Future Directions and Priorities for Canada’s Immunization Programs

Presentation to the
NATIONAL VACCINE ADVISORY COMMITTEE
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Purpose of Presentation

- Remind of key similarities and differences between U.S. and Canadian approaches to immunization programming
- Review Canada’s plans and directions for the future of immunization policies, programs and initiatives
- Highlight Canada’s current strategy to identify and pursue vaccine innovation priorities that address evolving public health and other needs
- Reflect on recent Canada/U.S. collaborations on vaccine innovation initiatives
## Some Key Comparisons

<table>
<thead>
<tr>
<th>Element</th>
<th>United States</th>
<th>Canada</th>
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</thead>
<tbody>
<tr>
<td>Immunization program policy advice</td>
<td>NVAC</td>
<td>F/P/T Public Health Network</td>
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<tr>
<td>Vaccine procurement</td>
<td>• Federal gov’t (VFC)</td>
<td>14 F/P/T public programs</td>
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<td></td>
<td>• Private insurance</td>
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<tr>
<td>Technical guidance</td>
<td>ACIP—integrated technical and programmatic</td>
<td>NACI (federal)—technical</td>
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<tr>
<td>Programmatic guidance</td>
<td>ACIP—integrated technical and programmatic</td>
<td>CIC (F/P/T)—programmatic</td>
</tr>
<tr>
<td>Coordinated schedules</td>
<td>Yes</td>
<td>No</td>
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National Immunization Strategy

• **Established in 2003** to facilitate federal/provincial/territorial (F/P/T) collaboration on immunization issues and initiatives

• **Operating under an F/P/T Public Health Network** that seeks consensus and cooperation on approaches and initiatives of mutual benefit

• **Comprehensive 2013 review** established new strategic directions

• **Now exploring, fleshing out and firming up** detailed proposals for implementation
## Key New Directions and Priorities

<table>
<thead>
<tr>
<th>Element</th>
<th>Enhancements and Innovations</th>
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<tbody>
<tr>
<td>Guidance</td>
<td>Integrated technical and programmatic guidance with collaborative F/P/T input and accountability</td>
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<tr>
<td>Schedules</td>
<td>Moving to promote and support coordinated vaccine schedules and immunization programs, while respecting jurisdictional autonomy</td>
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<td>Surveillance</td>
<td>“Blueprint” for federated national surveillance system</td>
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<td>Response</td>
<td>F/P/T coordinated all-risk outbreak/adverse event response Protocol</td>
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<td>Evaluation Research</td>
<td>Federally-initiated Canadian Immunization Research Network</td>
</tr>
<tr>
<td>Security of Supply</td>
<td>F/P/T prevention and response Protocol, and new measures to mitigate risks and impacts</td>
</tr>
<tr>
<td>Vaccine Acceptance and Uptake</td>
<td>Collaborative F/P/T strategy to understand and address determinants of hesitancy, acceptance and uptake, building on international best practices and knowledge sharing</td>
</tr>
<tr>
<td>Vaccine Development</td>
<td>Federal-led national research, innovation and development Action Plan, with P/T input on public health priorities</td>
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</table>
Vaccine Research, Innovation and Development

• **Federal-led national Action Plan** providing cohesive approach to vaccine research, innovation and development of priority national interest
  » Canada constitutes 1.6% of global market
  » some provinces are early adopters of new vaccines

• **Key features of approach**
  1) Integrated Objectives
  2) Whole-of-Government Approach
  3) Strategic Partnerships and Collaboration
  4) Active Engagement
  5) Objective Priority Setting
  6) Vaccine Priorities
  7) International Collaboration
1) Integrated Objectives

- Antimicrobial Resistance
- Public Health
- Vaccine Innovation
- Medical Countermeasures
- Agricultural Productivity
- International Development
- Industrial Innovation
2) Whole-of-Government Approach

<table>
<thead>
<tr>
<th>Category</th>
<th>Agencies/Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Health</td>
<td>Health Canada, Public Health Agency of Canada, Canadian Institutes of Health</td>
</tr>
<tr>
<td>Animal Health</td>
<td>Agriculture and Agri-Food Canada, Canadian Food Inspection Agency</td>
</tr>
<tr>
<td>International Development</td>
<td>International Development Research Centre, Foreign Affairs and Trade Development Canada</td>
</tr>
<tr>
<td>Medical Countermeasures</td>
<td>Department of National Defence, Defence Research Development Canada</td>
</tr>
<tr>
<td>Industry, Science and Technology</td>
<td>National Research Council, Industry Canada, Natural Sciences and Engineering Research Council</td>
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</tbody>
</table>
3) Strategic Partnerships and Collaboration

- Genome Canada
- Canadian Foundation for Innovation
- Prevent
- CQDM*
- MaRS Innovation
- Centre for Drug Research and Development
- Vaccine Industry Committee

* Consortium québécois sur la découverte du médicament
4) Active Engagement

- **High-level kick-off** by federal Assistant Deputy Minister-level steering committee and November 2012 multi-stakeholder workshop to frame issues
- **Ongoing research and analysis** by federal Directors General committee
- **Multi-stakeholder workshops and webinars** with industry and scientific/research community
  - overall vaccine priorities—human and animal
  - enabling technologies—adjuvants, biomarkers for efficacy and safety
- **Engagement of key national bodies**
  - Vaccine Industry Committee
  - Council of Chief Medical Officers of Health (F/P/T)
  - National Farmed Animal Health and Welfare Council
  - Chief Veterinary Officers (F/P/T)
  - Pan-Canadian Public Health Network (F/P/T)
5) Objective Priority Setting

• **Health issue** of national magnitude or significance—burden of disease, vulnerable populations, health security implications, link to AMR

• **Economic/industrial issue** of national magnitude or significance—threats to labour force and agricultural sector; opportunities for leveraged investments and commercialization

• **Cross-border dimensions and implications**—interprovincial, international

• **Unique/specialized requirements**—dependent on federal/national facilities, expertise and collaboration required

• **Industry interest and receptor capacity**—alignment with domestic research interests, development capacities and state of readiness along the pipeline
6) Vaccine Priorities

- **Canada using various tools and approaches** to identify and assess vaccine priorities of national interest in Canada

- **Pilot testing/refinement of “SMART” vaccines**
  - objective analysis and comparison of vaccines with respect to their expected “performance” against a set of variables of interest, including client-specific weighting of criteria
    - population (age, gender, socio-economic status, race, other variables)
    - burden of disease
    - vaccine efficacy
    - vaccine purchase and immunization program implementation costs
    - other considerations and outcomes
6) Vaccine Priorities (cont’d)

- International Prioritization of AMR Activities

  - **Centre for Disease Control** – 2013 Report on AMR threats in the US
    - assessed select pathogens based on seven criteria; work was initiated as a result of *Generating Antibiotics Incentives Now (GAIN) Act*
    - report aimed at lay public and policy makers
    - focused on pathogens where research/surveillance already being conducted in US

  - **World Health Organization** – 2014 Global report on AMR surveillance
    - selected bacterial drug combinations
    - choice for 'bug-drug' combinations likely based on committee decision
    - April 2014 WHO working group initiated to define priority AMR pathogens
6) Vaccine Priorities (cont’d)

• **Canadian AMR risk ranking and prioritization**
  » systematic analysis of pathogens/diseases associated with AMR, to assess potential contribution of vaccines in reducing AMR vulnerabilities
    o initial assessment of 32 diseases currently/potentially present in Canada
  » primary ranking against *health burden and residual risk*—incidence, mortality, case fatality, communicability, treatability and clinical impact
  » secondary prioritization against *additional contextual considerations*—10-year projection of incidence, economic impact, public and political attention, and preventability
### 6) Vaccine Priorities (cont’d)

Initial AMR ranking of 32 pathogens - Canada

![Graph showing initial AMR ranking of 32 pathogens for Canada]
7) International Collaboration

• Recent examples of international collaboration and cooperation on vaccine innovations
  » Innovative Medicines Initiative (European)
  » *Haemophilus influenzae* type a
  » Ebola medical countermeasures
Innovative Medicines Initiative (IMI)

- **Joint undertaking** between European Union and the pharmaceutical industry association EFPIA
- **Largest public-private initiative** aimed at speeding up development of better and safer medicines
- **Supports collaborative research projects** and builds networks of industrial and academic experts
- **Works in precompetitive space** to address important public health issues, including safety and efficacy of vaccines and drugs through programs like BIOSAFE
Incidence of Hia in Northern Populations by age group, (N=106)
Collaboration on *Haemophilus influenzae* (Hia)

- **Collaborative approach** involving Canada, US, PAHO, Brazil and Columbia
- **International Circumpolar Surveillance**
- **Genome sequencing of 40 Hia strains**—38 from Canada and 2 from Brazil:
  - allow bacteria characterization
  - advance Hi diagnostics using monoclonal antibodies
- **Public Health Agency of Canada (PHAC)** providing expertise to PAHO in typing Hia strains
- **CDC proposal to 20 states** for enhanced lab-based surveillance on non-b Hi
- **Arctic Investigations Program** (CDC) to start severity study
- **Protein polysaccharide conjugate vaccine** (NRC)
VSV-based Ebola Vaccine MCM

- Developed by Public Health Agency of Canada, with co-funding from Department of National Defence’s Canadian Safety and Security Program
- Licensed to Newlink Genetics Corporation
  - very good protection pre-exposure
  - less protection early post-exposure
- Administered to German researcher following high-risk needlestick lab exposure
  - not otherwise tested in humans
  - not approved for use in humans by Health Canada, FDA or other international regulators
- Phase I Clinical Trials fall 2014
- Collaboration DOD, NIAID, BARDA
Conclusions

- **Collaborative approach** vital, engaging all key partners and parties
- Need to give industry a **sense of market potential**
- Vaccines of **public health interest and MCM** have some overlap, but also distinctions
- Further **cross-border collaborative opportunities** to be explored