



NYPL Equity Ratio

A metric construction story

R IPL: From Insight to Action

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NYPL Strategy and Public Impact

New York Public Library

- Serves 3 of New York City's 5 boroughs: The Bronx, Manhattan, and Staten Island
- Service area population: 3.5 million (out of NYC's 8 million)
- Census tract median household income ranges from under \$15K to above \$250K and poverty from under 1% to above 65%
- 87 circulating branches, 3 bookmobiles, 3 research centers

Branch usage:

- Circ: 17M/year (checkouts & renewals of physical & e-materials; other e-resource use)
- Visits: 8M/year
- Program Attendance: 1.2M/year
- Public computer sessions: 1.3M/year

Tracking equity at NYPL

Metric Objectives

- Create a **metric** for the Library to track its progress on Equity & Access across various services and programs
- Understand what contributes to service equity and what drives changes
- Create opportunities to brainstorm actions that further equity & access
- Monitor the effects of interventions and service model changes

Equity & Access

What's a metric?

- Calculated from underlying data to help us understand or monitor a phenomenon
- Based on documented data pipeline - raw data, cleaning pipeline, transformed granular data
- Documented metric construction & calculation
 - Time period
 - Groups - consistent across metric calculations
 - Filters - what is/is not included (of the cleaned granular data)
 - Any transforms/calculations/use of outside data/norming***
- Simple counts (not so simple)
 - Borrowers (where to count them when they use more than one branch? More than one mode?)
 - Visits (how to handle broken cameras? How to document that?)
- Simple calculated metrics
 - Share of checkouts from holds
 - Ratio of checkouts to renewals

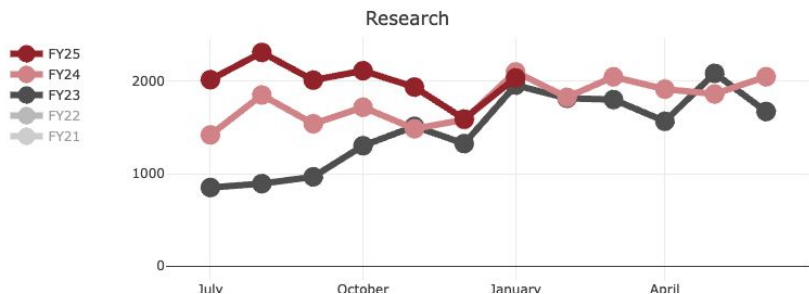
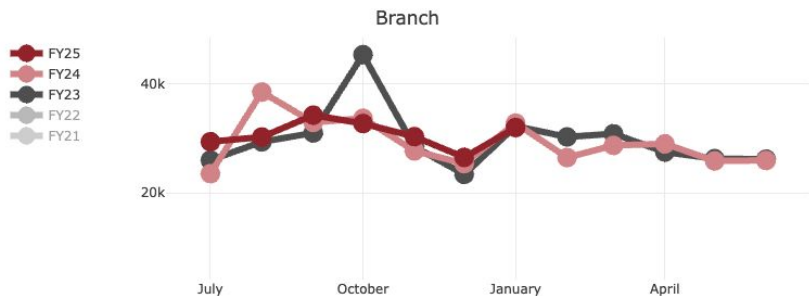
Cards Created

Monthly Full System

Equity Ratio

Breakouts

These plots show the number of cards created by month. Cards are designated Branch or Research based on the card's home library at creation. Digital cards created with the default "e-branch" are included in the Branch counts.



Domain	Cards		
Name short	cards_created		
Short definition	Number of non-temporary cards created		
Data source and calculation	BIC patron_info table; Cards with create date within given time frame, excluding ptype 7 cards and department cards (ptypes 103, 104, 105, 106, 130)		
Aggregation update approach: append or replace	Append		
rollup calc	sum		
mode	Mode is based on ptype at creation: ptypes 1 through 9 are considered digital, all others physical		
branch code	Branch code is based on home library at creation -“Core” home library used (first two letters of location code) -mm/cc switched to sn -my retained (which means we have cards with all of my, lp, and pa) -Invalid branches set to NA -If “at creation” value is NA and current home library is not, use current “core” home library		
age	Age is based on the card ptype at creation as translated to age level, consistent with age categories for borrower and computer user metrics		
branch_or_research	Branch/research is based on home library at creation, consistent with other core metrics		
Notes	See Card metric definitions for more discussion		

Equity Ratio

- For a given set of patron usage: Ratio of per-capita usage in Higher Income neighborhoods to per-capita usage in Lower Income neighborhoods
- Allows you say: Usage is [X] times greater in our Higher Income neighborhoods
- Because it's a ratio, can compare multiple different usage types and can look at inequality trends over time
- Designed at each step to be interpretable

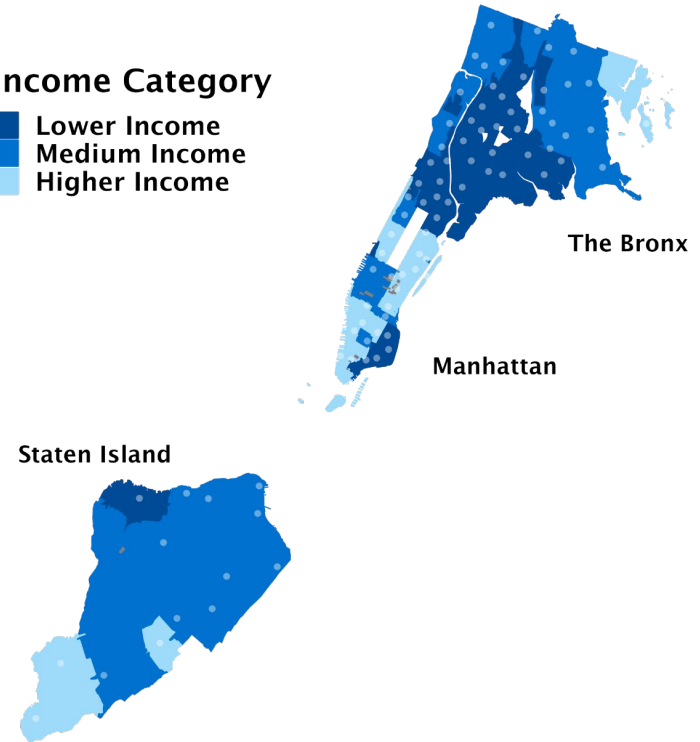
Income categories

Break NYPL service area into income categories

- *Lower Income*: median income below \$50,000 and/or poverty above 20%
 - Branches: 37; population 1.61M; share of total population 46%; share of Child population 55%
- *Medium Income*: median income between \$50,000 and \$100,000 and poverty below 20%
 - Branches: 30; population 1.15M; share of total population: 34%; share of Child population 28%
- *Higher Income*: median income above \$100,000 and poverty below 10%
 - Branches: 19; population .77M; share of total population: 22%; share of Child population 17%

Income Category

- Lower Income
- Medium Income
- Higher Income



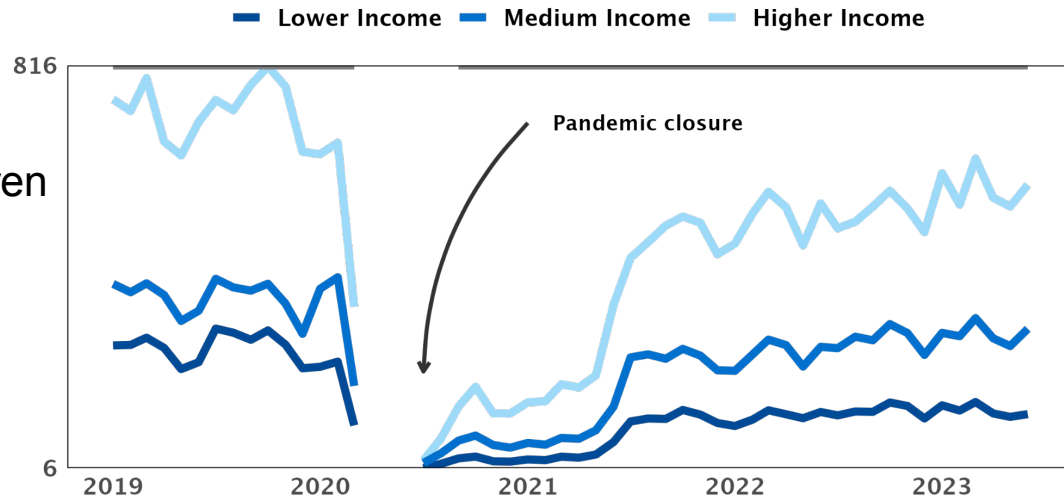
Per capita usage

Calculate usage per capita in each neighborhood type

Calculate per capita usage by neighborhood income level

- Example of children's print checkouts - per thousand children 0-12 yo
- Much higher in higher income communities, lowest in lower income ones

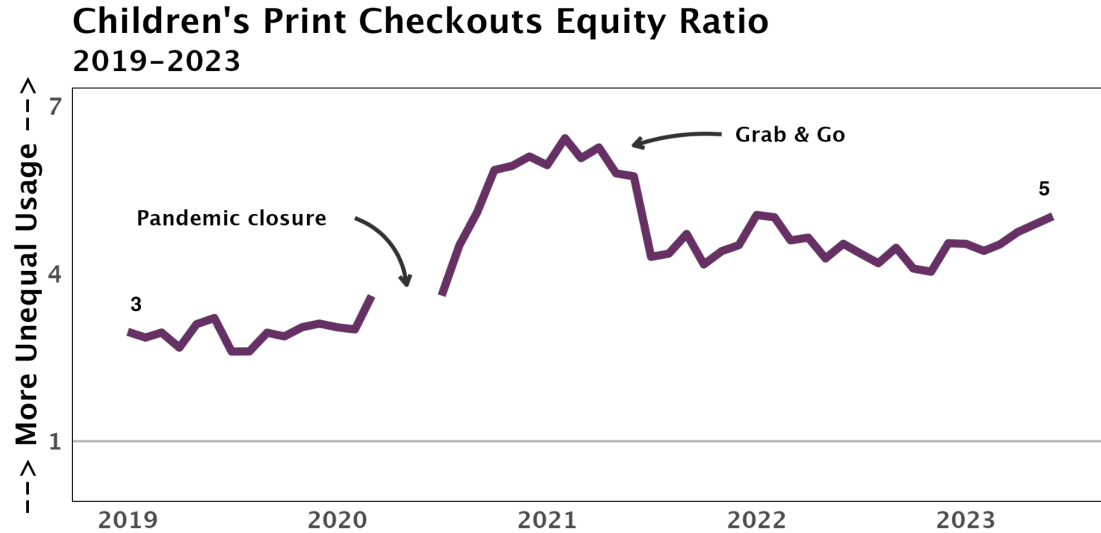
Checkouts per 1K Children
2019-2023



Equity Ratio

Ratio of per capita usage in higher vs. lower income communities

- Example: children's print checkouts - per thousand children 0-14 years
 - 2021 ratio is 6+
 - 2023 ratio is 4+
- Ratio of 1 means equitable utilization

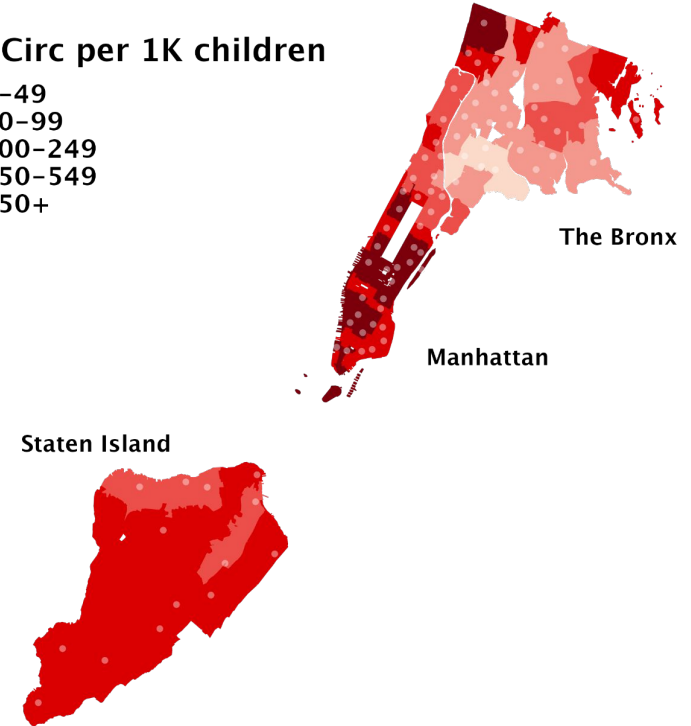
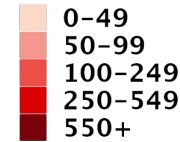


Activity by income category

Assigning activity to income categories

- Where possible (borrowing activity, in-branch computer usage), use the demographics of the patron's zip/census tract
- For branch-level usage (visits, programs, collections), use the aggregate income level of the branch's service area
- Means we can look more granularly at patron-level metrics but not branch-level metrics

Juv Circ per 1K children



Equity ratio across services

Ratio of per capita usage in higher vs. lower income communities, FY24

Usage metric	Equity ratio
e-materials checkouts	4.8
physical materials checkouts	2.8
new library cards	1.3
branch visits	1.7
program attendance	1.1
computer sessions	0.7

An institutional metric

NYPL Core Metrics

The visualizations below show monthly NYPL core activity metrics for the current and previous fiscal year. To see data for years before that, click on the year in the legend to the left of each plot. Hover or click on a data point to see its value, comparison to prior years, and YTD and quarterly total calculations.

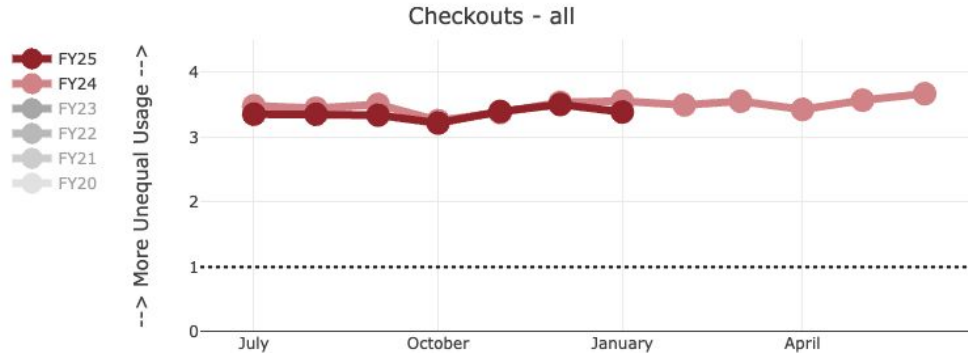
Checkouts

Monthly Full System

Equity Ratio

Breakouts

The equity ratio is calculated for branch checkouts (e and physical) based on the income level of the borrower's census tract (if available) or zip code. It differs from the borrower equity ratio above in that it uses the count of checkouts rather than the count of unique borrowers with a checkout.



Network of Interconnected Barriers

- **Fines**
 - Patrons in low income neighborhoods comprised 10% of all active patrons, but 33% of all patrons with fines, and 56% of patrons with fines over the account block threshold
- **Holds**
 - Patrons in higher income neighborhoods are 70% more likely to use holds at least once within a year; hold share of checkouts is 60% higher in higher income neighborhoods
- **Floating & Collection Equity**
 - Branches in lower income neighborhoods experienced net collection loss under floating and those in higher income neighborhoods experienced net gain
- **Language Accessibility**
 - 47% of New Yorkers in our catchment area speak a language other than English at home; 30% are foreign born; 18% have limited English proficiency
- **Access**
 - Most branches aren't open Sundays, close by 6 or 7 PM on weekdays
 - Most cards require formal ID and proof of address

Current Library Initiatives

Driving Question: How do we can we make our services and resources accessible to the communities that need and use us the most?

- Fine elimination
- Library Cards
- Books in the Home
- Language Accessibility
- Lucky Day Collections (suppressing holds)
- Pausing floating

Resources

- [Equity Ratio Analytical Framework](#)
- [Equity Ratio Technical Resources](#)

Thank You!

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