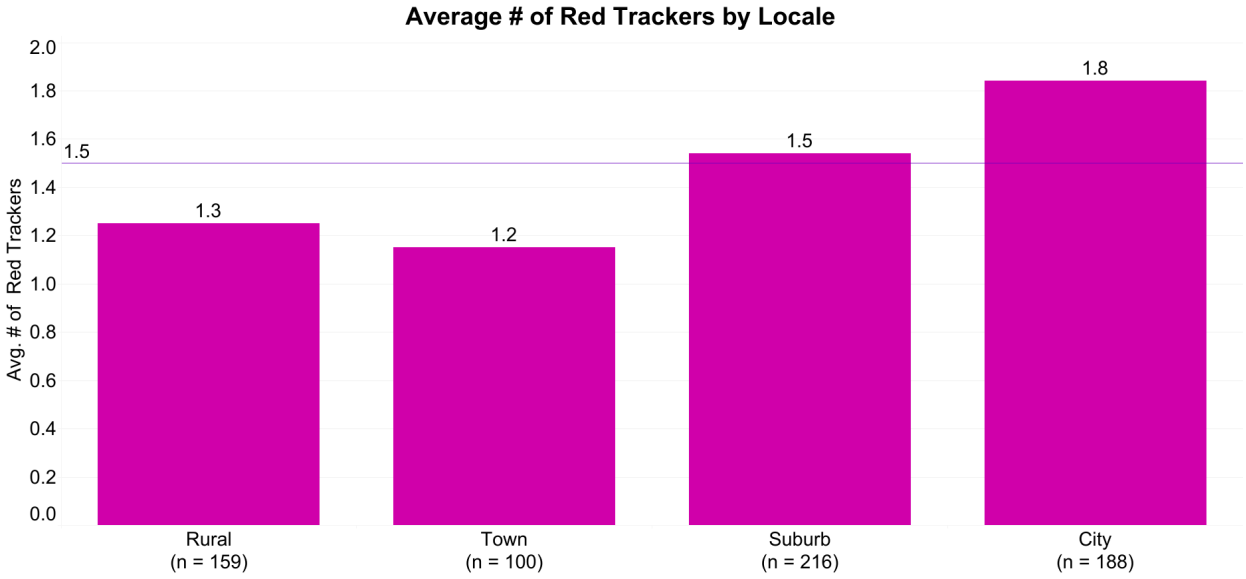


Figure 7.2.3

There are no significant trends in the average number of red trackers by School Majority Race (Figure 7.2.4), apart from the two Two or More Races schools as discussed in section 4.1.4.1.

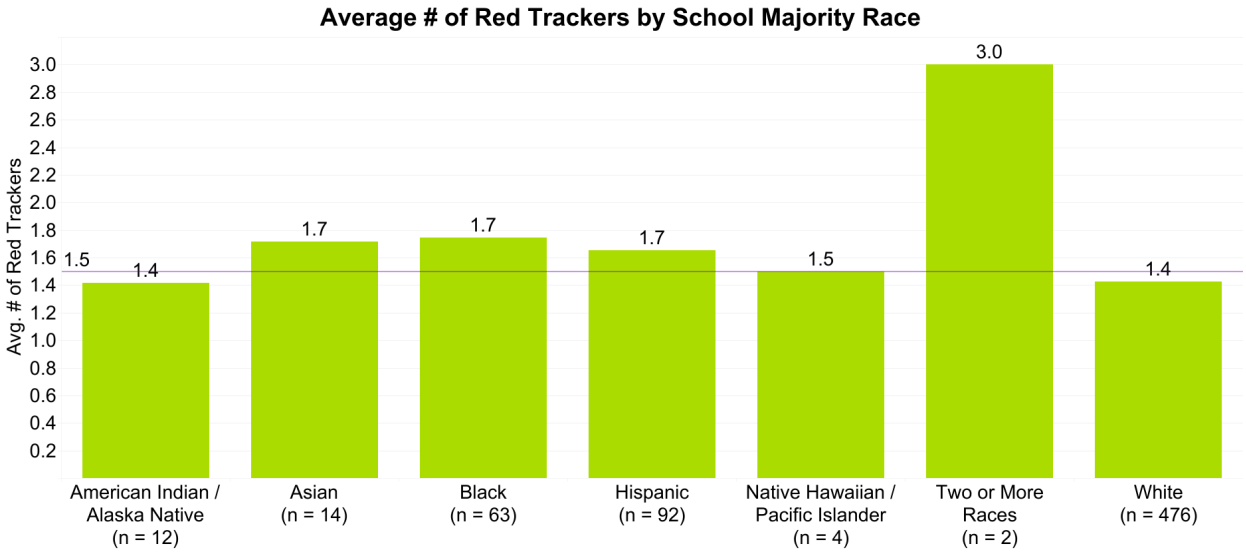


Figure 7.2.4

There is a slight upward trend in the average number of red trackers in school websites by School Size (Figure 7.2.5), especially if the "long tail" starting at 2500 students is ignored.

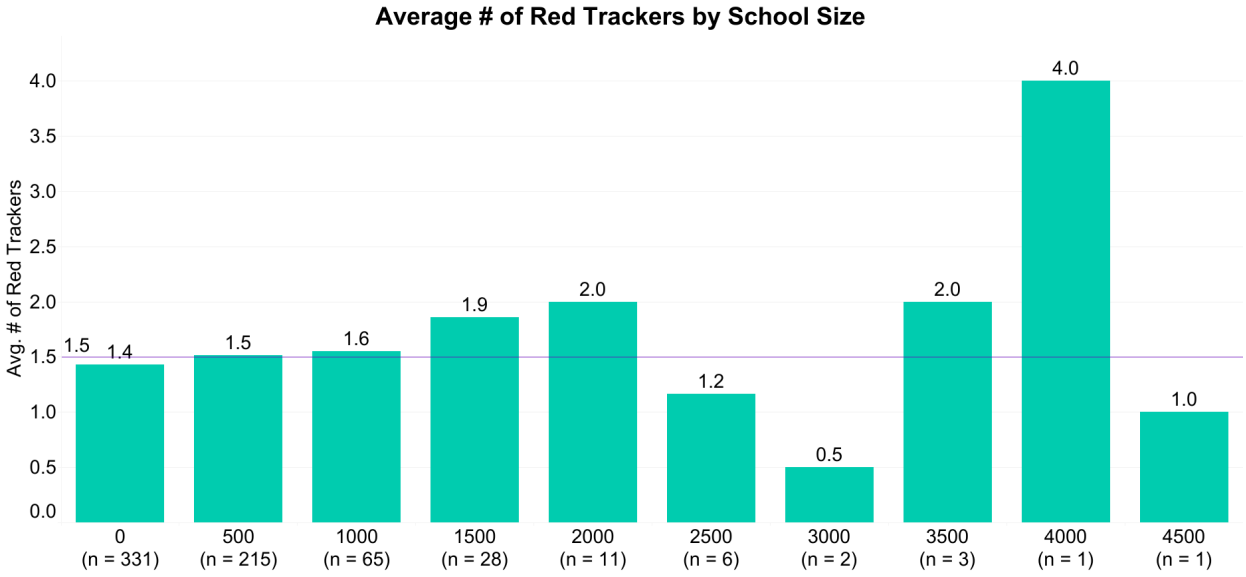


Figure 7.2.5

7.3 Website Ads

20.3% of schools in the national sample had digital ads (Figure 7.3.1). This is too much advertising surveillance for children. As can be seen from Figure 7.3.1, Private school websites had the lowest percentage at 11.8% (41.9% lower than the national percentage), and High Schools had the highest percentage at 23.0% (13.3% higher

than the national percentage). Elementary schools had the lowest percentage of digital ads of all public schools at 18.6% (8.4% lower than the national percentage).

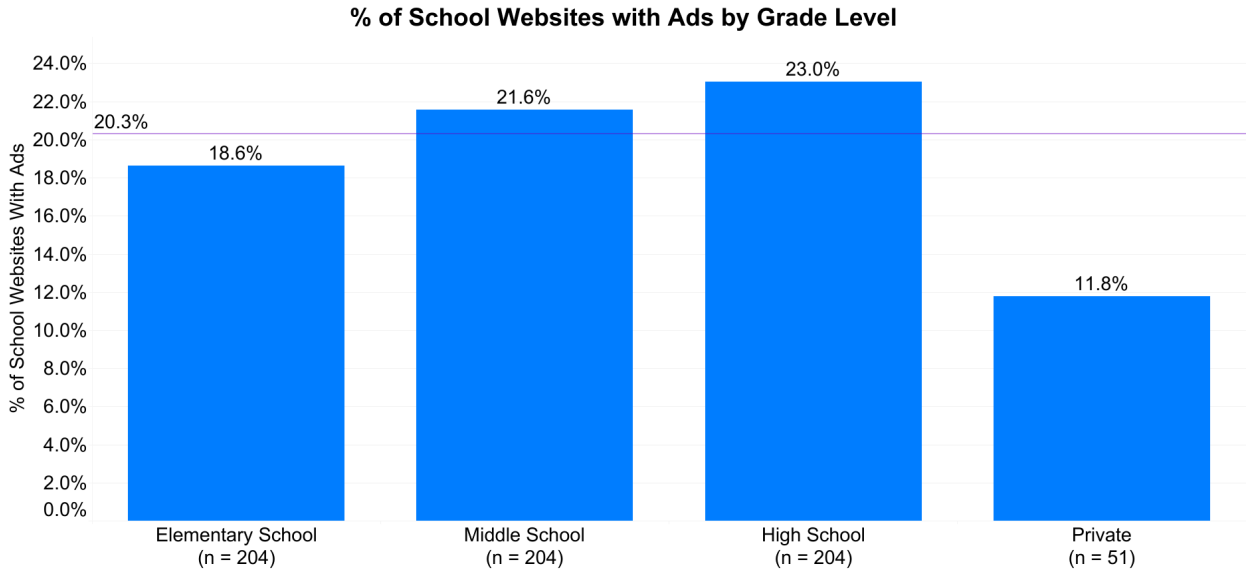


Figure 7.3.1

There is no observable trend in the distribution of percentage of websites with ads by Income (Figure 7.3.2).

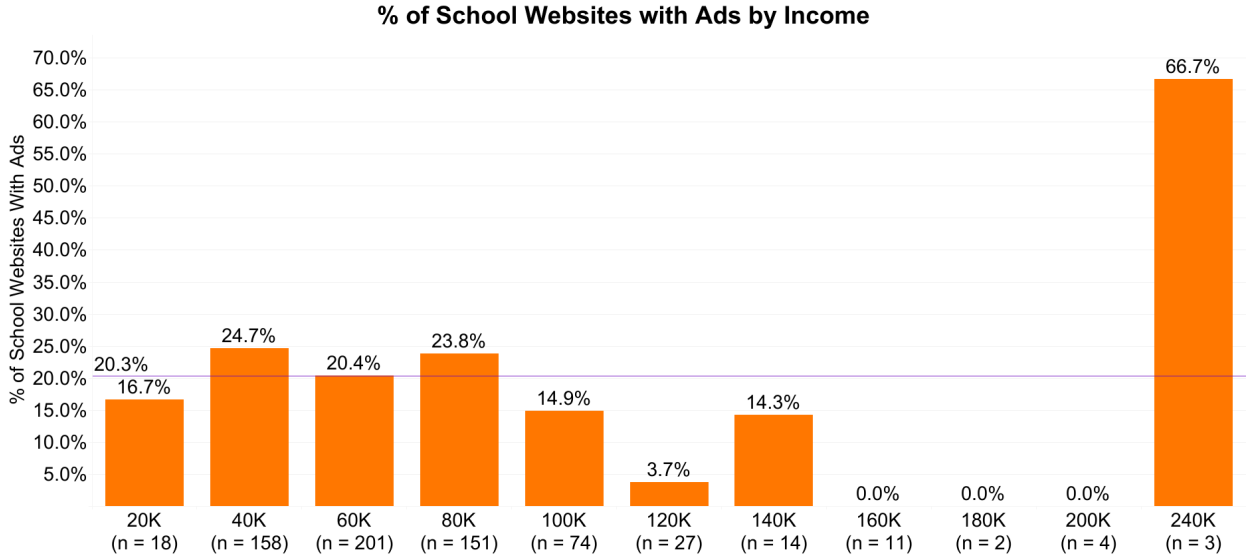


Figure 7.3.2

As with previous metrics by Locale, City school websites were most likely to contain ads at 25.0% (Figure 7.3.3), 23.2% higher than the national percentage. ***Town school websites were least likely to contain ads at 12.0% (40.9% lower than the national***

percentage). Thus, students in City and Suburban schools were nearly twice as likely as Town schools to encounter ads on school websites.

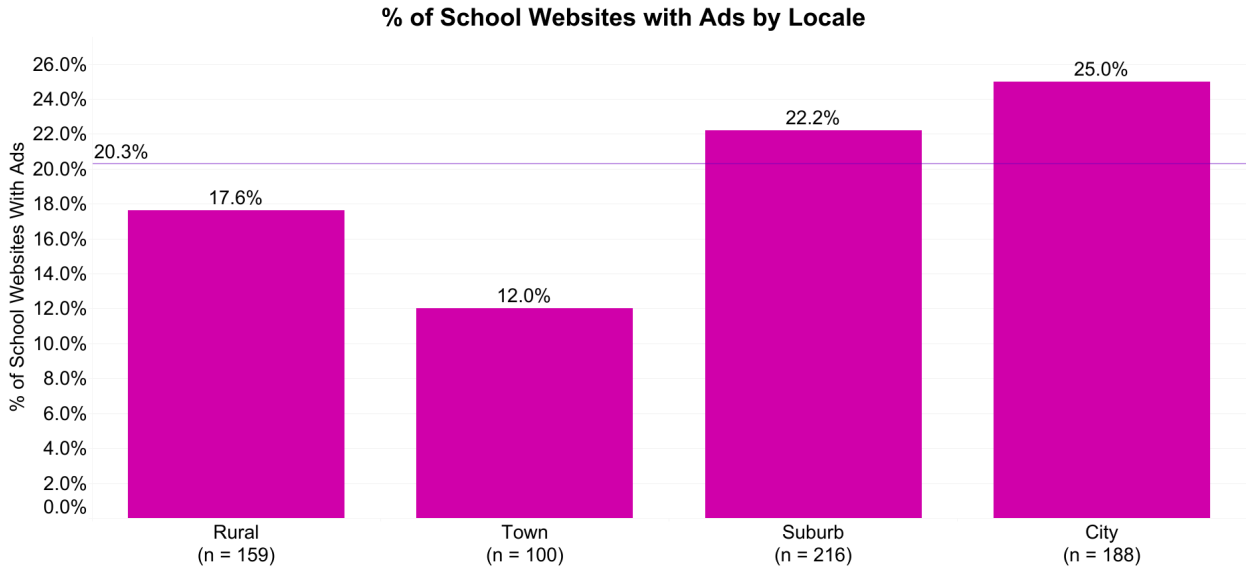


Figure 7.3.3

Perhaps the most disturbing finding in this report is that a third of schools with Black majority race had ads on their websites, 64% higher than the national average and 76.2% higher than schools with White majority race. (Figure 7.3.4)

There is a funding difference between white and non-white schools[17] which may contribute to the need to monetize school websites. Advertising on public school websites bears deeper investigation since they are funded with tax dollars. No parent likely wants to fund advertising surveillance of their children through school websites, especially parents of non-white students, who are subject to greater surveillance than white students[18].

[17] "White Students Get More K-12 Funding Than Students of Color: Report", Lauren Camera, February 26, 2019, U.S. News and World Report. https://www.usnews.com/news/education-news/articles/2019-02-26/white-students-get-more-k-12-funding-than-students-of-color-report

[18] "The Hidden Costs of High-Tech Surveillance in Schools", Priyam Madhukar, October 17, 2019, Brennan Center for Justice, https://www.brennancenter.org/our-work/analysis-opinion/hidden-costs-high-tech-surveillance-schools

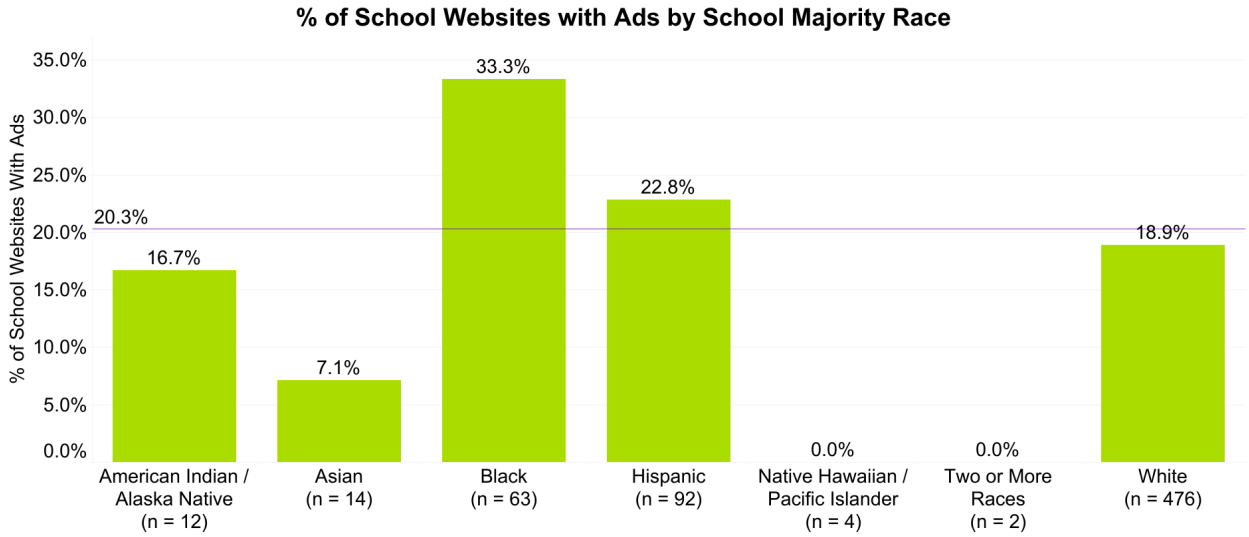


Figure 7.3.4

The distribution of percentage of school websites with ads by school size is multimodal and doesn't present any obvious patterns (Figure 7.3.5).

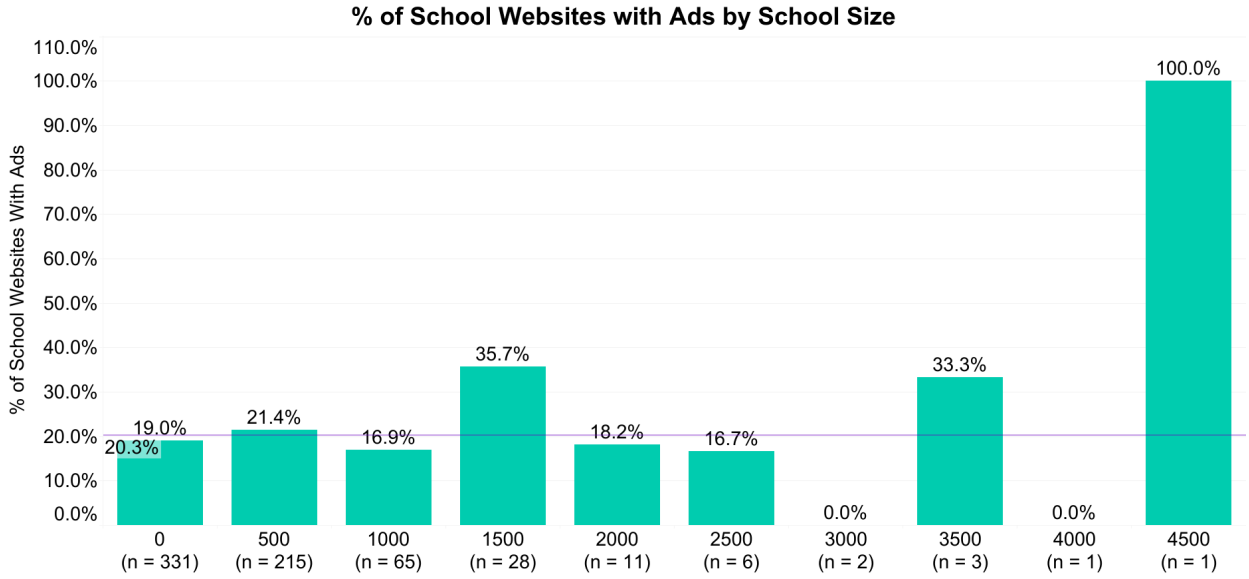


Figure 7.3.5

8 School Technology Practices

School Technology Practices were initially studied in ISL's second findings report.[19]

ISL studied four school practices related to technology:

1. Providing technology notice,
2. Obtaining consent for technology usage,
3. Performing systemic vetting of technology used by students, and
4. Providing individual devices to students.

8.1 Technology Notice

44.8% of schools in the US provide technology notice to students (Figure 8.1.1). Elementary Schools (52.5%) more frequently provided technology notice than High Schools (39.2), and Private Schools only provided technology notice information on 9.8% of the studied schools. Private schools may be providing technology notice but using private communication methods.

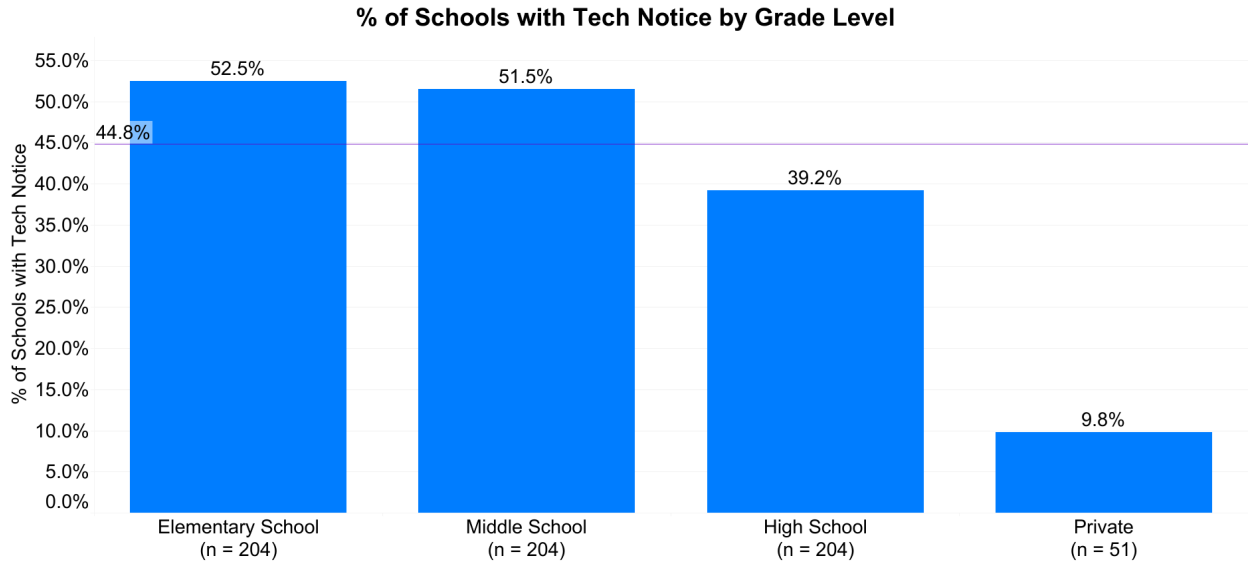


Figure 8.1.1

There is a clear upward trend for higher income level schools to be more likely to provide technology notice to students (Figure 8.1.2). The lowest income level segment

[19] "2022 K-12 EdTech Benchmark Findings Report 2: School Technology Practices & 3rd Party Certifications Analysis", Internet Safety Labs, June 27, 2024, https://internetsafetylabs.org/wp-content/uploads/2023/06/2022-K12-Edtech-Safety-Benchmark-Findings-Report-2.pdf

($20K-$39K) was the least likely to provide notice at 27.8% (38.0% lower than the national average).

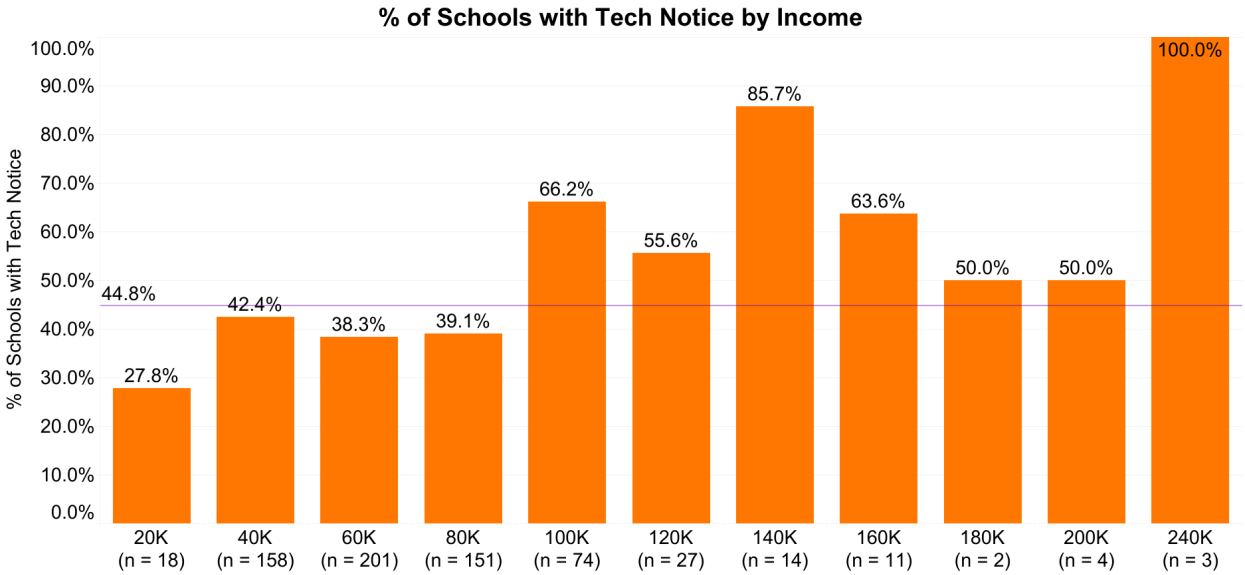


Figure 8.1.2

Suburban schools are most likely to provide technology notice at 56.0% of schools (Figure 8.1.3). Schools in Towns were least likely to provide technology notice at 35.0% of schools.

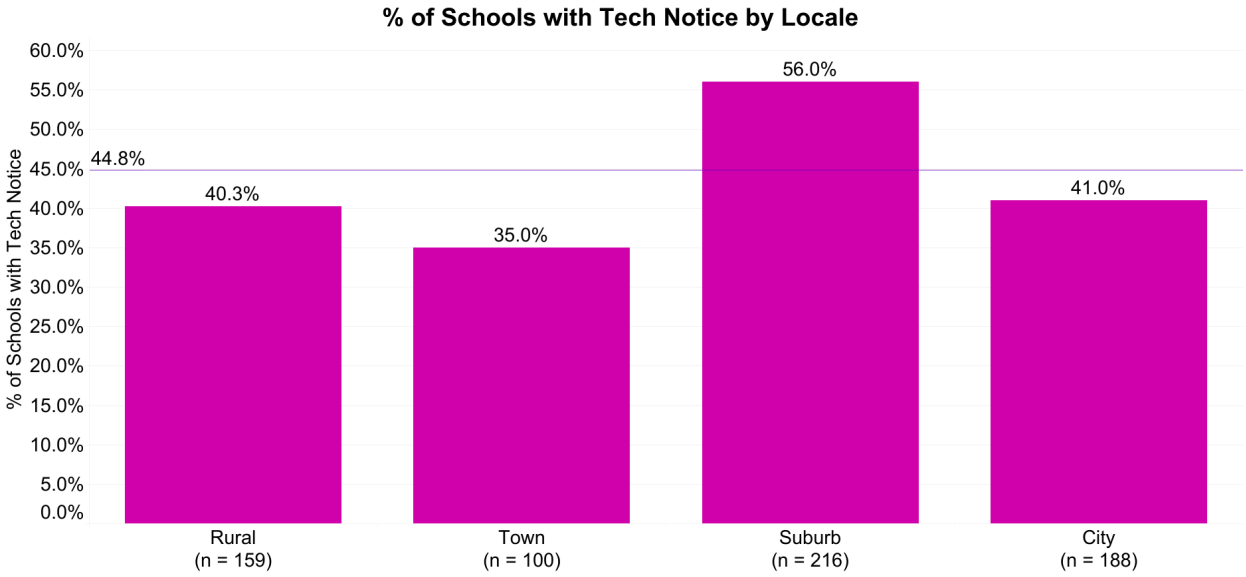


Figure 8.1.3

Ignoring the Two or More Race schools due to small sample size, Hispanic Majority Race Schools were most likely to provide a technology notice at 53.3% of studied schools (Figure 8.1.4). American Indian/Alaska Native schools were least likely to provide a notice at 16.7% of schools (62.7% lower than the national percentage).

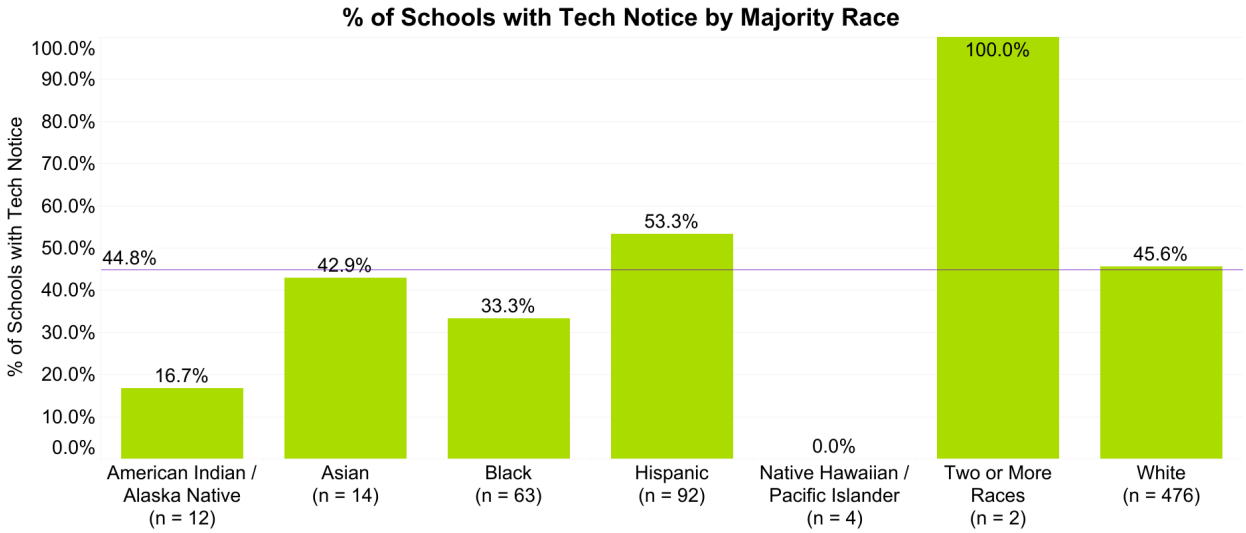


Figure 8.1.4

Figure 8.1.5 shows a fairly strong upward trend for larger schools being more likely to provide technology notice than smaller schools, with the exception of the six schools in the 2500-2999 students segment.

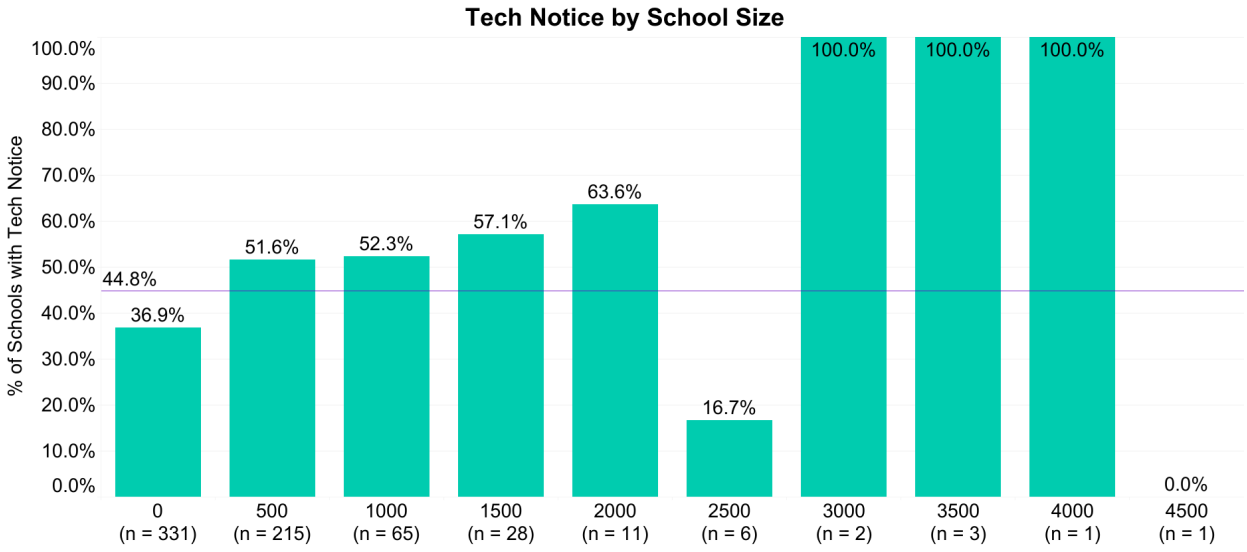


Figure 8.1.5

8.2 Technology Consent

Only 14.0% of schools in the national sample offered parents and students some form of opting in or consenting to using technology, so it appears to be an infrequent practice in the US. This is likely because schools are allowed to consent on behalf of students for technology use by both FERPA and COPPA. As noted in the ISL's second findings report, schools may be over-applying this ability for off-the-shelf

technologies. This is another item that should be clarified in the 2024 COPPA revised rules.

Private schools had the lowest percentage at 9.8% (Figure 8.2.1) but were the most opaque in general regarding technology practices, so the finding should not be taken as definitive. For public schools, middle schools were most likely to offer opportunities to consent to technology use at 15.2% (8.6% more likely than the national sample).

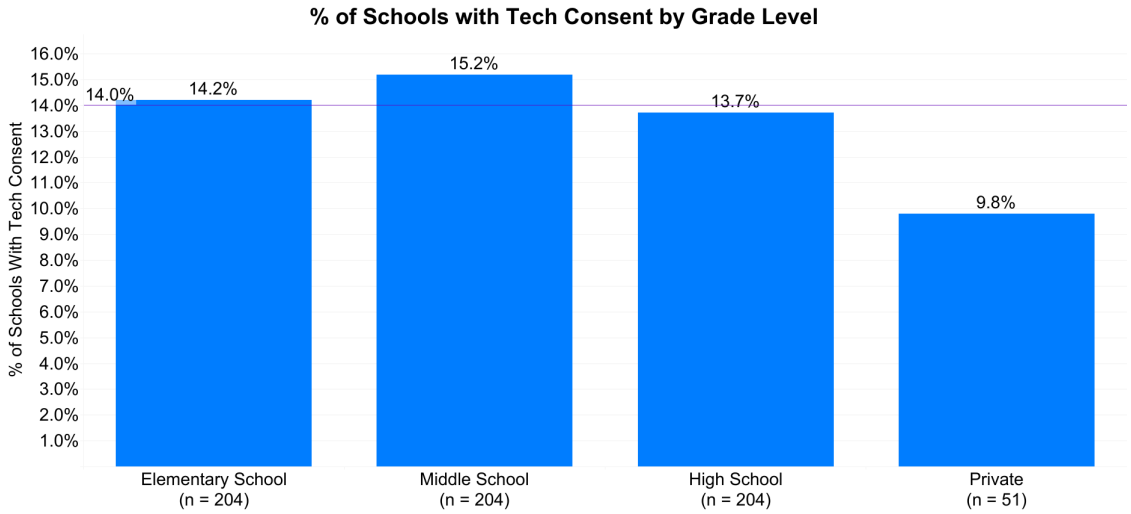


Figure 8.2.1

There does not appear to be any pattern between technology consent and income level (Figure 8.2.2). The $80K segment was least likely to offer consent at 18.3%, and the $160K segment was most likely at 40.0%.

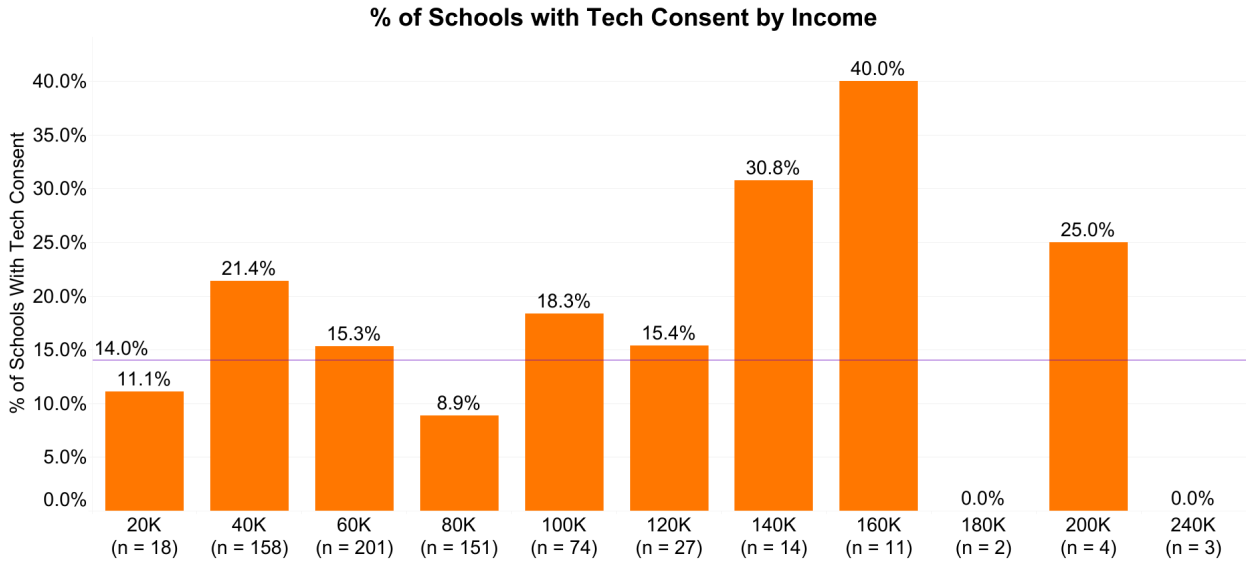


Figure 8.2.2

City schools were somewhat more likely than the national sample to provide technology consent at 16.0% (14.3% higher than the national sample) (Figure 8.2.3). Towns were the least likely to provide opportunity to consent at 9.0% of schools.

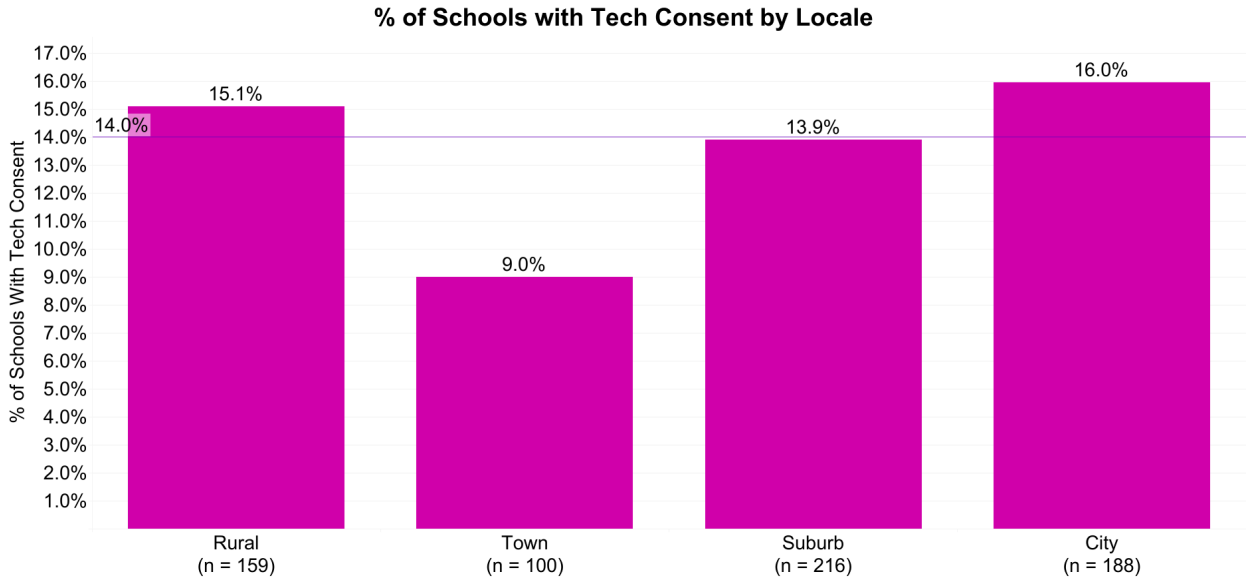


Figure 8.2.3

In contrast to the safety findings, Black and Hispanic Majority Race schools were more likely than the national sample to provide opportunity to consent to technology use at 15.9% and 16.3%, respectively (Figure 8.2.4). The two indigenous segments and Two or More Races tied for least likely to provide opportunity to consent to tech usage, all at 0.0%.

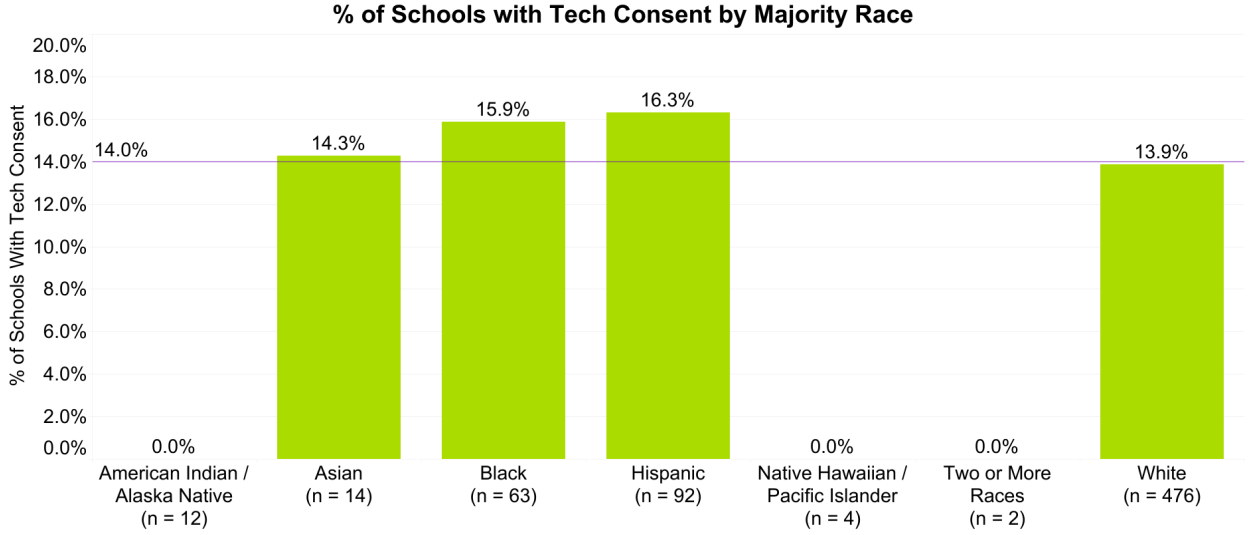


Figure 8.2.4

The larger the school population, the greater the likelihood that the school will provide an opportunity for technology consent (Figure 8.2.5). This may be due to the need for stronger IT organization and support for larger schools.

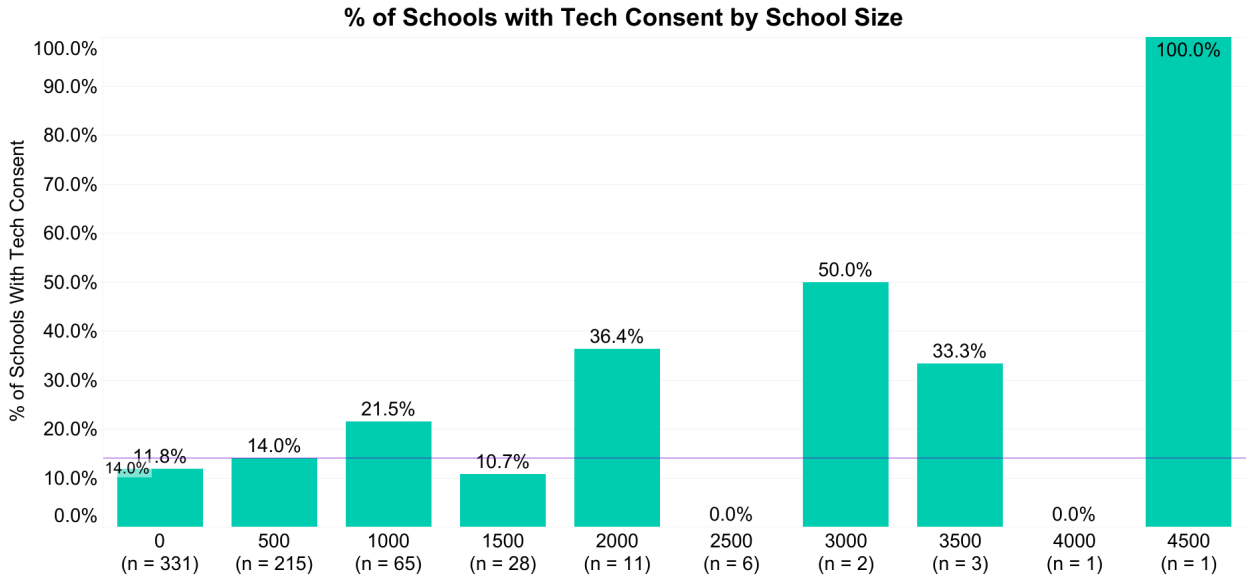


Figure 8.2.5

8.3 Technology Vetting

Only 28.7% of the national sample of schools were observed as systemically vetting technology for students. From Figure 8.3.1, there's a clear downward trend in public schools, with 34.3% of Elementary Schools performing tech vetting, but only 26.0% of High Schools. The data from Private Schools is unreliable due to the paucity of information on private school websites.

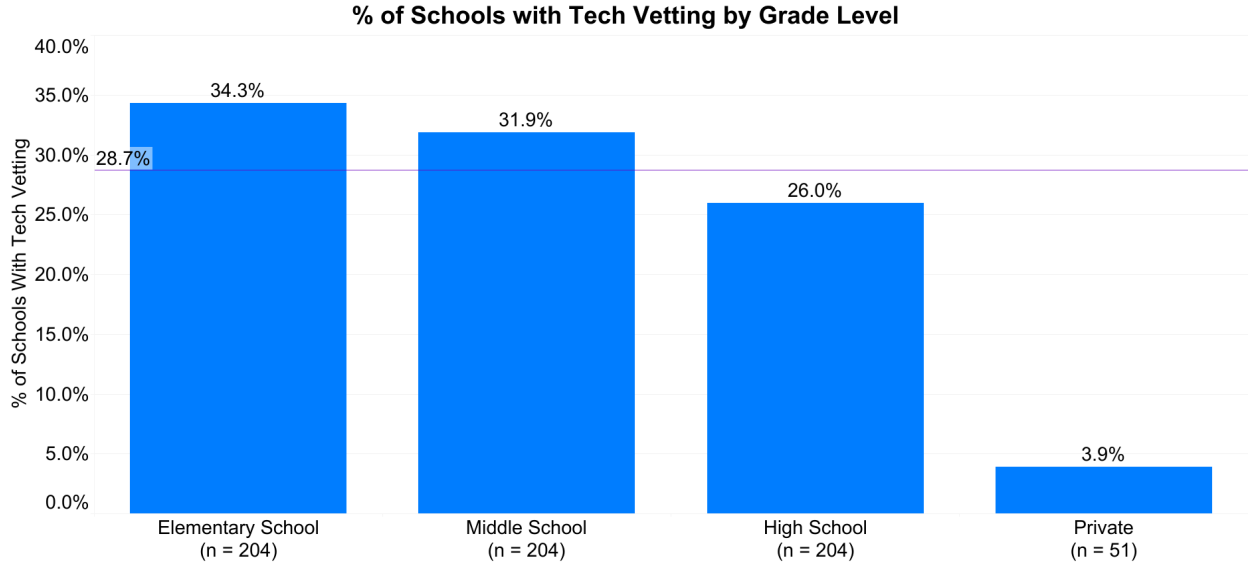


Figure 8.3.1

Schools with higher annual incomes are more likely to have tech vetting (Figure 8.3.2). Schools with annual incomes below $100K are less likely to have tech vetting. ***None of the schools in the lowest ($20K-$39K) range were found to be performing systemic tech vetting.***

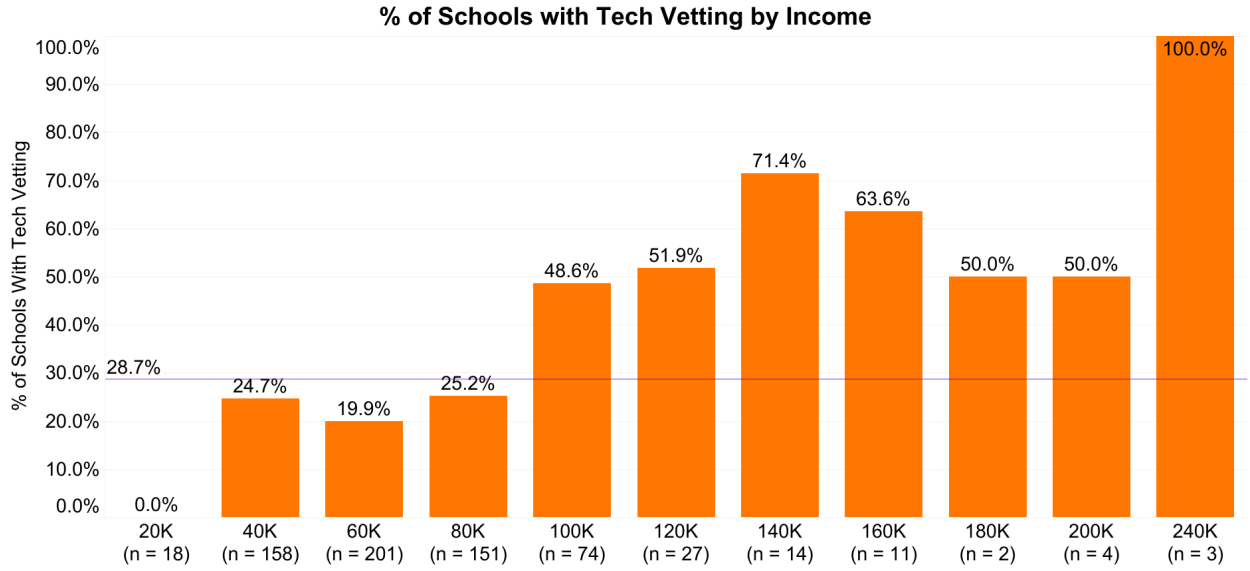


Figure 8.3.2

Suburban schools were most likely to perform tech vetting at 38.4% (33.8% higher than the national percentage, Figure 8.3.3). Schools in Towns were least likely to perform tech vetting at 16.0% (44.3% lower than the national percentage).

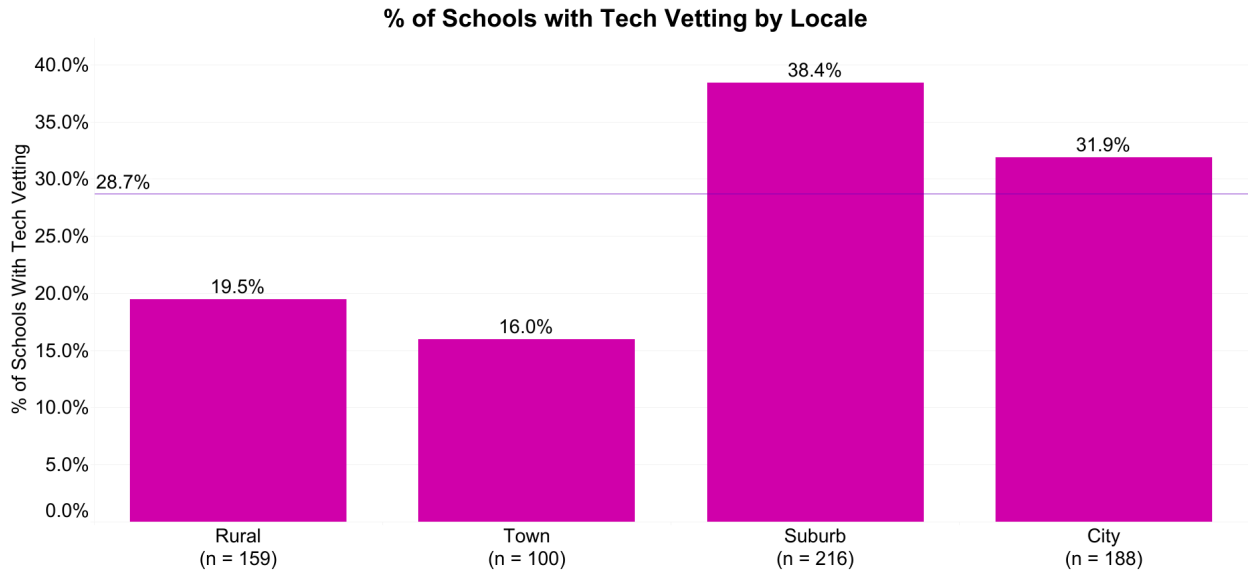


Figure 8.3.3

Once again ignoring the Two or More Race schools, Hispanic Majority Race schools were the most likely to perform technology vetting at 31.5% (Figure 8.3.4). American

Indian/Alaska Native Majority Race Schools were least likely to perform technology vetting at 8.3% (a whopping 71.1% lower than the national percentage).

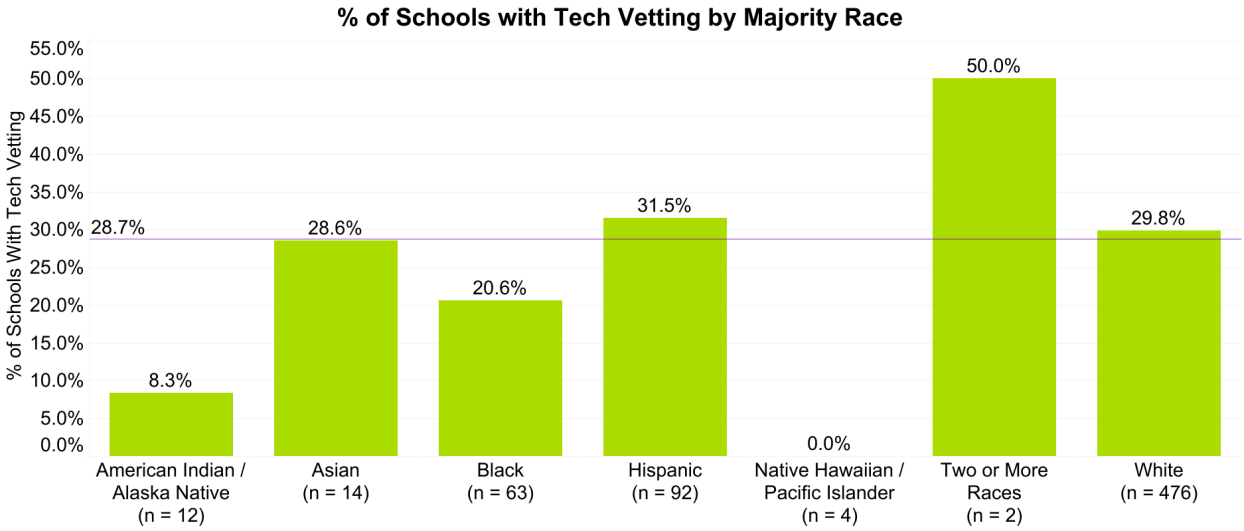


Figure 8.3.4

For schools under 2500 students, there is a clear upward trend of increasing percentage of schools performing systemic technology vetting (Figure 8.3.5). This makes sense, as larger schools need to be more regimented in general than smaller schools.

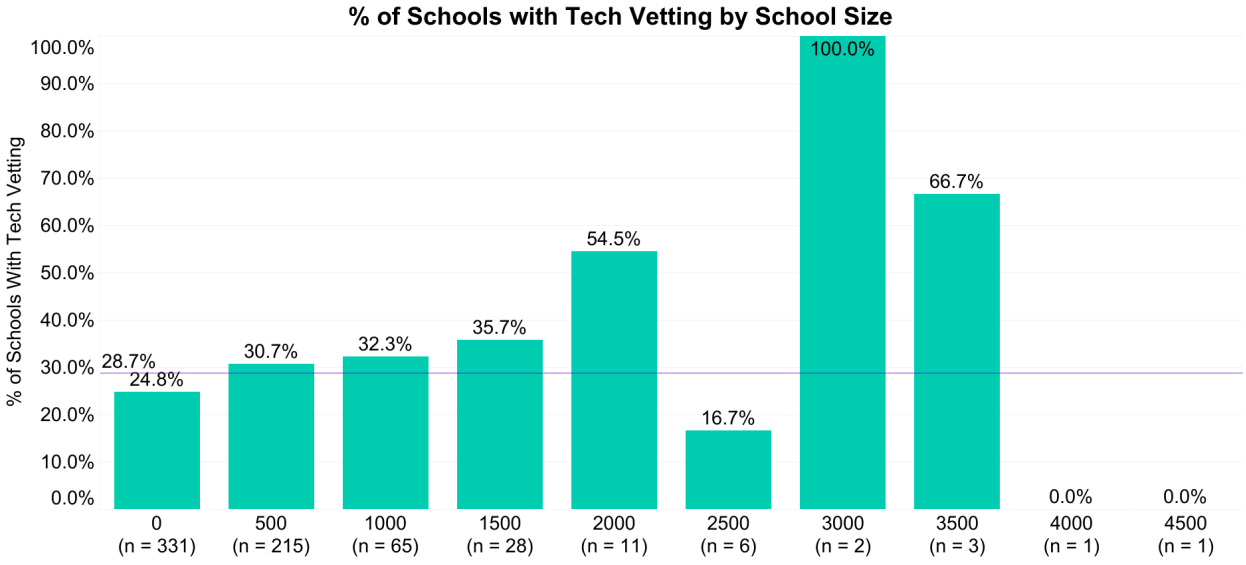


Figure 8.3.5

8.3.1 Relationship Between Technology Vetting and App Safety

ISL was interested to understand the impact of school technology vetting. The following charts present the mean and range of key safety metrics for schools that perform vetting vs. schools that do not.

8.3.1.1 Impact of Tech Vetting on Very High Risk Apps

As can be seen in Figure 8.3.6 below, tech vetting has a minimal impact on the percentage of Very High Risk apps in the school's portfolio. Schools with tech vetting average 69.8% Very High Risk apps, and schools without vetting average 68.5% Very High Risk apps (a negligible 0.4% improvement).

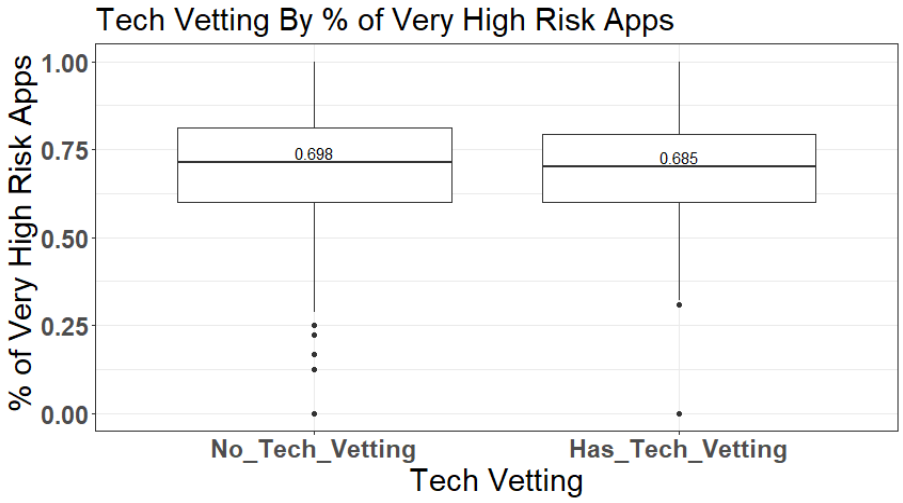


Figure 8.3.6

8.3.1.2 Impact of Tech Vetting on Apps with Ads

Figure 8.3.7 compares the effect of vetting on the percentage of apps in the school's portfolio containing ads. On average, schools with no vetting performed worse (8.3% of apps) than schools with vetting (6.6% of apps). Tech vetting resulted in a 20.5% improvement/reduction in apps with ads.

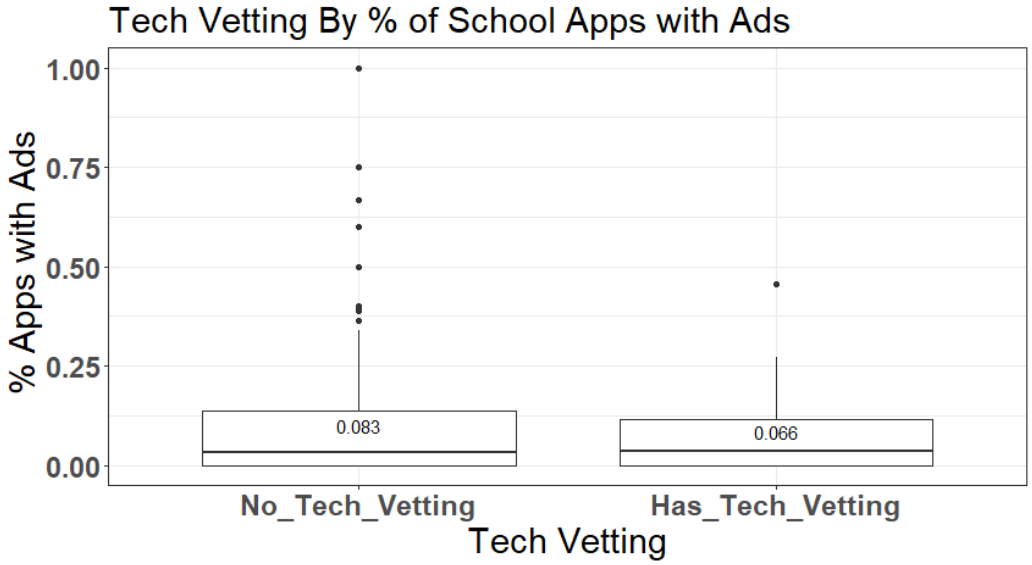


Figure 8.3.7

8.3.1.3 Impact of Tech Vetting on Apps with Behavioral Ads

Figure 8.3.8 shows the average percentage of apps containing behavioral ads in schools without tech vetting (3.1%) versus schools with tech vetting (1.6%). Tech vetting resulted in a 48.4% reduction in the likelihood of behavioral ads in apps.

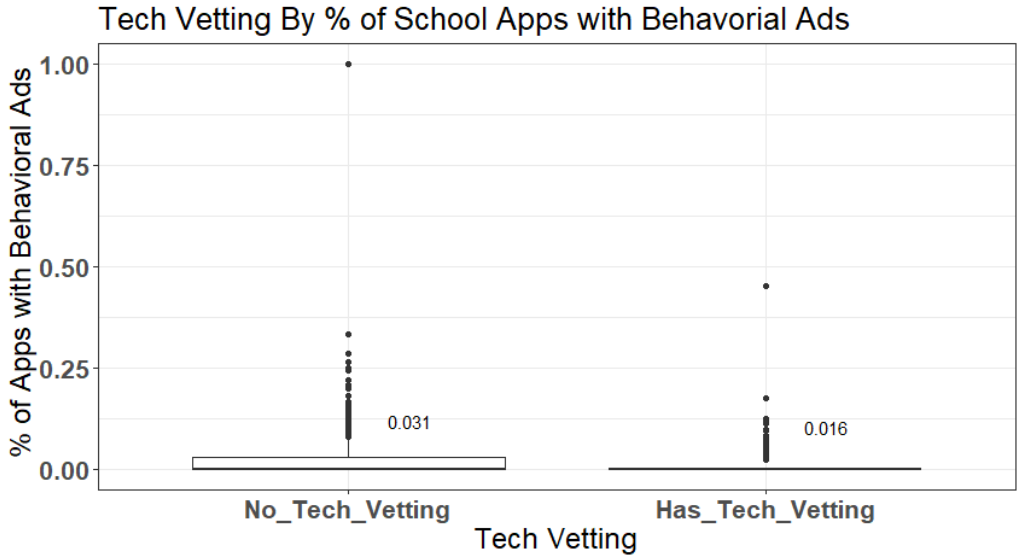


Figure 8.3.8

8.4 LEA-provided Individual Devices

LEA-provided devices were first studied in ISL's first findings report[20]. 78.0% of schools in the national sample provide students with individual devices. There is an upward trend among public schools by grade level, with elementary schools being the lowest at 70.1% (Figure 8.4.1).

70.6% of Private Schools provide devices to students, but the number could be closer to 100%, once again noting the scarcity of published information on Private School websites.

[20] pp. 31-32, https://internetsafetylabs.org/wp-content/uploads/2022/12/2022-k12-edtech-safety-benchmark-national-findings-part-1.pdf

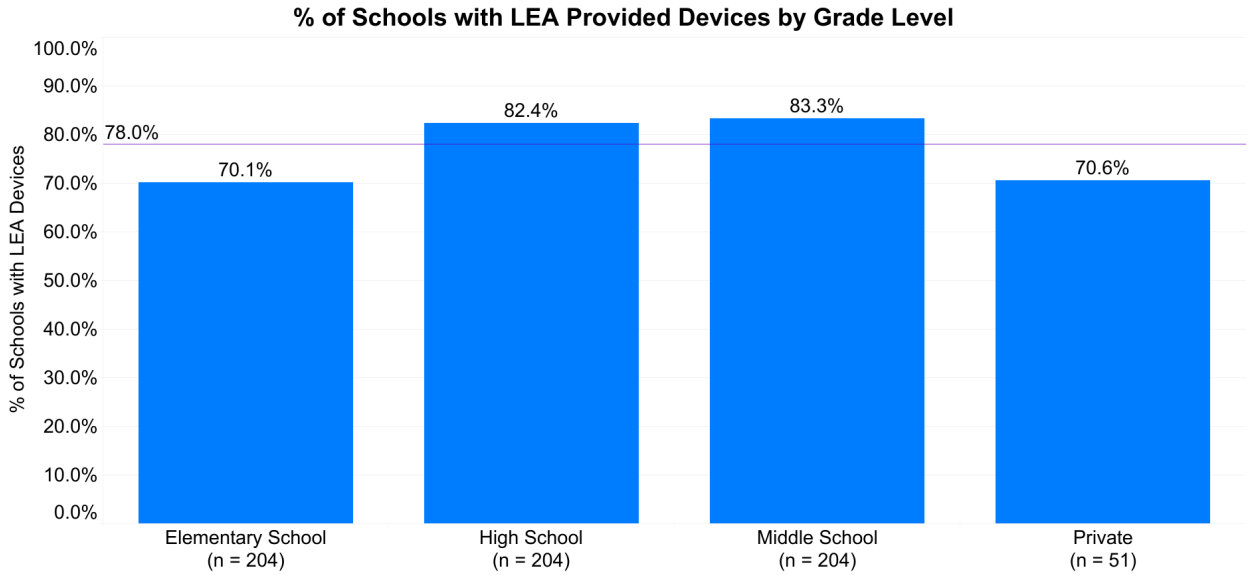


Figure 8.4.1

The distribution of schools that provide devices by Income is multimodal (Figure 8.4.2). The lowest level income segment ($20K-$39K) was least likely to provide devices at only 50% of the schools in the sample, a 35.9% decrease from the national average.

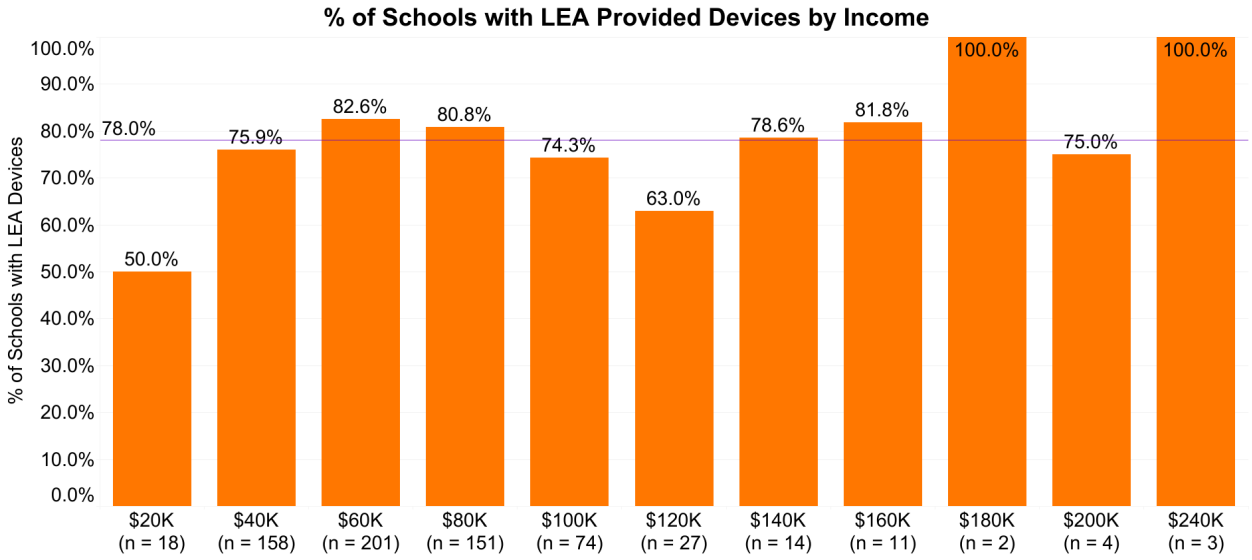


Figure 8.4.2

City Schools were 8.3% more likely than the national sample to provide computing devices to students at 85.1% of City Schools (Figure 8.4.3). Rural schools were the least likely at 73.6% (5.6% lower than the national sample).

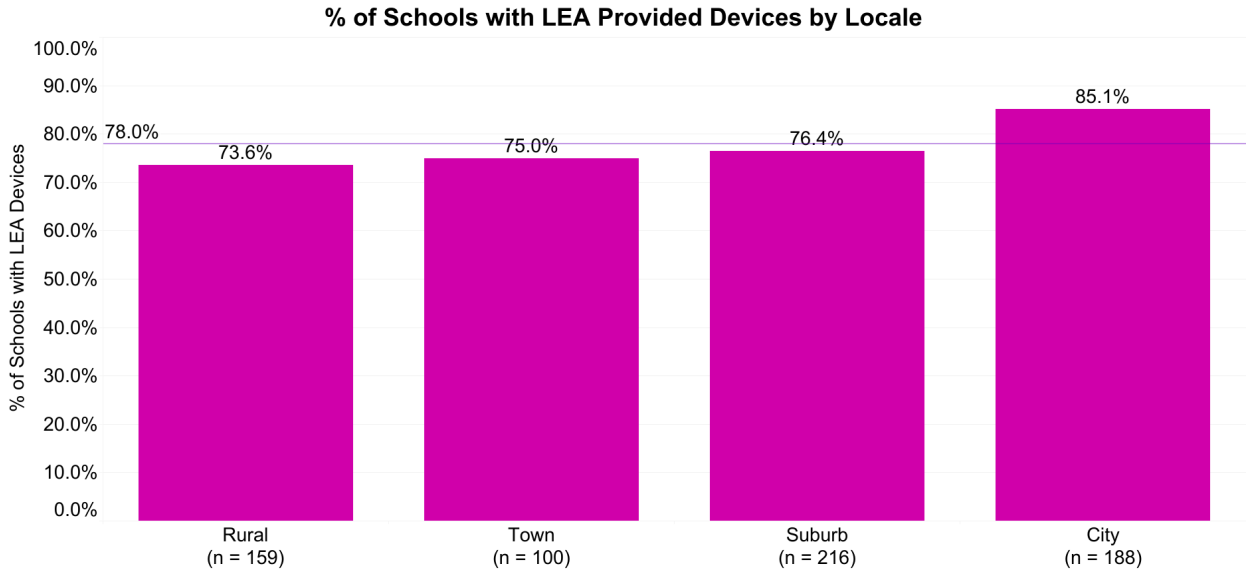


Figure 8.4.3

American Indian/Alaska Native Majority Race schools were least likely to provide computing devices to students at only 41.7% of the schools (46.5% lower than the national percentage) (Figure 8.4.4). Black Majority Race Schools were most likely to provide devices at 87.0% of schools (11.5% higher than the national percentage).

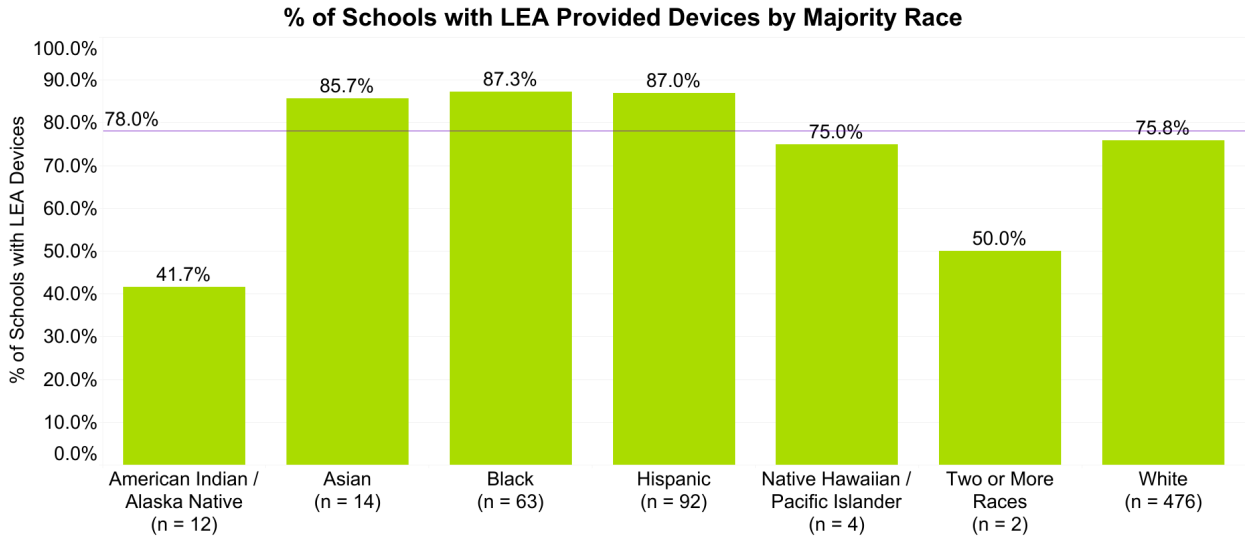


Figure 8.4.4

Schools with higher numbers of students were more likely to provide computing devices to students (Figure 8.4.5). The smallest schools (less than 500 students) were 8.2% less likely than the national sample to provide devices at 71.6% of schools. 100% of schools with 2000 or more students provided individual computing devices.

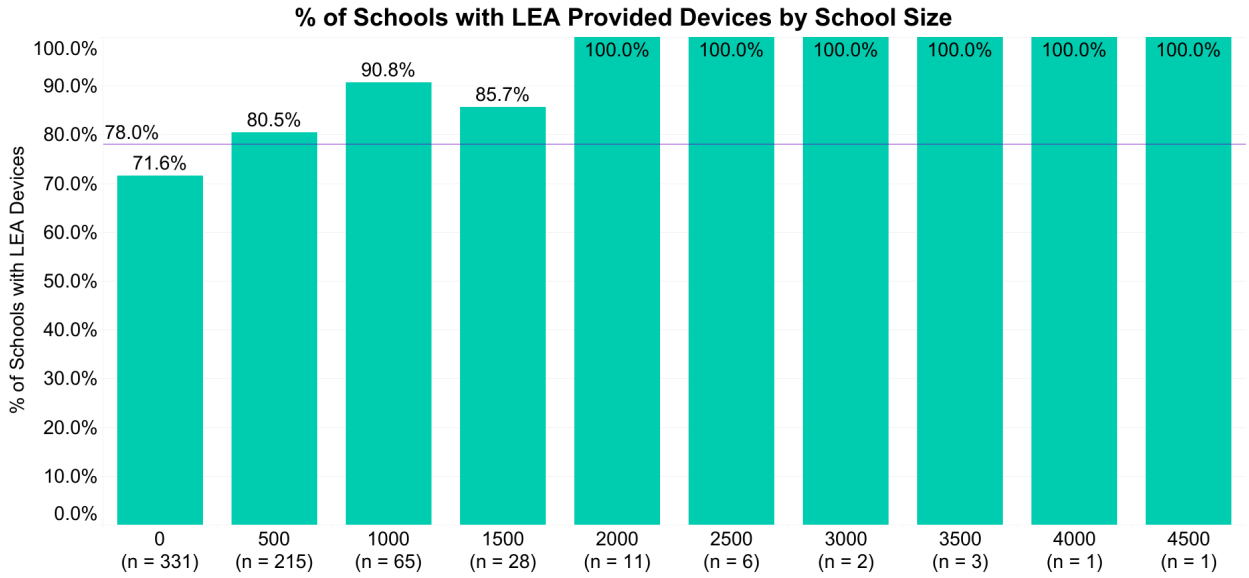


Figure 8.4.5

9 Recommendations

9.1 App Safety

1. All schools should have at least one full-time software procurement specialist empowered and responsible for developing and deploying technology vetting and oversight practices, as well as vendor management. Note that there is a significant difference between hardware procurement and device/asset management versus software procurement. These functions require differing skillsets and are often found in different people.
2. School software managers must develop processes and means to audit technology once a year. There are currently few tools to help analyze what's happening "under the hood" of technology, but there are some tools that school software procurement/management professionals can utilize:
    a. Examine website risks using EFF's Privacy Badger, or The Markup's Blacklight tools.
    b. Examine app risks using ISL's AppMicroscope.org and other resources.
3. Building on results from findings report 2[21] on the safety impact of certifications and promises, schools should:
    a. Have Data Privacy Agreements for all technologies the school is providing for students. (i.e. for school licensed technology, *not* off the shelf technology)
        i. SDPC has templates already in use by other schools around the country. Software vendors are already familiar with these templates and should be straightforward to deploy.
    b. Select apps that have been COPPA Safe Harbor certified.
    c. In particular, hold Community Engagement apps under much greater scrutiny, as they are the "leakiest" apps in the benchmark. These apps are the utility apps that often bear the school's name (e.g. https://appmicroscope.org/app/1597/).
4. Schools should be mindful that they have no actual control over the behavior of off the shelf technologies and should take pains to scrutinize these services carefully before recommending or requiring them for student use.

[21] Pg. 49, https://internetsafetylabs.org/wp-content/uploads/2023/06/2022-K12-Edtech-Safety-Benchmark-Findings-Report-2.pdf

    a. Schools are also reminded that even for licensed technologies, the vendor makes unilateral decisions regarding software behavior, and always has access to all of the data.
5. Less is more but too little may be leaving students behind. A good rule of thumb for schools is recommend/require no more technology than the school can reasonably manage and actively monitor on an ongoing basis.
    a. ISL encourages **elementary schools** in particular to reduce the amount of technology being foist upon these youngest of students.
6. American Indian / Alaska Native and low-income schools are at the greatest risk for experiencing a "digital divide" when it comes to EdTech. From this research, these schools seem most in need of additional support.
7. Additional research is required to determine the longer-term safety impacts of students with the lowest exposure to technologies in schools. Safety benefits may come with preparedness costs when compared to students in schools with higher use of technology.

9.2 Website Safety

1. Remove digital advertising on school websites—especially on public school websites, as these are funded by taxpayers. It's likely that schools are not substantially benefiting from advertising revenues given the relatively low website traffic. Moreover, any advertising on school websites also generates money for the ad platforms[22].
    a. Given the data leakage in real-time bidding (RTB), ISL suggests that all schools remove digital ads on school websites.
2. Remove advertising trackers on school websites. It's not enough to remove ads on the website, due to the presence of third-party trackers and scripts running on websites. Similar to the above recommendation—and for the same reasons—ISL recommends that schools remove ad related trackers from school websites.
    a. Schools and districts should minimize third-party resources on school websites.

[22] https://www.newsmediaalliance.org/google-ad-revenue-op-ed-70-percent/

9.3 School Technology Practices

1. **Technology Notice**: while there is no mandate requiring schools to publish comprehensive technology lists, ISL urges schools to do so as a matter of practice. This should be a by-product of effective vendor/software management practices. Students and parents have a right and need to know what technology is required or recommended by the school. It's also helpful for schools to maintain accurate lists.

    a. Another best practice is to make clear which technologies are required versus which are not.

    b. As the FTC proposes new COPPA rulemaking in early 2024, ISL hopes they provide new guidance to schools regarding tech notice. It should not be considered a burden to schools to keep reasonable track of the technologies being used; it's a basic practice for any professional organization. If there's so much technology in use that it **is** burdensome, the school should consider pruning its technology.

2. **Consent**: There's no mandate requiring schools to obtain consent for technologies and the level of adoption across schools in the study reflects that. Sensitive to the challenges schools face in managing students, ISL has no strong opinion on whether schools should allow opt-in consent more frequently. In an ideal world, students and parents should have a choice, and ISL encourages schools to endeavor to allow this where possible. ISL recognizes that for some core technologies like Student Information Systems, opting out creates difficulties for teachers and school administrators.
    a. Improving technology selection and oversight and publishing accurate lists of recommended/required technology are more urgent safety concerns.
    b. See also Findings Report 2[23] for examples of overuse of schools consenting on behalf of students. Schools should pay close attention to FTC requirements around the types of services for which school consent is allowed[24].

[23] https://internetsafetylabs.org/wp-content/uploads/2023/06/2022-K12-Edtech-Safety-Benchmark-Findings-Report-2.pdf

[24] https://www.ftc.gov/business-guidance/resources/complying-coppa-frequently-asked-questions#N.%20COPPA%20AND%20SCHOOLS

3. **Tech Vetting**: schools should be performing systemic vetting of all technologies recommended and required for students; as even imperfect measures appear to have a positive impact in reducing student exposure to behavioral advertising
    a. This begs another question, however: why are there *any* apps with behavioral ads in school portfolios? How many of these apps with behavioral ads are apps for children and therefore governed under COPPA? **The ISL benchmark findings underscore the challenges faced by enforcers of privacy regulation.**
    b. From this and earlier reports, ISL observes that current technology vetting is not as effective as it could be. This could be due to the immaturity of this kind of vetting, in combination with a lack of dedicated resources. It's clear that greater investment in training and development is crucial for school professionals.
4. **Devices**: Most schools in the US are providing devices. While this research did not cover the safety risks of using school provided devices, surveillance is the greatest concern. Given the seeming immaturity of software vendor management by schools, ISL is concerned that providing devices preloaded with lots of technology may be risky for student privacy and safety. In particular, website surveillance tools like Securly, which is used by many schools in the US, require additional research.

10 Appendix A Sampling Methodology Details

10.1 Sampling Procedure

To observe K12 Edtech app usage, 663 total school websites were reviewed by researchers. This sample size was chosen through a power analysis accepting 5% type 1 error and 1.5% margin of error. This suggests a sample size of 680, but in the interest of balanced representation across grades, we settled on 663. In selecting these schools, we made the following four design choices:

A. Representative and balanced sampling across the 50 states.
B. Representative and balanced sampling within the following school types: elementary school, middle school, high school.
C. Sample schools proportionally to the locale distribution of schools in the corresponding state.
D. Only sample schools with over 200 students. Note that we chose this threshold in order to maximize the impact of this benchmark, but this threshold may reduce the number of rural schools sampled.

To satisfy points A and D, we stratified our sample by the 50 states to account for possible differences in technology usage across the 50 states. To ensure balanced representation, we filtered schools with less than 200 students and then sampled 13 schools within each state. For these 13 schools, we decided to sample 12 public schools and 1 private school, 8% of our sample size, approximating the actual private school enrollment of about 9% of all students in the US[25] . Due to lack of technology use disclosure on private schools' websites, we chose to not strive for representation within our sample of private schools as our results would be biased and likely incorrect. Therefore, the next two steps only apply to public schools.

To satisfy point B, these 50 subpopulations (stratum) were then stratified by school type to account for differences in technology usage across grade levels. Again, to ensure balanced representation for public schools we sampled 4 schools of each type.

To satisfy point C, we chose to perform a weighted random sample within each {*state, school type*} subpopulation. These weights were assigned based on the proportion of schools within the corresponding subpopulation that were in each locale. For example, if a subpopulation had 4 schools (2 rural, 1 suburban, 1 city) a higher weight would be assigned to the rural schools.

[25] https://nces.ed.gov/programs/projections/projections2021/tables/table_01.asp

In layman terms, we split the population of all schools in the US to 150 sub-populations each corresponding to a particular {*state, school type*} combination. Within each of these 150 sub-populations 4 public schools were sampled where this sampling was weighted to represent the locale distribution of each respective subpopulation.

10.2 Sampling Procedure in Practice

Using the above sampling procedure, we used files exported from the National Center for Education Statistics(NCES) to characterize each population and subpopulation. NCES offers csv files containing every school within a particular state. Therefore, we had direct access to the full state subpopulations. Next, to form the school type subpopulations within these state files, each school was assigned to one or more school types based on their grade offerings. Schools were categorized using the following schema:

- Elementary Schools: NCES' *Low-Grade* designation is between PK and 6 and NCES' *High-Grade* designation is between 1 and 6.
- Middle Schools: NCES' *Low-Grade* designation is between PK and 8 and NCES' *High-Grade* designation is between 6 and 8.
- High Schools: NCES' *Low-Grade* designation is between PK and 12 and NCES' *High-Grade* designation is above 8.

This establishes the three subpopulations we want to sample from {*state*, elementary school}, {*state*, middle school} and {*state*, high school}. Next, within each of these subpopulations, we tally up the number of schools within each locale based on the NCES classifications and formulate the sampling weights which define the probability that each school would be selected using our random sample. Finally, the sampling was performed using a weighted random sample computer program forming a representative sample for all schools in the United States with over 200 students.

For example, for New York, we downloaded a dataset containing each school in the state of New York; this dataset is the population of all schools in the New York subpopulation. Then each school was categorized using the above schema and the weights were formulated.

10.2.1 App Selection

For each school in the sample, we utilized several methods to determine the technologies and apps in use by the school or school district, including:

- School or school district website manual discovery (looking for “Technology” information, for example).
- Site-search on the school or district website for key terms like “apps”.
- Searching AppFigures for the school name or school district name.

Note that we did not contact schools to confirm the technologies found in this way.

11 Appendix B Demographic Charts by Grade Level

11.1 Notes on demographic tables in Appendices B through F

The Key Findings tables in appendices B through F follow these conventions.

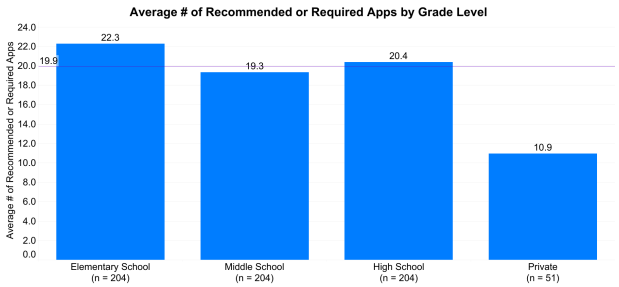
11.1.1 Color Coding Minimums & Maximums in the Key Findings Tables

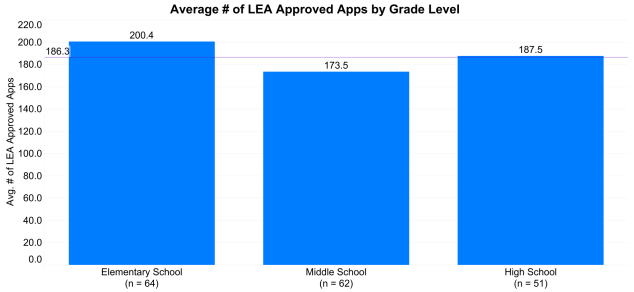
1. The following conventions are applied only to metrics with data sets where n is greater than three schools.
2. The following conventions are applied only to the Web Safety metrics for Private Schools. The App Safety and School Tech Practices were not included for private schools because they published the least amount of information of all schools. ISL is not confident that the data is truly reflective of private school behavior. Thus, it's excluded from the min/max color coding described in this section.
3. If the demographic segment had the best average number or percentage across all demographic categories, the cell is shaded green. Note that "best" is sometimes the highest and sometimes the lowest.
    a. Best maps to highest for School Technology Practices, else best maps to lowest.
    b. Worst maps to lowest for School Technology Practices, else worst maps to highest.
4. If the demographic segment had the worst average number or percentage across all demographic categories, the cell is shaded red.
5. If the demographic segment was the second or third best average number or percentage across all demographic categories, the cell is outlined in green.
6. If the demographic segment was the second or third worst average number or percentage across all demographic categories, the cell is outlined in red.

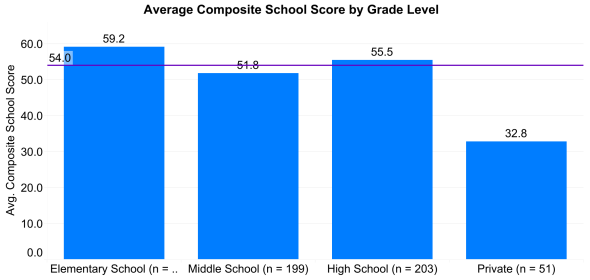
Table 11.1 Metrics by Grade Level

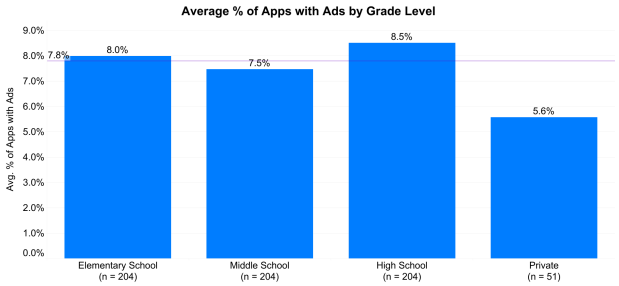
METRIC	National Average	Public Schools Average	Elementary	Middle	High	Private
APP SAFETY						
Avg # Rec/Req Apps	**19.9**	**20.7**	22.3	19.3	20.4	10.9
Avg # LEA Approved Apps	**186.3**	**187.3**	200.4	173.5	187.5	
Avg School Composite Score	**53.7**	**55.5**	59.2	51.8	55.5	32.8
Avg % Very High Risk Apps	**69.4%**	**69.3%**	68.0%	68.6%	71.1%	71.9%
Avg % Ads in Apps	**7.8%**	**8.0%**	8.0%	7.5%	8.5%	5.6%
Avg % Behavioral Ads in Apps	**2.7%**	**2.6%**	2.1%	2.5%	3.2%	3.3%
WEBSITE SAFETY						
Avg # Trackers in School Website	**6.5**	**6.6**	6.3	6.7	6.8	5.2
% School Websites with Trackers	**91.1%**	**91.0%**	89.2%	92.6%	91.2%	92.2%
Avg # Red Trackers in School Website	**1.5**	**1.5**	1.5	1.4	1.5	1.9
% School Websites with Red Trackers	**79.3%**	**79.0%**	78.9%	79.4%	78.9%	82.4%
% School Websites with Ads	**20.3%**	**21.1%**	18.6%	21.6%	23.0%	11.8%
SCHOOL TECHNOLOGY PRACTICES						
% Schools Providing Notice	**44.8%**	**47.8%**	52.5%	51.5%	39.2%	9.8%
% of Schools Allowing Consent	**14.0%**	**14.4%**	14.2%	15.2%	13.7%	9.8%
% of Schools Vetting Technology	**28.7%**	**30.1%**	34.4%	31.9%	26.0%	3.9%
% of LEAs Providing Devices	**77.8%**	**78.6%**	70.1%	83.3%	82.4%	70.6%
	(n = 663)	**(n = 612)**	(n = 204)	(n = 204)	(n = 204)	(n = 51)

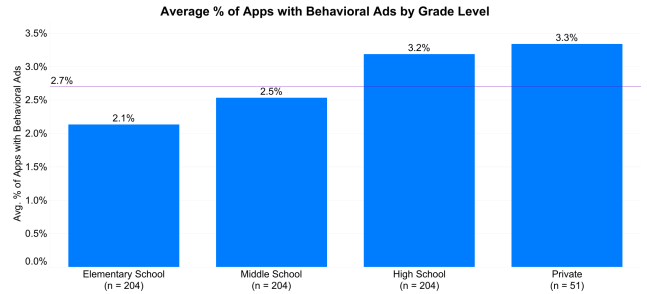
11.2 App Safety by Grade Level



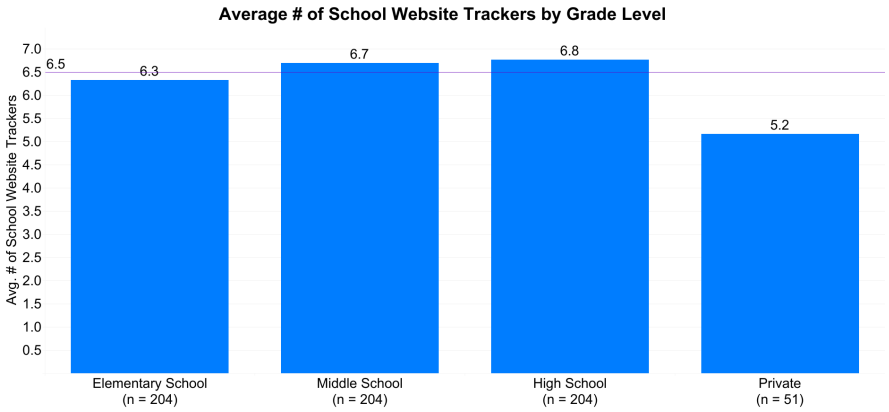


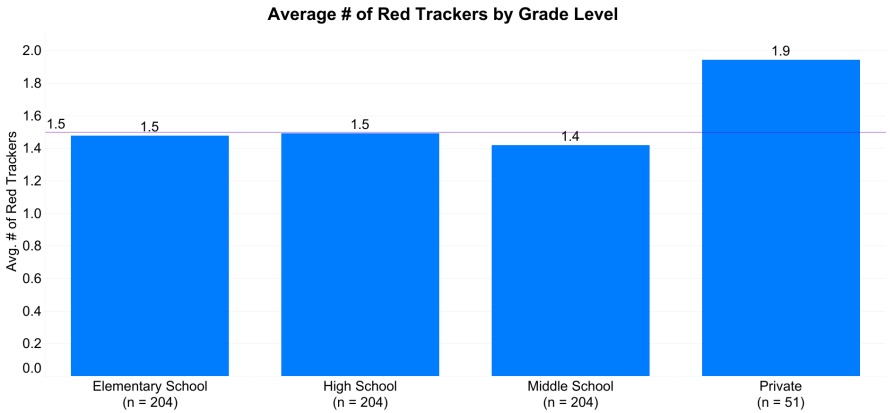


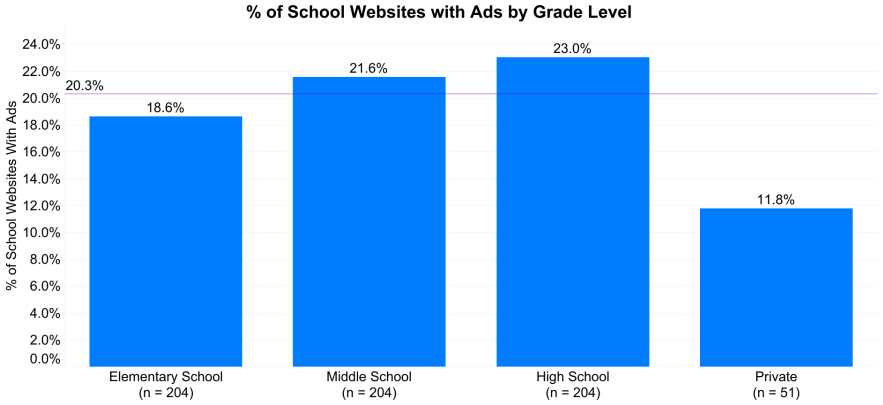




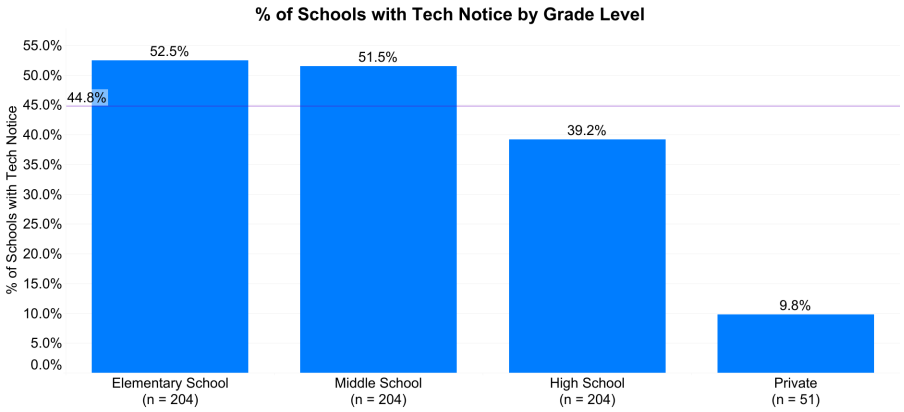
11.3 Website Behavior by Grade Level

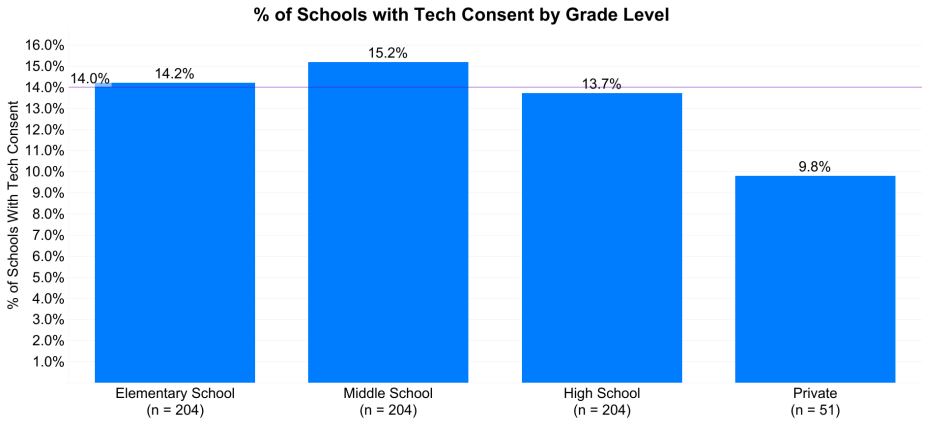


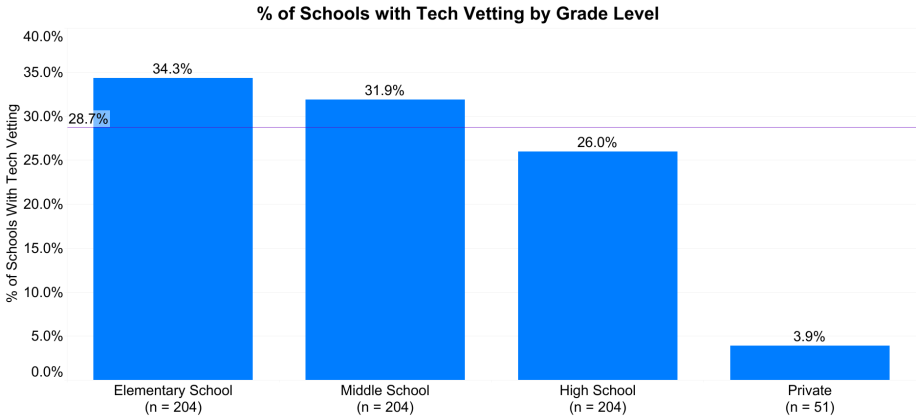


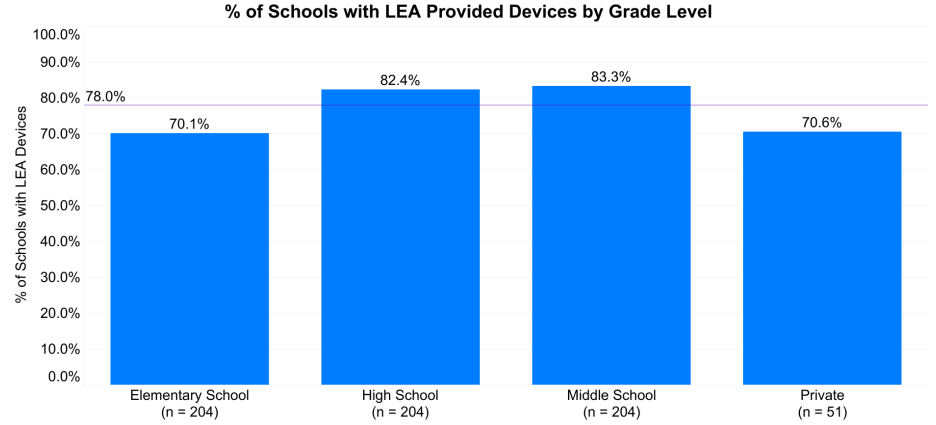


11.4 School Technology Practices by Grade Level







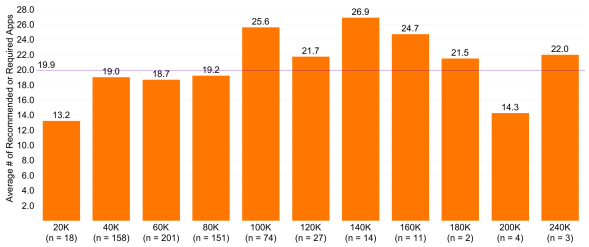


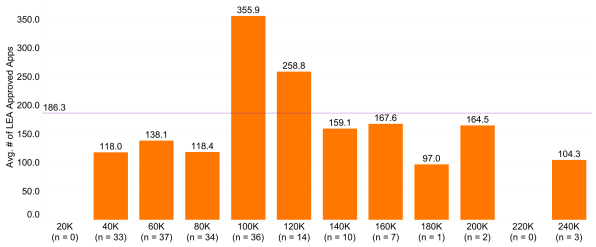
12 Appendix C Demographic Charts by Income

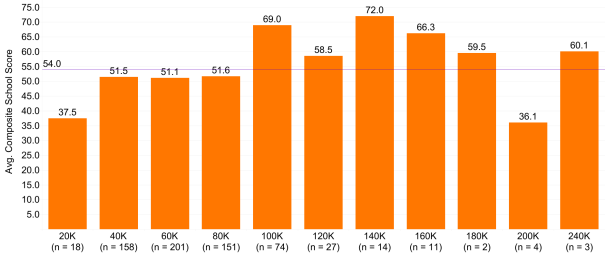
Table 12.1 Metrics by Income

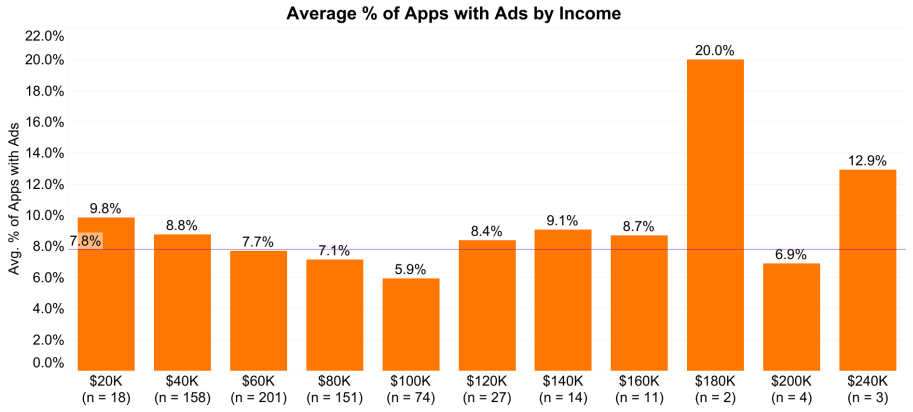
METRIC	National Average	$20K-$39K	$40K-$79K	$80K-$119K	$120K & Above
APP SAFETY					
Avg # Rec/Req Apps	**19.9**	13.2	18.8	21.3	23.0
Avg # LEA Approved Apps	**186.3**	N/A	128.6	240.6	192.6
Avg School Composite Score	**53.7**	37.5	51.3	57.4	61.7
Avg % Very High Risk Apps	**69.4%**	69.8%	69.7%	69.3%	68.4%
Avg % Ads in Apps	**7.8%**	9.8%	8.2%	6.7%	9.1%
Avg % Behavioral Ads in Apps	**2.7%**	9.5%	2.4%	2.6%	2.7%
WEBSITE SAFETY					
Avg # Trackers in School Website	**6.5**	5.6	6.4	6.6	7.2
% School Websites with Trackers	**91.1%**	88.9%	91.1%	91.1%	91.8%
Avg # Red Trackers in School Website	**1.5**	1.7	1.4	1.6	1.7
% School Websites with Red Trackers	**79.3%**	83.3%	77.7%	80.6%	83.6%
% School Websites with Ads	**20.3%**	16.7%	22.3%	20.9%	8.2%
SCHOOL TECHNOLOGY PRACTICES					
% Schools Providing Notice	**44.8%**	27.8%	40.1%	48.0%	65.6%
% of Schools Allowing Consent	**14.0%**	11.1%	15.6%	9.8%	21.3%
% of Schools Vetting Technology	**28.7%**	0.0%	22.0%	32.9%	60.6%
% of LEAs Providing Devices	**77.8%**	50.0%	80.3%	78.9%	73.8%
	(n = 663)	(n = 18)	(n = 359)	(n = 225)	(n = 61)

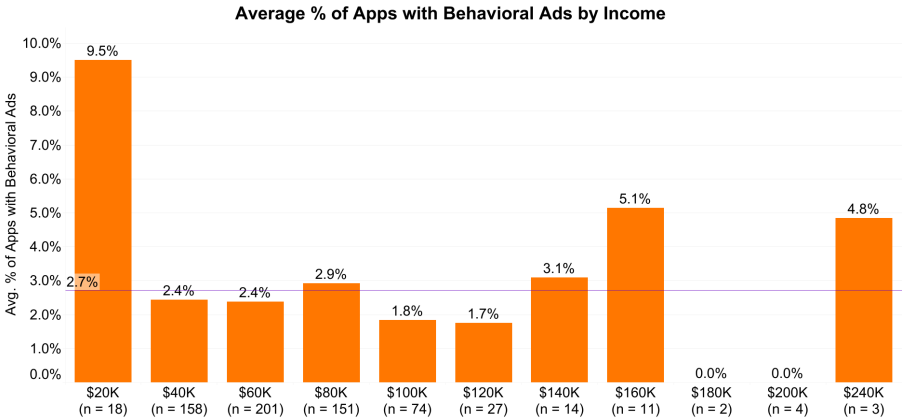
12.1 App Safety by Income



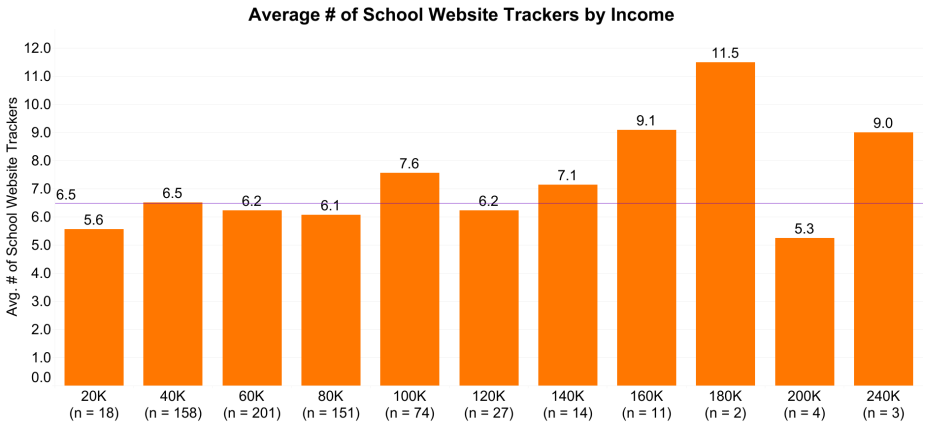


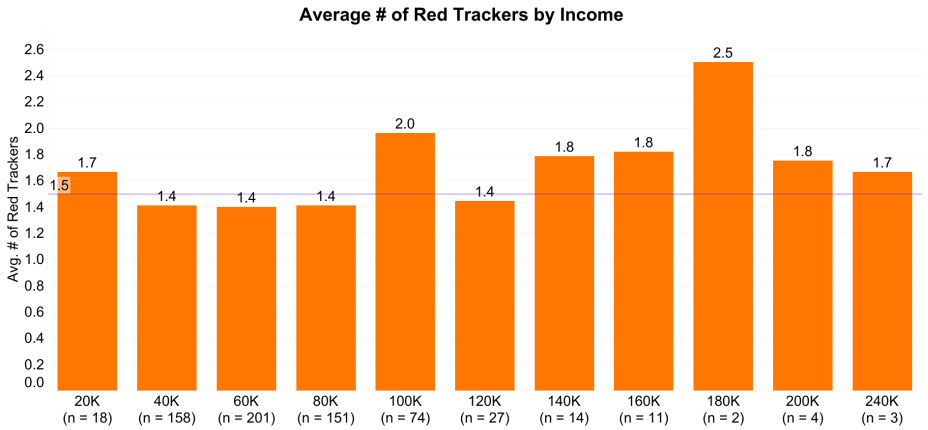


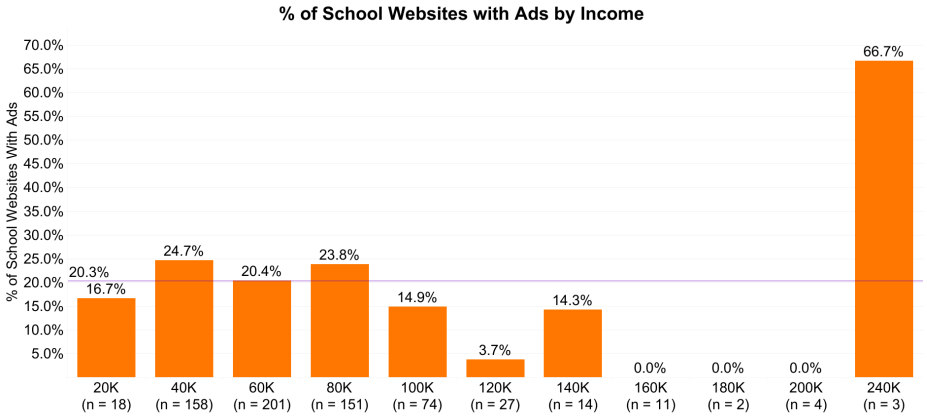




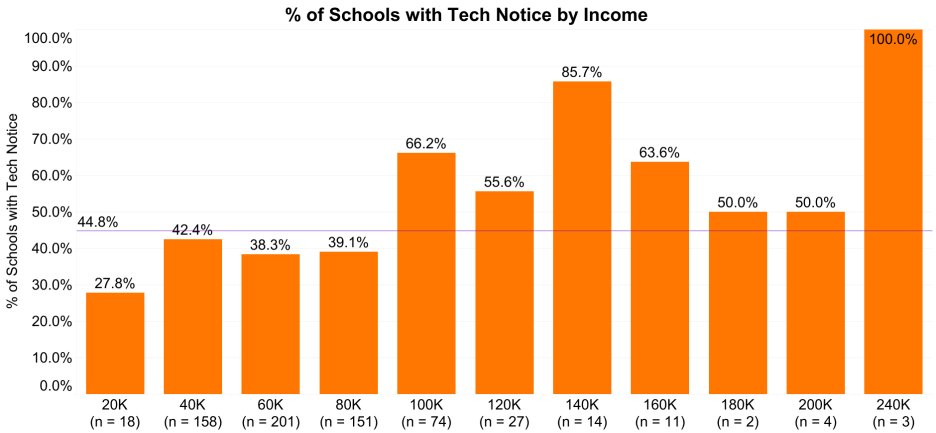
12.2 Website Behavior by Income

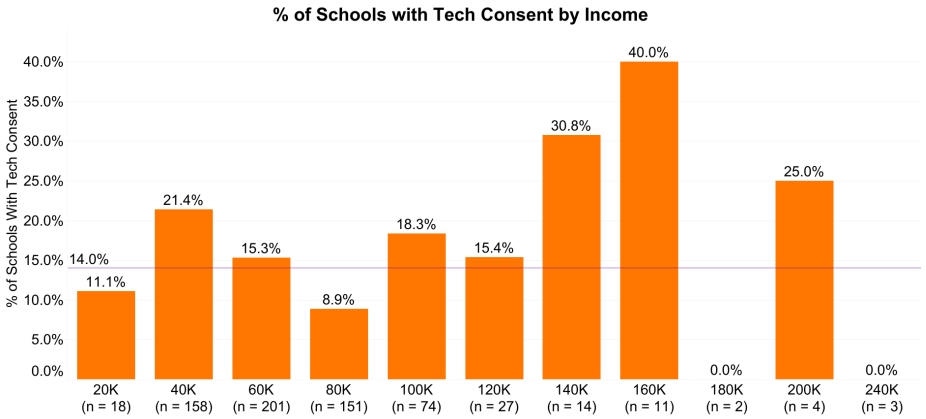


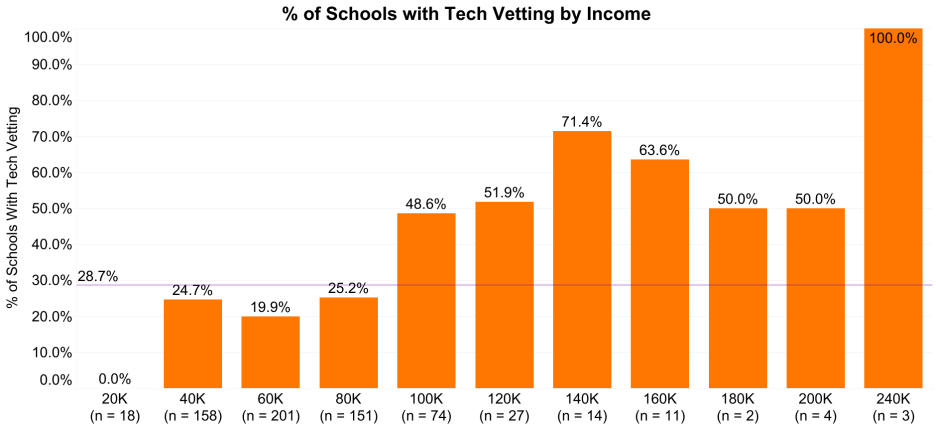


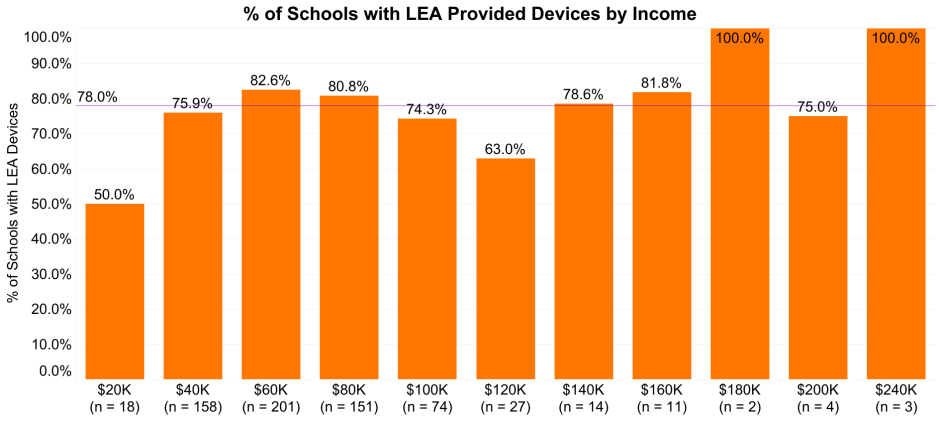


12.3 School Technology Practices by Income







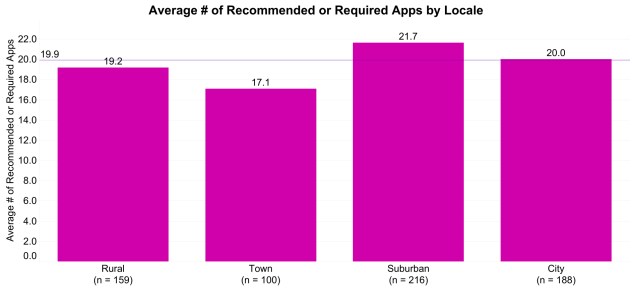


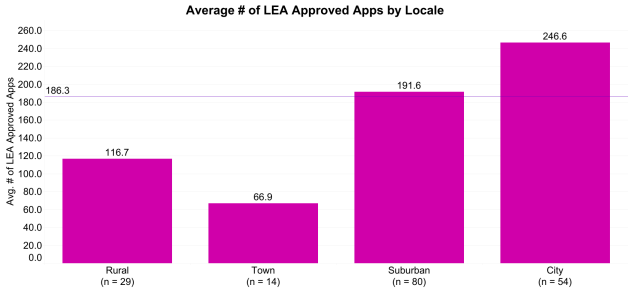
13 Appendix D Demographic Charts by Locale

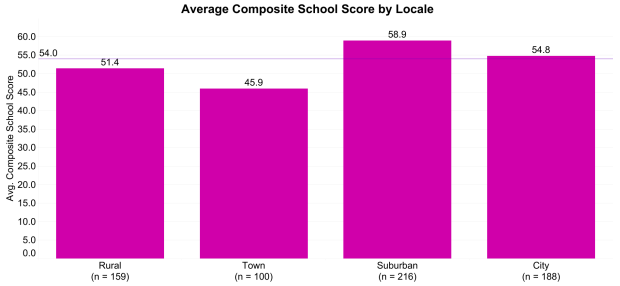
Table 13.1 Metrics by Locale

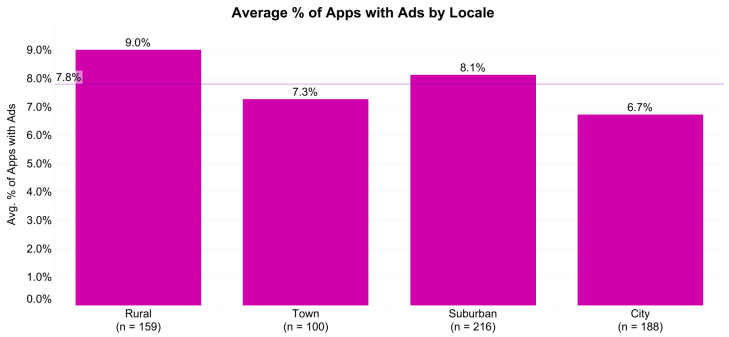
METRIC	National Average	Rural	Town	Suburb	City
APP SAFETY					
Avg # Rec/Req Apps	**19.9**	19.2	17.8	21.7	20
Avg # LEA Approved Apps	**186.3**	116.7	66.9	191.6	246.6
Avg School Composite Score	**53.7**	51.4	45.9	58.9	54.8
Avg % Very High Risk Apps	**69.4%**	68.9%	68.0%	70.5%	69.4%
Avg % Ads in Apps	**7.8%**	9.0%	7.3%	8.1%	6.7%
Avg % Behavioral Ads in Apps	**2.7%**	3.6%	2.2%	2.2%	2.7%
WEBSITE SAFETY					
Avg # Trackers in School Website	**6.5**	5.6	5.4	6.8	7.4
% School Websites with Trackers	**91.1%**	85.5%	86.0%	94.0%	95.2%
Avg # Red Trackers in School Website	**1.5**	1.3	1.2	1.5	1.8
% School Websites with Red Trackers	**79.3%**	71.7%	75.0%	81.5%	85.6%
% School Websites with Ads	**20.3%**	17.6%	12.0%	22.2%	25.0%
SCHOOL TECHNOLOGY PRACTICES					
% Schools Providing Notice	**44.8%**	40.3%	35.0%	56.0%	41.0%
% of Schools Allowing Consent	**14.0%**	15.1%	9.0%	13.9%	16.0%
% of Schools Vetting Technology	**28.7%**	19.5%	16.0%	38.4%	31.9%
% of LEAs Providing Devices	**77.8%**	76.3%	75.0%	73.4%	85.1%
	(n = 663)	(n = 159)	(n = 100)	(n = 216)	(n = 188)

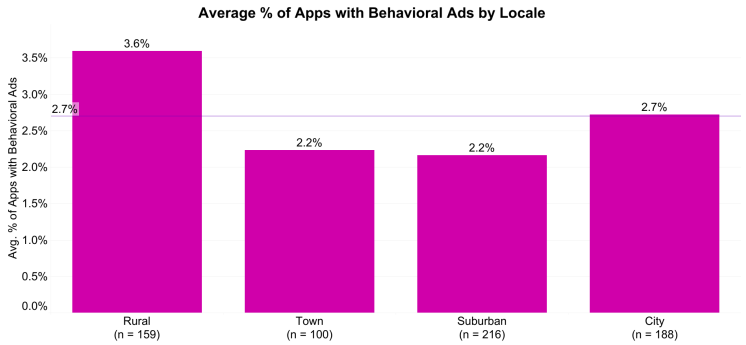
13.1 App Safety by Locale



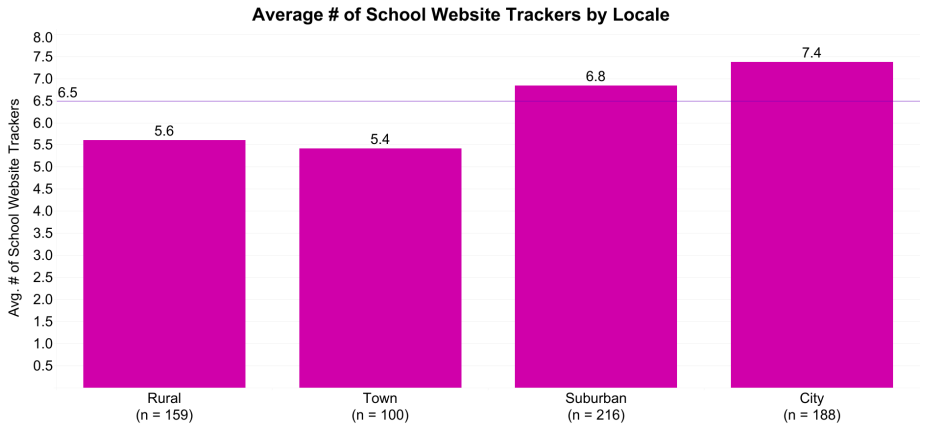


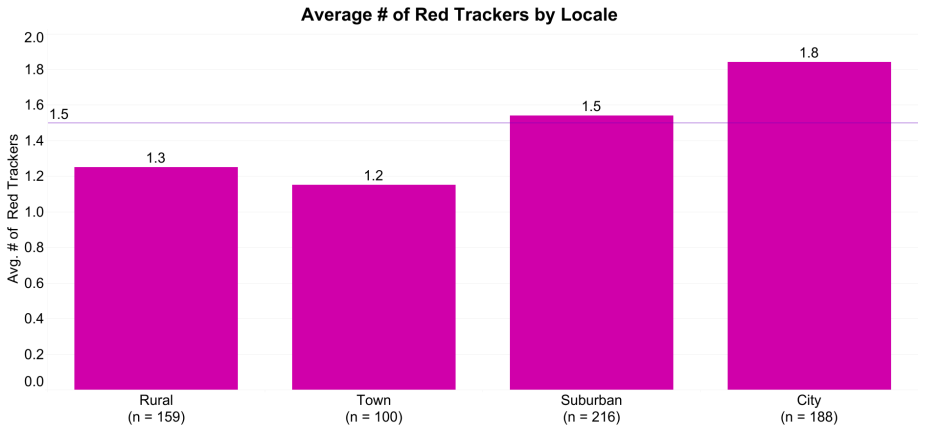


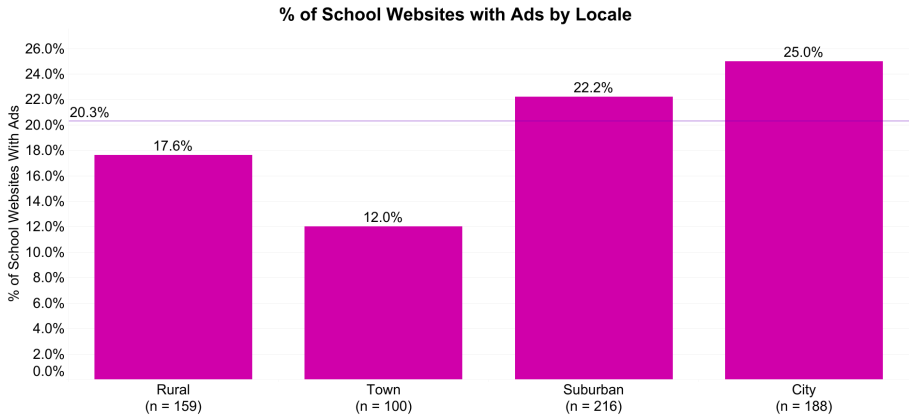




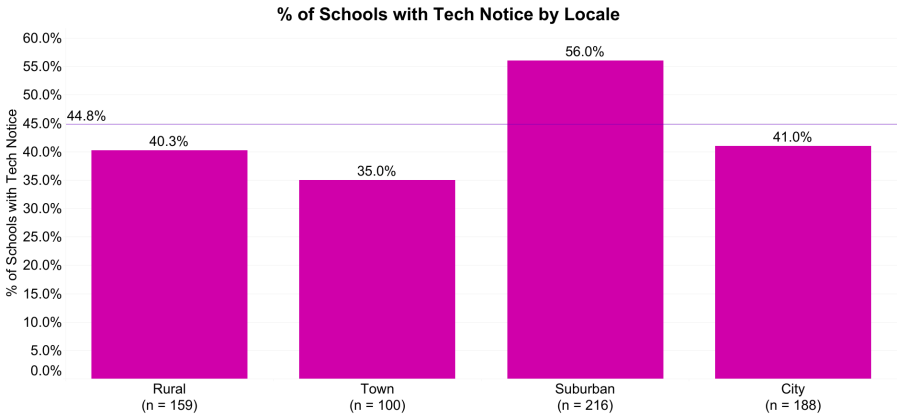
13.2 Web Behavior by Locale

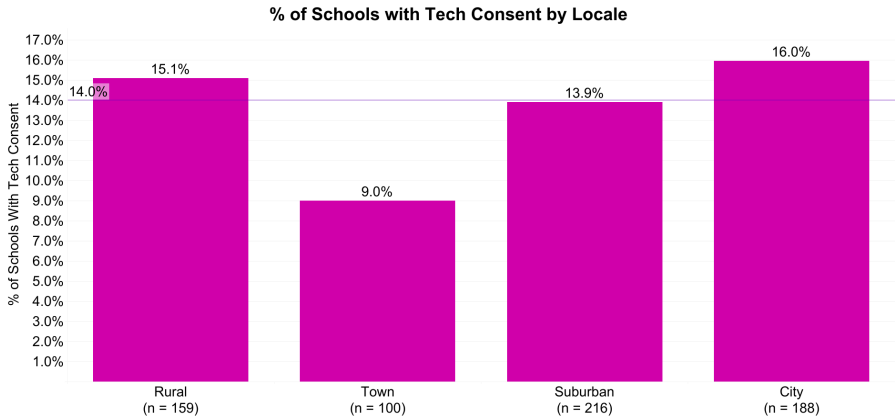


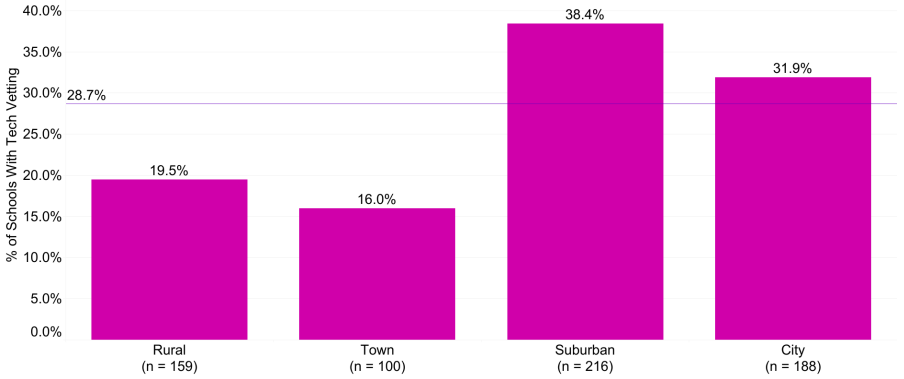


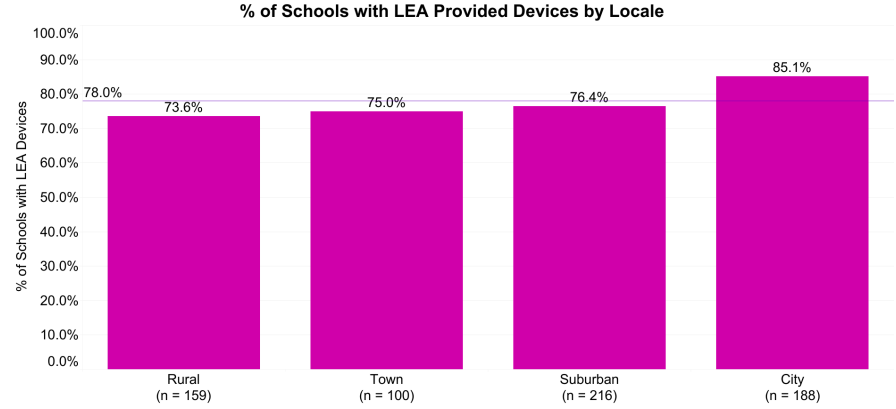


13.3 School Technology Practices by Locale







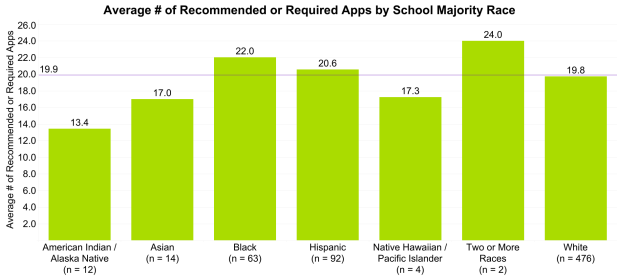


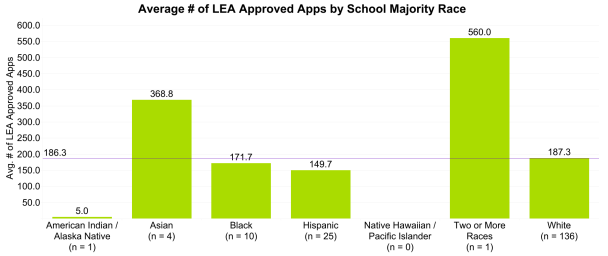
14 Appendix E Demographic Charts by Majority Race

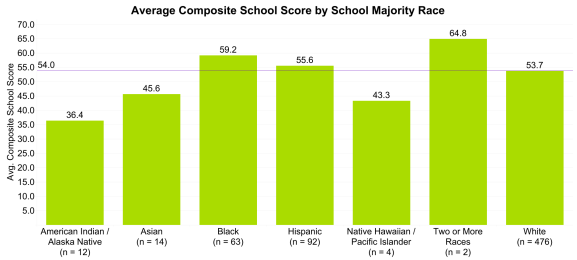
Table 14.1 Metrics by Majority Race

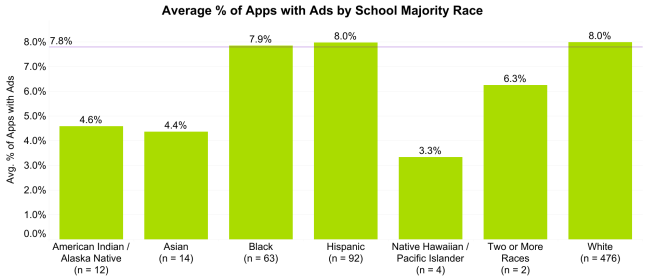
METRIC	National Average	American Indian/Alaska Native	Asian	Black	Hispanic	Native Hawaiian/ Pacific Islander	Two or More Races	White
APP SAFETY								
Avg # Rec/Req Apps	**19.9**	13.4	17.0	22.0	20.6	17.3	24.0	19.8
Avg # LEA Approved Apps	**186.3**	5.0	368.8	171.1	149.7	N/A	560.0	187.3
Avg School Composite Score	**53.7**	36.4	45.6	59.2	55.6	43.3	64.8	53.7
Avg % Very High Risk Apps	**69.4%**	72.9%	64.7%	70.0%	67.6%	56.1%	69.8%	69.9%
Avg % Ads in Apps	**7.8%**	4.6%	4.4%	7.9%	8.0%	3.3%	6.3%	8.0%
Avg % Behavioral Ads in Apps	**2.7%**	4.3%	2.4%	2.5%	2.9%	3.3%	3.1%	2.6%
WEBSITE SAFETY								
Avg # Trackers in School Website	**6.5**	3.9	6.5	7.7	7.4	7.8	9.0	6.2
% School Websites with Trackers	**91.1%**	83.3%	92.9%	100.0%	98.9%	100.0%	100.0%	88.4%
Avg # Red Trackers in School Website	**1.5**	1.4	1.7	1.7	1.7	1.5	3.0	1.4
% School Websites with Red Trackers	**79.3%**	83.3%	78.6%	85.7%	88.0%	100.0%	50.0%	76.7%
% School Websites with Ads	**20.3%**	16.7%	7.1%	33.3%	22.8%	0.0%	0.0%	18.9%
SCHOOL TECHNOLOGY PRACTICES								
% Schools Providing Notice	**44.8%**	16.7%	42.9%	33.3%	53.3%	0.0%	100.0%	45.6%
% of Schools Allowing Consent	**14.0%**	0.0%	14.3%	15.9%	16.3%	0.0%	0.0%	13.9%
% of Schools Vetting Technology	**28.7%**	8.3%	28.6%	20.6%	31.5%	0.0%	50.0%	29.8%
% of LEAs Providing Devices	**77.8%**	41.7%	85.7%	87.3%	87.0%	75.0%	50.0%	75.8%
	(n = 663)	(n = 12)	(n = 14)	(n = 63)	(n = 92)	(n = 4)	(n = 2)	(n = 476)

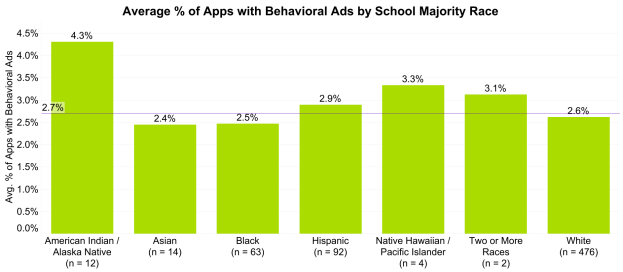
14.1 App Safety by Majority Race



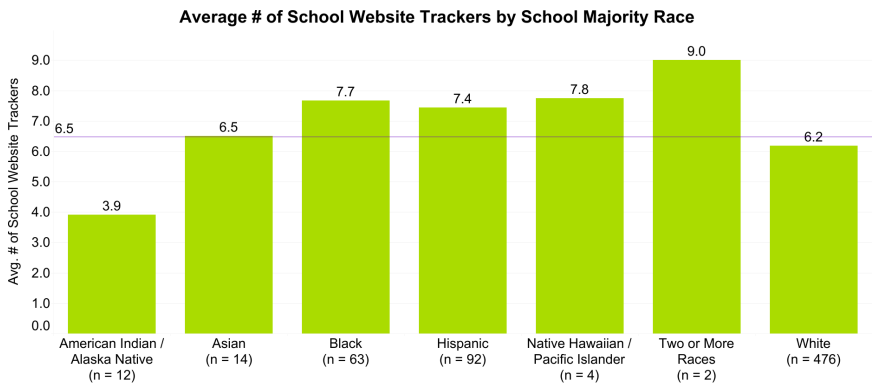


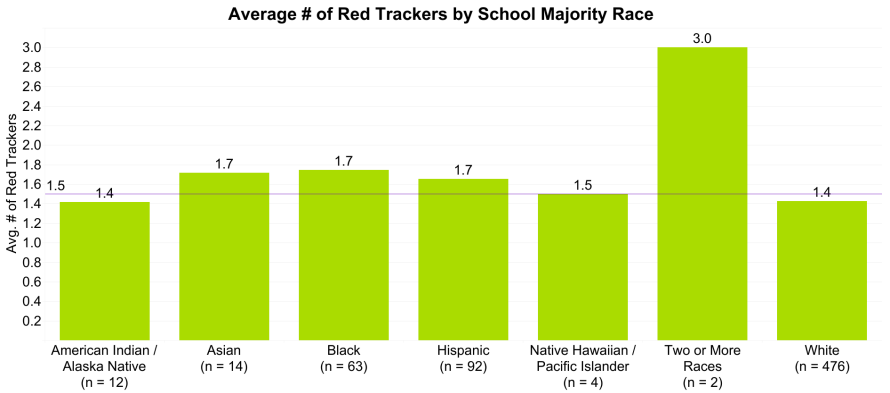


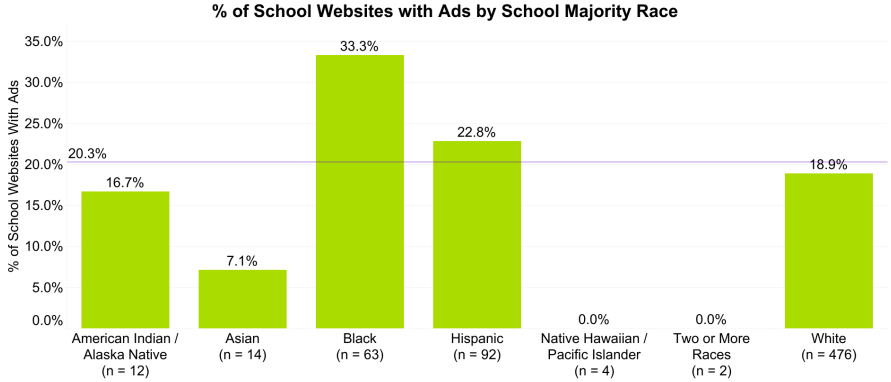




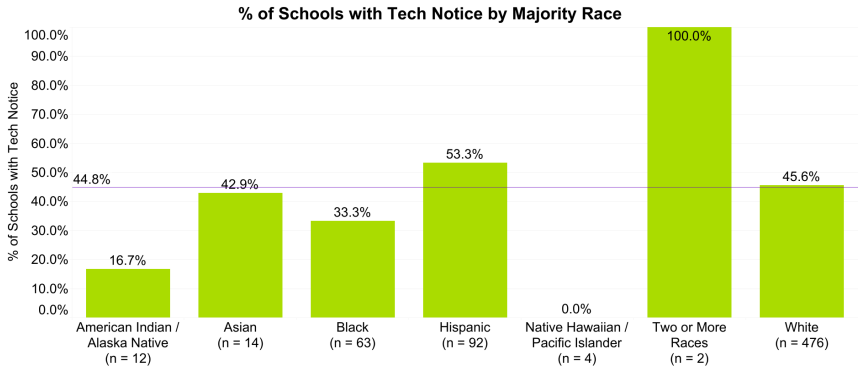
14.2 Web Behavior by Majority Race

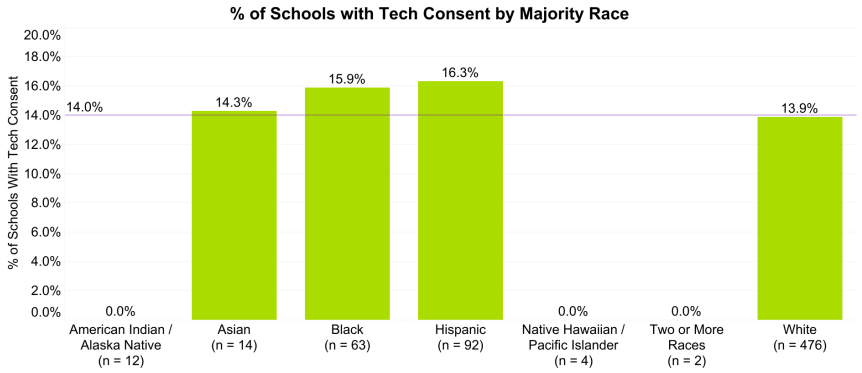


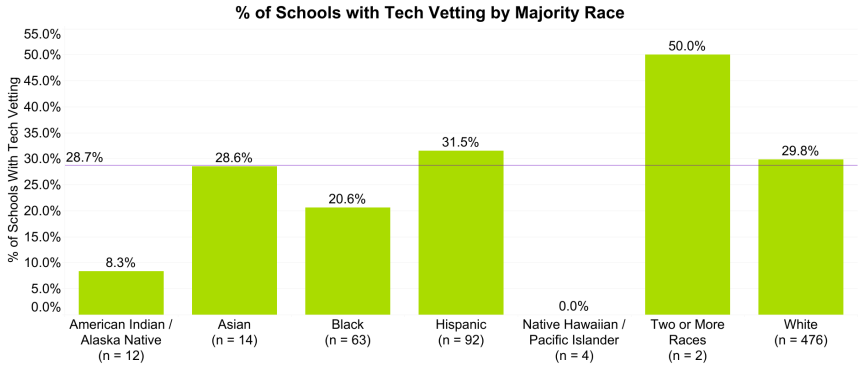


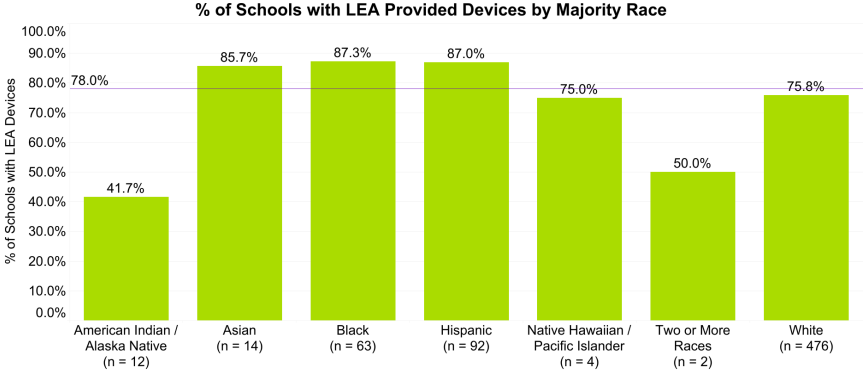


14.3 School Technology Practices by Majority Race







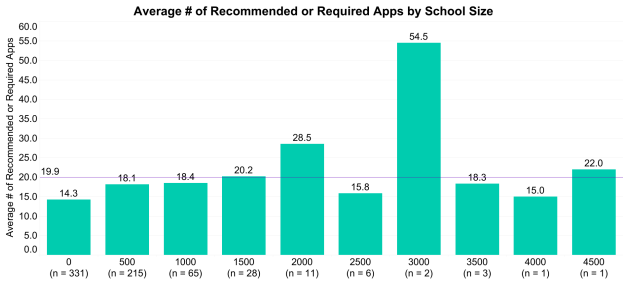


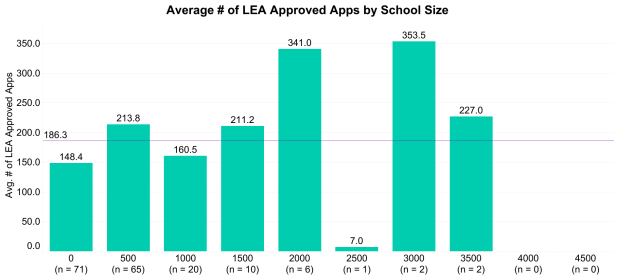
15 Appendix F Demographic Charts by School Size

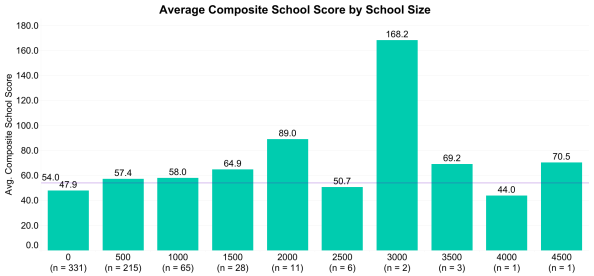
Table 15.1 Key Findings by School Size

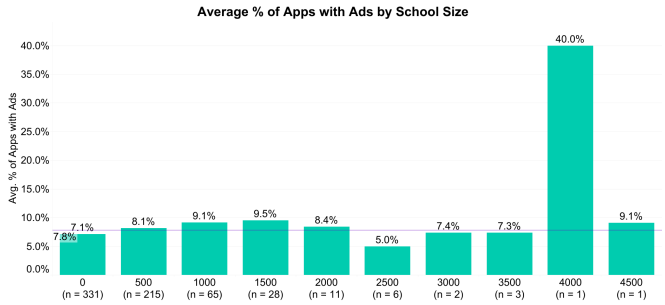
METRIC	National Average	0-499 Students	500-999 Students	1000-1999 Students	2000+ Students
APP SAFETY					
Avg # Rec/Req Apps	**19.9**	17.6	21.4	22.1	29.4
Avg # LEA Approved Apps	**186.3**	148.4	213.8	177.4	292.2
Avg School Composite Score	**53.7**	47.9	57.4	60.1	80.9
Avg % Very High Risk Apps	**69.4%**	69.5%	68.2%	71.2%	73.2%
Avg % Ads in Apps	**7.8%**	7.1%	8.1%	9.2%	8.7%
Avg % Behavioral Ads in Apps	**2.7%**	2.7%	2.4%	3.2%	3.3%
WEBSITE SAFETY					
Avg # Trackers in School Website	**6.5**	5.9	6.8	7.7	7.2
% School Websites with Trackers	**91.1%**	87.9%	92.6%	96.8%	100.0%
Avg # Red Trackers in School Website	**1.5**	1.4	1.5	1.6	1.7
% School Websites with Red Trackers	**79.3%**	76.1%	81.9%	80.6%	95.8%
% School Websites with Ads	**20.3%**	19.0%	21.4%	22.6%	20.1%
SCHOOL TECHNOLOGY PRACTICES					
% Schools Providing Notice	**44.8%**	36.9%	51.6%	53.8%	58.3%
% of Schools Allowing Consent	**14.0%**	11.8%	14.0%	18.3%	29.2%
% of Schools Vetting Technology	**28.7%**	24.8%	30.7%	33.3%	45.8%
% of LEAs Providing Devices	**77.8%**	71.6%	80.5%	89.2%	100.0%
	(n = 663)	(n = 331)	(n = 215)	(n = 93)	(n = 24)

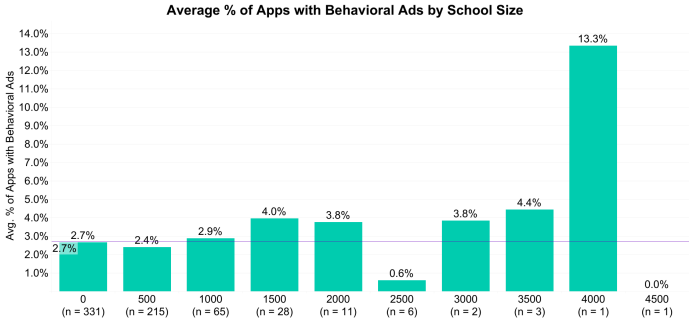
15.1 App Safety by School Size



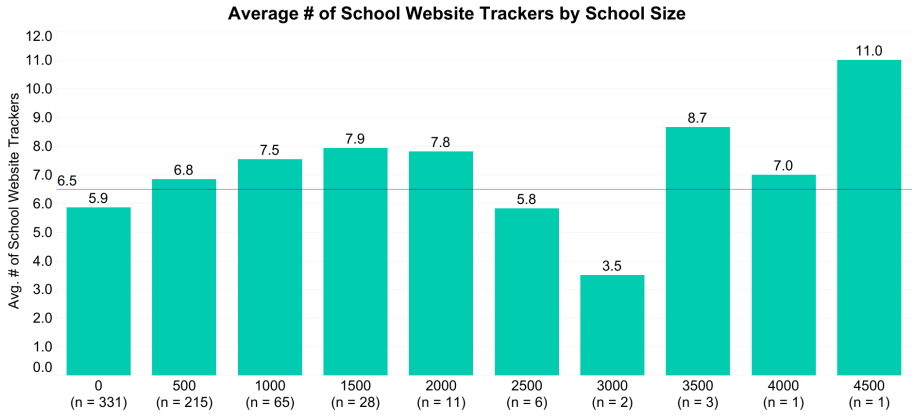


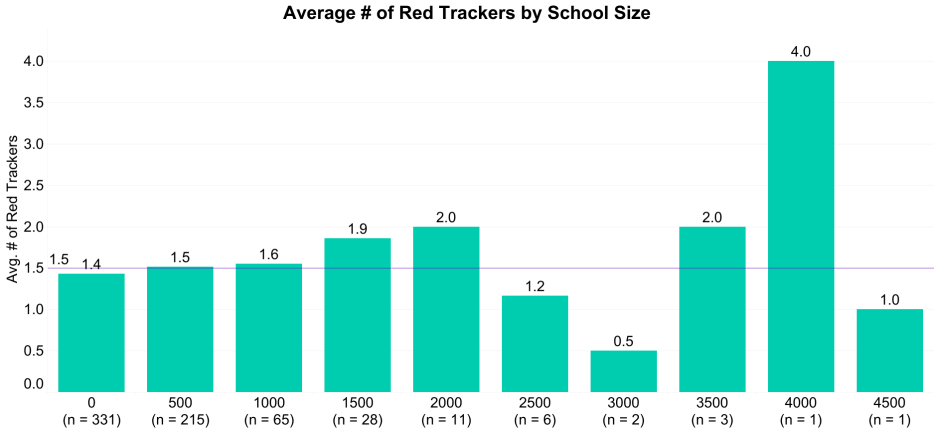


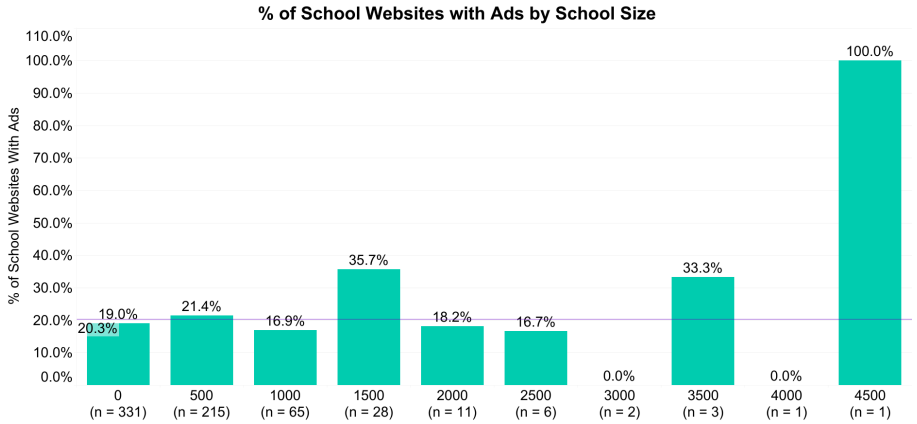




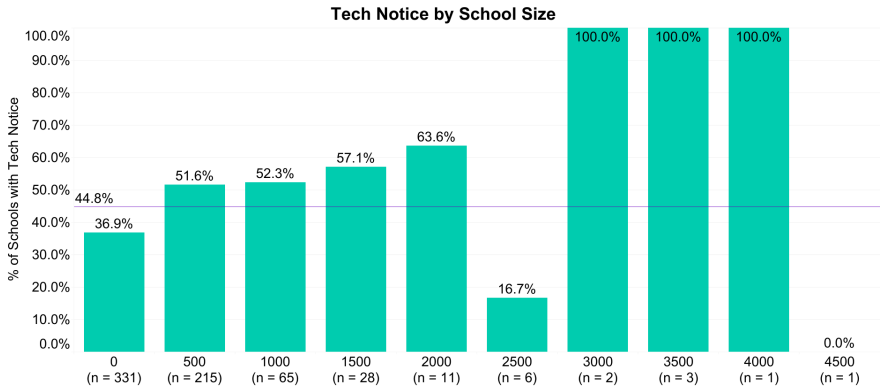
15.2 Web Behavior by School Size

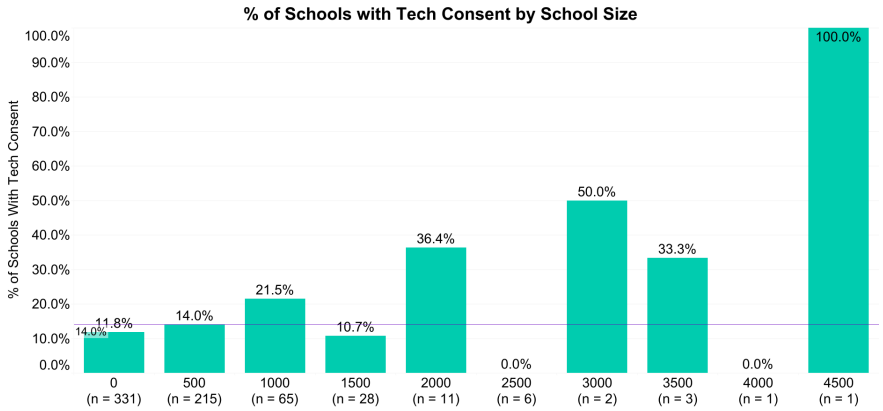


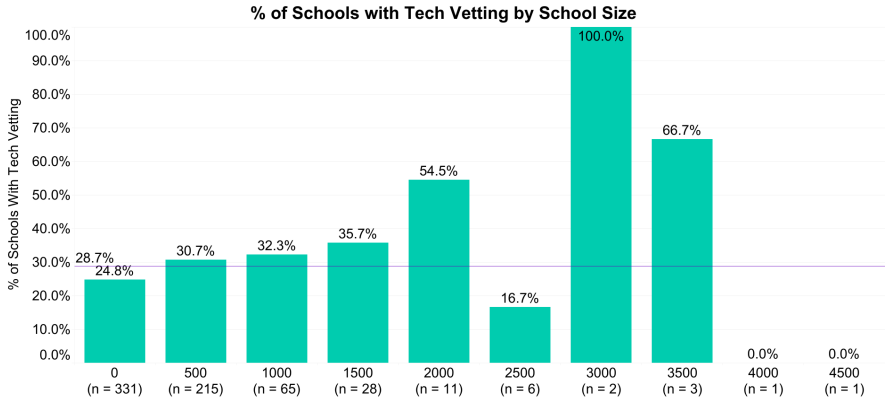


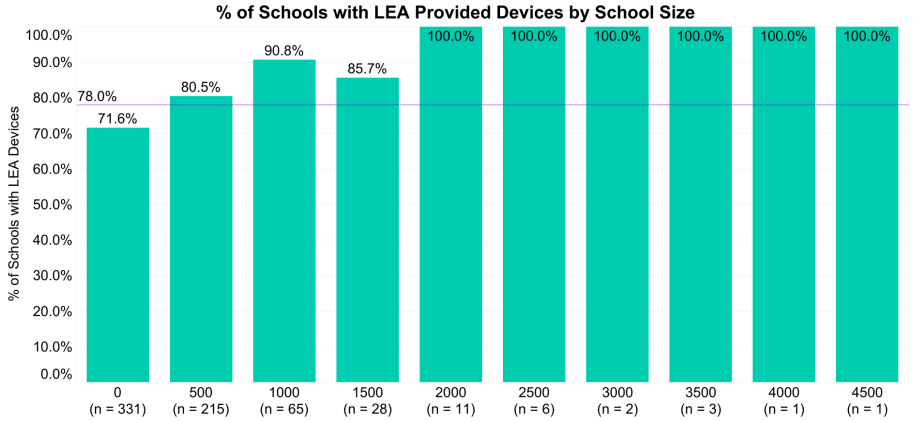


15.3 School Technology Practices by School Size









16 Glossary

16.1 Advertising

In this report, we use the term Advertising to mean digital advertising of any sort.

16.2 Behavioral Advertising

See Retargeting Advertising (16.10).

16.3 Contextual Advertising

Contextual advertising refers to digital advertising content based on characteristics of the publication site, not based on user behavior. This is in contrast to **behavioral** or **retargeting advertising** (16.10).

16.4 EdTech

In this research, we use the term EdTech in a very broad manner to mean the collection of digital technologies (app, webservices, etc.) that K12 schools require or recommend students to use as a part of their educational process. We further define EdTech App Categories (16.5).

16.5 EdTech App Category

EdTech apps come in a very wide range of functionality and utility. We created an edtech typology to facilitate comparing like-to-like edtech apps. The categories are listed here and details on the typology can be found in Appendix A of Findings Report 1[26].

- Classroom Messaging Software (CMS)
- Community Engagement Platform (CEP)
- Digital Learning Platform (DLP)
- Learning Management System (LeMS)
- Library Management Software (LiMS)
- Non-Education Specific (NES)
- [Educational] Other (O)
- School Transportation Software (STS)

[26] https://internetsafetylabs.org/wp-content/uploads/2022/12/2022-k12-edtech-safety-benchmark-national-findings-part-1.pdf

- Safety Platform (SP)
- Single Sign On (SSO)
- School Management Software (SMS)
- Student Information System (SIS)
- Study Tools (ST)
- Virtual Classroom Software (VCS)

16.6 ISL Safety Score

The ISL safety score was introduced in Findings Report 1 and conveys the overall safety of a mobile app. There are four possible score dispositions:

1. Unable to Test: which means we were unable to assign a score,
2. Some Risk: the safest of the three scores, meaning that there is some risk in the app,
3. High Risk: the middle of the three risk scores,
4. Very High Risk: the highest risk score assigned.

See ISL's https://appmicroscope.org/help for more information.

16.7 K12 / K-12

K12 or K-12 is shorthand for kindergarten through twelfth grade, the full range of primary education for children in the US.

16.8 Local Educational Agency

"Local educational agency or LEA means a public board of education or other public authority legally constituted within a State for either administrative control or direction of, or to perform a service function for, public elementary schools or secondary schools in a city, county, township, school district, or other political subdivision of a State, or for a combination of school districts or counties as are recognized in a State as an administrative agency for its public elementary schools or secondary schools." https://sites.ed.gov/idea/regs/c/a/303.23

For the purposes of this research, a school, a school district, a state school board, or any combination of the above can comprise a local educational agency.

16.9 Personally Identifiable Information (PII)

Personally identifiable information refers to any data which can in principle be joined to an individual person, with or without the use of additional data.

16.10 Retargeting Advertising

Retargeting refers to the capability to anonymously 'follow' consumers all over the Web. Retargeting ads are ads that rely on information that has followed the user from another site, based on the testing by our researchers. This is also referred to as "behavioral advertising", meaning ads are delivered in accordance with the user's observed [usually surveilled] behaviors.

16.11 School Composite Score

The school composite score is the weighted average of the scores of all scored apps used by a school multiplied by the total number of apps in use at the school. The higher the score, the riskier the overall technology portfolio being recommended/required by the school.

e.g. Riverdale High School uses 9 apps:

App	Score	Weight
App 1	Very High Risk	3
App 2	High Risk	2
App 3	High Risk	2
App 4	Very High Risk	3
App 5	Very High Risk	3
App 6	Very High Risk	3
App 7	Some Risk	1
App 8	Very High Risk	3
App 9	Unable to Test	Not included in average.

Riverdale High School's composite score = (((5 Do Not Use Apps * 3) + (2 High Risk Apps * 2) + (1 Some Risk app * 1) / 8 Scored Apps) * 9 Total Apps = 22.5

Note that the average school composite score across the entire US was 54.3. Thus, the fictitious Riverdale High School is performing *better* than the national average school composite score.

16.12 Student Data Privacy Consortium (SDPC)

SDPC provides LEAs with data privacy agreement templates, as well as a management platform to review, aggregate, and manage data privacy agreements between LEAs and EdTech vendors.

The Student Data Privacy Consortium is part of the Access 4 Learning Community:

"A4L's Student Data Privacy Consortium (SDPC) is an unique collaborative of schools, districts, divisions, regional, territories and state agencies, policy makers, trade organizations and marketplace providers addressing real-world, adaptable, and implementable solutions to growing data privacy concerns. The Consortium also leverages work done by numerous partner organizations but focuses on issues being faced by "on-the-ground" practitioners."[27]

SDPC provides LEAs with data privacy agreement templates, as well as a management platform to review, aggregate, and manage data privacy agreements between LEAs and EdTech vendors.

16.13 Software Developer Kit (SDK)

SDKs are externally developed and maintained reusable software modules/functions that can be integrated and invoked by an app, seamlessly within the app source code. SDKs provide commonly used functionality that developers don't wish to develop from scratch.

From ISL's Spotlight Report #1[28]:

"Most mobile apps are built with SDKs, which provide app developers with pre-packaged functional modules of code, along with the potential of creating persistent data channels directly back to the third-party developer of the SDK. SDKs almost always start running "behind the scenes" as soon as a user opens a mobile app –

[27] Student Data Privacy Consortium website: https://privacy.a4l.org/privacy-community/

[28] https://internetsafetylabs.org/resources/reports/spotlight-report-1-school-mobile-apps-student-data-sharing-behavior/

without the express consent of the user. These SDK providers use this data for a variety of reasons, from performing vital app functions to advertising, analytics and other monetization purposes."