Trends in Toronto's Licensed Childcare Centres: Analyzing Age Group Capacity and Availability Disparities*

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This study investigates the distribution of licensed childcare spaces across Toronto, focusing on age group availability and provider types (AUSPICE). The analysis highlights a significant shortage of infant spaces, with the majority of capacity allocated to preschool and school-aged children. Non-profit organizations manage the bulk of childcare centers, reinforcing their critical role in providing accessible care. However, the limited availability of infant spaces, particularly among commercial and public providers, signals the need for policy interventions to address the gaps in early childhood care. These findings build on Cleveland's (2018) work on childcare affordability and accessibility in Ontario.

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*A GitHub Repository containing all data, R code, and other files used in this investigation is located here: https://github.com/jeno0403/Licensed_Child_Care.git

1 Introduction

Childcare is a fundamental service that supports both the developmental needs of children and the economic participation of families. In urban centers like Toronto, the availability of licensed childcare spaces plays a critical role in facilitating early childhood education and allowing parents, particularly mothers, to engage in the workforce. However, despite the increasing demand for childcare services, the distribution of licensed childcare spaces remains uneven across different age groups and geographic areas. This project analyzes the allocation of childcare spaces in Toronto, focusing on key age groups, including infants, toddlers, preschoolers, and school-aged children, to identify gaps in service provision and potential areas for policy intervention (Cleveland 2018).

The demand for childcare services in Toronto has been steadily rising, driven by population growth and changing workforce dynamics. As Cleveland (2018) notes, access to affordable and high-quality childcare is essential for families, particularly those with young children. However, the high cost of childcare in Ontario remains a significant barrier for many families, especially in lower-income neighborhoods. Studies by Pennerstorfer and Pennerstorfer (2021) emphasize that spatial inequalities in the availability of childcare services exacerbate these challenges, as families in underserved areas are often left with fewer and more expensive options (Pennerstorfer 2021).

Despite efforts to expand the availability of childcare services, certain age groups, particularly infants and toddlers, remain underserved. Providing care for infants requires higher staff-to-child ratios and specialized facilities, making it more expensive and less profitable for providers. Gershon and Moon (1997) highlight the difficulties in providing infant care due to these regulatory and operational challenges. The scarcity of spaces for younger children not only limits access to critical early developmental support but also creates challenges for parents seeking to re-enter the workforce after childbirth (Gershon and Moon 1997).

To address these gaps, this project employs data visualization and statistical techniques to analyze the distribution of licensed childcare spaces in Toronto. Using tools such as R (R Core Team, 2023), the tidyverse package (Wickham et al. 2019) and the kableExtra package (Zhu 2023), the analysis focuses on identifying disparities in the allocation of spaces by age group and management type. By drawing on data from the City of Toronto's Open Data Portal (Gelfand 2022), this study aims to provide policymakers with insights that can guide future investments in childcare services, ensuring that all families, regardless of income or location, have access to the resources they need (Alexander 2023).

2 Data

2.1 Overview

The dataset used in this analysis is sourced from Toronto's licensed childcare facilities and provides insights into the distribution of childcare spaces across various age groups. It includes data on the capacity of centers for infants, toddlers, preschoolers, and school-aged children, allowing for a comprehensive examination of available spaces. This dataset is publicly accessible as part of Toronto's open data initiative (Children's Services 2024) and is licensed under the City of Toronto's Open Data License. Proper attribution is required, as outlined in the appendix (Section A.3) (City of Toronto, n.d.b).

The dataset uses geographic coordinates (latitude and longitude) based on the NAD27 datum (North American Datum of 1927), a geodetic reference system commonly used in North America for regional datasets. NAD27 defines locations based on the Clarke Ellipsoid of 1866, with a fixed reference point in Kansas, and was widely used before more modern datums like NAD83 and WGS84 became prevalent (National Oceanic and Atmospheric Administration n.d.).

Key variables in this analysis include "Center Type," which categorizes centers as non-profit, commercial, or publicly operated; "Age Group," which identifies the age groups served (infants, toddlers, preschoolers, school-aged children); and "Number of Spaces," representing the capacity of each center (Children's Services 2024).

During a search of the City of Toronto's Open Data Catalogue (City of Toronto, n.d.a), two relevant datasets related to childcare services were identified. However, one of these datasets, "Child Care - Licensed Child Care Spaces," is somewhat outdated, as it includes data only up to 2019.

For this analysis, the R programming language (R Core Team 2023) and the tidyverse package (Wickham et al. 2019) were utilized for data manipulation and visualization. The opendatatoronto package (Gelfand 2022) was employed to download the raw dataset. Once obtained, the dataset was cleaned and prepared using tidyverse, and the final version was used to generate visualizations highlighting the distribution of childcare spaces across different age groups in Toronto (Wickham et al. 2019).

2.2 Results

Table 1: Preview of the First 3 Columns of the Child Care Data (First 6 Rows)

Facility ID	Location Name	Auspice
1013	Lakeshore Community Child Care Centre	Non-Profit
1014	Alternative Primary School Parent Group	Non-Profit
1015	Cardinal Leger Child Care Centre (Scarborough)	Non-Profit
1016	George Brown - Richmond Adelaide Childcare Centre	Non-Profit
1017	Woodland Nursery School (Warden Woods Community Centre)	Non-Profit
1021	Centennial College Progress Campus Child Care Centre	Non-Profit

After loading the dataset using the R programming language (R Core Team 2023), the tidyverse (Wickham et al. 2019), knitr (Xie 2023), and kableExtra (Zhu 2023) packages were used to generate and format tables and graphs. In doing so, R code was adapted from Alexander (2023).

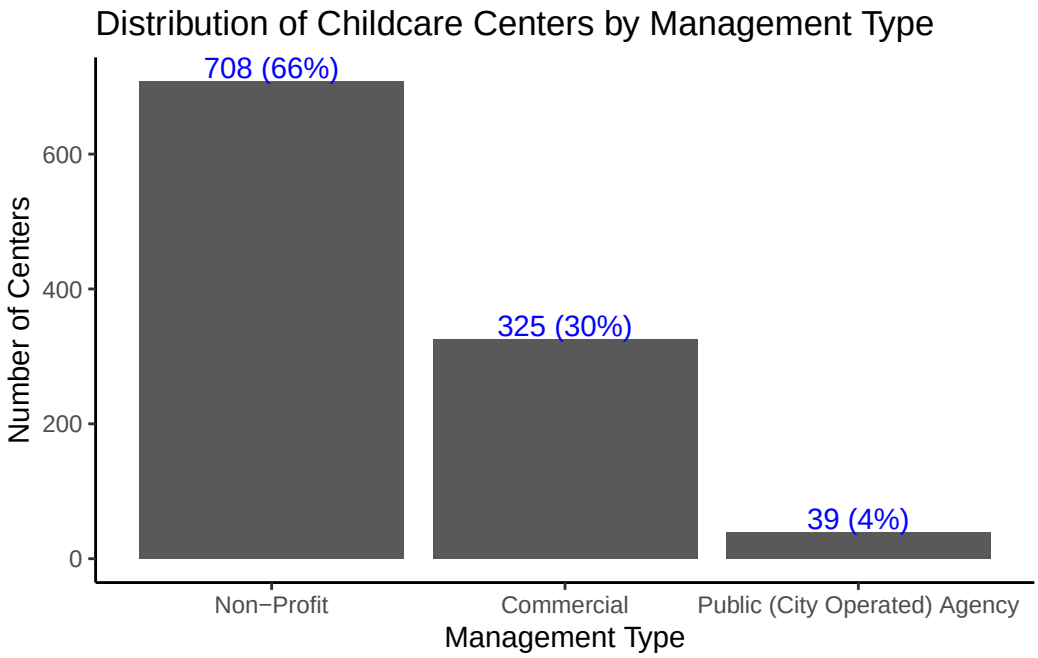

Figure 1: Number of childcare centers by management type in Toronto in 2023

Figure 1 illustrates the distribution of licensed childcare centers in Toronto by management type in 2023. Non-profit organizations manage the majority, approximately 66%, reflecting the city's emphasis on accessibility and public service. Commercially run centers account for 30%, while publicly operated centers represent only 4%. This breakdown highlights the dominant role of non-profits in providing affordable and accessible childcare, as discussed by Cleveland (2018). Similar trends in public and non-profit childcare systems have been explored in Washington State (Miller and Schrager 2000). Additionally, the focus on childcare structure may influence critical areas like infant care practices, as noted by Gershon and Moon (1997).

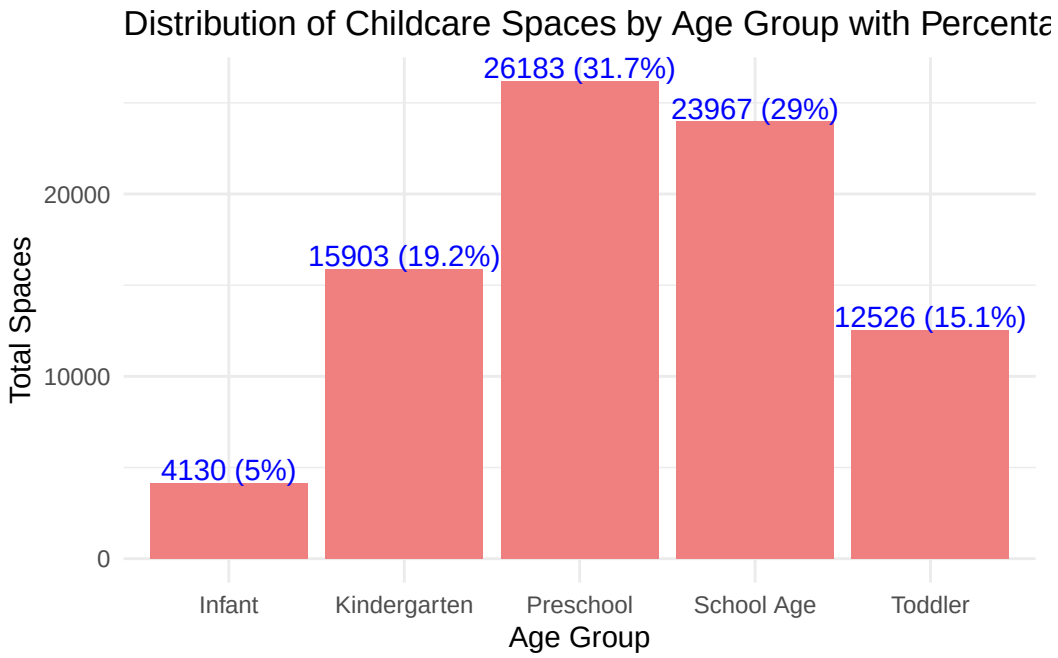

Figure 2: Distribution of childcare spaces by age group in Toronto in 2023, with percentage labels.

Figure 2 shows the distribution of childcare spaces across different age groups in Toronto. Preschool-aged children have the highest number of spaces, comprising 31.7% of the total, followed closely by spaces for school-aged children, which account for 29%. Toddler spaces make up 15.1%, and kindergarten-aged children represent 19.2% of the total spaces available. Spaces for infants are the fewest, representing only 5% of the total. This distribution reflects the higher demand for preschool and school-age childcare services, as noted in studies such as Cleveland (2018), highlighting the need for targeted investment in early education and childcare accessibility.

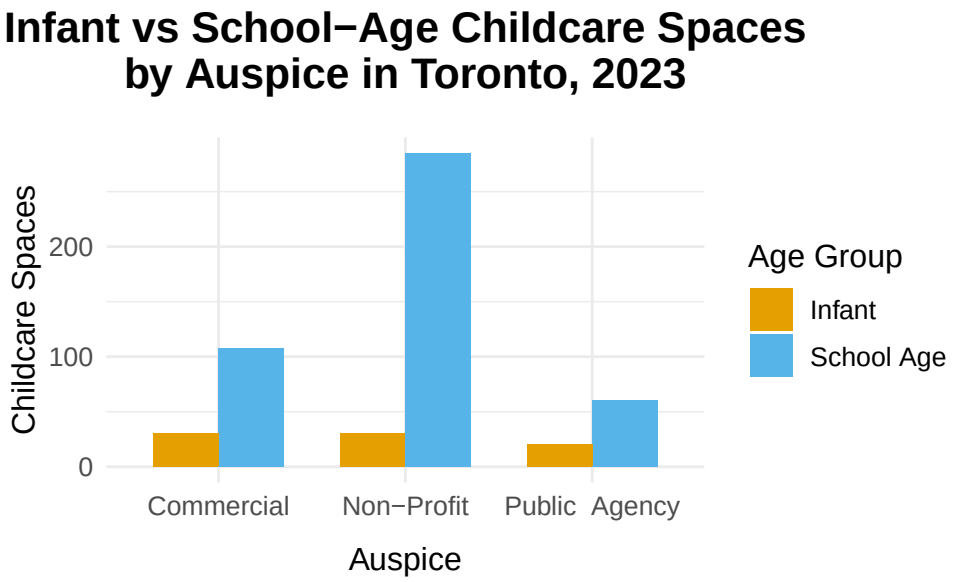

Figure 3: Infant vs School-Age Childcare Spaces by Center in Toronto, 2023.

Figure 3 compares Infant and School-Age childcare spaces by management type in Toronto (2023). Non-Profit centers allocate the most spaces, particularly for School-Age children, while Commercial centers also favor School-Age spaces but on a smaller scale. Public (City Operated) Agencies offer the fewest spaces overall, maintaining the same trend. This reflects an emphasis on care for older children across all types, consistent with findings in other cities see Cleveland (2018), while Infant spaces remain limited due to higher costs and resource needs Miller and Schrager (2000).

3 Discussion

The analysis of Toronto's licensed childcare centers reveals significant disparities in how childcare spaces are distributed across different age groups and management types. This issue is clearly illustrated in the three figures. As shown in Figure 1, non-profit organizations dominate the management of childcare centers, accounting for 66% of all centers. This aligns with research by Cleveland (2018), who underscores the importance of non-profit organizations in providing accessible and affordable childcare services. These services are crucial for low-income families, as noted by Pennerstorfer (2021), who emphasize the role of non-profits in mitigating spatial inequalities and offering affordable care. The limited presence of public childcare centers (only 4%) raises concerns about the government's ability to meet growing demand, a point further supported by Mahon (2007), who argues that stronger political advocacy is required to ensure equitable access to childcare services in Toronto.

Moving to the distribution of childcare spaces by age group, Figure 2 highlights a clear empha-

sis on preschool and school-age children, with these two groups accounting for 31.7% and 29% of the total spaces, respectively. This trend reflects a broader focus on early childhood education and after-school programs, which are essential for supporting working families. However, the stark shortage of infant spaces (only 5% of the total) is concerning and echoes findings from Cleveland (2018), who points out that infant care is particularly challenging due to higher regulatory requirements and the need for a lower staff-to-child ratio. Similarly, Gershon and Moon (1997) highlights the specialized nature of infant care, including health and safety considerations that make it more costly and less profitable for providers, further contributing to the shortage.

Figure 3 reinforces these findings by comparing the availability of infant and school-age spaces across different management types. School-aged children have more available spaces across all management types, particularly in non-profit centers, whereas infant spaces remain consistently low across all types. This critical gap underscores the need for more targeted policy interventions to address the shortage of infant care services. Similar challenges have been identified by Bernal et al. (2019) in Colombia, where the transition from home-based to licensed childcare has raised concerns about both availability and quality, particularly in terms of health and developmental outcomes for young children.

The impact of childcare accessibility on labor market participation is another critical concern. Landivar et al. (2022) suggests that limited access to affordable childcare continues to restrict the labor force participation of mothers, particularly those in lower-income families. Although subsidies can help alleviate some financial burdens, as discussed by Bettendorf et al. (2015), they do not fully address the access issues, particularly for infants and toddlers. This is an area where Toronto's childcare system could benefit from policy interventions aimed at increasing both affordability and availability.

Additionally, research by Zick, Kowaleski-Jones, and Greenwalt (2022) shows that parental decisions about childcare are influenced by the proximity of care to their home and the quality of services offered. This is particularly relevant in densely populated urban areas like Toronto, where the demand for high-quality, accessible childcare exceeds supply. The findings of this study align with those of Zick, Kowaleski-Jones, and Greenwalt (2022), suggesting that parents in Toronto face similar challenges, with many struggling to find appropriate care within a reasonable distance from their homes.

In conclusion, this study reaffirms the findings of previous research (Cleveland (2018); Pennerstorfer (2021); Gershon and Moon (1997)) while offering new insights into the capacity and age-related disparities in Toronto's licensed childcare centers. The limited availability of spaces for infants and toddlers remains a critical issue that requires targeted policy intervention. As Mahon (2007) argues, political advocacy will be essential in ensuring that the city's childcare system evolves to meet the needs of all families, particularly those who are currently underserved. Further research is needed to explore the impact of these disparities on both children's developmental outcomes and parents' employment opportunities.

A Appendix

A.1 Dataset and Graph Sketches

Sketches depicting both the desired dataset and the graphs generated in this analysis are available in the GitHub Repository.

A.2 Data Cleaning

The data cleaning process involved filtering out some of the columns from the raw dataset and renaming some of the data entries for clarity and simplicity.

A.3 Attribution Statement

"Contains information licensed under the Open Government Licence – Toronto" (City of Toronto, n.d.b).

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