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Misconceptions About Vaccine Safety

THE ISSUE

Misconceptions about the safety of vaccines

may cause Canadians to delay or avoid immunizations. Vaccines protect against a number of preventable diseases such as measles, whooping cough, and inf uenza (the f u). Avoiding immunizations puts you, your children, and your community at risk of disease.

VACCINES

The successful use of vaccines in preventing disease means that most parents of young children in Canada today have never seen a life-threatening case of diphtheria or polio. The continued success of immunization programs depends on a high level of public participation and conf dence in the safety of vaccines.

Unfortunately, misconceptions about the safety of vaccines exist. A small minority of people actively oppose immunization practices and spread these misconceptions. Their messages can be dramatic and can cause confusion for people who want to make responsible, informed decisions about immunization for their children and themselves.

COMMON MISCONCEPTIONS ABOUT VACCINES

Here are some common **misconceptions** about vaccines, followed by the **facts**.

Misconception: Vaccines are not safe.

The facts: Vaccines are among the safest medical products available. Prior to approval they are extensively tested and they continue to undergo rigorous ongoing evaluations of their safety when on the market. Serious side effects such as severe allergic reactions are very rare.

On the other hand, the diseases that vaccines f ght present serious threats. Diseases like polio, diphtheria, measles and pertussis (whooping cough) can lead to paralysis, pneumonia, choking, brain damage, heart problems, and even death. The dangers of vaccine-preventable diseases are many times greater than the risk of a serious adverse reaction to the vaccine.

Misconception: Vaccines don't work.

The facts: When there is an outbreak of a disease, some people who have been immunized do get sick. Vaccines are not 100% effective. When disease is spreading in a community, about 10–15% of those vaccinated may get sick.

However, almost 100% of those who were not immunized will get sick. Further, immunization can reduce the risk of severe disease. Immunization is the most effective way to prevent illness and to reduce the risk of transmitting infections to those around you.

Misconception: Vaccines are linked to chronic diseases like autism, multiple sclerosis (MS), and sudden infant death syndrome (SIDS).

The facts: Peer-reviewed research using the best scientif c methods has provided strong evidence that:

- MMR (measles, mumps and rubella) vaccine does not cause autism.
- Hepatitis B vaccine does not cause multiple sclerosis (MS) or relapses of pre-existing MS.
- Pertussis (whooping cough) vaccine does not cause brain damage.
- Childhood vaccines do not increase the risk of asthma.
- Vaccines do not cause sudden infant death syndrome (SIDS).

Allegations to the contrary are still circulated on the Internet and in some books and publications by opponents of vaccination. These allegations are false. Many investigations around the world have shown no link between immunization and increased incidence rates for these diseases.

Misconception: Vaccines weaken the immune system.

The facts: Vaccines strengthen the immune system and protect children and adults from specif c diseases. Scientists estimate that the immune system can recognize and respond to hundreds of thousands, if not millions, of different organisms. The vaccines recommended for Canadian children and adults use only a small portion of the immune system's overall capacity.

Vaccines work by 'prepping' the immune system to make a rapid response the next time there is exposure to the disease prevented by the vaccine. The f rst time someone encounters a vaccine-preventable disease it takes time for the immune system to respond, ranging from days to weeks. Until that immunity develops the disease can take hold, and in severe cases irreparable damage or even death can result. The vaccine stimulates the immune system's memory so that there is an immediate response, eliminating germs before they can establish a signif cant infection.

Misconception: There are many serious side effects from vaccines.

The facts: The vast majority of vaccine side effects (adverse events) are minor and temporary, like a sore arm with some redness at the injection site, or mild fever. These can often be controlled by taking acetaminophen. Serious side effects are very rare, and it is often very diff cult to determine if a 'reaction' was directly linked to a vaccine or was an unrelated 'event' which would normally occur in a population.

They are so rare in fact, that the risk cannot be accurately assessed. Such is the case, for example, with the concern that the f u vaccine causes Guillain-Barré Syndrome (GBS). Cases of GBS have been reported within the weeks following vaccination, but GBS has several possible causes and may arise without any identif ed cause. Only very large studies were able to show that the risk following vaccination is about one for every million shots administered. It should be noted as well that the inf uenza infection itself has been associated with Guillain-Barré syndrome.

Misconception: Vaccines are not necessary because the diseases are gone.

The facts: You are not safe from a vaccine-preventable disease just because it is uncommon in Canada. Travellers carry diseases from country to country, and if you are not immunized, you are at risk. Recent outbreaks of measles in Canada have been imported this way.

Experiences from other countries have shown that diseases return quickly when fewer people are immunized. For example, in 1994, there were 5,000 deaths from diphtheria in Russia after the organized immunization system was suspended. Previously, Russia (like Canada) had only a few cases of diphtheria each year, and no deaths. Unless a disease has completely disappeared, there is a real risk that small outbreaks can turn into large epidemics if most of the community is not protected.

It is also important to realize that some people cannot have vaccines because of certain medical conditions. When you are vaccinated, you help protect those who cannot be immunized.

Misconception: Vaccines contain toxic substances.

The facts: The main ingredient in most vaccines is the killed or weakened germ (virus or bacterium), which stimulates the immune system to recognize and prevent disease, along with other substances that are required to ensure the vaccine does its job and is safe. These substances include what are called adjuvants, which help stimulate the immune response, and preservatives to prevent the vaccine itself from bacterial contamination when it is used. Every batch of vaccine in Canada is tested before it is released for public use to ensure it meets rigorous standards.

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IT'S YOUR HEALTH

One preservative, called thimerosal, has received a lot of attention because it contains a trace amount of one form of mercury. The amount present in thimerosal is minute, and does not accumulate in the body as other forms can, such as the mercury that is found in f sh. Today, most vaccines in Canada either do not contain thimerosal or contain only trace amounts as manufacturers have been working to further reduce its presence.

Canada's National Advisory Committee on Immunization (which includes recognized experts in the f elds of paediatrics, infectious diseases, immunology, medical microbiology, internal medicine and public health) has reviewed the latest science and concluded: "there is no legitimate safety reason to avoid the use of thimerosal-containing products for children or older individuals."

Other claims about toxic ingredients in vaccines include anti-freeze and formaldehyde. Vaccines do not contain anti-freeze. Formaldehyde is used to inactivate or weaken the virus or bacteria used to make a vaccine and it is removed during the manufacturing process. Any trace amounts that may remain are safe – in fact our bodies produce more formaldehyde naturally than that which is contained in the vaccine.

Misconception: Some vaccines aren't safe because they are released too soon.

The facts: Canada, like many other countries worldwide, exercises tight scrutiny (or regulatory oversight) over vaccines. All vaccines intended for use by Canadians are subject to the provisions of the *Food and Drugs Act* and the *Food and Drug Regulations*. Before a new vaccine is authorized for the Canadian market, the manufacturer must submit scientif c and clinical evidence that demonstrates the safety and effectiveness of the vaccine and that its manufacture meets high standards of

quality for Canadians.

As part of the approval process, Health Canada experts do an on-site evaluation of the manufacturer's facilities to check the quality of the vaccine manufacturing process and to make sure that the manufacturer is able to carry out the necessary quality controls for the vaccine. The manufacturer must also provide samples of the vaccine for testing in Health Canada laboratories.

Rarely, when a vaccine not yet authorized for use in Canada is needed urgently to deal with outbreaks of a specif c disease (as happened during the H1N1 inf uenza pandemic), Health Canada has ways of completing the review of submissions for these vaccines in a shorter period of time. However, no matter how urgently the vaccine is needed, it will not be authorized until Health Canada has determined that the

Canada

available evidence meets its strict criteria for safety and effectiveness. Authorized vaccines are also subject to ongoing evaluations by Health Canada and the Public Health Agency of Canada.

REDUCE YOUR RISK

There is no reason to suffer from a disease if there is a safe and effective way to prevent it. Take steps to protect your family against vaccine-preventable diseases.

If you have concerns about vaccines, talk to your doctor, pediatrician, or other health care provider. You can also find reliable, science-based information about vaccine safety on websites produced by the Public Health Agency of Canada, the Canadian Immunization Awareness Program, the Canadian Paediatric Society, and the World Health Organization. The websites for these organizations contain the facts about vaccines and vaccine safety, and can be found below.

GOVERNMENT OF CANADA'S ROLE

Health Canada regulates vaccines through a rigorous licensing process. This includes an extensive pre-market review of information about the product's quality, safety and effectiveness. Once a vaccine is on the market, the Public Health Agency of Canada (PHAC) monitors side effects (adverse events) following immunization with the help of public health authorities in the provinces and territories, and works with Health Canada to assess emerging safety concerns.

Also, PHAC monitors and analyzes the number of vaccine preventable diseases, identifies risk factors, develops guidelines for the control of vaccine-preventable diseases, and works with public health authorities in the provinces and territories during emergency situations to help contain outbreaks of disease.

The Public Health Agency of Canada and Health Canada also participate in public information initiatives, like the Canadian Immunization Awareness Program, and work with other countries to develop and implement disease-reduction or eradication strategies.

FOR MORE INFORMATION

- For other *It's Your Health* fact sheets on vaccine safety, visit: www.hc-sc.gc.ca/iyh-vsv/alpha_e.html#v
- Public Health Agency of Canada's "Immunization and Vaccines" website at: www.phac-aspc.gc.ca/im/index-eng.php
- Canadian Coalition for Immunization Awareness & Promotion (CCIAP) at: www.immunize.cpha.ca
- Canadian Pediatric Society's "Caring for Kids" website at: www.caringforkids.cps.ca/immunization/index.htm
- Public Health Agency of Canada's Fight Flu website at: www.fightflu.ca
- *It's Your Health*, Influenza: www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/flu-grippe-eng.php
- Public Health Agency of Canada, Influenza: www.phac-aspc.gc.ca/influenza/index-eng.php

FOR INDUSTRY AND PROFESSIONALS

- National Advisory Committee on Immunization (NACI) at: www.phac-aspc.gc.ca/naci-ccni/
- Canadian Immunization Guide, 7th edition (2006) : www.phac-aspc.gc.ca/publicat/cig-gci/

RELATED RESOURCES

- World Health Organization "Vaccines" website: www.who.int/topics/vaccines/en/
- U.S. Centers for Disease Control and Prevention, vaccine safety at: www.cdc.gov/vaccinesafety/Concerns/Index.html
- For safety information about food, health and consumer products, visit the Healthy Canadians website at: www.healthycanadians.gc.ca
- For more articles on health and safety issues go to the *It's Your Health* web section at: www.health.gc.ca/iyh

You can also call toll free at 1-866-225-0709 or TTY at 1-800-267-1245*

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