Blueprint4Summer Colorado: Mapping Denver's Landscape for Summer Enrichment

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Introduction

Every year, starting as early as November and continuing into the spring, families across the country map out how their children will spend their summer break. For many families, summer activities offer necessary childcare for the time their children won't be in school. For all families, whether they need child care or not, the search for summer activities is about finding experiences that offer their children a productive use of their time, an opportunity to explore new interests or engage more deeply in their passions, and a chance to simply have fun.

For many parents, mapping out their children's summer means searching options online, tapping their parent networks, and making arrangements for drop off and pick up. For families living in neighborhoods with limited offerings or with more constrained budgets, this process unfolds with even less information, more daunting transportation challenges, and the ever-present balance of what is available and what they can afford.

In 2018 RESCHOOL Colorado launched the Blueprint4SummerCO (B4SCO) website, an online resource that aggregates summer activities available around Metropolitan Denver into a comprehensive searchable database. The activities are available for children in preschool through high school. The RESCHOOL team aimed to both surface summer programming throughout the community and provide families with a tool that would simplify their search efforts.

The RESCHOOL team did not simply populate the website with information scraped from the internet. They recruited summer programs to post their information on the website, intentionally seeking providers that offered free or low-cost programming or provided programming in neighborhoods where they recognized a shortage of programming. The team concentrated their program recruitment efforts in communities that were historically underserved within the education system. They also actively marketed the website—initially via appearances and presentations at public events for parents and citywide media, and then more recently with a media campaign that targeted community-based communication outlets.

We examined the 2018 and 2019 website data to understand two things: the extent to which the RESCHOOL team met its goals for B4SCO and what the programming provided on the platform reveals about the landscape of summer programming in the Denver area.

In its first two years of operation, B4SCO informed Denver-area[1] families about an increasing number of activity sessions[2] with increasing diversity and geographic distribution. The website also saw increased usage during this time. Despite these improvements in program visibility via B4SCO, gaps in program availability and affordability persist in Denver's summer programming landscape.

Data Used in This Report

This report draws from several different data sources, including:

U.S. Census: We obtained demographic information at the census block group level from the American Community Survey (ACS). The census block group level is the smallest unit the Census reports and includes between 600 and 3,000 people. We used these data to map the population by racial and ethnic categories and to identify the distribution of school-aged children.

Blueprint4SummerCO Program Data: We drew B4SCO session data from its website. These data include information about each program and session offered, as well as the session time, hours, duration, location, gender requirements, disability accommodation, costs, scholarship availability, and program topic. Session topics include "academic," "arts," "cooking," "dance," "drama," "music," "nature," "sports," and "STEM." These categories are non-mutually exclusive per program session and were determined by B4SCO.

Google Analytics: We obtained data on B4SCO website visits and searches from Google Analytics. The 2018 analytics reflect activity from January 2018 to July 2018, while 2019 analytics reflect activity from the same period in 2019.

Google Distance Matrix API: Distances between approximate student locations and program addresses were geocoded using the Google Distance Matrix API. Distances were computed in terms of driving, transit, and walking travel times. All searches were performed with arrival times of 8:00 AM Mountain Standard Time. Preliminary analysis tested arrival times of 8:00 AM, noon, and 5:00 PM for the first 10 block groups and the first 30 program addresses. However, we found that the mean difference in time traveled, for each mode of transport and across arrival times, was less than five minutes. Thus, for the sake of efficiency, we decided to use an 8:00 AM arrival time for all Google Distance Matrix API calls for the remainder of our analysis.

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1. In 2018 the RESCHOOL team focused on including activities available in Denver, Boulder, and Aurora. In 2019 the team concentrated their efforts on adding activities in the metropolitan Denver area, though they included activities from outlying areas that had previously been listed on the website.
2. A session is defined as an activity offered at a specific time. For example, an art camp offered during the first week in July is considered one session. Because many programs are offered multiple times through the summer, a single activity may have multiple sessions.
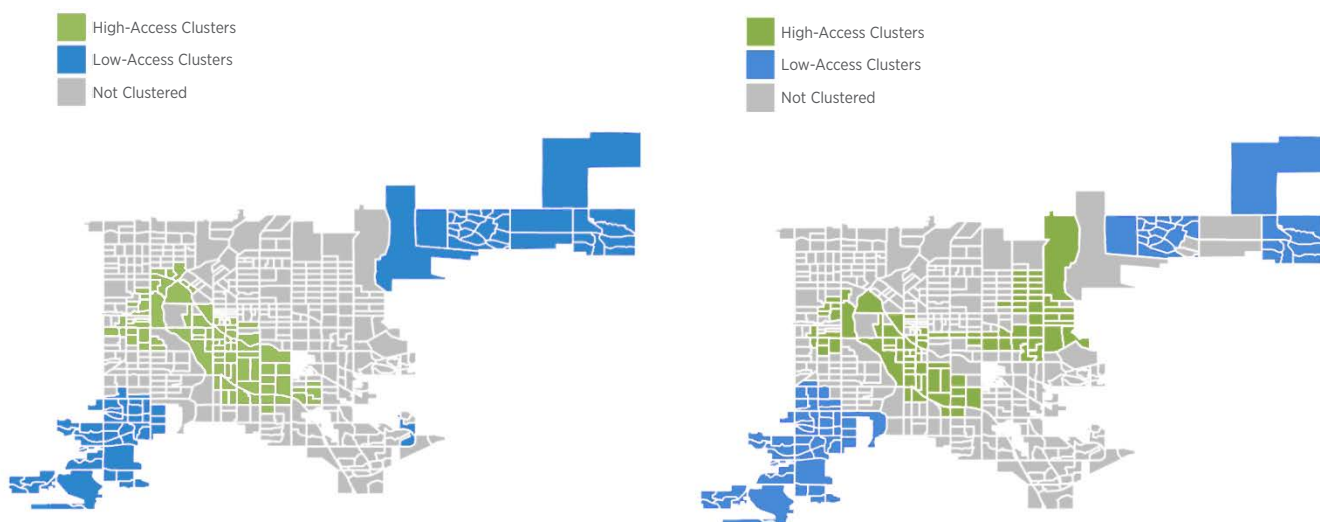
B4SCO Presents a Wealth of Enrichment Opportunities That Parents Readily Explore

Over time, B4SCO improved the number and geographic representation of sessions publicized on the website. B4SCO debuted in early 2018 with over 3,000 summer programming sessions captured on the website and increased the number of summer sessions to 4,098 in 2019. The camp sessions stretched across 90 ZIP Codes in the region. Almost 15 percent of sessions presented on the website in 2019 were free to attend. The available sessions included academic (e.g., STEM, reading), sports and outdoors, visual and performing arts (e.g., dance, drama, music, art), and cooking programs. The website includes programming for children aged 3 through 18, though the majority of programming is available to children aged 5 through 18.

It is impossible to know how completely B4SCO captures the city's summer programming; some small providers, and providers whose programming fills rapidly—such as the city's recreation centers, the YMCA, and the Denver Zoo—do not have an incentive to publicize on the website.[3] The B4SCO team focused on including diverse programming across all communities. That said, the website does list programming from 115 different providers, including many of the city's major providers, such as the public library system, Avid4 Adventure, and local arts and culture venues.

The increased programming presented on B4SCO in 2019 also appeared to fill some geographic gaps seen in the 2018 B4SCO program offerings (see figure 1). To understand how readily children could access summer programming they searched for on the B4SCO website, we calculated an access index for each census block group, which ranges from 0 to 100 and reflects a combination of the number of sessions available and the travel time to attend them. This access index reflects how difficult or easy it is to search for the programming presented on B4SCO. For example, children in the census block with the highest access to programming lived about 21 minutes away from programming. Only 19 percent of programming took more than 30 minutes for them to reach. Meanwhile, their peers in the census block with the lowest access lived, on average, 39 minutes from programming. Seventy percent of programming took more than 30 minutes to reach.

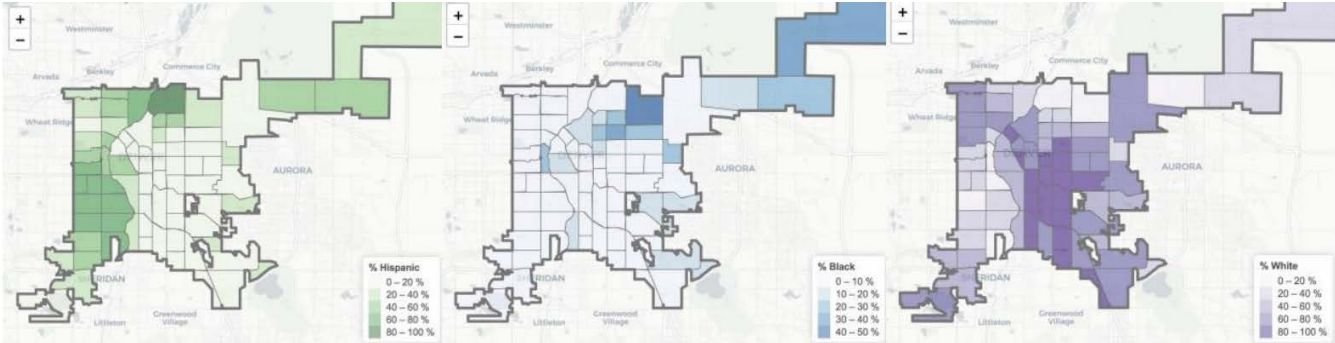FIGURE 1. Access to Programming on B4SCO Website Increases

Notes: Data used include the updated 2019 Blueprint4Summer Programs Data, 2017 ACS 5-year estimates (block group), and Denver Public Schools student demographics from 2018.

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3. B4SCO did not seek out programming that tends to fill within a couple hours of posting. They would post information on these sessions if the provider submitted information but they would not actively recruit them for inclusion.

Between 2018 and 2019 the access index increased in most neighborhoods. Moreover, when we looked for regions in the city where census blocks cluster together—sharing not only proximity but similar high- or low-access scores—we found that these clusters shifted between 2018 and 2019. Clusters of relatively high-access census blocks expanded into the neighborhoods northeast of the city's center, while the cluster of low-access blocks (shown in blue) shrank in the Far Northeast, which, as shown in figure 2, is home to many of the city's black households. However, the number of low-access census blocks in the Southwest, home to many Hispanic households, increased. (See inset, Measuring Access to Summer Programming Found on B4SCO Website.)

FIGURE 2. Racial and Ethnic Distribution of Households in Denver

Measuring Access to Summer Programming Found on B4SCO Website

Creating an Access Index

The access index reflects the sum of travel times from the geographic center of each census block to program locations and accounts for mode of transportation, the number of sessions at each location, program types, and program costs. For more detailed information on the calculation, see the 2018 CRPE working paper, *Access to Out of School Resources*.

Identifying Clusters of High- and Low-Access Neighborhoods

To identify regions in which high- and low-access census blocks cluster, we performed a cluster analysis referred to as the Moran I. Applying this methodology, we consider the access index for all census blocks, as well as the distance every census block is from other census blocks, and identify those census blocks that appear to have similar access scores and are in relatively close proximity to each other. In doing so we are able to locate clusters of census blocks that have similar high or low access. It is important to note that other individual census blocks throughout the city have high- or low-access scores, but because they are not in close proximity to other blocks with similar access scores they do not fall into the identified clusters.
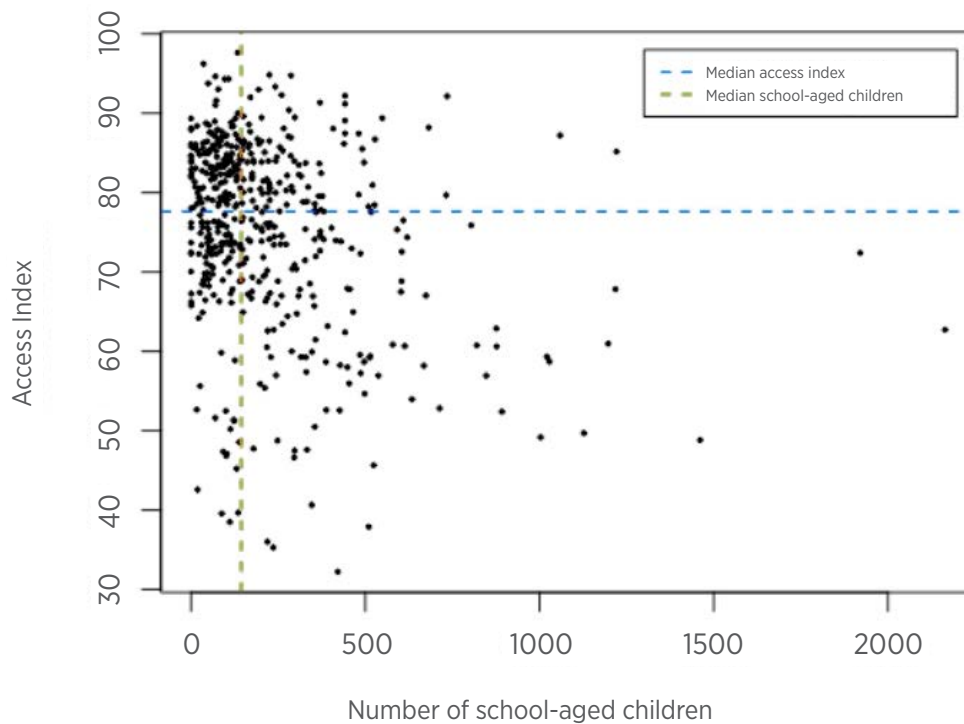
Visitors to the B4SCO website conducted 17,500 searches each year, with a 2.4 percent increase in searches in the second year. In 2019 more than 6,000 of the searches requested summer programming centered around a specific ZIP Code. In these searches, users looked for programming in 123 different ZIP Codes in the region, suggesting that families residing and/or working in all corners of the city visited the website.

By these numbers, RESCHOOL and the B4SCO team met its goals to present a large number and wide range of activity sessions, including free sessions, for children to participate in. They also reached a large number of families. While the B4SCO website represents an incomplete picture of all available offerings in the region, it nonetheless offers a large share of the region's programming and provides a valuable reflection of the summer programming landscape.

Despite Expansion of Sessions Captured by B4SCO, Access to Summer Learning for All Children Remains a Concern

Many children in the Denver area continued to face limited access to the summer programming presented through B4SCO. As shown earlier in figure 1, regions within the city stand out as clusters of relatively high- or low-access communities. Figure 3 shows how communities' access to summer programming relate to its school-aged population by displaying the 2019 access index and school-aged population for each block group in Denver. The median access index and median school-aged population are represented by green and blue lines, respectively. This display reveals that many block groups with relatively low access scores are also home to a large number of school-aged children. In fact, 62 percent of Denver's school-aged population lives in a block group with an access index below the citywide median.
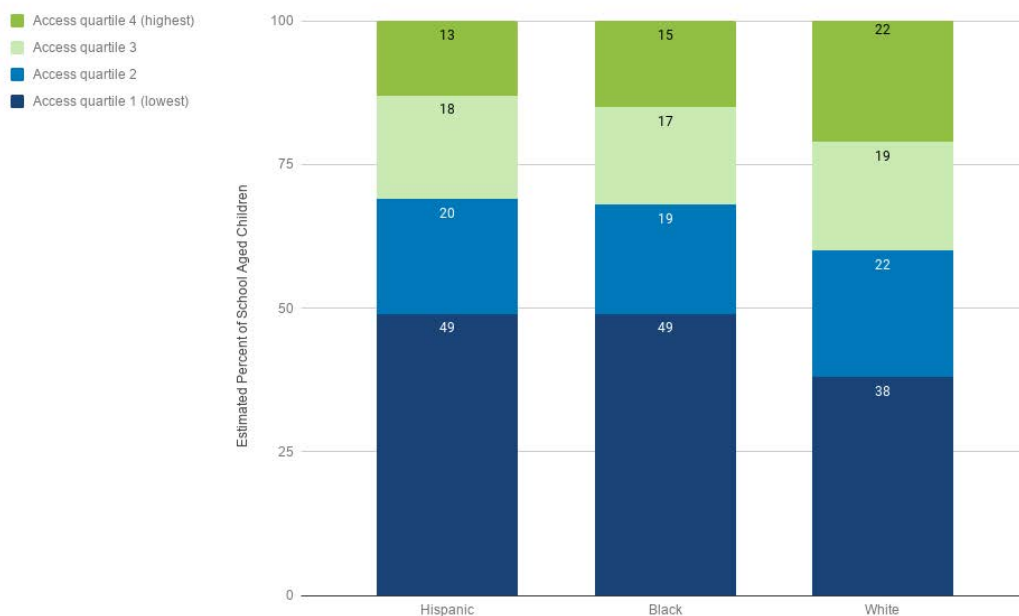
FIGURE 3. Lower Access Neighborhoods Tend to Have a Large School-Aged Population (2019)

Notes: Access index shows access to all programming presented on B4SCO. Data used include the updated 2019 Blueprint4Summer Programs Data, 2017 ACS 5-year estimates (block group).

We also found that the city's Hispanic and black children, relative to white children, are less likely to live in census blockgroups with high access to programming as captured on B4SCO. Figure 4 divides Denver's communities into quartiles based on their access index and estimates the share of school-aged children living in each quartile. About 30 percent of Hispanic and black children live in communities with access indices above the median, but 40 percent of white children live in these higher-access communities.

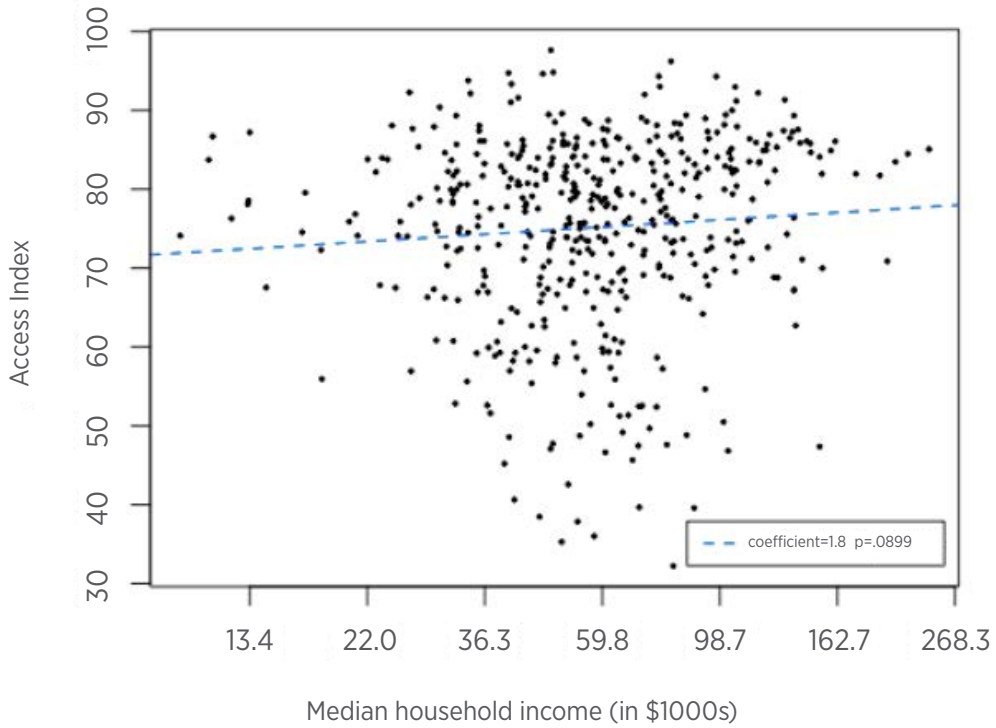**FIGURE 4. Hispanic and Black Children Have Less Access to Programming Captured on B4SCO**

Notes: Data used includes the updated 2019 Blueprint4Summer Programs Data. Estimates of school-aged population by race and ethnicity and by block group are calculated based on 2016 ACS.

On average, higher access to summer programming tends to correspond with higher-earning households, but only weakly. Figure 5 shows the access index for each block group by the log of median household income. The figure shows a slight upward (though not statistically significant) trend in access indices with median income. More apparent, however, is that block groups with high access to summer programming captured on B4SCO run the spectrum on median household income.
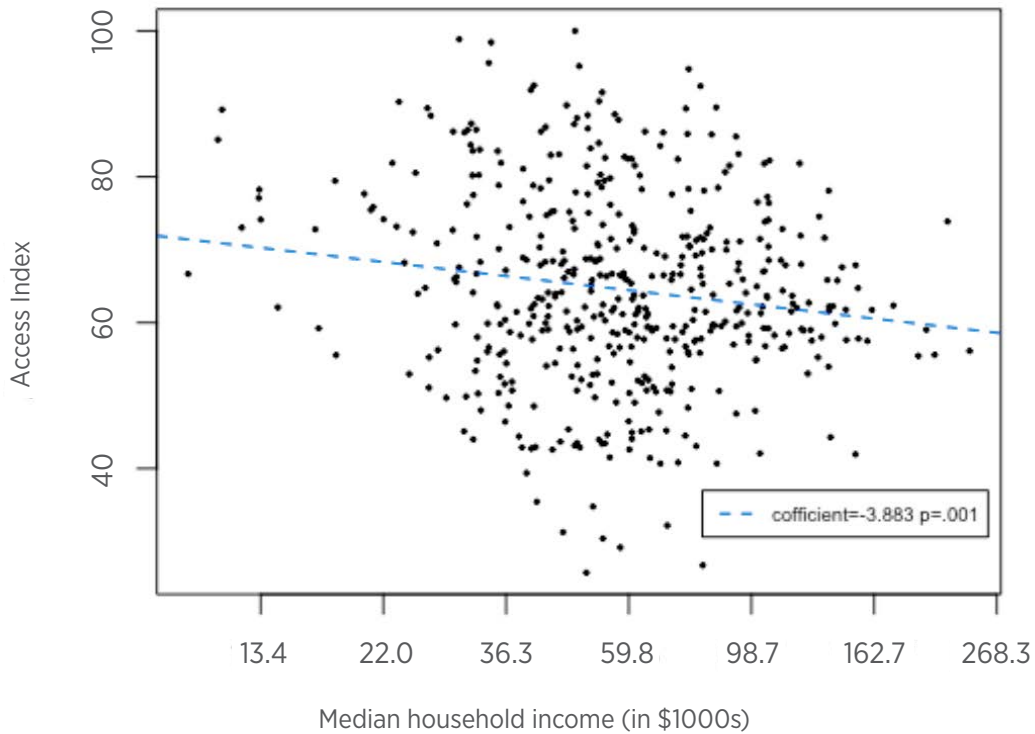
Free programming, however, appears more readily available in communities where the median household income is lower. Figure 6 arrays each block group by their access index for programming that is free and the log of household income. The trend, as indicated by the blue line, is statistically significant and declines as incomes rise.

FIGURE 5. Access to Summer Programming Captured on B4SCO is Weakly Associated with Neighborhood Income

Notes: Access index shows access to all programming presented on B4SCO. Data used include the updated 2019 Blueprint4Summer Programs Data, 2017 ACS 5-year estimates (block group).

FIGURE 6. Free Summer Programming is Readily Accessible in Communities with Lower Household Incomes
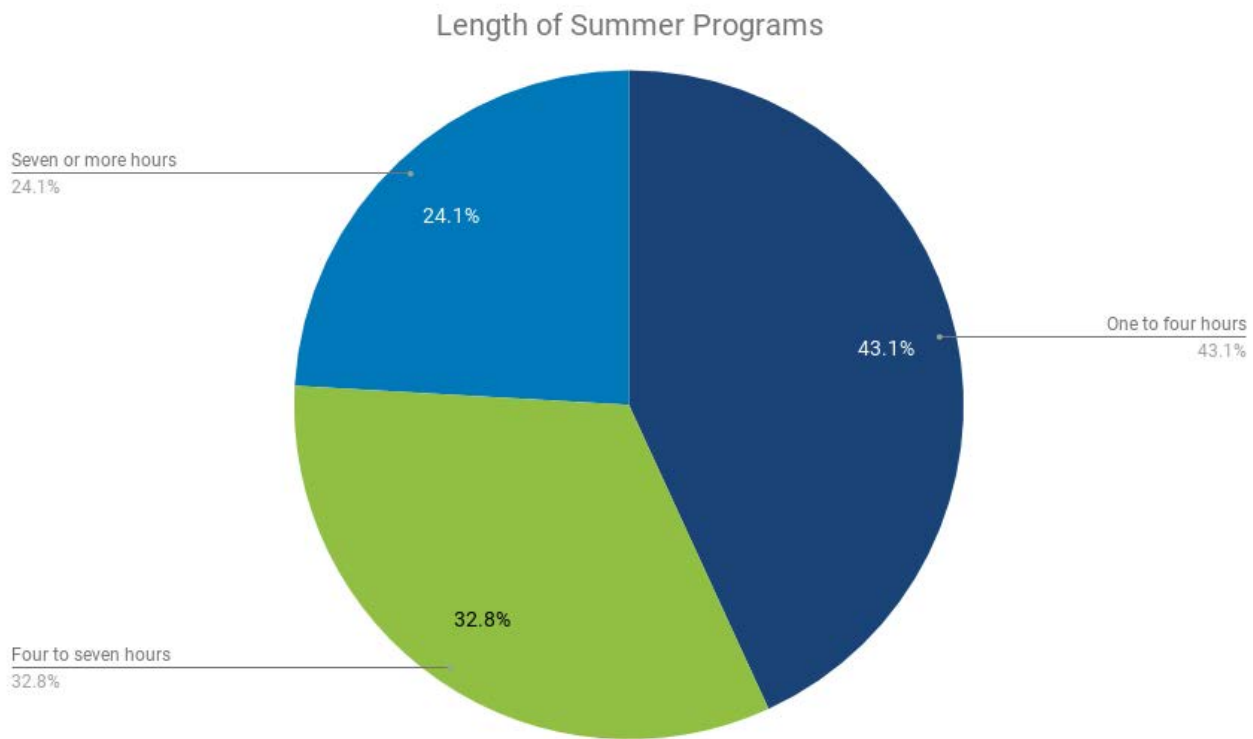

Notes: Median household income is represented in a log scale and the blue line represents the linear regression of the access index to free programming on the natural log of median household income.

Available Summer Learning Does Not Fully Cover the Time Students Are Out of School

For many parents, summer programming is intended to provide childcare, replacing the time students spend in class or in before- and after-school programs during the academic year. Our analysis of sessions provided on the 2019 B4SCO website shows that the available summer programming is largely inadequate in providing this coverage. We found that less than a quarter of sessions presented on B4SCO are full-day programs and nearly 50 percent of sessions are a half day or less (see figure 7). Managing pick up and drop off for partial-day sessions is difficult for families in which all of the adults work full time. Constantly changing providers may prove difficult for children who favor establishing longer-term relationships.

FIGURE 7. Fewer Than 25 Percent of Program Sessions Offer Full-Day Programming

Length of Summer Programs

Seven or more hours
24.1%

24.1%

One to four hours
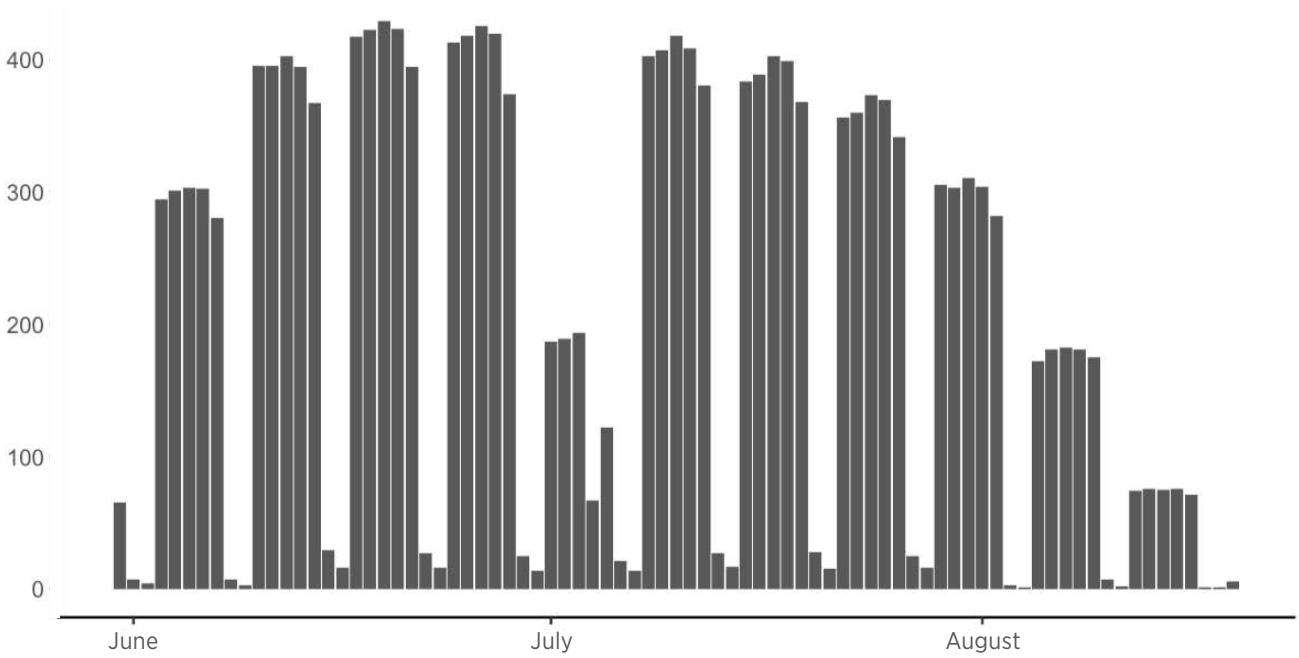43.1%

43.1%

32.8%

Four to seven hours
32.8%

Notes: Data used include the updated 2019 Blueprint4SummerCO Programs Data.

Fortunately, programming, as reflected on B4SCO, seems to be available for most of the summer. The first sessions presented on B4SCO begin just as the Denver Public Schools finish in late May. Sessions continue for most of the summer, with a break around the Fourth of July holiday. The only apparent gap in coverage appears in the two weeks before school starts in late August.[4] At this point, program sessions and hours offered on B4SCO drop off significantly (see figure 8).
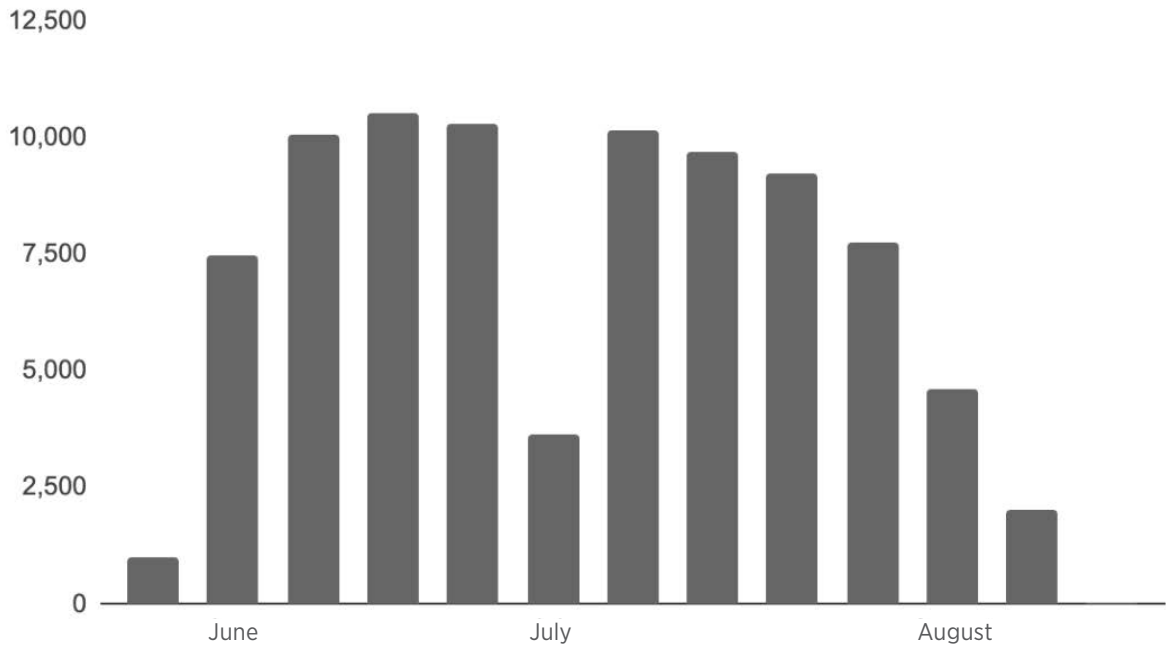
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4. A small number of schools in Denver Public Schools operate on an alternative schedule to the district and begin operating earlier than the district.

FIGURE 8. Programs Begin Once School Ends, But Trail Off a Few Weeks Before School Begins

Number of sessions offered by month, B4SCO 2019

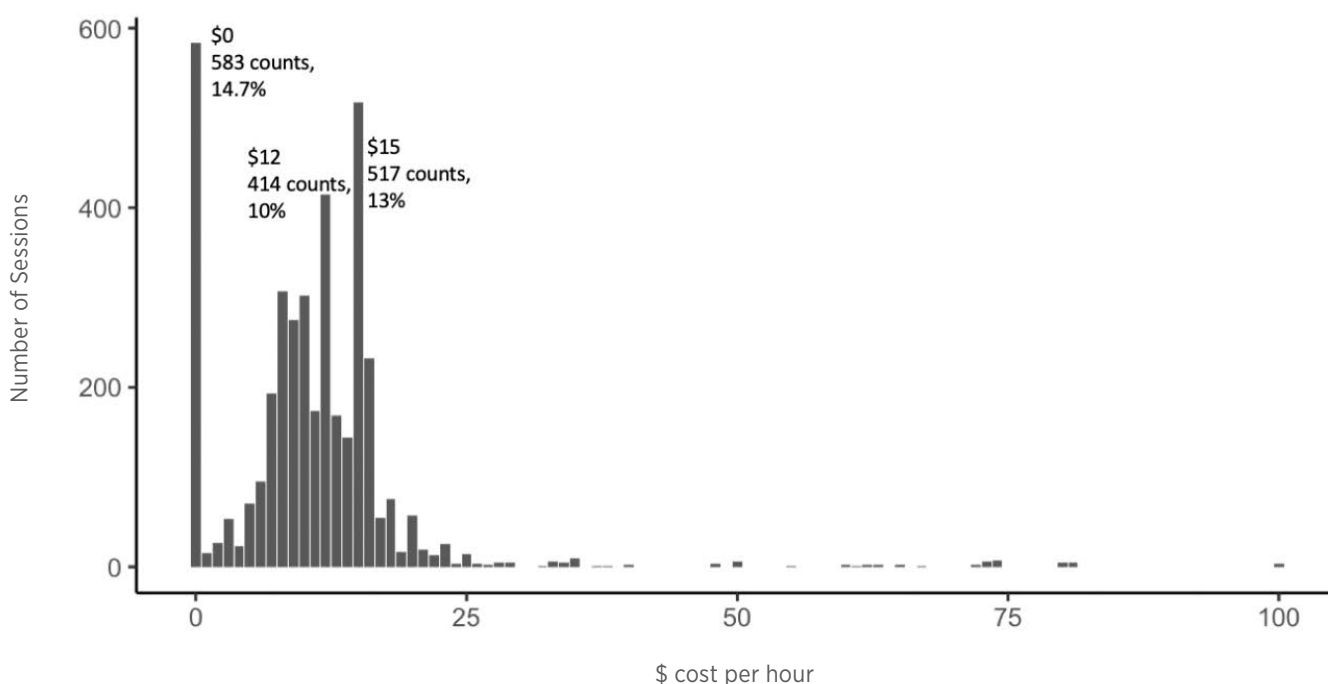*Number of session hours offered by month, B4SCO 2019*

Summer Programming Hourly Costs Equal the Region's Minimum Wage, Forcing Hard Tradeoffs for Families

The cost for summer programming is, no doubt, a concern for most families, but it is most acutely felt by families with lower incomes. The RESCHOOL team intentionally recruited providers that offered free or low-cost programming to post their programs on B4SCO. In 2019 the website presented 600 free programs—about 14 percent of the total sessions presented. The median session on the website cost $215. The session cost, however, doesn't account for the number of hours covered by the session.

When examining the hourly cost for children over the age of five[5] (shown in figure 9), we found that hourly costs ranged from zero to $100. As figure 9 shows, around 15 percent of sessions were free. However, the median hourly cost for all sessions was $11, close to the local minimum wage of $11.10. This means that half of all available programming costs more than the minimum wage, which likely creates a difficult tradeoff for families with an adult working at or near minimum wage. About half the sessions presented on B4SCO provide scholarships to students in need but these scholarships are generally limited.

FIGURE 9. Free Program Sessions are Common, But Half Cost More Than the Minimum Wage

Notes: Includes program sessions for students 5 to 18 years old. Data used include the updated 2019 Blueprint4Summer Programs Data.

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5. We decided to exclude programming for children under the age of 5 from this analysis because they differ substantially in cost and are more akin to preschool programming. In total, 70 of the 4,093 sessions offered in 2019 B4SCO served only preschool-aged children.

Conclusion

In just two years the B4SCO platform has brought transparency to the historically fragmented world of out-of-school summer programming. Given the large number of website visits and searches, the platform seems to provide a service that many parents find useful.

The transparency provided by this platform also revealed that the local supply for out-of-school learning continues to have some important gaps. Access to learning opportunities, at least as presented on the B4SCO website, is improving, but the city's Hispanic and black families live in communities with less access to this programming relative to their white peers. The programming that provides full-day coverage is limited in the city, and the hourly cost of half of the programming offered costs more than the local minimum wage, forcing parents into challenging logistics and financial tradeoffs.

This critical assessment of the supply of out-of-school learning, however, shows what may be one of the most impactful benefits of the B4SCO: the ability to assess the landscape for out-of-school learning. Few cities have the opportunity to see the landscape of learning opportunities throughout their region. Providers typically have little to no sense of what other activities are being offered in their communities. City leaders have no measurable sense of which students have opportunities and which do not. Without this information, it is difficult, if not impossible, to make strategic decisions about how to improve access and opportunity for the students who most need it. The Denver area is at a great advantage in having these data.

Acknowledgments