Exploring the social and economic impact of schools in small Ontario communities

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Submitted to:
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Quick Facts

- There is no statistically significant relationship between number of school age children in a community and the presence of an elementary school in the community
- New housing construction in a community is associated with a higher chance of having a school. New housing construction may also incentivize the opening, or relocation of a school to the community
- Private and public amenities tend to also be present in communities with schools, potentially signifying the economic development potential of a community that has a school
- Northern Ontario and Western Ontario schools are consistently further away from communities than those in the rest of the province

Objectives

The Community Schools Alliance (CSA) has retained the Human Environments Analysis Lab (HEAL) with partner Spatialists Consulting Ltd. to conduct a geospatial investigation of the differences in demographics, community structure, and housing values based on the distribution of English Public and Catholic schools across the province.

Background

The past two decades of educational policy in Ontario has resulted in the amalgamation of smaller local schools into larger buildings, and often the closure of schools in smaller communities. Instead of attending school within their local community, many students are forced to attend schools in communities further away from home. This trend towards bussing rural and smaller community students into other communities can have wide-ranging impacts on the health, wellbeing, and stability of students, parents, and affected communities. The impacts of these closures may also not manifest immediately, with longer term impacts being experienced decades later in economic competitiveness and socioeconomic outcomes. School closures are also not solely a rural community issue. Urban areas have also experienced closures that result in a cycle of disinvestment, depressed property values, and worse access to education across the community.

The accommodation review procedure used by the Ontario Ministry of Education and local school boards often fails to account for the unique challenges of serving the educational needs of rural Ontario communities. The Community Schools Alliance has made changing provincial education and infrastructure policy in the delivery and maintenance of school properties, a priority for their organization. To support this lobbying goal, evidence of the impacts of geographic distribution of schools in Ontario is needed to inform decision-makers of the potential impact from school closures.

The project was proposed by the Community Schools Alliance under the direction of Doug Reycraft, Chair of the Board. The project was completed at the HEAL at Western University with partner Spatialists Consulting Ltd. by Dr. Jason Gilliland, Director and supported by Alexander Wray, Research Associate and Braden Dyce, Research Associate.

Methods

The HEAL used sophisticated statistical and geographic information science techniques to:

- Locate schools and communities outside of major population centres within the Province of Ontario
- Determine communities with a school (within 3.2km of the centre of town) & distance to the nearest school for those that do not have a school
- Understand the sociodemographic structure of, and amenities in each community
- Examine the statistical differences in the socioeconomic characteristics between communities with schools and without schools using regression modelling

The study area includes all areas outside of medium to large population centres (30,000 people), as defined by Statistics Canada. Communities in the sample include small population centres (1,000 – 29,999 people) and designated places (< 1000 people) as defined by Statistics Canada. In addition, other smaller communities (300 – 999 people) were manually added to the sample based on their intersection density. Each community was assigned a point at the centroid of the built-up area. Communities with less than 300 people or more than 10,000 people were removed from the sample.

Amenities such as grocery stores (NAICS 44511), variety stores (44512), pharmacies (44611), doctors (621111) and dental (62121), banks, emergency services (ambulance, fire, police), libraries, community centres, and public parks were also included in the analysis. These locations were all sourced from DMTI Spatial (2016). All other data was sourced from Statistics Canada (2016).

A buffer distance of 3200 metres around the centre of the community was used to determine the presence of a school and/or other amenities within the community. A buffer distance of 1200 metres around the centre of the community was used to select the census dissemination areas (DAs) that comprise the community. Distance from the centre of the community was calculated to the nearest English Public or Catholic elementary (kindergarten to grade 8) and secondary (grade 9 to 12) school. All buffers were generated along the street network, as delineated by the Ontario Ministry of Transportation (2016).

Analysis Context

There are four different analyses undertaken to determine the effects of schools on different sized communities, and the proximity to school:

1) Small communities – those communities that have less than 1500 people
2) Large communities – those communities that have more than 1500 people
3) Elementary Schools – distance from the community's centre to the closest elementary school along the road network, regardless of community size
4) Secondary Schools – distance from the community's centre to the closest secondary school along the road network, regardless of community size

Table 1. Summary of key variables by school presence for communities with less than 1500 people

Variable	Communities WITHOUT School, N = 164	Communities WITH School, N = 104
Bank, in community	13 (7.9%)	38 (37%)
Grocery, in community	21 (13%)	39 (38%)
Variety, in community	21 (13%)	23 (22%)
Pharmacy, in community	4 (2.4%)	18 (17%)
Doctor, in community	7 (4.3%)	14 (13%)
Emergency Services, in community	33 (20%)	42 (40%)
Library, in community	25 (15%)	41 (39%)
Community Centre, in community	7 (4.3%)	27 (26%)
Public Park, in community	17 (10%)	17 (16%)
Total Population	994 (746, 1224)	1102 (905, 1310)
# School Age Children	156 (95, 201)	180 (124, 224)
Median housing value	$250318 (193559, 318222)	$221141 (159590, 276913)
Median household income	$64128 (56699, 71936)	$60341 (53632, 70864)
% Low-income	3.35% (2.25, 4.53)	3.55% (2.75, 4.96)
% Residents	90% (69, 95)	89% (72, 95)
% New Dwellings (2011-16)	2.74% (0, 5.28)	2.70% (0, 5.07)
% Move in last year	7.50% (5.60, 10.50)	8.90% (6.80, 11.30)
% Move in last 5 years	25% (22, 30)	27% (23, 31)

Table 2. Summary of key variables by school presence for communities with more than 1500 people

Variable	Communities WITHOUT School, N = 131	Communities WITH School, N = 334
Bank, in community	18 (14%)	243 (73%)
Grocery, in community	24 (18%)	224 (67%)
Variety, in community	23 (18%)	182 (54%)
Pharmacy, in community	5 (3.8%)	158 (47%)
Doctor, in community	10 (7.6%)	206 (62%)
Emergency Services, in community	42 (32%)	253 (76%)
Library, in community	26 (20%)	197 (59%)
Community Centre, in community	21 (16%)	182 (54%)
Public Park, in community	40 (31%)	231 (69%)
Total Population	1978 (1681, 2444)	2930 (2187, 4820)
# School Age Children	340 (282, 444)	512 (366, 778)
Median housing value	$325353 (266699, 440392)	$260185 (213764, 333568)
Median household income	$71760 (61161, 82994)	$63484 (55912, 75062)
% Low-income	2.97% (2.18, 3.91)	3.83% (2.67, 5.22)
% Residents	94% (81, 97)	95% (91, 97)
% New Dwellings (2011-16)	3.90% (2.00, 5.30)	3.70% (2.00, 5.90)
% Move in last year	8.70% (6.95, 10.83)	10.01% (8.05, 12.04)
% Move in last 5 years	27% (24, 30)	31% (27, 35)

Results

Small Communities

In small communities having a school in the community means the community is 2.75 times more likely to have a bank, and 6.69 times more likely to have a community centre. Small communities without schools have slightly higher housing values likely because young families are looking for more affordable housing stock in communities that do have schools.

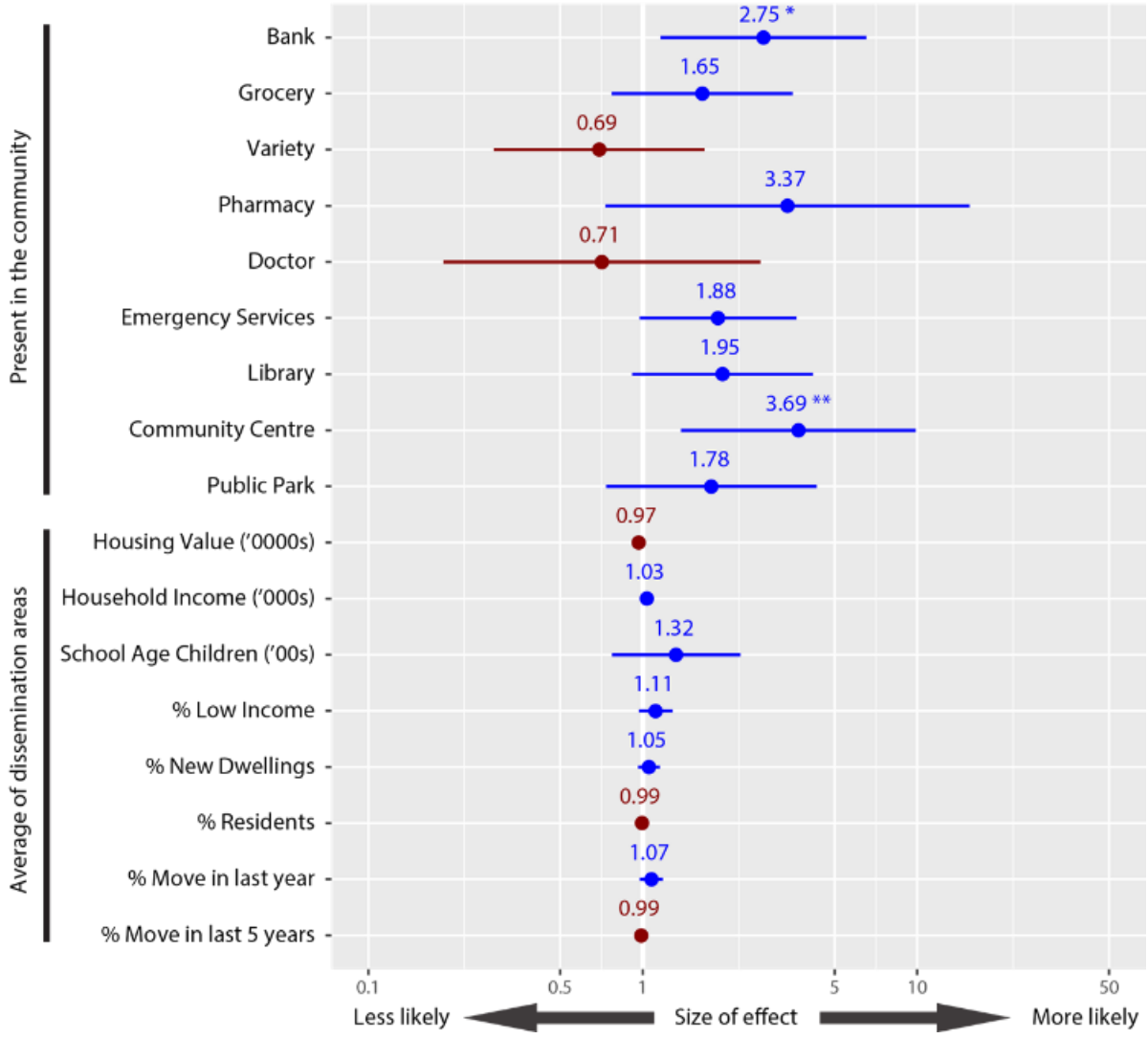

Figure 1. Summary of regression model results for small communities

Large Communities

In large communities, having a school in the community means the community is 3.71 times more likely to have a bank, 2.78 times more likely to have emergency service, and 1.88 times more likely to have a public park. Large communities with a school tend to have a higher percentage of dwellings constructed in the last five years.

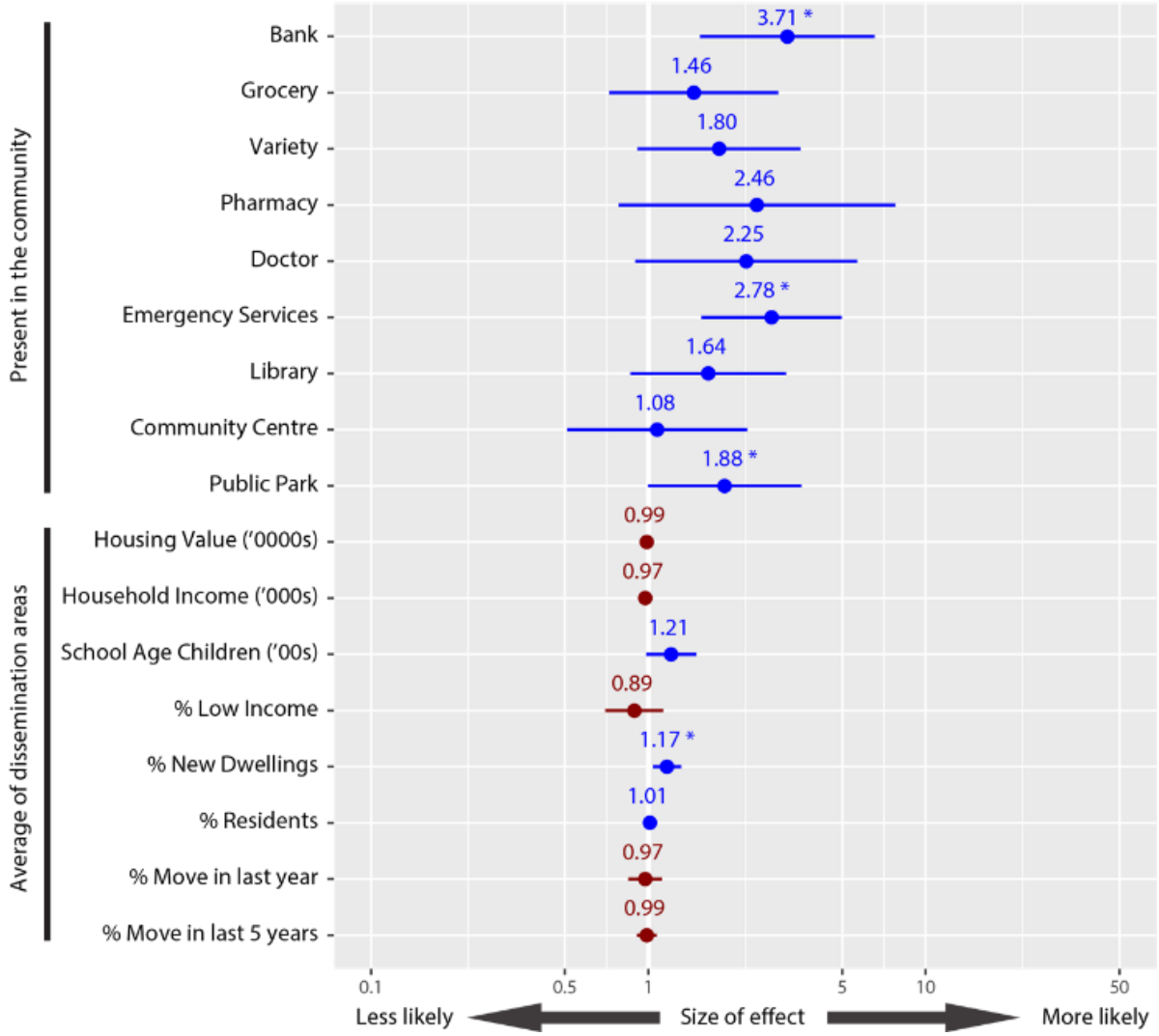

Figure 2. Summary of regression model results for large communities

Elementary Schools

In communities with an elementary school, having a bank or a library means the elementary school is about 1.5 kilometers closer on average, while a grocery store, community centre, or emergency services means the elementary school is about 1 kilometer closer. Communities with more primary residences and more people that have moved into the community in the last year see a school approximately 150 meters closer per percent. Northern and Western Ontario have schools further away than those in Central Ontario.

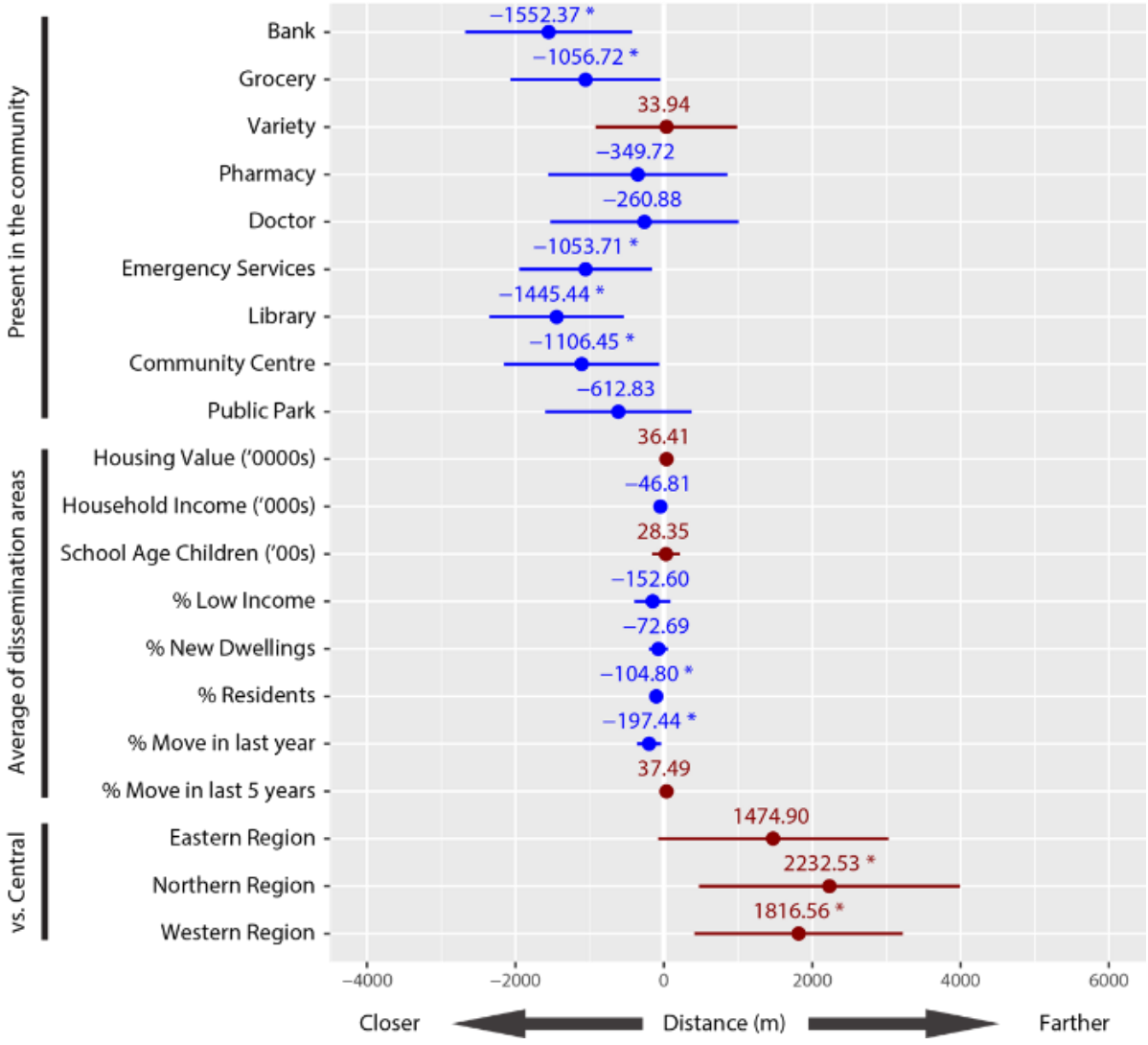

Figure 3. Summary of regression model results for distance to elementary schools

Secondary Schools

In communities with a secondary school, schools are 641 meters closer for every 100 children in the community. Schools are 446 meters further away for every percentage point increase in new dwellings in the community. Schools become slightly closer with every percentage point in residents and new residence within the last year. Northern Ontario schools are 8 kilometers further away than they are in central Ontario.

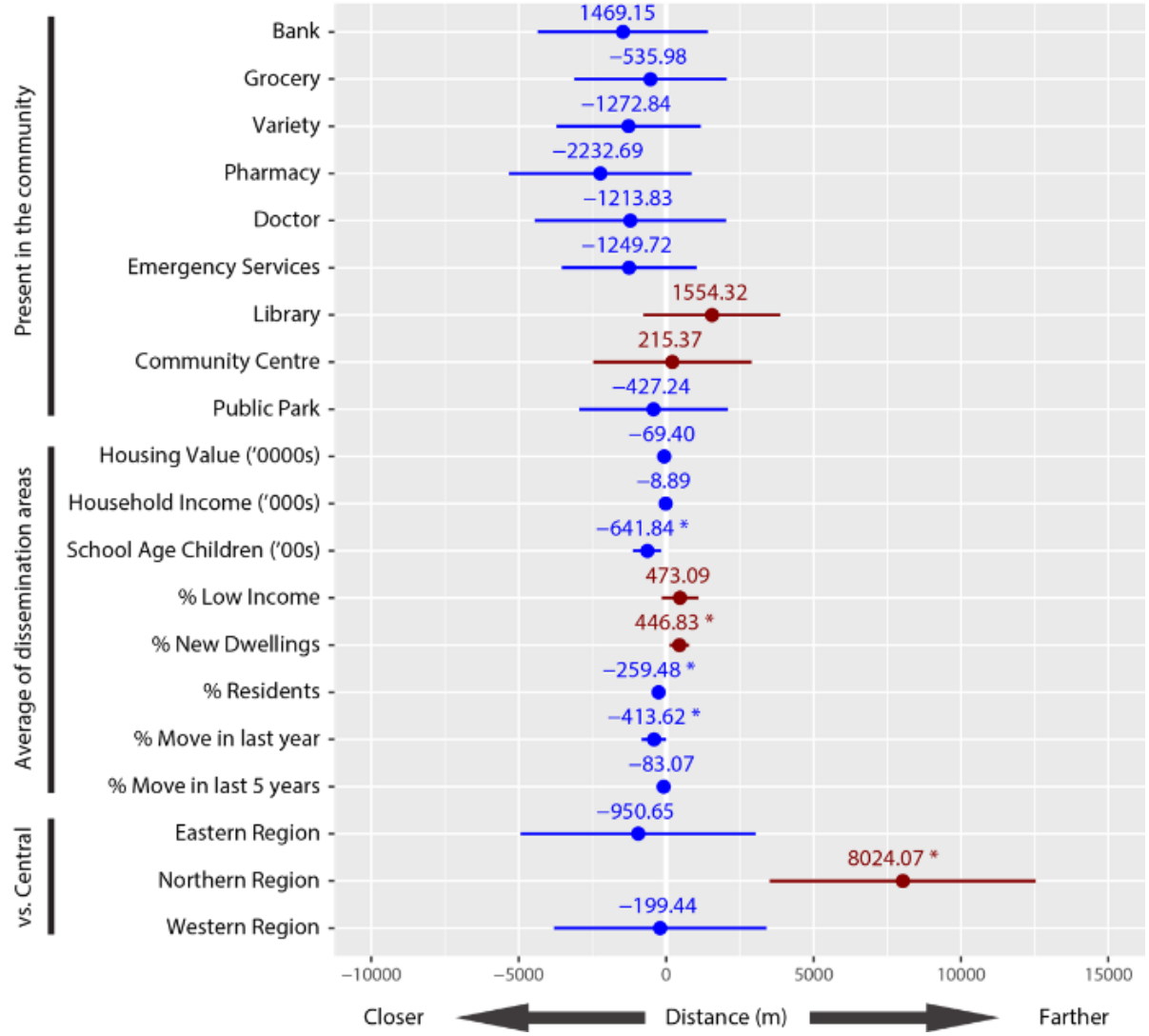

Figure 4. Summary of regression model results for distance to secondary schools

Discussion

Housing value and median income

Although it would be expected that both housing value and median income would be higher in communities that have a school present, our study has revealed that this is not the case. The most likely reason for higher housing values and median incomes in communities without schools is that there is a higher proportion of retirement age (or near retirement age) individuals in those communities without schools, while young families with school-age children may be seeking out cheaper communities with schools.

New dwelling effect

This can be summarized as the 'chicken and the egg' effect. Although there are a higher percentage of schools where there are new dwellings (and vice-versa) it is not clear which came first. Ontario's system of capital construction for schools may mean that new development brings the land, and expected population, for a new school. Therefore, communities with recent new developments may attract a new school, or the relocation of an older school from another community.

Main differences between communities with schools vs. communities without schools

Communities with schools tend to have more private amenities (Bank, Grocery, Variety, Pharmacy, Doctor) and public services (Emergency Services, Library, Community Centre, Public Park), regardless of their population. This indicates that the presence of a school aligns with both public and private investment in community, creating a possible "lock-in" effect. In smaller communities and at the elementary school level, the number of school age children in a community does not predict having a school which runs counter to the service delivery expectation for education.

Data Sources

- DMTI Spatial. (2016). Enhanced Points of Interest. Retrieved from: http://geo.scholarsportal.info/#r/details/_uri@=56448532
- Statistics Canada. (2016). Census of Population. Retrieved from Computing in the Humanities and Social Sciences Data Centre at the University of Toronto.
- Statistics Canada. (2016). Designated Places. Catalogue no. 98-301-X