

# *Canada's Vaccine Implementation*

# Purpose

- Provide an overview of the approach taken by a Canadian jurisdiction to implement SNOMED CT within their system to manage immunization data
- Provide *Infloway's* role in supporting the Canadian jurisdiction in meeting their Immunization requirements.

# Business Use Cases to Support

- Active recording
  - At the “actual product” level: “Patient Y has received administration of ‘Tripacel® Hybrid’ at the clinic today”
- Historic recording
  - “Patient X had a TB vaccination in 1987” – no idea which actual product was used
- Pharmacoeconomics – immunization forecasting
  - Proactively identify patients who need a vaccine
    - “Patient X had dose 1 of Twinrix ® 12 months ago; overdue for dose 2” -recall reminder to be sent
- Analytics at various levels to support management of information (e.g. coverage report)
  - Provide public health resources with data that will allow them to consolidate all single component (e.g. IPV / OPV) and combination (e.g. DPTP; DPTP-Hib) products to calculate coverage for a particular antigen (e.g. polio)

# Approach

- Iterative approach
  - Top down (leveraged/refined the existing pharmacy model) / bottom up (working with a stakeholder who will be using the content asap with the Canadian Immunization Guide as our “Bible”)
  - Test with end users
- Document the concepts, the patterns and the decisions
- Provide lots of examples (it’s a small domain)
  - Starting point was known business requirements and the unknown business requirements got fleshed out
- Construct administration vaccine subset first
  - It’s describing what exists, that can be held in your hand

# Project Scope

- Develop subsets to be used to meet the following high level business requirements:
  - Recording administration of vaccines (current and past)
  - Inventory management
  - Immunization forecasting
- Concepts to be authored into the Canadian extension of SNOMED CT and to include descriptions to be used at the user interface and delivered in the following subsets
  - VaccineAdministeredNameCode
  - VaccineHistoricalNameCode
  - PassiveAdministeredImmunizingAgentCode
  - PassiveHistoricalImmunizingAgentCode
  
  - Antigens (for forecasting)
  
  - Vaccine Preventable Diseases

# Key Assumptions

- Content initially intended for public health resources, but to be extended to primary care practitioners
- Concepts must support the Public Health Agency of Canada (PHAC) abbreviations that are well recognised in the domain (e.g. “DTaP”)
- All descriptions must be unique
- Concept authoring should be underpinned by a terminology (concept) model that:
  - Provides a firm foundation for any future development of a pan-Canadian Medicinal Product terminology for clinical use
  - Is compatible with proposed SNOMED CT concept model from the IHTSDO Pharmacy SIG

## VaccineAdministeredNameCode Subset

- The scope of this Subset is vaccines that are currently licensed for use in Canada and those obtained through special access programs for use in Canada. The Subset includes concepts represented by the trade name (brand name) of the vaccine administered to the Client. This content is intended to be used when populating a record at the point of immunization.

# Administrable Product – FSN and PT

## General FSN Pattern:

Trade Name strength Manufacturer (product)

Example:

Engerix B 10 micrograms per 0.5 milliliter suspension for injection GlaxoSmithKline Inc. (product)

## General PT Pattern:

PHAC Abbreviation Trade Name (“qualifier strength”) Manufacturer Abbreviation

Example:

HB Engerix B pediatric GSK

Rules (examples):

- Trade name
  - The case will be mixed /title
  - Will be as provided by the manufacturer
  - Will not include trade mark “TM” or “R” symbols



# VaccineHistoricalNameCode Subset

- The scope of this Subset is
  - vaccines used in Canada (without specifying the trade name, i.e., generically described),
  - those obtained through special access programs, and
  - vaccines that have been discontinued and/or never licensed in Canada.

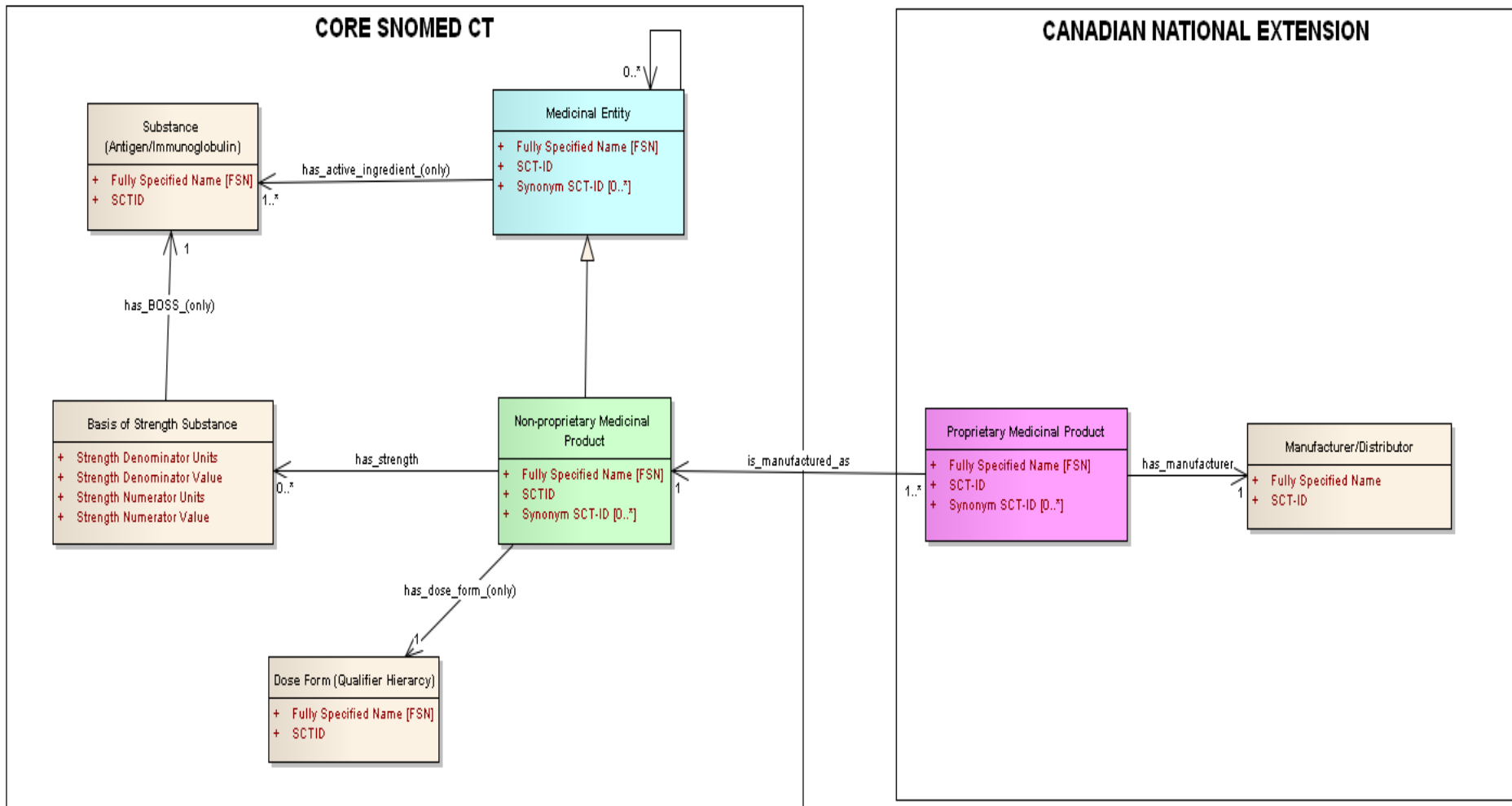
This content is intended to be used when populating an immunization history when the client and /or provider does not have the detail of the trade name of the vaccine administered OR the product has been discontinued and/or never licensed in Canada. It also include concepts represented by the trade name of products that have been discontinued.

# Historical Vaccine Examples

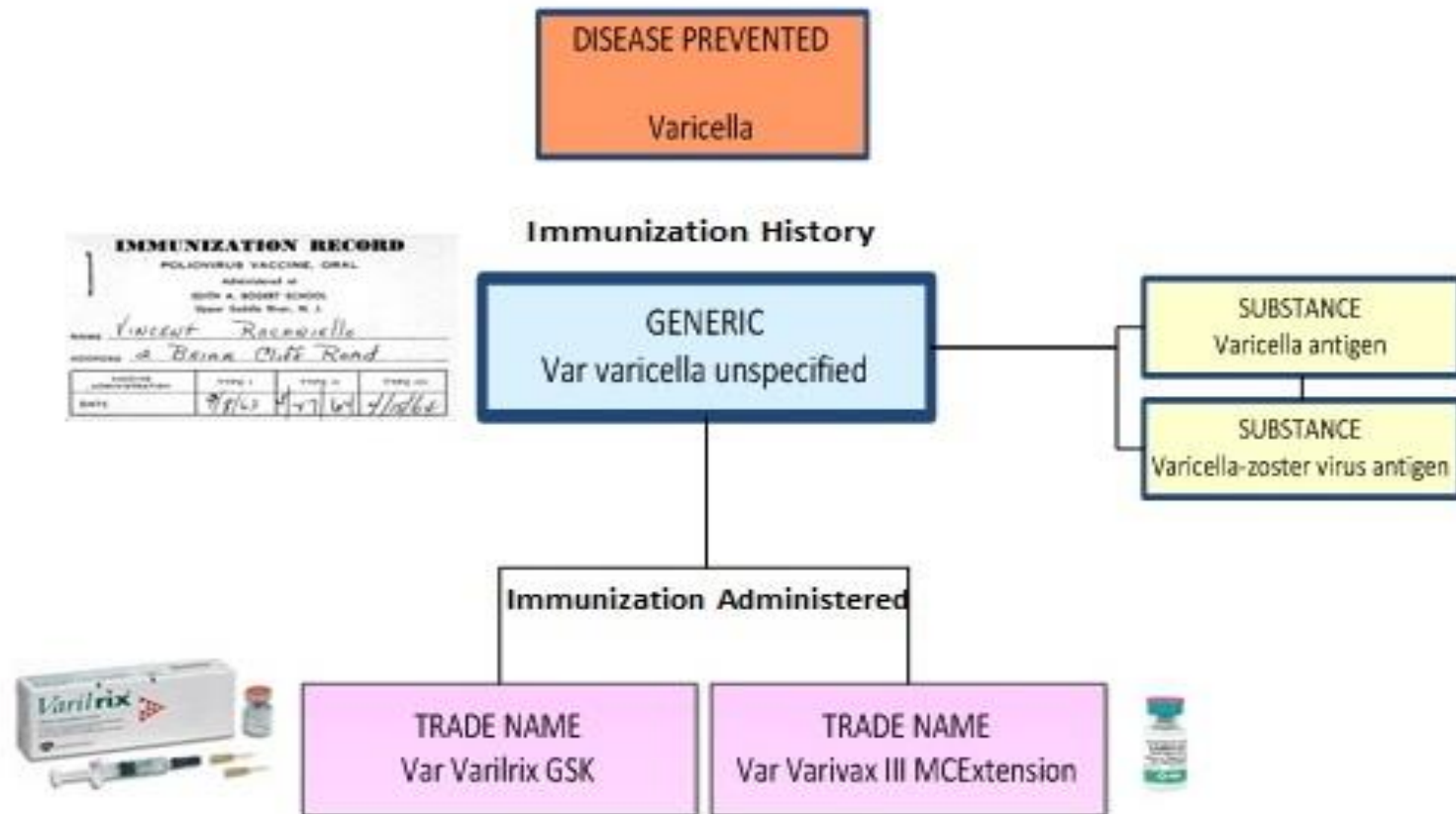
Code	Fully Specified Name	Preferred Term
34689006	Hepatitis B virus vaccine (product)	HB hepatitis B unspecified
8771000087109	Hepatitis B virus vaccine regular strength (product)	HB hepatitis B regular strength unspecified
8781000087106	Hepatitis B virus vaccine dialysis strength (product)	HB hepatitis B dialysis strength unspecified

# Vaccine Model

class Simplified View



# Vaccine Model Example

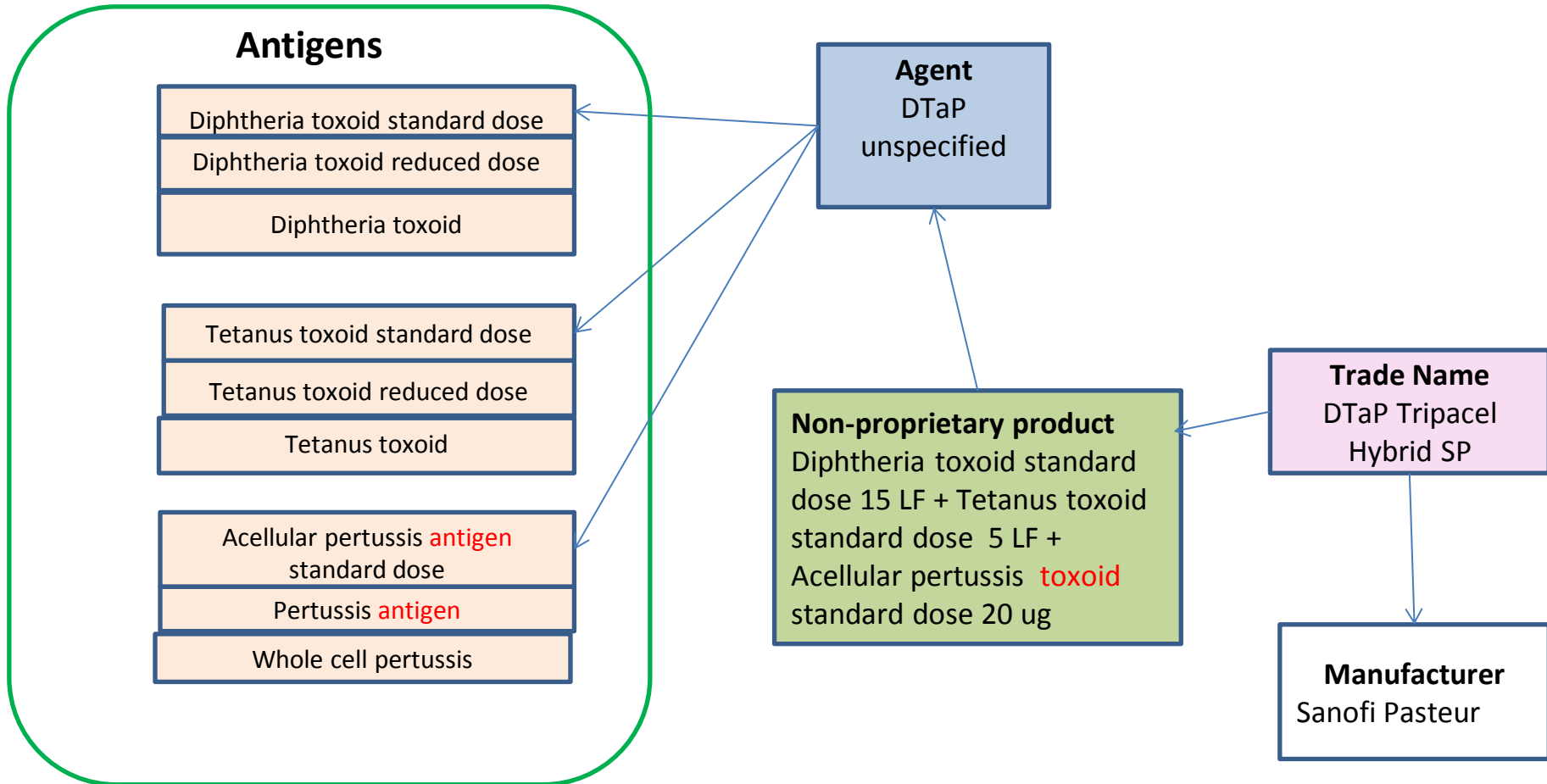


# Antigens (substance)

- Immunization forecasting requirements:
  - “antigen + dose quantity” concept (e.g. Diphtheria toxoid standard dose)
  - “**Specific** antigen” (e.g. live attenuated Varicella zoster virus antigen)
  - “Pure antigen serotype” when possible (e.g. Human papillomavirus type 16 antigen)
  - In some cases forecasting will be done based on the product, as different brands (trade names) have been licensed with different immunization schedules

# Vaccine Model – Antigen Challenge

## Substance hierarchy



# What Worked Well

- Having a stakeholder ready to implement
  - Could articulate their requirements clearly and assist with decisions
- Stakeholder engagement
  - Governance
  - Assisted with socializing with other jurisdictions
    - Subsets (specifically the user interface descriptions) received amazingly well by all
- Resource team
  - Domain expert, terminology expert and advisor
  - Reached out to IHTSDO resources as needed

# Challenges

- Priority of an interface terminology over a reference terminology
  - Managing multiple descriptions (public health and EMR clinicians)
- Multiple & different “authoritative source”(s) of information
  - Health Canada (HC)
  - Global Trade Item Number (GTIN)
  - Public Health Agency of Canada (PHAC) Guidelines
  - Clinical requirements not always defined or published by experts at the antigen level.
- Appropriate levels of granularity, and expression of this
  - Number of active substances within a vaccine product
  - Valency of antigens or serovars within vaccine
  - Adjuvanted haptens as antigens (conjugated polysaccharide as opposed to polysaccharide subunit)
  - Differences in dosage and administration patterns (“D” and “d”)
  - Pack size or not (especially if two HC drug identifiers (DINs) for one “product”)
- Substance hierarchy
  - Antigens, toxoids vs vaccines content



# Challenges within SNOMED CT Core

Find tuberculosis v

- tuberculosis vaccine
- tuberculosis vaccination
- tuberculosis verrucosa cutis
- tuberculosis of seminal vesicle
- tuberculosis of vertebral column
- Mycobacterium tuberculosis Asian variant

Hierarchy Subtype hierarchy

- vaccine
  - tuberculosis vaccine

Descriptions

- Lang: en-GB
  - tuberculosis vaccine (product)
  - tuberculosis vaccine
- Definition: Fully Defined as ...
  - is a
    - vaccine
  - has active ingredient
    - tuberculosis vaccine
- Codes
  - Original SNOMED Id : C-B6013
  - Read Code (Ctv3Id) : XUe3K

BCG vaccine or TB vaccine?  
BCG vaccination is administration  
of an antineoplastic agent?

Words - any order

Find vaccine

- vaccine
- vaccine
- FIV vaccine
- MMR vaccine
- wart vaccine
- cholera vaccine
- typhus vaccine

Hierarchy Subtype hierarchy

- antineoplastic agent
  - vaccine
    - attenuated Bacillus Calmette Guerin
      - bcg live intravesical 120mg solution
      - connaught strain Bacillus Calmette-Guerin 81mg i
      - tice Bacillus Calmette-Guerin 12.5mg pdr for reco

Concept Status: current

Descriptions

- Lang: en-GB
  - attenuated Bacillus Calmette Guerin (product)
  - attenuated Bacillus Calmette Guerin
- Definition: Primitive
  - is a
    - antineoplastic agent
  - is a
    - vaccine
  - has active ingredient
    - attenuated Bacillus Calmette Guerin
- Codes
  - Original SNOMED Id : C-781CA
  - Read Code (Ctv3Id) : XUdRe

Concept Status: current

Descriptions

- Lang: en-GB
  - Bacillus Calmette-Guerin vaccination (procedure)
  - BCG vaccination
  - Bacillus Calmette-Guerin (BCG) vaccination
  - Bacillus Calmette-Guerin vaccination
  - BCG immunisation
  - tuberculosis vaccination
  - tuberculosis immunisation
- Definition: Fully Defined as ...
  - is a
    - immunisation against bacterial disease
  - is a
    - administration of antineoplastic agent
- Group
  - method
    - administration - action
  - direct substance
    - attenuated Bacillus Calmette Guerin
- Qualifiers
  - access
    - surgical access values
  - priority
    - priorities

## Outcome

There are 4 jurisdictions, including ON in various stages of implementation (ON, MB, SK, Canadian Forces) and it is anticipated that there are will be other opportunities for use

This work resulted in a request from 6 provinces for Infoway Standards Collaborative support to develop sub sets for Communicable Disease.

# Thankyou