
**ANALYSIS OF TRENDS IN IMMUNIZATION
AMONG GRADE 2 STUDENTS
IN THE
REGION OF WATERLOO,
1994 – 2004**

Regional Municipality of Waterloo, Public Health

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INTRODUCTION

The purpose of this assessment is to provide an overview of coverage trends in respect to immunization among Grade 2 students in public, separate and parochial schools in the Region of Waterloo from 1994-2004.

BACKGROUND

The Ontario *Immunization of School Pupils Act, 1990* stipulates that for each student there exist demonstrated proof of immunization against the following diseases, Diphtheria, Tetanus, Polio, Measles, Mumps and Rubella, or a formal record of medical or religious/philosophical exemption.¹ These vaccines are administered in sets throughout infancy and childhood. In Ontario, parents are responsible for reporting immunizations to their health unit, and many health units are mandated to suspend pupils not immunized with all required, age-appropriate vaccines.²

Since 2001, the health unit of the Regional Municipality of Waterloo has enforced suspensions and is currently enforcing suspension of pupils in Grades 2, 3, 4, and 5 who are not appropriately immunized against Diphtheria, Tetanus, Polio, Measles, Mumps and Rubella.³ This process involves the collection and entry of each child's immunization history into a region-wide database, *Immunization Records Information System* (IRIS), and communication with parents regarding the prescribed schedule of immunizations, the potential of suspension and the process of exemption.

METHODS

In order to identify coverage trends, Grade 2 students were chosen as the sample population for three key reasons. First, the average age of this population represents a significant stage in Ontario's prescribed immunization schedule, i.e. by seven years of age children are required to have received seven of eight sets of childhood vaccinations, the last set to be administered between 14-16 years of age.⁴ Second, considering the sizable population of Mennonite students in Waterloo Region and the common practice among Mennonite parents to withdraw children from the formal school system during pre-pubescence, analyzing coverage data during the primary grades ensures the most accurate representation of Mennonite children.⁵ Lastly, the Region of Waterloo returned to enforcing suspensions initially among Grade 2 students (2001), and has been adding an older grade with each consecutive year, i.e. Grade 2 & 3 in 2002,

Grade 2, 3 & 4 in 2003; comparison among Grade 2 students will provide a degree of uniformity when analyzing data dating prior to and after the reinforcement of suspension.

There are a number of factors to consider when appraising the following data. First, due to its primitive nature, IRIS cannot compile a coverage report based on a geographic location or school; it can only compile coverage statistics on groups of presently enrolled students. Therefore, coverage data reflects the immunization history of older students when they attended Grade 2, regardless of where they attended school at that time.⁶ Considering this limitation, coverage statistics of students in Grade 2 prior to the 2003/2004 school year serve as approximations. Second, the sharp increases in coverage rates can be attributed in great part to the reinforcement of suspensions and increased communication between various actors, and it does not necessarily indicate that the practice of immunization increased as dramatically. Third, the data has been classified and analyzed according to four time periods, each marked by particularly sharp increases/decreases in coverage.

RESULTS & DISCUSSION

The first period consists of 1994-1997, and it is marked by a steadily decreasing rate of coverage (Figure 1.1). In 1994, the coverage rate for the Region of Waterloo was 68% and it continued to decline to 40% in 1997. In each of the seven municipalities, the rates were similar, with the exception of 100% coverage in Wellesley in 1994 and North Dumfries in 1997. Closer scrutiny reveals that the IRIS database identifies only three students as having been enrolled in schools in Wellesley (1994) and two students in North Dumfries (1997), yet the total populations of seven-year-olds were 195 and 129 respectively.⁷

The second period consists of 1998-1999, and it is marked by a general increase in the rates of coverage (Figure 1.1). In 1998, the coverage rate for the Region of Waterloo rose from 40% to 48%, and then to 57% in 1999. Among the seven municipalities, many experienced dramatic increases in coverage rates. For example, coverage for the Township of Woolwich increased from 44% (1997) to 60% (1998) and then to 70% (1999). Increased coverage can most likely be attributed to the Meningitis outbreak in 1997, during which time children were immunized against this disease at clinics throughout the Region. Increased exposure to Public Health and heightened public fear may have contributed to increased communication of children's vaccinations histories and greater compliance with the prescribed immunization schedule. Increased information exchange between parents/schools and Public Health can be observed in the case of North Dumfries. For the year of 1997, only two students from North Dumfries

were accounted for by IRIS, as compared to the total population of 129 children cited by Statistics Canada; whereas, in 1998 the number of students accounted for by IRIS increased to 85 of the 153 cited by Statistics Canada.⁸

The third period is the year of 2000, and this period is marked by a sudden drop in coverage rates. (Figure 1.1) For the Region of Waterloo, the rate of coverage declined from 57% (1999) to 33% (2000), as it did similarly for each of the seven municipalities. In general, the coverage rates in 2000 were the lowest throughout 1994-2004. Such low rates may suggest that the increases in the real number of students identified by IRIS has skewed coverage rates, i.e. the total population of students identified increased considerably and disproportionately to incoming immunization histories. Yet, regionally there was a four percent decrease in the total population of Grade 2 students, and of the seven municipalities, most experienced decreases in total population ranging from 5-12 %.

Figure 1.1

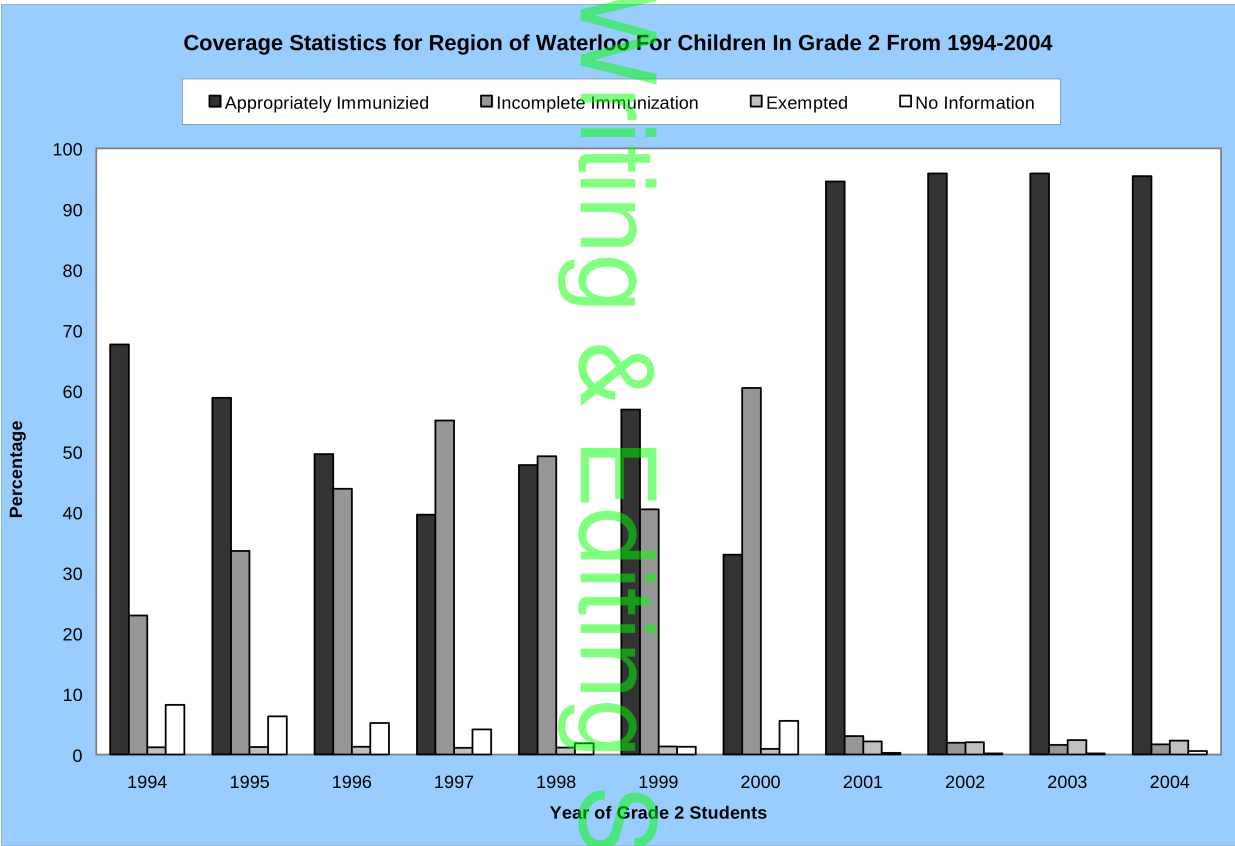
Complete As Appropriate For Age, As A Percentage Of Grade 2 Students Enrolled In Public, Separate and Parochial Schools							
Area	1994	1995	1996	1997	1998	1999	2000
Region of Waterloo	68	59	50	40	48	57	33
Cambridge	71	57	51	41	45	53	30
Kitchener	65	58	48	36	45	54	30
Waterloo	67	58	49	41	51	62	37
Woolwich	79	74	59	44	60	70	42
Wilmot	62	65	46	39	55	62	44
Wellesley	100	63	58	62	55	73	50
North Dumfries	-	-	-	100	56	48	26

The last period consists of 2001- 2004, and this period is marked by substantially increased coverage rates (Figure 1.2). In May 2001, of 5,882 students in public, separate and parochial schools, 95% were appropriately immunized; the coverage rate increased to 95-96% for 2002, 2003 and 2004.⁹ The coverage rates of the seven municipalities were similar to the regional average, with the exception of the Township of Wellesley.¹⁰ As compared to regional rates prior to the reinforcement of suspension, the coverage rates in this period potentially attest to the efficacy of suspension as a method to gather coverage information and to promote immunization.

Figure 1.2

Complete As Appropriate For Age, As A Percentage Of Grade 2 Students Enrolled In Public, Separate and Parochial Schools				
Area	2001	2002	2003	2004
Region of Waterloo	95	96	96	95
Cambridge	94	97	96	96
Kitchener	95	96	97	97
Waterloo	95	96	97	96
Woolwich	91	96	93	89
Wilmot	92	97	94	95
Wellesley	86	82	84	80
North Dumfries	100	98	92	95

Figure 1.3



CONCLUSIONS

Throughout the Region of Waterloo from 1994-2004, there have been four distinct periods of coverage trends. The first period from 1994-1997 revealed a trend of lowering coverage rates, with the regional average at 68% (1994) and 40% (1997). This low period was followed by a period of rising rates in 1998-1999, where the regional average increased to 48% and 57% respectively. This increase may have resulted from increased communication between Public Health and the public as a result of fear generated by the Region-wide outbreak of Meningitis. The third period is the year 2000 during which time the regional coverage rate was 33%; this was the lowest rate of coverage from 1994-2004. With the reinforcement of suspensions in 2001, the regional average rose to 95% (2001) and maintained itself throughout the fourth period, 2001-2004.

First, it can be observed that increased communication with Public Health impacts the overall estimated coverage rates in Waterloo Region. Greater communication increases the number of individual records collected and improves the credibility of statistics produced by IRIS. This can be observed in the case of the Townships of Wellesley and North Dumfries, where from 1994-1997 IRIS only accounted for 0-50% of their Grade 2 populations. Second, the reinforcement of suspension has greatly increased communications between parents and Public Health. This can be observed in the sharp increase of coverage rates as greater numbers of parents relayed immunization information to Public Health from 2001-2004 than previously.¹¹ Lastly, it can be speculated that though fear of disease did initially increase coverage rates- as in the case of the Meningitis outbreak in 1997- the momentum was short-lived as coverage rates once again decreased substantially by the year 2000.

The emerging trends in coverage rates in the Region of Waterloo and in individual municipalities are promising as rates of appropriately immunized children are of the highest in the last decade. Through increased communication between parents and Public Health, such high coverage rates have been achieved; and, through the maintenance of effective lines of communication, such success may continue in the future.

¹ Ontario Ministry of Health and Long-Term Care. *Immunization of School Pupils Act*. 1990. The coverage rates provided in this report include immunization against Pertussis, though it is not required by law. This is due to the fact that the vaccine against Pertussis is often included in the combined vaccines against Diphtheria, Tetanus and Polio, and immunization against Pertussis is highly recommended by the Canadian government (Health Canada).

² In respect to medical, religious and conscientious exemptions, parents are responsible for attaining, completing and returning exemptions forms to the health unit.

³ Here onward, references to “appropriately immunized” will refer to complete immunization against Diphtheria, Tetanus, Polio, Measles, Mumps and Rubella, as appropriate for the child’s age.

⁴ Health Canada, National Advisory Committee on Immunization. *Canadian Immunization Guide Sixth Edition*. Ottawa: Canadian Medical Association, 2002.

⁵ Statistics Canada. *2001 Census of Canada*. Mennonites as a percentage of the total population (2001): 44.5% Wellesley; 24% Woolwich; 13% Wilmot; 3% Waterloo; 2.2% North Dumfries; 1.6% Kitchener; 0.5% Cambridge; and 3.6% Region of Waterloo.

⁶ Coverage reports were compiled for each child’s immunization in May of the school year that they attended Grade 2. The month of May signifies winding down from the suspension period which begins in March, approximately.

⁷ Statistics Canada. *2001 Census of Canada*.

⁸ Ibid.

⁹ Ibid. The 5,882 students represent 91% of 6,455 seven- year-old children in Waterloo Region in 2001.

¹⁰ Ibid. The Township of Wellesley is a predominantly Mennonite population with Mennonites representing 44.5% of the population in 2001. The large Mennonite population may account for the lower rates of coverage, as adherents are observant of particular conditions in respect to immunization.

¹¹ It is assumed that greater communication resulted in increased coverage rates, as the real numbers of students did not change proportionately to the dramatically increased coverage rates.