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A Single Shot, A Lifetime Of Protection:

Vaccinations in 21st Century Canada

Three million lives are spared annually worldwide, and up to 750,000 people are protected against the risk of developing a disability, all as a result of the incredible medical health care initiative; vaccines. Russell Williams, president of Canada's Research-Based Pharmaceutical Companies, states in the FrontLine Medicine 2010 article that in the last century, "Smallpox vaccine was first introduced in Canada in the late 1800s. Once a parent's worst nightmare, smallpox was eradicated within Canada by 1962 and globally by 1979" (3). Vaccines are syringes that contain selective substances that stimulate antibodies, introducing the immune system to a potential virus or bacteria by "making a memory of that germ without ever having to fight the real germ in the first place. Now, when the immune system encounters the real pathogen — whether it's a virus, bacterium or other microbe — it is ready to attack it" (Konkel, par 2). These biological preparations provide long-term immunity to various diseases to its individuals; thus, the vaccination policy in schools across Canada must be amplified in every province and territory. By offering cost-effective immunizations, reducing the burden of infectious diseases,

and undoubtedly serving as the most effective healthcare initiative in medicine, vaccinations should be required for all Canadian schoolchildren.

It is reasonable to assume that due to Canada being a developed country, most individuals have the financial resources available to cover health care expenses – vaccines are no exception. The government of Canada considers immunization as one of the most cost-effective public health interventions to date “as they compare favourably to other public health care interventions in terms of cost per life year saved ... Hep B screening in immunization of children: \$164 ... Varicella vaccine in children: \$16,000 ... HPV vaccine for 12-year-old girls in school-based immunization: \$12, 921” (Canadian Immunization Guide: Part 1 - Key Immunization Information 3). Immunizations provide significant savings in healthcare costs, meaning that implementing an immunization based program in Canada is more affordable than the cost of treating the disease, had the program not been introduced. Authors of the *C.D. Institute Commentary No. 421*, Colin Busby and Nicholas Chesterley, address the benefits of children receiving immunizations since their risk of contracting a particularly severe, if not fatal, disease is significantly reduced. Their observations indicate the cost savings achieved through several immunization programs for every one dollar spent, through the Public Health Agency of Canada. For every dollar spent on the MMR (measles, mumps, rubella) immunizations, there is \$16 in cost savings achieved from fewer visits to healthcare providers, fewer premature deaths in children, and reduced time off from work for parents that need to care for their ill children (3). In addition to the savings in healthcare costs, a FrontLine Medicine article published by David Butler-Jones, Chief Public Health Officer at the Public Health Agency of Canada, estimates that

Canada spends \$60 million each year to vaccinate children against polio, however it costs roughly \$2.5 billion annually just to maintain costly equipment, such as negative pressure ventilators, needed to facilitate a polio-stricken individual's everyday life (5). Even though they are the most cost-effective method of controlling infectious diseases, immunizations not only save millions of dollars in health care costs; they are also the elixir to diseases that can be preventable.

In April of 2007, fifteen-year-old Brodie Campbell started developing symptoms that mimicked the flu and was taken to the ER. Three hours later, he died. His parents never suspected that Brodie's killer was one that could have been vaccine-preventable; meningococcal meningitis strain Y. Brodie Campbell's immunizations were up to date; however, the one that could have saved his life was never administered to him. His father, Colin Campbell, cannot stress enough how essential it is to educate parents and raise awareness for the different types of immunizations offered for different strains of the same disease. In June of 2009, the school-based immunization program, Menactra, was implemented into Ontario schools by the provincial government, which protects infants, children, and adolescents from all four strains of IMD (meningitis). These include strain A, strain C, strain W-135, and strain Y. Prince Edward Island, New Brunswick, Newfoundland, and the Northwest Territories have followed in Ontario's footsteps for implementing the Menactra immunization programs in their schools as well ("Advanced vaccine guards against lethal meningitis"). In addition, statistics taken from the Meningitis Research Foundation of Canada, have revealed that Menactra can prevent an additional 71% of meningococcal cases in teens, the age group at the highest risk. Likewise, Ian

Gemmill, former chair of the Canadian Coalition of Immunization Awareness and Promotion, reveals how vaccine effectiveness, in percentage, ranges from 90% for measles and up to 100% for human papillomavirus and hepatitis B (2). Erin Walkinshaw, author of *Mandatory Vaccinations: The Canadian Picture*, explains how infants and children are more susceptible to vaccine-preventable diseases due to their immature immune systems, and therefore, routine immunizations are essential. Older children and adults must be vaccinated continuously throughout their lives in order to maintain immunity against certain infections. Walkinshaw asserts that, “The Public Health Agency of Canada supports immunization as an effective means to protect Canadians from infectious diseases and encourages all Canadians to keep their immunizations up-to-date” (2). Dr. Sabrina Jeanty, a pediatrician in Montreal, examined a five-week-old infant who suffered from pertussis, or “whooping cough”. The infant’s twin had already passed away from the disease, as it is particularly fatal in babies and Dr. Jeanty needed to act fast. She intubated the infant and administered a single shot of a vaccine designed to protect against pertussis, who thankfully survived (“The dangers of not vaccinating are horrifying and graphic”). Vaccines will ensure the protection against rapidly spread diseases, but there are anti-vaccination ideologies that may convince the public otherwise.

In order for a vaccine to be deemed safe and effective, and considered for approval by Health Canada, it must undergo at least ten years of development and adequate research, as well as multiple tests before it can be released to the public. The Canadian government warns, “Though the efficiency of vaccines is near perfect, there is always the potential of serious side effects that may cause adverse reactions in certain individuals” (Vaccines for Children: Vaccine

safety, concerns and side effects). According to Evidence-based immunization information and tools for B.C. residents (Immunize BC), vaccine side effects are mild and its side effects can range from soreness, redness, swelling, or a mild fever. Some side effects are a direct result from the immunization process, related to the fear of getting a needle; these include anxiety with hyperventilation or fainting. Similarly, tentative research shows that in extremely rare events, an individual may develop Guillain-Barre Syndrome (GBS), a form of paralysis that may be linked to vaccines that protect against influenza and tetanus (“Side Effects”). Furthermore, the cost of certain immunization services may vary from province/territory and may require Canadian citizens to pay fees. The Ontario government states, “that paying a fee for an immunization clinic depends on whether: you qualify for a particular publicly funded vaccination and [if] the immunization service (including the vaccine and its administration) is covered by OHIP” (Immunization clinics: Fees). Statistics Canada reveals, “There were 4.8 million Canadians living in a low-income household in 2015, of whom 1.2 million (nearly one in four) were children” (Census in Brief: Children living in low-income households). The majority of individuals living in poverty cannot afford to take their children to a local immunization clinic to get vaccinated, which ultimately may lead to increased risk of contracting an easily preventable disease, due to the financial burden of these services.

Nonetheless, the CCIAP, the Canadian Coalition for Immunization and Awareness Program states in a FrontLine Medicine article that, “Immunization ranks among the 20th century’s most important public health triumphs” (6). The most effective medical innovation to date as it is known, an article published by the Canadian Public Health Association asserts that

vaccines have saved the lives of more Canadians “than any other health care initiative in the past 50 years, by eradicating smallpox globally and increasing the life expectancy from 50 years (before the introduction of vaccines) in 1900, to 81 years in 2012” (“The Value of Immunization in the Future of Canada’s Health System”). As David Butler-Jones states in the FrontLine Medicine article of The Globe and Mail:

A case in point: before the end of the second wave of the H1N1 pandemic in 2010, approximately 45 percent of Canadians rolled up their sleeves for the vaccine. This was one of the highest percentages globally, and the first time in history we’ve benefitted from this type of intervention ... we know the vaccine reduced the impact of the disease and has served our country well. (5)

The benefits associated with receiving timely immunizations outweigh the potential risks that a child or adult may be susceptible to if they have not yet been vaccinated. Kathy Smith, a Canadian woman diagnosed with cervical cancer in 2007, is no stranger to advocating for the education and awareness of vaccinations. She underwent chemotherapy and radiation for two years following her diagnosis. Ms. Smith is now cancer free and reveals in an article published by the Globe and Mail:

What a gift it is to have a vaccine that can help prevent women from going through what I went through ... I want to send the message that young women should get vaccinated to protect themselves against cervical cancer. (5)

For instance, the implementation of the school-based HPV immunization program designed to protect girls and women aged 10-25 from cervical cancer caused by HPV, has been successfully funded in all provinces and territories across Canada. Barbara Romanowski, Clinical Professor of Medicine at the University of Alberta, explains to the Globe and Mail, how in combination with regular PAP tests and the Cervarix vaccine, the risk of developing cervical cancer is reduced by a staggering 98% (5). An article published by CNW indicates that Health Canada approved Cervarix in February 2010 (“Health Canada approves Cervarix”). Additionally, the Canadian Public Health Association published the findings of the largest survey on Canadian parents regarding their attitude toward child vaccinations conducted by Ipsos, revealing that “on a scale of 0 (not at all important) to 10 (extremely important), 74% of parents rate having children immunized as a full “10” in terms of its importance in keeping children healthy” (25). Another survey conducted by the same market research and opinion polling firm indicated that “nine in ten parents (91% total agree, 63% strongly agree) believe that vaccinating children can prevent illness and ease the burden on hospitals and other healthcare services. And, a solid majority (90%) feel that all children should receive all of the standard vaccinations” (25). Vaccinations in Canada continue to serve as a primary healthcare initiative, as well as social and economic benefits.

Immunizations are “the shot in the arm that Canada needs” (Vaccine Research, Development and Awareness). Schoolchildren across the country can highly benefit from the protection they are granted when they are immunized, seeing as how vaccinations are the most cost-effective health care intervention, the primary method in minimizing the spread and eradicating potentially severe and fatal diseases, and ultimately becoming one of the greatest medical advancements in the last century. The implementation of school-based immunization programs should be mandatory in all Canadian schools of every province and territory, as well as continuing to raise awareness about the safety and efficacy of these tiny but mighty substances that will save a human life.

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