A Socio-Spatial Analysis of Communities Affected by Public School Closures in Ontario

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Abstract

The prevalence of public school closures in Ontario is growing. Though schools provide extensive social benefits for communities they, the current Ministry of Education (MOE) model for determining school closures called Pupil Accommodation Review Guidelines (PARG), principally relies on economic efficiency as criteria. In response to growing concern surrounding the inequity of the current model – with apprehension that vulnerable communities are the disproportionate targets —a moratorium on school closures was declared in June 2017 to revamp the model. The proposed research aims to fill the existing gaps in data and research on Ontario school closures to inform the creation of a model that minimizes hardship on vulnerable communities. Specifically, this research will produce a comprehensive and publicly-available dataset of pending and completed school closure locations in Ontario since the

establishment of PARG in 2006 and a subsequent analysis that identifies socio-spatial inequities in Ontario school closures. This research will consist of four phases (school closure dataset creation; acquisition of community socioeconomic profiles; data harmonization; and spatial analysis) and will draw from Ontario public school board website archives for data creation and the 2017 Ontario Marginalization Index (ON-Marg), for existing socioeconomic data. This research will make important contributions to research, policy, and practice in its production of data and analysis that are presently non existent and its tremendous potential to influence policy that can protect vulnerable communities from the permanent loss of public schools.

Executive Summary

Schools are essential in creating healthy, sustainable and complete communities (Butler & Diaz, 2016). Despite the many ways communities benefit from schools, public schools are being closed in Ontario (People for Education, 2009). Closures have been found to have a range of negative impacts on communities, including lowered parental involvement and academic performance in students, reduced physical activity as a result of increased distance from school and more time commuting by bus or car, as well as diminished community vitality and capacity for growth (Valencia, 1984; Kirshner, Gaertner & Pozzoboni, 2010; Eyre and Finn, 2002; Witten et al., 2001; Lipman & Haines, 2007). The growing trend of school closures in Ontario have been thoroughly covered in the media however, there is currently no publicly available record detailing where and how many school closures are occurring in the province, making it impossible to validate these claims. This information gap is the basis of the main objectives of this research.

This study has two principal objectives. The first is to create a comprehensive, spatially-referenced Ontario public school closure dataset for the 2010 to 2018 timeframe. The second is to understand where closures are occurring in Ontario and equally, the socioeconomic and geographic characteristics of affected communities and how they compare to communities that have not been recently affected by closures.

Two achieve these objectives, this report addresses the following research questions:

1. What is the scope (i.e., how many, when, where) of school closures in Ontario since 2010?

2. How do closed schools differ from open schools in Ontario in terms of school board type and school language?

3. How do the geographic profiles of the communities in which closed schools are situated differ from those in which open schools are situated?

4. How do the deprivation profiles of the communities in which closed schools are situated differ from those in which open schools are situated?

5. To what extent can school closures in Ontario be predicted by school board type, school language, geographic profile, and deprivation profile?

A quantitative analysis approach was employed to answer the research questions. Data on open schools were acquired online, while a Freedom of information (FOI) request was filed for closed school data. The postal codes of both open and closed school data was processed through Postal Code Conversion File Plus (PCCF+) to be assigned dissemination area (DA) codes. Once the DAs for all closed and open school communities were identified, the dataset was then linked to an existing dataset on area-level deprivation. Once acquired and harmonized, data was analyzed in SPSS using descriptive statistics and binary logistic regression, and mapped using ArcGIS.

Analysis of school closures by year revealed that between 2010 and 2016, school closure rates have been relatively consistent, and that there is little difference in the proportions of open and closed schools by language or board type. Closed schools were, however, significantly more likely to be located in small and rural communities, and in deprived communities. Indeed, binary logistic regression revealed that of all independent variables, the strongest predictors of school closures were community type and 2006 deprivation index quintile (both material and social), respectively.

Given these findings as well as study limitations and points raised in the literature review, the report provides four policy considerations, as follows.

1. Increase community engagement and collaboration in school closure decision-making process;

2. Account for geography in the current funding formula;

3. Introduce community reliance on schools as a formal metric in accommodation reviews;

4. Consider the long-term, community-level impacts of school closures.

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Chapter 1: Introduction

I.   Background

Public schools are more than educational institutions; they are central to enabling and preserving healthy and stable communities (Butler & Diaz, 2016). In Ontario for instance, public schools host a number of community programs including youth violence prevention, poverty reduction, and early education (Clandfield & Martell, 2010). Nonetheless, public school closures are on the rise in Ontario, with 58 schools slated for closure in 2017 alone (People for Education, 2016). These school board decisions have been directed by the Ministry of Education's (MoE) *Pupil Accommodation Review* (PAR) model (MoE, 2015), which was introduced in 2016. While the effects of school closures on communities inevitably vary, the loss of these critical public assets can expose already materially and socially-deprived communities (e.g., low-income, rural) to undue hardship. And increasingly, there has been public concern that deprived communities in Ontario are being disproportionately targeted for school closures (MoE, 2017), given the model's heavy emphasis on economic efficiency above long-term social impacts on community livability (Schmidt, Murray & Nguyen, 2007), and a per pupil funding formula that favours schools with large student enrolments (REF).

Despite these concerns, there is a lack of concrete evidence regarding the socioeconomic and geographic profiles of communities in which schools are being closed because there is no comprehensive and publicly available dataset that specifies the location of public school closures in Ontario. To its credit, the ruling provincial government at the time acknowledged the flaws of the PAR model and declared a moratorium on school closures in June 2017 to provide the MoE time to revamp the model (MoE, 2017). While a new version of the

guidelines were released in 2018, the moratorium remains in effect to this day, as the new government of Ontario determines how it will proceed with school closure processes. The current scenario presents a rare and timely opportunity to identify socio-spatial inequities in Ontario public school closures, which can inform a new approach to school closure decision-making that minimizes hardship to already vulnerable communities.

II. Research Objective and Questions

The purpose of this research was to document the spatial relationship between public school closures and the socioeconomic and geographic profiles of affected communities in Ontario, through the creation and subsequent analysis of a comprehensive dataset of public school closure locations over an 8-year period ending in 2018. The analysis aimed to ascertain whether socio-spatial inequities in Ontario school closures exist, to inform the creation of a decision-making model that minimizes hardship to materially and socially-deprived communities.

The research was guided by the following questions:

1. What is the scope (i.e., how many, when, where) of school closures in Ontario since 2010?

2. How do closed schools differ from open schools in Ontario in terms of school board type and school language?

3. How do the geographic profiles of the communities in which closed schools are situated differ from those in which open schools are situated?

4. How do the deprivation profiles of the communities in which closed schools are situated differ from those in which open schools are situated?

5. To what extent can school closures in Ontario be predicted by school board type, school language, geographic profile, and deprivation profile?

III.   Temporal and geographic scope of work

This study retrieved data on all publicly funded (i.e., public and catholic) elementary, middle, and secondary school closures that have occurred in Ontario between 2010 and 2018, as well as all currently open and operating public schools in Ontario. Both English and French public school boards were included in the analysis, which constitutes a total of 83 school boards (MOE, 2018). Geographic profiles of the communities in which closed and open schools were/are located were drawn from 2016 Census data, courtesy of the PCCF+. Socioeconomic profiles were available through the Deprivation Index developed by Canadian researchers, Gamache, Pampalon and Hamel and made available on the Quebec National Institute of Public Health website (INSPQ) and the dataset was linked to deprivation quintile data from 2006 and 2016.

IV.   Study Methods

This research employed a quantitative analysis approach and was completed in five phases: closed and open school dataset creation; acquisition of community socioeconomic profiles; data harmonization; spatial analysis; and mapping. The creation of a geo-coded dataset of Ontario public school closures from 2010 to 2018 constituteed Phase 1. Data for Phase 2 drew from Pampalon's existing Deprivation Index, which establishes an index using six socioeconomic indicators from the Canadian census to document social and material deprivation at the dissemination area level for all census years between 1991 and 2011 (1991, 1996, 2001, 2006 and 2011) (Gamache, Pampalon, & Hamel, 2010). In Phase 3, school closure

data was harmonized with Deprivation Index data to enable socio-spatial analysis. Phase 4 relied on SPSS software to determine whether correlations between material and social aspects of deprivation and school closures exist. Mapping in Phase 5 used ArcGIS to produce visualizations of correlations and findings derived from quantitative analysis in Phase 4.

V.   Report Structure

This report is organized into five sections: Introduction, Literature Review, Methodology, Results and Discussion and Recommendations. The Literature Review section reviews existing literature on Ontario public school closures, including the importance to schools to communities, the general and community-specific impacts of school closure, the history of the Ontario public school funding formula, and the closure decision making process. The Methodology section will outline the data collection, harmonization and analysis methods utilized in this study. The Results section will review the findings generated from analyzing the 2010 to 2018 Ontario school closure dataset. The Discussion and Recommendations section will review study findings as well as provide policy and research recommendations.

Chapter 2: Literature Review

The role of public schools in communities surpasses the provision of education; these institutions are fundamental in maintaining community well-being, health and sustainability. Though the importance of schools to communities has been widely accepted by academics, planners and policy makers alike, public school closures are on the rise in Ontario. This chapter will discuss the value of schools to communities, the context of public school closures in Ontario, and the gaps in our knowledge about the scope of school closures in Ontario.

The Value of Schools to Communities

Public schools are more than educational institutions; they are central to enabling and preserving healthy and stable communities (Butler & Diaz, 2016). This section details the roles of schools in communities and how these roles vary according to the geographic and socioeconomic contexts of communities. The implications of school closures for communities are also discussed.

Complete communities and the importance of schools

The notion of complete communities has recently proliferated within Canadian planning legislation, at both municipal and provincial levels (City of Airdrie, 2009; City of Barrie, 2011; City of Calgary, 2009; Town of Markham, 2005; City of Surrey, 2010). Recognized as a tool for developing successful communities, 'complete communities' is an urban and regional planning concept that promotes the development of communities that "are well-designed, offer transportation choices, accommodate people at all stages of life and have the right mix of housing, a good range of jobs, and easy access to stores and services to meet daily needs." (Grant & Scott, 2012). Founded on principles of community health and sustainability, this concept

emphasizes the importance of civic facilities—namely schools—in the development of complete, integrated communities (Pivo, 2005). Evidence of the importance of schools to communities is not limited to literature on complete communities. A subject of extensive study, the importance of schools to communities, especially in their contribution to community health and well-being, has been widely recognized by academics (Botchwey, Trowbridge & Fisher, 2014; Kearns et al, 2009; Garcia, Flores & Chang, 2003).

Some research suggests that schools play a critical role in the development and maintenance of strong, cohesive community networks. Studying the role of schools in the New Zealand community of South Taranaki, Kearns et al. (2001) found that—by drawing people with "common needs and life stage experiences of parents and young children" together in public places— schools "provide informal meeting places, outside home and work, where social relationships can be formed and maintained" (p. 308). In this article, Kearns et al. (2001) stresses that sustaining social networks in which local news and information is circulated, emotional support is given and the sharing of parental responsibilities is negotiated is challenging without community schools. An Ontario researcher arrived to comparable conclusions. Studying the role of schools in urban and rural Ontario contexts, Irwin (2012) also concluded that schools are catalysts in community building. Specifically, Irwin found that schools were foundational in enabling community cohesion by acting as the common ground in which in which relationships were formed and community events were hosted. Similarly, by examining the impacts of school closures on communities, Bushrod (1999) found that school closures resulted in the "reduced socialization and social control" of affected communities, which further emphasizes the role of schools in maintaining the social vitality of communities (p. 124).

Other researchers have found that schools contribute to the physical health of communities. For instance, a study conducted by Garcia, Flores and Chang (2003) identified the local school archetype as the "ideal setting for physical activity and education to address health, fitness and nutrition" (p. 1288). Beyond serving their intended educational purpose, this study highlights the importance of schools as locales for physical activity and recreation. Additionally, several studies suggest that proximity to school is associated with positive outcomes in the physical health of school-aged children. Ramanathan et al. (2014) found that schools play a fundamental role in physical health and well-being by promoting active travel, with parents and children actively travelling to school reporting more positive health outcomes than those relying on passive travel. Meanwhile, Eyre and Finn (2002) found that West Virginia students with longer bus commutes to school were significantly less physically active and less likely to engage in extracurricular activities than students residing within walking distance from school.

A number of studies have shown that schools carry a symbolic importance to the communities they serve. This was a key finding of Irwin's 2012 study. Interviews with individuals affected by community school closures demonstrated that schools were described to have more than material significance; they were fundamental in preserving community identity and pride and were described to be "an essential element of the community's DNA" (p. 146). Similarly, Witten et al. (2001) argue that schools are well-suited to be symbols of community identity. Because schools host a considerable number of experiences and interactions between community members and play an instrumental role in preserving community cohesion, community identity will likely become associated with its school over time. Meanwhile, Kearns et al. (2009) suggest that for a number of communities, schools preserve a community's past or in other words, are "markers of

community history" as a result of their long-standing physical presence and unique capacity of enabling social togetherness in communities (p. 136).

Importance of schools to communities different geographic and socioeconomic contexts

A growing body of literature claims that the importance of schools and the roles they assume varies based on the geographic and socioeconomic contexts of communities. Some researchers for instance, assert that schools play a distinct role in rural communities. Fredua-Kwarteng (2005) found that relative to their urban counterparts, rural communities were more reliant on their schools. Because the number of public institutions has been dwindling in many rural communities, rural schools assume broad roles in these communities, serving as meeting places and venues for hosting community programming and events for instance. Fredua-Kwarteng (2005) claims that closures "would affect the life of those communities" (p. 9).

Other studies have linked the presence of schools in rural communities with socioeconomic well-being and stability. In a study comparing the characteristics of rural communities with schools and without schools, Lyson (2002) determined that rural communities with schools had higher housing values and better quality municipal infrastructure and employment opportunities than those without schools. Additionally, a number of studies explain that having a school is necessary for the future growth and prosperity of rural communities (Peshkin, 1978), and that schools play a large role in attracting new families and local businesses and services to rural communities (Witten et al., 2001; Dreier, 1982; Autti & Hyry-Beihammer, 2014). Additionally, the well-being of low income rural communities is more heavily associated with the presence of local schools. In their work, Witten et al. (2001) explain that schools in poorer rural communities provide all community members with "emotional and informational support" (p. 309). They conclude that for these communities, school closures would "conceivably have

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greater impacts on [their] well-being…because of the cost and mobility barriers to other forms of community contact and resources" (p. 309).

Schools are also essential to urban communities, especially those experiencing poverty, as they provide venues for recreation that may otherwise not be available. By studying the inequities in distribution of parkland and open spaces in low-income urban areas for example, Garcia, Flores and Chang (2003) concluded that schools constitute rare sites for play and physical activity in otherwise built-up, underserviced areas. Similarly, Maddock et al. (2008) highlight the importance of schools in creating recreation and physical activity opportunities and promoting health among low-income, urban youth and their communities. In response to significant disparities in parkland, open space and recreation facilities in an urban Honolulu community, Maddock et al. (2008) show how local schools can very effectively act as recreational hubs for deprived, urban communities (p. 1).

Urban schools also act as primary resource centers for vulnerable groups, providing a range of services and social supports. Accommodating high proportions of new Canadians and at-risk students, Anderson and Jaafar (2003) remark that urban schools are invaluable assets for urban communities as they provide language training, specialized education and homework support and adult education programs catered to community needs. Likewise, in their study of communities with large migrant populations and high poverty rates, Blank, Melaville and Shah (2003) found that public schools were increasingly becoming "social, educational and recreational anchors of their communities" (p. 12). Meanwhile, others have pinned urban schools as critical sources of stability in urban communities. Because urban communities are "often transitional in nature and delicately balanced in social and economic terms", Vincent (2006) points out that school loss could have devastating impacts on these communities. Similarly, Lee and Lubienski (2017)

explain that amidst significant instability experienced by "low-income urban youth" schools offer "stable environment[s] in which youth spend a large portion of their time" (p. 492).

General implications of school closures

Studies have shown that school closures can generate a range of effects on students, vis-à-vis decreased parental involvement, reduced academic performance, and longer commute times, and communities, vis-à-vis reduced community vitality and cohesion.

The effects of school closures on students have generated considerable study, especially in the USA. For instance, Valencia (1984) found that—following the closure of local schools— the parents of children attending these schools were less likely to engage in activities hosted by their new schools such as, "…parent-teacher conferences, school board meetings [and] field trips" (p. 19). Valencia explains that drops in parental involvement was the result of increased distance from school as well as reduced familiarity with parents, staff and school protocols (p. 19). Meanwhile, a U.S study on the closure of an urban high school revealed significant declines in the academic performance of students after transferring to other schools (Kirshner, Gaertner and Pozzoboni, 2010). A year earlier, De la Torre & Gwynne (2009) found that of elementary-school aged children that changed schools as a result of closures, "40 percent [were] on probation and 42 percent…were in the lowest quartile" of performance on a state-administered standardized test (p. 2). And, multiple studies have found that school closures result in long bus commutes for students to their new schools, leaving them with less time for recreation and exercise (Cohen et al., 2006, Eyre and Finn, 2002).

At the community level, school closures have been proven to have negative consequences on community vitality and growth. Regardless of the geographic and socioeconomic context of

communities, schools play a significant role in attracting new residents—namely those with children—and maintaining services and businesses (Witten et al., 2001; Autti & Hyry-Beihammer, 2014; Dreier, 1982; Bushrod, 1999). However, with the loss of these valuable social and physical assets, communities are prone to deterioration. Autti and Hyry-Beihammer (2014) explain that the closure of community schools "accelerates the withering of life in the surrounding [communities] and leads to a downward spiral in which the remaining services in the [communities] are terminated" (p. 13). This post-closure trend of community decline is also present in the work by Brasington (1999) in which it is affirmed that without schools, communities "could not develop successfully and hold its population" (p. 1). Similarly, closures were found to have negative impacts on community cohesion and weaken social ties between residents (Lipman & Haines, 2007; Witten et al., 2001).

The Context of School Closures in Ontario

Public school closures are on the rise in Ontario, despite a growing body of research demonstrating the costs such closures bring to students and communities at-large. There are many factors that have contributed to closures of Ontario's public schools; however, scholars and experts have identified the Province's public school funding formula and its closure decision-making methods as the principal culprits. These structures are described in detail below.

Ontario's Public School Funding Formula

Historically, public school boards in Ontario were funded through two sources; 60% of funds were in the form of provincial government grants, and the remaining 40% were generated by municipally generated property tax revenue (Ontario Ministry of Education [Document D], 2018). By the mid 1970s, however, significant cuts were made to government spending, resulting

in the provincial government's inability to uphold its funding commitment to Ontario public school boards (Mackenzie, 2007). This caused their contributions to fall well below 60% of total school board funding by 1975. At the same time, property taxes became an increasingly important revenue source as a result, with property tax revenues contributing far more than the intended 40% (Rozanski, 2002). This dependence on property tax revenues created significant resource inequities across school boards over time, reflecting inherent differences in municipalities' capacities to generate revenues to support public education. In response, the Conservative Harris government introduced the 'student-focused funding' formula in 1998 to address these growing fiscal inequities between Ontario's public school boards (O'Sullivan, 1999), and this funding formula remains in place to this day.

The principle objective of the 'student-focused' funding formula was to restore equity and fairness in the Ontario education system by ensuring that all students had access to quality education, regardless of where they lived in the province (Ontario Ministry of Education [Document D], 2018). To accomplish this, Ontario's school funding strategy underwent a complete transformation, which involved removing school boards' abilities to raise funds independently via property tax revenues (Anderson & Jaafar, 2003). Instead, the Province allocated funds in three streams. The first stream, which accounts for over half of total annual funding, is distributed on a per-student basis with each Ontario student being allocated a fixed amount of funds (Rozanski, 2002). The remaining two streams are distributed via grants. Special Purpose Grants provide funding for conditions and needs unique to school boards and students (Ontario Ministry of Education [Document C], 2018), which include differences in transportation, language, special education and staff training needs (Rozanski, 2002). The remaining funds are distributed under the Pupil Accommodation Grant, which provides funds for

the operation, maintenance and repair of school infrastructure (Ontario Ministry of Education [Document C], 2018).

Acknowledging its adverse impacts on school board budgets, the 1998 funding formula has been criticized for failing to adjust formula input costs and to account for differences in funding need across boards. According to Mackenzie (2007), formula input costs were based on 1997 pricing estimate data. Under this formula for instance, school funding for operations and maintenance was based on the average operations and maintenance cost per square foot of Ontario public schools in 1997. Despite measurable changes in costs over time— attributed to annual inflation and market force changes— this funding formula continued to rely on 1997 cost estimates to determine funding allocation. As a result, gaps between formula-estimated and actual costs arose and expanded over time, causing school boards' budgetary challenges to intensify (Mackenzie, 2007). School boards with above average funding needs – whether it be due to the cost of maintaining older infrastructure, providing extensive bus transportation or special needs support services or operating in harsh weather conditions – were hit hardest by this particular formula inadequacy (Rozanski, 2002).

Another common criticism of the 1998 funding formula is that it overestimates the impact of student enrollment on funding need. Over half of total allocated funds are distributed on a per-student basis (Ontario Ministry of Education [Document D], 2018). As highlighted by Mackenzie (2007), the required number of classes, level of staffing need and maintenance and operation costs of schools will be marginally affected, if at all, by moderate changes in enrolment. Consequently, boards experiencing declining annual enrolment are allocated less funds despite experiencing a lack of notable change in funding need, revealing a fundamental flaw of this funding strategy (Anderson & Jaafar, 2003).

Though the 1998 funding formula adversely impacts the budgets of all Ontario boards, some have been more impacted than others. Because student enrolment heavily dictates school board funding, communities and districts experiencing population decline are disproportionately affected by enrolment-related funding cuts (Rozanski, 2002). These communities are most often located in inner-city urban and rural areas, as Ontario becomes increasingly suburban and urban (Gordon, et al., 2018). Urban schools accrue costs associated with providing specialized programming and supporting high needs populations as well as elevated maintenance and repair costs associated with typically older infrastructure (Mackenzie, 2007). For instance, new Canadians often settle in denser urban areas, and as such, urban schools typically provide language training, special education and after school homework programs to support these populations. Urban schools are also typically responsible for providing adult education programs, which receive significantly less per student funding than its primary and secondary counterparts (Anderson & Jaafar, 2003). Meanwhile, the geographic conditions of rural and northern schools mean that they accrue above-average costs associated with student transportation, facility operations (i.e. heating, snow removal), and securing staffing and resources (Rozanski, 2002).

School Closure Decision-Making in Ontario

Guidelines for Pupil Accommodation Reviews (PAR) were first released in 2006 to replace Ontario's School Closure Guidelines (Ontario Ministry of Education, 2006). With the ultimate objective of optimizing students' academic experiences, the purpose of these guidelines was to provide standards that direct school boards' decisions regarding the future of their schools. The PAR guidelines provided minimum accommodation review requirements to ensure that evaluation criteria determining schools' futures and concurrent processes (i.e. school

closure/consolidation) were standardized and adhered to Ministry of Education (MoE) objectives. Additionally, these PAR requirements ensured that school board accommodation processes were efficient and transparent, enabled community engagement and adequately considered the value of schools to students, communities, school boards, and local economies in the overall decision-making process (Ontario Ministry of Education, 2006). Since their introduction, the PAR guidelines have been revised three times: 2009, 2015, and 2018 (Ontario Ministry of Education [Document B], 2018; Ontario Ministry of Education [Document E], 2015).

Early versions of the PAR guidelines were not well received by the communities it affected. Generally, Irwin (2012) found that communities often reported feeling as if their opinions were not represented in final decisions following the PAR process (Irwin, 2012). Fredua-Kwarteng (2005) described the general decision-making methods employed by the Ontario Ministry of Education as being top-down, fiscally-motivated, and lacking impactful, transparent public engagement. Indeed, though PAR legislation required school boards to engage with affected communities through public consultation and that the public comments be integrated into final reports (Ontario Ministry of Education [Document B], 2018), the legislation does not specify how or to what extent the board of trustees must consider public opinion. By assigning ultimate authority to school boards' trustees, Fredua-Kwarteng (2005) argued that decisions could effectively override public opinion to satisfy the Ontario Ministry of Education's economic goals. As a result, PAR processes have caused notable tension and confrontation between communities and school board officials (Irwin & Seasons, 2012), and have led to feelings of powerlessness among affected communities (Cranston, 2017). These tensions came to a head in

2017, leading the provincial government to declare a moratorium on school closures so that the PARG could be re-examined and revised (Ontario Ministry of Education, 2018).

A revised version of the PAR guidelines was released in April 2018, following consultation in 2017 and early 2018 with provincial and municipal government stakeholders, as well as those employed in education (Ontario Ministry of Education [Document A], 2018). Changes to the guidelines primarily involved public engagement, school board reporting, and supports for urban schools. Under the revised model, school boards are required to hold more public meetings over an extended consultation period (Ontario Ministry of Education [Document B], 2018). When an accommodation review is conducted for any given school, school boards must include three future scenarios for said school (one recommended scenario and two alternatives), and analyze the potential impacts of each scenario on student programming, student well-being, school board resources and the local community (Ontario Ministry of Education [Document A], 2018). In addition to these four impacts, scenarios developed for rural and northern schools must also address impacts on the local economy. Finally, the revision provides increased financial supports for urban schools, acknowledging that population growth in urban areas is exacerbating the financial pressures they experience (Ontario Ministry of Education [Document A], 2018). Though these changes show promise in improving the model's equity, the novelty of the revised PAR guidelines along with changes in government make it difficult to predict how it will be received by the public and how it will impact the future of Ontario's schools and communities.

Gaps in Knowledge about the Scope of Ontario Public School Closures

While the flaws in Ontario's school closure decision-making process have been well documented, what remains unclear is the full scope of school closures in Ontario since the PAR guidelines were introduced in 2006. Media coverage suggests that Ontario school closures are disproportionately occurring in rural and inner-city areas (People for Education [Document B], 2017). However, there is currently no publicly available record detailing where school closures have occurred in Ontario (CBC, 2018), making it impossible to validate this claim. As the owner of this data, Ontario's Ministry of Education restricts record access, requiring that interested parties file freedom of information requests that involve considerable processing times and fees (Ontario Ministry of Education, 2017). Although the issue has gained considerable media coverage (Cranston, 2017), there remains a need for comprehensive and reliable research on where school closures are occurring in Ontario, and the characteristics of the communities in which they are happening.

Chapter 3: Methodology

The purpose of this research was to document the spatial relationship between closures of publicly-funded schools and the socioeconomic and geographic profiles of affected communities in Ontario. To achieve this, a comprehensive dataset of Ontario school closure locations over an 8-year period ending in 2018 was created and subsequently analyzed using quantitative methods. The research was completed in five phases: literature review; school status dataset creation; acquisition of community socioeconomic profiles; data harmonization and modification; and, statistical analysis. These research phases are discussed in detail below.

I. Literature review

A thorough literature review was conducted to better understand the numerous factors that have shaped Ontario's current public education system. To that end, policy documents from the Ministry of Education on the public school funding formula and the Pupil Accommodation Review guidelines were reviewed. Scholarly literature on the impacts of school closures to communities was also retrieved from Google Scholar and the Queen's Library Database and reviewed. Of the peer-reviewed articles consulted, the majority were Canadian and American publications. International works were examined whenever the North American body of literature was insufficient.The search terms used to locate literature include but are not limited to: 'school closure', 'enrolment', 'school siting', 'funding formula', 'Ontario', 'Ministry of Education', 'Pupil Accommodation Review Guidelines', 'rural', 'urban' and 'community impacts'. Given that this research involved school closures occurring between 2010 and 2018, the aim was to select literature that was based on and published during this timeframe.

II.   School closure dataset creation

To acquire data on Ontario public school closures that occurred between 2010 and 2018, a freedom of information (FOI) request was submitted to the Ministry of Education in August, 2018. The request was accepted by the Ministry and a dataset of approximately 400 entries was received two months after the request was submitted. In this dataset, each school closure entry was defined by the following fields: school board, school board type, school board language, city, postal code, address and closure year. Entries in this dataset had to meet the following inclusion and exclusion criteria:

- The site was previously funded by a public school board to deliver education;
- The site no longer offers any type of elementary and/or secondary-level education that receives funding from a public school board; and
- The site must not have been the location for renovated or replaced facilities to deliver education for a publicly funded school board.

After the dataset was acquired, it was merged with a comprehensive 2018 dataset of all publicly-funded schools in Ontario that are currently open. This merged dataset of all publicly-funded Ontario schools—including both open and closed schools—is heretofore referred to as the 'School Status dataset'. Entries were then reviewed and modified in preparation for processing through PCCF+ and subsequent harmonization with the Ontario Deprivation Index data. Dataset review involved formatting standardization (i.e. Postal codes are capitalized and presented without spaces) and ensuring that fields were accurate and complete. Also, modification involved the addition of the 'ID' field, as PCCF+ requires that data entries have unique identifiers. Within this ID field, entries were assigned unique identification codes (i.e. SC1, SC2. SC3…).

III. Acquisition of community socioeconomic profiles

The community profiles used for this research draw from the Deprivation Index, which is publicly available for download from the Quebec Public Health website (INSPQ, 2016). The degrees of deprivation are represented by quintiles, with quintile 1 being the least deprived and quintile 5 being the most deprived, and are available at the dissemination area level for all census years between 1991 and 2016 (1991, 1996, 2001, 2006, 2011 and 2016) (Gamache, Pampalon, & Hamel, 2010). This index uses six socioeconomic indicators from the Canadian census to document social and material deprivation. The Index indicators are summarized below.

Indicators of material deprivation:

- The proportion of the population aged 15 years and over without a high school diploma or equivalent;
- The employment to population ratio for the population 15 years and over; and,
- The average income of the population aged 15 years and older.

Indicators of social deprivation:

- The proportion of the population aged 15 and over living alone;
- The proportion of the population aged 15 and over who are separated, divorced or widowed; and,
- The proportion of single-parent families.

To reflect the timeframe captured in the School Status dataset, the 2006 and 2016 Ontario Deprivation Indexes were deemed most appropriate and were thus acquired. Acquisition of this index data allowed for analysis of material and social deprivation at the dissemination area-level across the 8-year timeframe of this research (2010 to 2018).

IV. Data Harmonization and Modification

This research phase involved harmonizing the School Status dataset (i.e. open or closed) with Ontario Deprivation Index data to enable statistical socio-spatial analysis. Prior to harmonization, the School Status and Ontario Deprivation Index datasets were both spatially referenced, however they relied on different geographic systems. School Status dataset entries were referenced via 6-digit postal codes while those of the Ontario Deprivation Index, via census geography codes (i.e. unique codes developed by Statistics Canada to identify census tracts, census subdivisions, dissemination areas, etc.). To enable simultaneous analysis of school status and deprivation quintile, these datasets were joined by a common geographic system. The following paragraphs will review how the software packages, Postal Code Conversion File Plus (PCCF+), SAS and SPSS were used to achieve this.

First, the School Status dataset was processed through PCCF+. By doing this, entries in the School Status dataset were assigned census geography codes based on their existing 6-digit postal codes. If a postal code is located between two census areas, PCCF+ uses a population-weighted process to determine which geographic area to assign said postal code. Additionally, PCCF+ assigned valuable population characteristics to each entry. The variable, CSizeMIZ, for instance, provides critical dissemination area-level data on community size and the degree to which said community is influenced by metropolitan area(s).

Once PCCF+ assigned dissemination area-level census geography codes and population data to School Status dataset entries, it became possible to link this dataset to the Ontario Deprivation Index. Based on common census geographic codes (i.e., DAuid), the School Status and Ontario Deprivation Index datasets were merged in SPSS. The result of this merge was a comprehensive dataset of roughly 5,300 entries which contains information relating to school status, school

specifications (i.e. level, board type, language, location, etc.), population characteristics, census geographic codes, and social and material deprivation quintiles.

The final task of this phase was modifying variables in the comprehensive dataset. Specifically, this involved recoding variables of interest. For example, the 'School Status' variable was recoded so that open schools were coded as 0 and closed schools, 1. Similar recoding was performed for the following variables: School Types; School Level; School Language; and, CSizeMIZ (referred to as 'community type').

V.   Statistical analysis

The comprehensive dataset was analyzed using SPSS. Descriptive analyses included frequency distributions and cross tabulations of the dataset. Inferential analyses included chi-square tests and parametric paired sample t tests. The purpose of these analyses was to better understand when and where closures were occurring in Ontario, the relationship between school status and school profile (i.e. language, board type, level, and general location) and the relationship between school status and social and material deprivation level.

SPSS was also used to perform a binary logistic regression, to better understand how school characteristics, geographic profile, and socioeconomic profiles predict closure status. Closure status constituted the only dependent variable while school type, school language, community type and 2006 material and social deprivation quintile were selected as the independent variables. The five independent variables were defined as categorical covariates, with 'Catholic', 'French' and '1,500,000+', and 'Quintile 1 (least deprived)' selected as the reference categories for school type, school language, community type, and 2006 material and social deprivation, respectively. A 95% confidence interval and the Hosmer-Lemeshow goodness-of-fit were selected. Once the regression was completed, the appropriate outputs were organized in a table

Chapter 4: Results

This chapter presents the results generated from analyzing the dataset described in the previous chapter. Specifically, the dataset links open and closed public school data in Ontario with PCCF+ derived geographic identifiers and quintiles of the Ontario Deprivation Index. The analyses were guided by the following questions:

1. What is the scope (i.e., how many, when, where) of school closures in Ontario since 2010?

2. How do closed schools differ from open schools in Ontario in terms of school board type and school language?

3. How do the geographic profiles of the communities in which closed schools are situated differ from those in which open schools are situated?

4. How do the deprivation profiles of the communities in which closed schools are situated differ from those in which open schools are situated?

5. To what extent can school closures in Ontario be predicted by school board type, school language, geographic profile, and deprivation profile?

The Scope of School Closures in Ontario since 2010

The first stage of analysis aimed to understand how many schools have closed in Ontario from 2010 to 2016, and when they occurred (Figure 1). From 2010 and 2016, the total number of school closures was 354, with per year ranges from 41 to 66. Closures were highest in 2011 (n=63) and 2016 (n=66), which may be related or in response to 2009 and 2015 revisions to the PAR guidelines.

Figures 2 and 3 illustrate the spatial distribution of public school closures in Ontario between 2010 and 2018. It is apparent that most closures during this timeframe occurred in southern Ontario, and many within the CMAs of this region, which is reflective of the concentrated population in the province's southern region. Beyond closures in CMAs, a substantial number of closures also occurred outside CMAs, in small and rural southern Ontario communities.
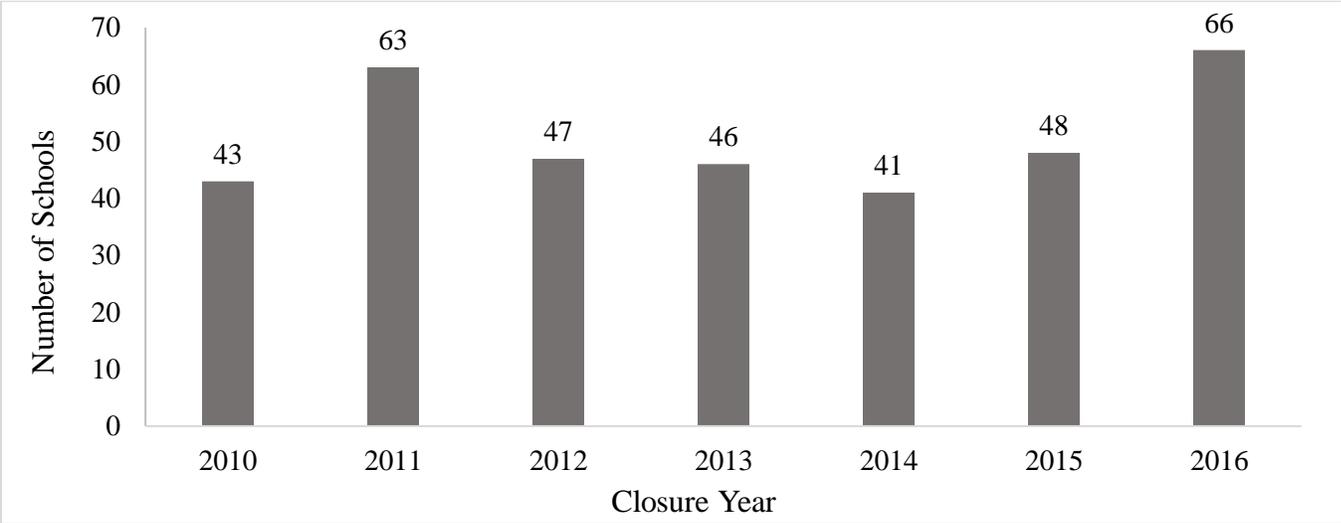
Figure 1. Frequency test showing the number of school closures per year from 2010 to 2016

Figure 2. Spatial distribution of school closures in Ontario from 2010 to 2018.
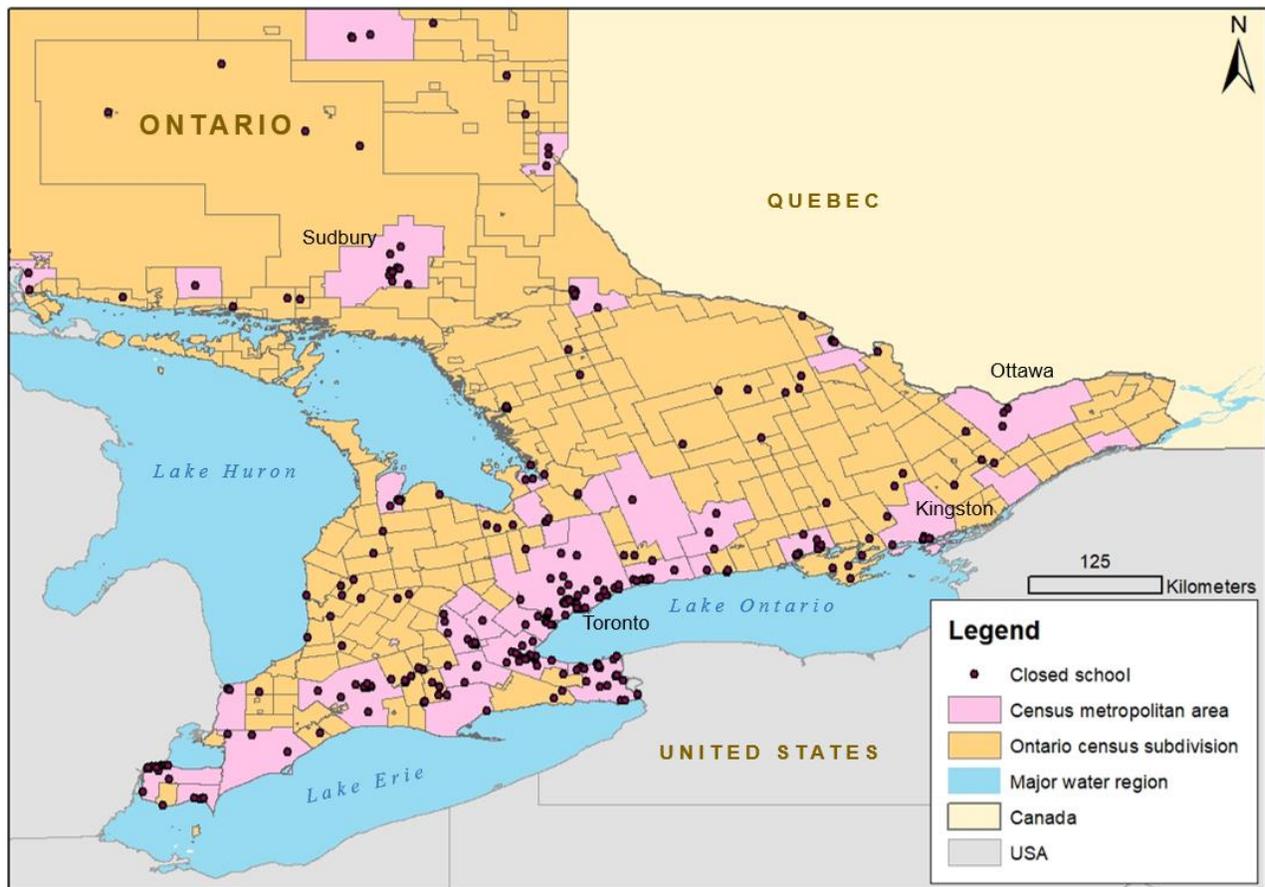
Figure 3. Spatial distribution of school closures in southern Ontario from 2010 to 2018.

School and Geographic Profiles of Open and Closed Schools

To better understand public school closures in Ontario, the profiles of closed schools were compared to those of open schools based on a combination of school and geographic characteristics (Table 1). The school characteristics included school board type (i.e., public or catholic) and school language (i.e., English or French). Meanwhile, a measure called "CSizeMIZ" was used to characterize the geographies of communities. This measure classifies communities into 7 categories according to population size and degree of metropolitan influence.

The majority of Ontario school closures that occurred from 2010 to 2016 were public and English. Specifically, 68.8% of closures affected public schools and 92.5% were English

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schools. These proportions are comparable to those of open schools, where 65.5% are public and 90.1% are English. The lack of significant differences in school characteristics between open and closed school profiles suggests that no single type of school—be it a matter of board type or language— is being disproportionately targeted for closures.

Table 1 also shows the distributions of geography types for closed and open schools, and the differences in these distributions were extremely significant ($p<0.001$). The highest proportion of closed schools was located in census metropolitan areas (CMAs) with populations ranging from 100,000 to 499,999 people (26.6%). Of particular note is that school closures were significantly more common in settlements with populations of less than 500,000, and approximately double the proportions of open schools in settlements with populations of less than 100,000. For instance, while settlements with weak to no MIZ had the lowest proportion of closures at 5.9%, the proportion of open schools in these places is only 3.3%. Meanwhile, large, urban centers are disproportionately less affected by closures; 37.6% of open schools are within the largest communities while only 12.4% of closures occurred in these communities. Taken together, these results demonstrate school closures are occurring disproportionately in smaller and more rural settlements in Ontario.

Table 1. Table comparing the profiles of open and closed schools in terms of language, board type, level, and community type, and testing the relationship between closure status and school profile attributes.

		Closure Status			
		Closed Schools (N=372)	Open Schools (N= 4917)	Chi-square	P-value
Board Type	Public	68.8	65.6	1.5[a]	0.223
	Catholic	31.2	34.4		

School Language	English	92.5	90.1	2.2[a]	0.142
	French	7.5	9.9		
Community Type	1,500,000 +	12.4	37.6	144.9[a]	<0.001
	500,000 – 1,499,999	11.3	15.3		
	100,000 – 499,999	26.6	22.6		
	10,000 – 99,999 (any CMACA < 100,000)	20.2	9.6		
	Non-CMACA, Strong MIZ	13.2	6.2		
	Non-CMACA, Moderate MIZ	8.6	5.4		
	Non-CMACA, Weak / No MIZ	5.9	3.3		

Distribution of 2006 and 2016 Deprivation Index Quintiles by Closure Status

The 2006 and 2016 Deprivation Index was used to document the level of deprivation in communities where schools have closed and in communities where schools have remained open (Table 2, Figures 4 -7). The results demonstrate a clear gradient in school closure prevalence by pre-closure (i.e., 2006) deprivation levels (Figure 4), ranging from 9.8% to 29.6% in the least and most *materially* deprived quintiles, respectively, and from 11.6% to 21.8% in the least and most *socially* deprived quintiles, respectively. Meanwhile, the proportions of open schools within each social and material deprivation quintile in 2006 were relatively consistent, ranging from 16% to 22% (Figures 5). The 2016 deprivation quintile trends for closed and open school dissemination areas closely mirrored those of the 2006 results (Figures 6 and 7), highlighting concerns about the capacities of the communities left behind by school closures to cope with the loss of these public resources.
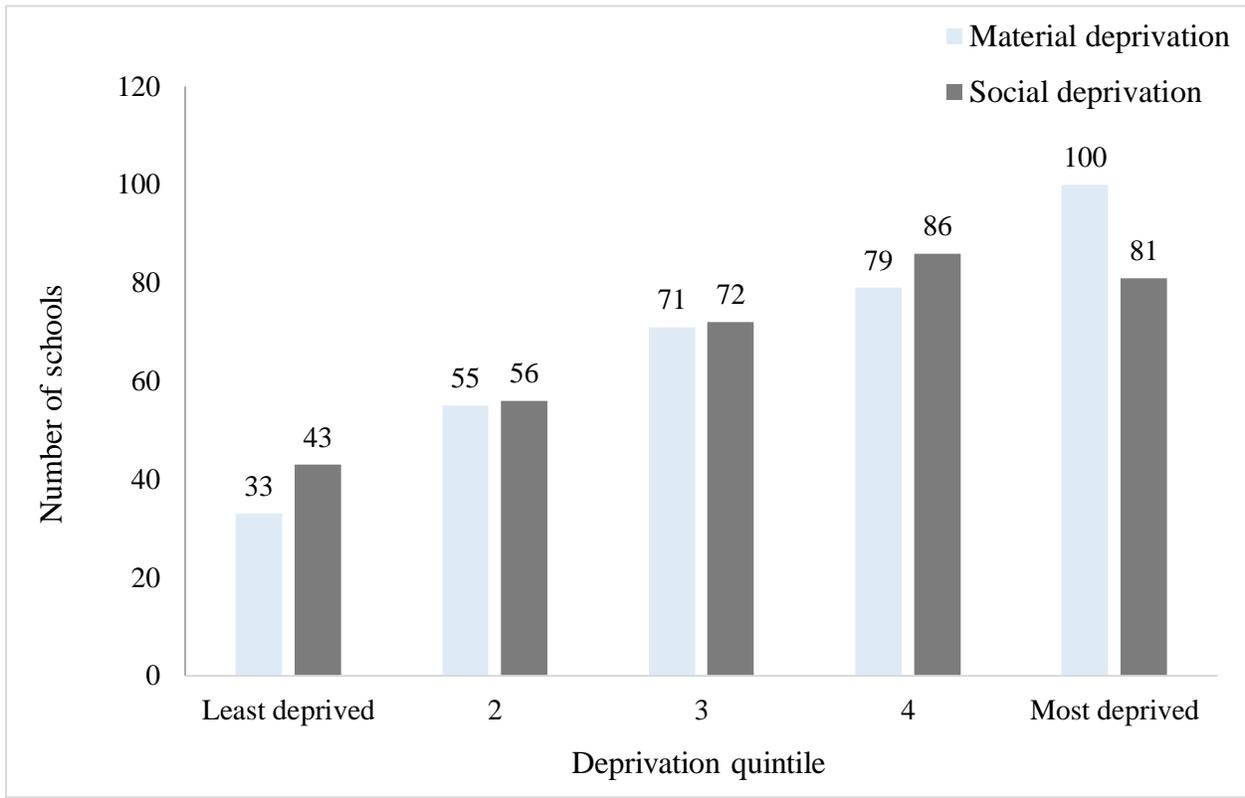
Figure 4: Distributions of the 2006 material and social deprivation quintiles for closed schools in Ontario.
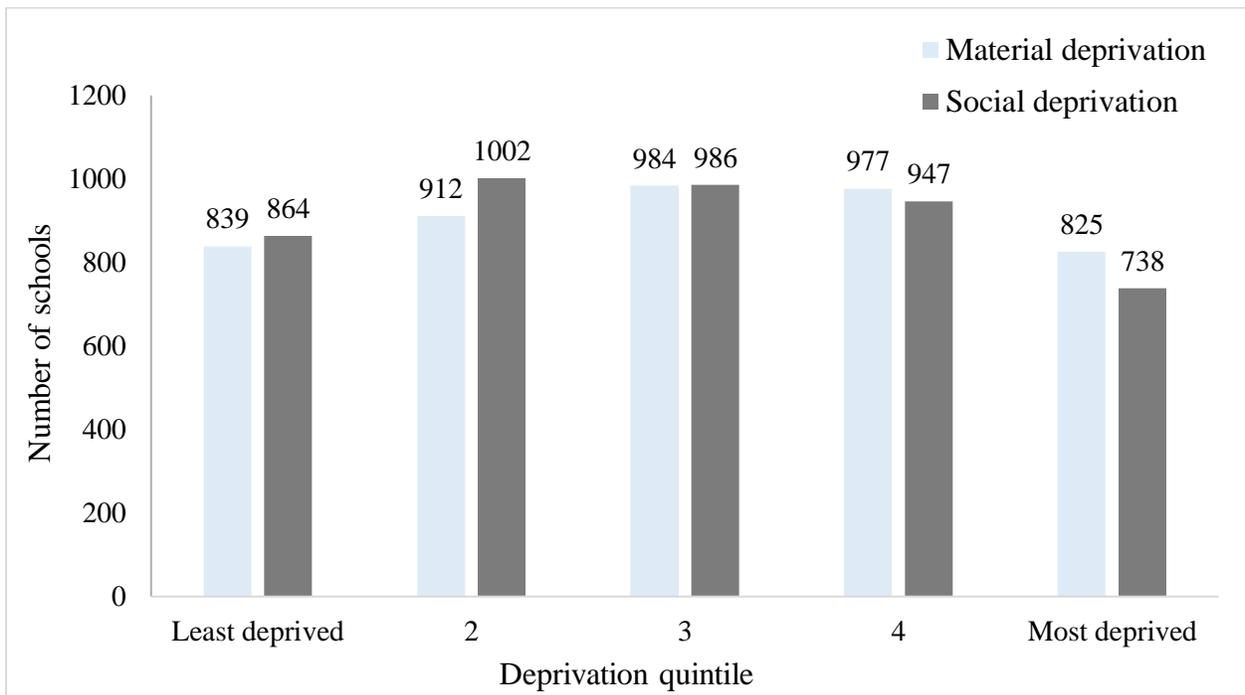
Figure 5. Distributions of the 2006 material and social deprivation quintiles for open schools in Ontario.
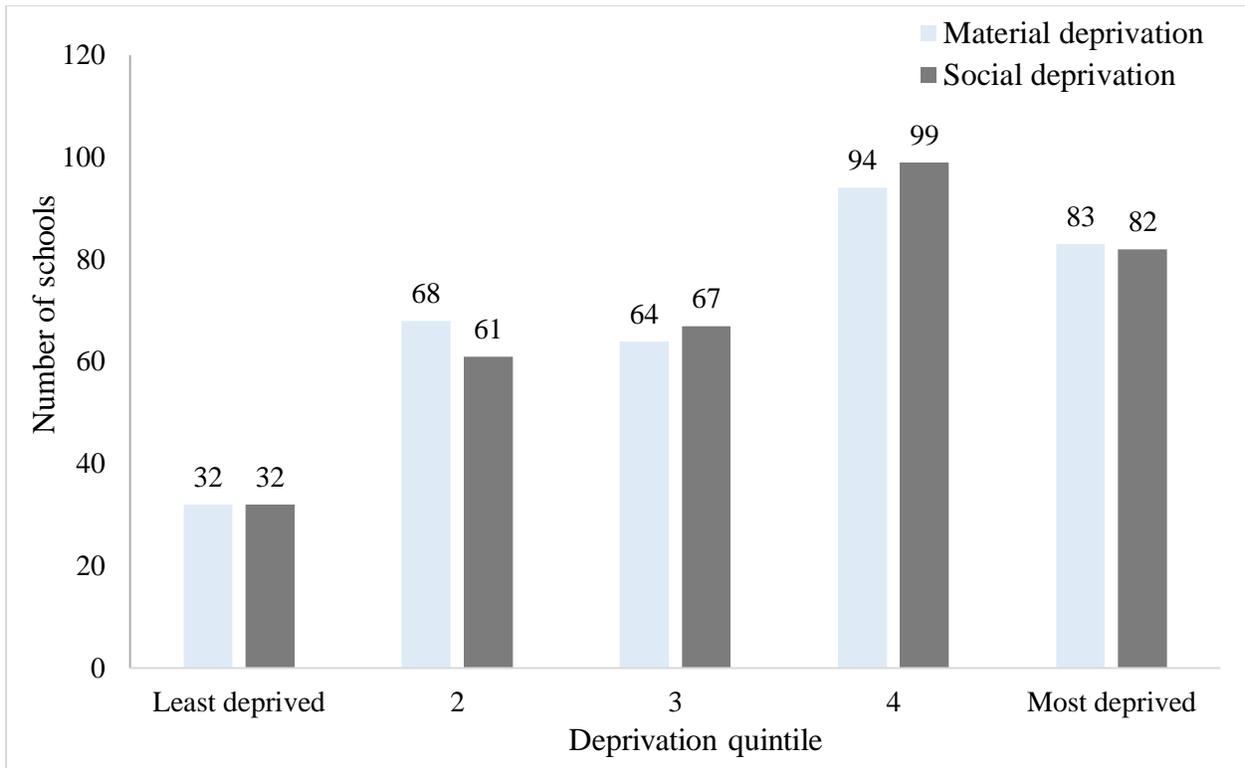
Figure 6. Distributions of the 2016 material and social deprivation quintiles for closed schools in Ontario.

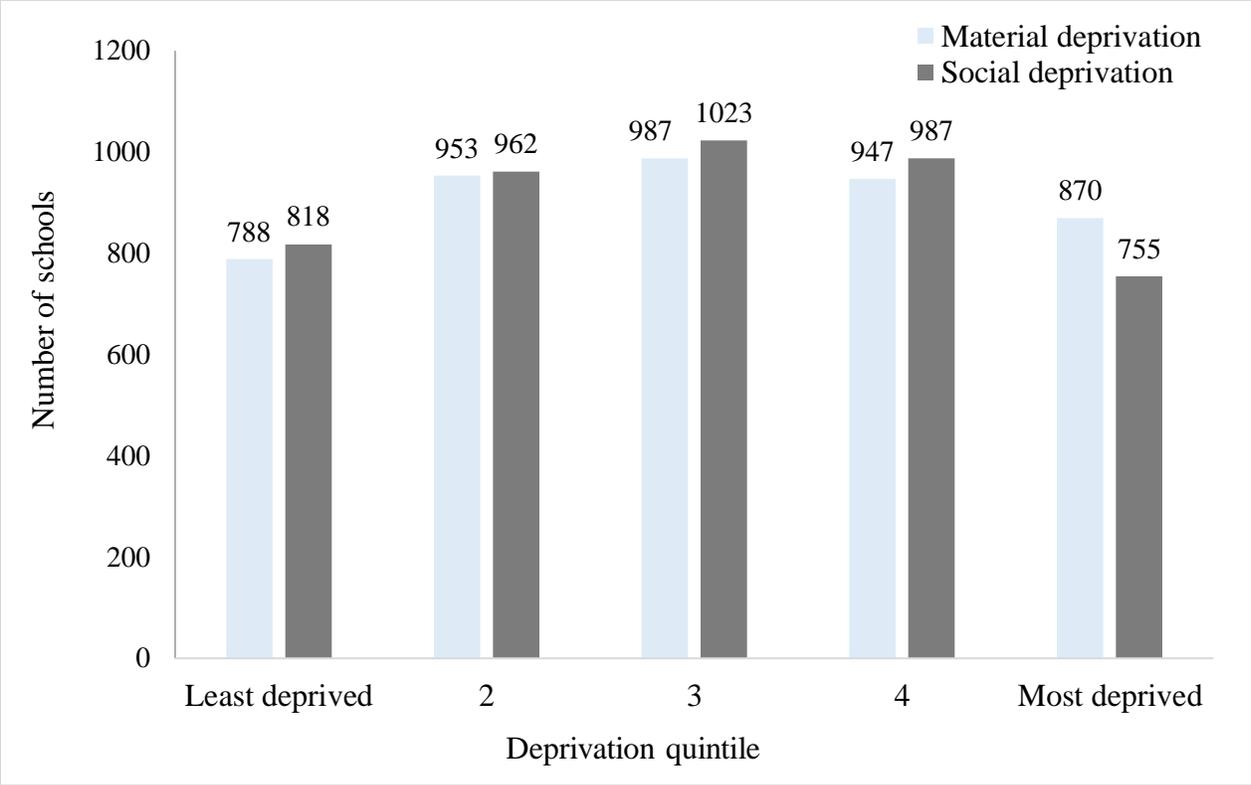*Figure 7. Distributions of the 2016 material and social deprivation quintiles for open schools in Ontario.*

Table 2 illustrates how the deprivation profiles of communities in which schools have closed differ from those of communities in which schools have remained open. For each measure of deprivation, there are significantly larger proportions of closed school communities in Quintiles 4 and 5 than open school communities.

Table 2. Open and Closed School Deprivation Index Profiles in 2006 and 2016.

| | | Closure Status | | Chi-Square | p-value |
		Closed Schools (N=372)	Open Schools (N=4549)		
2006 Material Deprivation	Quintile 1 (Least Deprived)	9.8	18.5		
	Quintile 2	16.3	20.1		
	Quintile 3	21.0	21.7	37.8[a]	<0.001
	Quintile 4	23.4	21.6		
	Quintile 5 (Most Deprived)	29.6	18.2		
2006 Social Deprivation	Quintile 1 (Least Deprived)	11.6	19.0		
	Quintile 2	15.1	22.0		
	Quintile 3	19.4	21.8	25.4[a]	<0.001
	Quintile 4	23.1	20.8		
	Quintile 5 (Most Deprived)	21.8	16.3		
2016 Material Deprivation	Quintile 1 (Least Deprived)	9.4	17.3		
	Quintile 2	19.9	20.9		
	Quintile 3	18.8	21.7	24.5[a]	<0.001
	Quintile 4	27.6	20.8		
	Quintile 5 (Most Deprived)	24.3	19.2		
2016 Social Deprivation	Quintile 1 (Least Deprived)	9.4	18.0		
	Quintile 2	17.9	21.1		
	Quintile 3	19.6	22.5	34.2[a]	<0.001
	Quintile 4	29.0	21.8		
	Quintile 5 (Most Deprived)	24.0	16.6		

Predicting School Closure Status based on School, Geographic, and Deprivation Profiles

Binary logistic regression was performed to predict the likelihood of a school being closed based on its school, geographic, and deprivation profiles. The model contained five independent variables: school board type, school language, geography, 2006 material deprivation quintile, and 2006 social deprivation quintile. The 2016 deprivation quintiles were not used, since these variables did not precede the school closures in time. The model in its entirely was statistically significant (X^2 (16, N = 4875) = 175.18, p < .001), indicating that the model was successful in differentiating between schools of open and closed status. The model explained between 3.5% (Cox and Snell R square) and 8.9% (Nagelkerke R square) of the variance in closure status and correctly classified 93.1% of cases. Generating a p-value of 0.950, the Hosmer Lemeshow test indicates that the model is a very good fit and as such, indicates the model's acceptability.

Table 3 shows that four of the five independent variables contributed significantly to the model (school language, geography, 2006 material deprivation, and 2006 social deprivation). The strongest predictor of closure status was geography, with odds ratios ranging from 2.4 (for communities with 500,000 to 1,499,999) to 6.2 (for Non-CMACA, strong MIZ communities) when compared to communities of 1.5 million people or more. In general, as population and MIZ strength decrease, the likelihood that a community experienced a school closure increased.

Table 3 also reveals that 2006 material and social deprivation quintiles are strong predictors of closure status. Across both measures of deprivation, the likelihood of a school being closed increased with that of deprivation level. For instance, schools in communities classified as quintile 5 (most deprived) for material and social deprivation are a respective 2.4 and 1.5 times more likely to be closed than schools in quintile 1 (least deprived) communities, controlling for other factors in the model.

Last, school language emerged as a moderate predictor of closure status. Table 3 indicates that

English schools are 1.8 times more likely to close relative to French schools.

Table 3. Table showing the impact of school type, school language, community type and 2006 material and social deprivation quintiles on closure status.

		p-value	Odds Ratio	95% CI for Odds Ratio	
				Lower	Upper
Board Type	Public	.931	1.011	.788	1.297
Language	English	.009	1.775	1.156	2.726
Geography	1,500,000 +	<.001			
	500,000 – 1,499,999	<.001	2.384	1.523	3.731
	100,000 – 499,999	<.001	3.350	2.301	4.876
	10,000 – 99,999 (any CMACA < 100,000)	<.001	5.661	3.776	8.486
	Non-CMACA, Strong MIZ	<.001	6.165	3.957	9.606
	Non-CMACA, Moderate MIZ	<.001	4.062	2.456	6.718
	Non-CMACA, Weak/No MIZ	<.001	5.281	3.023	9.224
2006	Quintile 1 (Least Deprived)	<.001			
Material	Quintile 2	.209	1.334	.851	2.093
Deprivation	Quintile 3	.117	1.416	.917	2.185
	Quintile 4	.054	1.530	.993	2.358
	Quintile 5 (Most Deprived)	<.001	2.356	1.543	3.597
2006 Social	Quintile 1 (Least Deprived)	.045			
Deprivation	Quintile 2	.753	.935	.617	1.419
	Quintile 3	.492	1.150	.772	1.713
	Quintile 4	.093	1.396	.946	2.060
	Quintile 5 (Most Deprived)	.036	1.536	1.028	2.295

Discussion and Conclusions

This chapter offers an overview of report findings and limitations, which inform a series of recommendations to improve the current Ontario school closure decision-making model in terms of equity and community well-being. The chapter concludes with a discussion of future research directions.

I.   Summary of Analysis

Analysis of Ontario public school closures from 2010 to 2018 highlights that school closures are disproportionately occurring in small, rural communities in the province and that affected communities were experiencing above-average levels of deprivation prior to closures. The study generated four main findings:

1. From 2010 to 2016, a total of 354 public schools in Ontario were permanently closed. The greatest number of closures occurred in 2011 and 2016, with 63 and 66 schools closing respectively.

2. While the distributions of closures by school language and board type was proportionate with the distributions for open schools, closures were disproportionate by geography; that is, closures were more common in smaller and more rural communities.

3. School closures were more common in deprived communities (based on the 2006 Deprivation Index), while open schools were more evenly distributed across all five deprivation quintiles.

4. Through regression, geographic and socioeconomic profiles were both found to be very strong predictors of closure status, such that small and rural communities and those with

higher levels of material and social deprivation are significantly more likely to experience school closures.

VI.   Limitations

Though this study was successful in addressing its objectives and research questions, some limitations should be noted. First, the full scope of variables that were initially proposed for this study could not be acquired through the FOI process within the study timeframe. Consequently, the relationship between closure status and school level (i.e., primary, secondary) could not be analyzed for this report. Second, the analytical timeframe initially intended to cover 1990 to 2016, which would have required the harmonization of two different school closure datasets: a 1990-2009 dataset that was already in hand, and a 2010-2016 dataset that would need to be acquired from the MoE. After acquisition of the 2010-2016 dataset, it was apparent that the harmonization of these datasets was not feasible due to lack of clarity with the inclusion criteria of the 1990-2009 dataset. As such, this study focused exclusively on the 2010-2016 period. Lastly, the imprecision of CSizeMIZ as a measure of community type was identified as a minor study limitation. Though this measure of community type was effective in providing general information regarding the population and level of rurality of Ontario communities, it was largely unable to detect fine-grain variations in rurality within large CMA's and CA's. For instance, small communities on the fringe of the Toronto CMA, such as Newmarket or Milton, would be attributed the same community classification as would those in Toronto's downtown core despite major differences in community characteristics and population. As such, communities within CMAs could not be differentiated in this way, which limits the depth of knowledge that can be generated from this analysis.

VII.   Policy Recommendations

After jointly considering the study findings, limitations, and the points raised in the literature review, the following recommendation intend to inform amendments to the Ontario Ministry of Education's Pupil Accommodation Review Model and school funding formula.

Recommendation 1: Increase community engagement and collaboration in school closure decision-making process

Existing studies have highlighted the tense and confrontational nature of interactions between the Ontario Ministry of Education, associated board officials, and communities amidst school closure decision-making processes (Irwin & Seasons, 2012). Throughout these processes, community members often feel powerless, suggesting a lack of meaningful engagement in the public consultation process and the Ministry's prioritization of economic efficiency. While schools are valuable public amenities that play diverse, central roles in their communities, these roles have historically been under-recognized in the Province's school closure decision-making model (Mackenzie, 2007). To address this oversight, it is essential that the next version of the Ministry of Education's Pupil Accommodation Review (PAR) guidelines require school boards to increase their collaboration and engagement with communities in PAR processes. Though increased public engagement is among the changes made to the revised version of the PAR guidelines released in 2018, not enough time has lapsed to determine whether this enacted change will improve board-community relations and increase the extent to which the inherent value of schools is formally recognized in the school closure decision-making model.

Recommendation 2: Account for geography in the current funding formula

Over half of total annual school funding is distributed on a per-student basis under the current Ontario public school funding formula. This strategy has proven to be inequitable, favoring

urban and suburban communities with growing populations while disadvantaging small and rural areas with declining populations. As confirmed by the analyses in this study, the application of this formula has resulted in small and rural communities (i.e. non-CMA/CA communities) being disproportionately affected by school closures. The net result is forcing (often very young) children onto lengthy commutes to school by bus to neighbouring communities, and the potential for a hollowing out of the communities left behind by school closures. Although restoring equity was the objective of this particular funding formula—with the per-student funding model replacing the property tax revenue funding model—another form of inequity has emerged as a result. Moving forward, Ontario's MoE should address this issue of geographic inequity by adjusting the funding formula for schools located in small towns and rural communities. Not only would this protect communities with lower capacities for resilience, it also reflects a sound evidence base that smaller schools provide better environments for learning and teaching (Egalite & Kisida, 2016).

Recommendation 3: Introduce community reliance on schools as a formal metric in accommodation reviews

A considerable number of studies have found that deprived communities, often characterized by limited public infrastructure and recreational opportunities, are more reliant on their schools and utilize them for a broader range of purposes (Garcia, Flores & Chang, 2003). The current closure decision-making model fails to adequately consider these differences in school reliance across communities, resulting in communities losing far more than just educational institutions. Furthermore, school closures in communities with already high levels of deprivation serve to further disadvantage those communities in which schools were critical public assets. Given this shortcoming, it is recommended the PAR guidelines be revised to mandate the consideration of

community reliance on schools and the breadth of ways in which the schools are used in the decision-making process, and to account for the socioeconomic context of the communities in which the schools are situated. In circumstances where schools are found to have significant roles in their communities beyond education, additional studies should be required prior to making decisions, effectively requiring more justification to close schools with proven high community value.

Recommendation 4: Consider the long-term community-level impacts of school closures

Schools are critical to the growth and prosperity of rural communities by attracting new residents, services, and businesses, and maintaining existing ones. Conceivably then, the closure of these schools would gravely threaten the social, demographic, and economic futures of the communities in which they served. Given the key findings of this research— that small and rural communities experiencing higher than average levels of social and material deprivation are disproportionately targeted by closure— it seems likely that a number of these Ontario communities will experience extensive decline following school closures. As the current PAR guidelines disproportionately consider short term impacts (i.e. economic efficiency of schools and their boards) relative to long term impacts, such as the future well-being and vitality of communities, it is recommended that the PAR guidelines take additional steps to ensure that the broad and long-term community impacts of closures be formally and more extensively considered in the overall school closure decision-making process.

Directions for Future Research

This report is part of a larger research program examining public school closures in Ontario. Contributing to a team of Ontario-based university researchers that seek to understand the

processes and consequences of school closures in the province, the principal objective of this report was to fill data and informational gaps through the creation of a comprehensive, spatially-referenced Ontario public school closure dataset for the 2010 to 2016 timeframe. With these gaps addressed, it is possible to look further into the issue of Ontario school closures. As such, future research involves examining the topic of Ontario school closures using more qualitative approaches. Lead by Dr. Patricia Collins and funded through an Insight Grant from the Social Sciences and Humanities Research Council of Canada, the upcoming project aims to use a case study approach to compare the experiences of school closure decisions in several Ontario communities across two public school boards.

Moreover, a future direction of this research involves examining Ontario school closures over a larger timeframe. At early stages of this report, the intention was to study Ontario school closures that occurred between 1990 and 2016. This analysis required that two datasets be harmonized: a 1990 to 2010 Ontario school closure dataset acquired from another Ontario university researcher and the 2010 to 2016 dataset acquired through the previously-mentioned FOI. Data harmonization was found to be challenging and not feasible within the timeframe of this project. With the completion of this report, it is possible that the analysis of closures between the full data timeframe—1990 to 2018—and that the analysis of school level will be revisited.

To enhance this research, it would be beneficial to explore different community type measures. As mentioned previously, the CSizeMIZ was successful in providing general community qualities, like whether it is located within a CMA for example, but it is unable to identify fine-grain differences between communities (i.e., differentiating the qualities of various communities within the same CMA). It is believed that this research would benefit from one or more other

community type indicators that can better detect these small but significant differences between communities.

Once sufficient time has lapsed, it will also be valuable to examine community change over time and what has come of closure properties. Specifically, analyzing changes in the deprivation profiles of communities in which schools have closed would contribute to an understanding of how closures to schools might contribute to changes in community resilience, sustainability, and well-being. Equally, determining how closed school properties are repurposed is a crucial component to understanding long-term community change and effects of closures.

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