Learning Objectives

- Define the role of public health in relation to communicable disease control
- Recognize the role infection prevention and control in public health
- Examine the resurgence of measles disease
- Describe measles immunization recommendations and coverage rates
- Define vaccine hesitancy
Public Health

Health Authorities

Regional

Local

Provincial

Global

National

BC Centre for Disease Control

Public and community health units, acute and primary care

World Health Organization

Public Health Agency of Canada
The Role of IPC in PH

Infection Prevention is Everybody's Business
We are all connected

The global airline transportation network visualized by the flight pathways of all commercial flights worldwide.
### Top 10*

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madagascar</td>
<td>86376</td>
</tr>
<tr>
<td>India**</td>
<td>44020</td>
</tr>
<tr>
<td>Ukraine</td>
<td>41933</td>
</tr>
<tr>
<td>Philippines</td>
<td>32414</td>
</tr>
<tr>
<td>Nigeria</td>
<td>23342</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>7925</td>
</tr>
<tr>
<td>DR Congo</td>
<td>6443</td>
</tr>
<tr>
<td>Myanmar</td>
<td>4206</td>
</tr>
<tr>
<td>Sudan</td>
<td>3296</td>
</tr>
<tr>
<td>Angola</td>
<td>2840</td>
</tr>
</tbody>
</table>

*Disclaimer: The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not be full agreement.
Measles cases quadruple globally in 2019, says UN

The World Health Organization says the latest figures paint "an alarming picture"
Measles in BC - 2019

Confirmed cases of measles by epidemiological week, British Columbia, 2019 to July 26.
Vaccine Preventable Diseases

- Measles
- Mumps
- Rubella
- Tetanus
- Pertussis
- Polio

Source: Immunization Action Coalition
www.immunize.org
How many lives are saved by current immunization programs?

- 2-3 million lives per year
- 6-8000 lives per day
- 2-300 lives per hour
- 4-6 lives per minute
- 1 life every 10 seconds

Measles Immunization
Immunization Recommendations

- 2 doses of measles-containing vaccine are recommended for protection.
- MMR vs MMRV
- Why 2 doses?
### BC Routine Immunization Schedule
#### INFANTS & CHILDREN

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>2 Months</th>
<th>4 Months</th>
<th>6 Months</th>
<th>12 Months</th>
<th>18 Months</th>
<th>Starting at 4 years (kindergarten entry)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DTaP-HB-IPV-Hib</strong> (diphtheria, tetanus, pertussis, hepatitis B, polio, <em>Haemophilus influenzae</em> type b)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Pneumococcal Conjugate</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Rotavirus</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Meningococcal C Conjugate</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>MMR</strong> (measles, mumps, rubella)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Varicella</strong> (chickenpox)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>DTaP-IPV-Hib</strong> (diphtheria, tetanus, pertussis, polio, <em>Haemophilus influenzae</em> type b)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Tdap-IPV</strong> (tetanus, diphtheria, pertussis, polio)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>MMRV</strong> (measles, mumps, rubella, varicella)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Influenza</strong> (inactivated)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>(annually for children 6 months to 4 years of age)</td>
</tr>
<tr>
<td><strong>Hepatitis A</strong> (for Aboriginal Children only)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Who else should get the vaccine?

- Susceptible individuals born in or after 1970 (1957 for health care workers) should have 2 doses, 4 weeks apart.

- What about those born before 1970?
Measles Vaccine Uptake Rates
Herd Immunity

If only SOME get vaccinated...
...the virus spreads.

If MOST get vaccinated...
...spreading is contained.

Healthy, non-vaccinated
Healthy, vaccinated
Not-vaccinated, sick, contagious
Percent of Children Immunized Over Time
2 Year olds, MMR, All BC

2010: 74.3%
2011: 75.4%
2012: 88.1%
2013: 85.8%
2014: 85.0%
2015: 86.2%
2016: 87.2%
2017: 87.3%
2018: 87.2%
Percent of Children Immunized Over Time
7 Year olds, Measles, All BC

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent Immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>89.5%</td>
</tr>
<tr>
<td>2013</td>
<td>90.9%</td>
</tr>
<tr>
<td>2014</td>
<td>90.3%</td>
</tr>
<tr>
<td>2015</td>
<td>90.2%</td>
</tr>
<tr>
<td>2016</td>
<td>90.2%</td>
</tr>
<tr>
<td>2017</td>
<td>88.4%</td>
</tr>
<tr>
<td>2018</td>
<td>82.1%</td>
</tr>
</tbody>
</table>
Percent of Children Immunized by BC Health Region
Age 7 years – Measles 2018
Measles cases in BC: 2003 - 2018
Barriers to Immunization Uptake

Client Factors

Provider Factors

System Factors
Immunization Communication

IMMUNIZATION IS ESSENTIAL!

IMMUNIZATION IS DANGEROUS!

HI KID, I'M MENINGOCOCCUS, WANNA PLAY?
Vaccine hesitancy is a term used to describe a refusal of vaccination or a delay in an immunization schedule due to concerns about immunization.
Ten Threats to Global Health in 2019

1. Air pollution and climate change
2. Non-communicable diseases
3. Threat of a global influenza pandemic
4. Fragile and vulnerable settings
5. Antimicrobial resistance
6. Ebola and high-threat pathogens
7. Weak primary care
8. **Vaccine hesitancy**
9. Dengue
10. HIV
What influences vaccine hesitancy?

- Lack of understanding about the vaccine being given
- Mistrust of the source of information
- Conflicting information from a variety of sources
What influences vaccine hesitancy?

- Perceived risk of serious adverse events
- Lack of appreciation of the severity and incidence of VPDs
- Sociocultural beliefs
In the last 50 years immunization has saved more lives than any other health intervention.

Immunization Communication Tool
For Immunizers
Immunization Information on the Internet: Can you trust what you read?

This fact sheet can help you decide if vaccine information you find on the Internet is accurate. Note: The words “immunization” and “vaccination” are often used interchangeably.

1. Is it clear who owns the website?
   - Is the name of the organization or the name of the person responsible for the website in clear view?
   - Websites you can trust do not hide their identity. Look for text that tells you more about the owner or author of the site, e.g. their credentials.
   - Look for a page called “About Us” or “About [Sponsor’s Name]”. This page should provide contact details such as an e-mail address, telephone number, or mailing address.
   - The website should be endorsed by a health agency or organization.

2. Is the information on the website based on sound scientific study?
   - Scientists discover truth by testing their findings again and again. This approach helps them to be sure that their thinking and methods are not flawed. It works to ensure that they are not making personal assumptions or that special conditions have not had an effect on the results.
   - Studies that involve hundreds of people or cases have more credibility than accounts of a single case.
   - The most useful studies compare the findings from similar studies.
Immunization Information for the Public

Measles information for British Columbians

24/02/19: Two new measles cases & more possible public exposures confirmed.
Information about Vaccines

“Do you agree or disagree with the following statements?”

- Usually follow advice of child’s doctor/nurse
  - Disagree (1-3): 3
  - Neither (4): 7
  - Agree (5-7): 89

- Health provider explains risks/benefits clearly
  - Disagree (1-3): 11
  - Neither (4): 11
  - Agree (5-7): 78

- Lot of misinformation about vaccines on the Internet
  - Disagree (1-3): 11
  - Neither (4): 20
  - Agree (5-7): 62

- Internet is giving parents access to good information to make decisions
  - Disagree (1-3): 15
  - Neither (4): 28
  - Agree (5-7): 54

- Have often felt confused about number/scheduling of vaccines
  - Disagree (1-3): 64
  - Neither (4): 13
  - Agree (5-7): 21

- Don’t really understand how vaccines work
  - Disagree (1-3): 69
  - Neither (4): 14
  - Agree (5-7): 17

n=1235-1280
Vaccine Safety Survey, 2011
The Power of Your Recommendation

- HCP are the most trusted source of information on vaccination for patients
- Main predictor of vaccine acceptance is recommendation of vaccination by a HCW

Dube et al. Hum Vaccin Immunother. 2013 Apr 12;9(8)
Resources

- BCCDC Communicable Disease
- BCCDC CD dashboard
- BCCDC Immunization_coverage_dashboard
- BC Immunization_Manual
- Immunization_Comication_Tool_for_Immunizers
- ImmunizeBC
- Canadian_Immunization_Guide
- BCCDC News & Stories – Measles
- Immunize Canada – Immunization Information on the Internet: Can you trust what you read?
Thank you!