Understanding the Rules for Creating CVX and MVX Codes

Objective:
The objective of this document is to explain the HL7 codes needed to identify the vaccine used in an immunization. The document will:

- Provide background information on the concepts behind CVX codes
- Describe the business rules for creating new CVX and MVX codes
- Provide resources and explanation on data mapping

Background Information:

Vaccine Coding Systems
In 1999, the CDC published an implementation guide for messaging immunization histories. Two value sets were defined that allowed specification of the vaccine used at the vaccine administration level. The CVX code is a numeric string, which identifies the type of vaccine product used. The MVX code is an alphabetic string that identifies the manufacturer of that vaccine. Taken together, the immunization can be resolved to a trade name (the proprietary name of the product).

For example, a CVX code of 43 represents Hepatitis B, adult formulation. There are 2 manufacturers of this vaccine, GlaxoSmithKline (MVX = SKB) and Merck (MVX = MSD). An immunization using Recombivax, a Hepatitis B vaccine manufactured by Merck, would have a CVX of 43 and an MVX of MSD.

When these codes were developed, they were designed to accommodate reporting of vaccine histories when the manufacturer and trade name are not known. This is because a client often had a shot card listing the vaccinations received, but with only a date and vaccine group listed. If the manufacturer and formulation were not known, then the Hepatitis B vaccine administered would be coded with a CVX of 45 (Hepatitis B, not otherwise specified).

Other codes exist that are associated with the coding of a vaccine. These include: RXNorm, NDC, and CPT. RxNorm, a standardized nomenclature for clinical drugs and drug delivery devices, is produced by the National Library of Medicine (NLM). In RxNorm, the name of a clinical drug combines its ingredients, strengths, and/or form.

The NDC is produced by the Federal Drug Administration (FDA) and serves as a universal product identifier for human drugs. These codes indicate the product, the manufacturer or packager, and the packaging (e.g. 5 dose vial).

The CPT (Current Procedural Terminology) is produced by the American Medical Association (AMA). CPT codes are used to report medical procedures and services.

Each of these codes is tied to actual products or services and cannot accommodate the historical vaccination records typically found on paper-based sources. This is the reason that codes directly linked to trade name were not selected.

Vaccination History

An individual immunization history may be recorded in a number places:

- shot cards
- paper medical records
- one or more electronic systems, such as:
    - Electronic Health Records (EHR)
    - Electronic Medical Records (EMR)
    - Immunization Information Systems (IIS)
    - Health Information Exchange (HIE) networks

Typically, an immunization history contains:

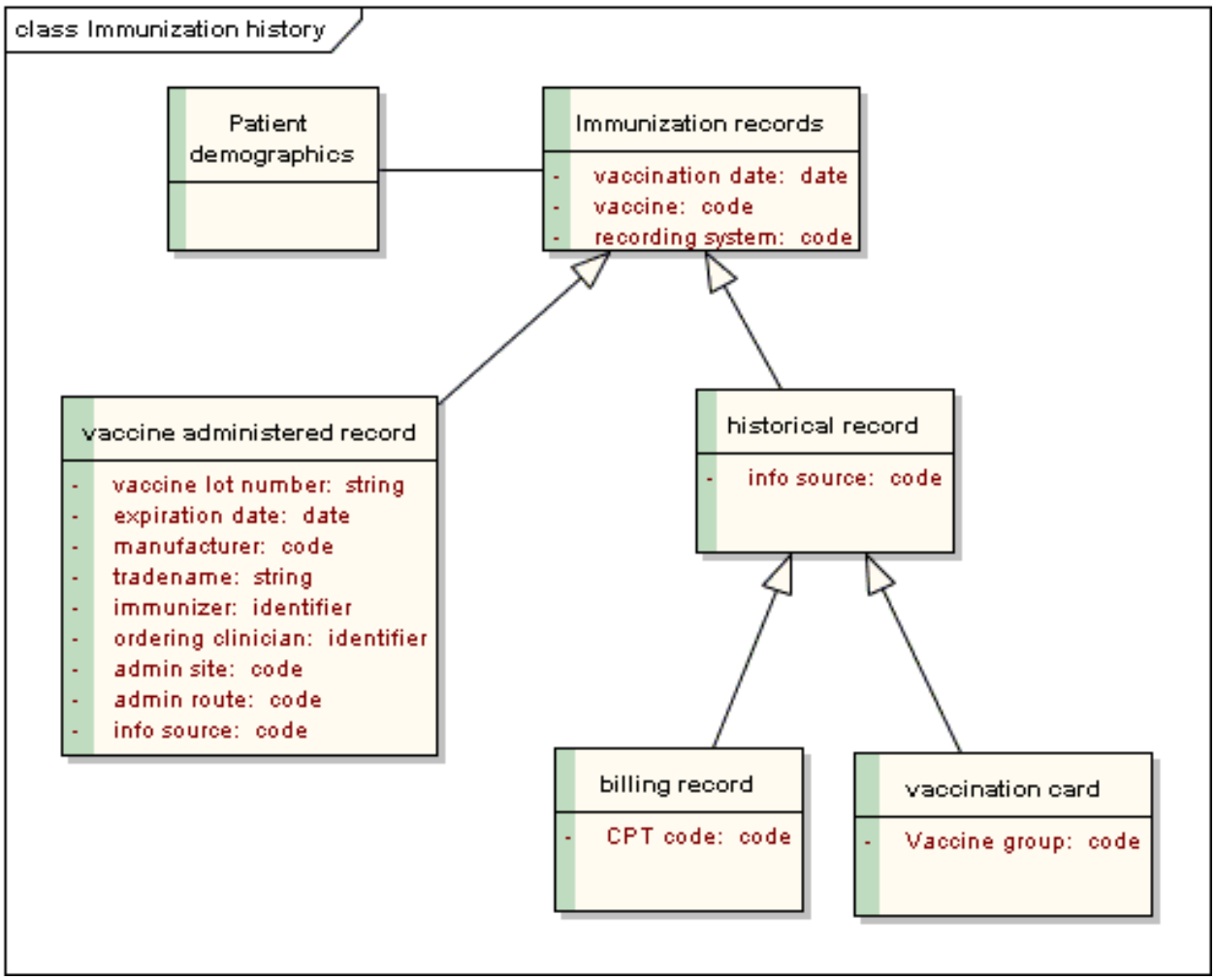
- a limited amount of demographic information
- a record of the immunization event
- noted reactions to immunization

Coding Alternatives

One of the efforts to ensure that health information systems can communicate is the Health Information Technology Standards Panel (HITSP). HITSP reviewed existing standards and value sets and selected HL7 Version 2.x as the standard for transmitting immunization data. It selected CVX value set to code the vaccine administered in an immunization and MVX value set to code the manufacturer of the vaccine. As a result, each immunization record in an HL7 message includes a field to record vaccine and manufacturer. The vaccine field is required, while the manufacturer code is required but may be empty.

Immunization Event Domain

The following diagram illustrates the immunization event domain. Each patient/client has zero or more immunization records. Every immunization record has a vaccine and a vaccination date. The source of a particular record influences what is likely to be known about that immunization event. If the immunization was given by the recorder, specific information about the vaccine product can be known. On the other hand, a historic record of an immunization is much less likely to have information on lot and manufacturer. There are several common sources for these historical records: billing systems and vaccination cards (paper records).



<u>Definitions and Business Rules</u>:

CVX

Definition

The CVX code is a numeric string, which represents the type of product used in an immunization. Every immunization that used a given type of product will have the same CVX, regardless of who received it. Typically, there are a number of factors that determine which vaccine will have the same or a different CVX code:

- the formulation
- the concentration
- the manufacturing process (egg culture vs. cell culture)
- the route of administration

Business Rules for Creating CVX Codes

The following is a set of principles that are used in the decision to create new CVX codes. Some of these codes have been used as historical principles and some are being newly implemented.

BR Number	Situation	Outcome
1	Vaccines with similar formulation are manufactured with and without preservative.	Different CVX code
2	Vaccines with formulation that contain different concentrations of active ingredient. e.g. adult vs.pediatric formulation	Different CVX code
3	Vaccines against the same disease(s) that have different formulations: • Conjugate vs. polysaccharide • Oligosaccharide vs. polysaccharide • Different conjugations (HIB-PRP-T vs. HIB OMP)	Different CVX code
4	Vaccines with manufacturing processes that are significantly different. e.g. cell culture vs. egg culture	Different CVX code
5	Vaccines with different routes of administration.	Different CVX code
6	Vaccines that are meant to fight exactly the same disease(s) and do not meet one of the conditions above.	Same CVX code
7	Vaccine from one lot is used at different dose, depending on recipient factors.	Same CVX code

Other Key Principles of CVX

- Vaccines that are no longer manufactured are set to inactive.
- Inactive codes are not removed from the table of CVX codes.

For example, Oral Polio Virus Vaccine (OPV) is no longer produced, but remains in the CVX code list to allow historical records of doses of this vaccine to be a part of a person's immunization history.

MVX

Definition

The MVX is an alphabetic string, which represents the manufacturer of a vaccine. It reflects the manufacturer of the specific instance of the vaccine. For example, Pfizer (MVX = PFR) acquired Wyeth (MVX = WAL). Prevnar is a vaccine that was manufactured by Wyeth. Immunizations of Prevnar that were manufactured by Wyeth continue to use the MVX of WAL. Prevnar that is now manufactured by Pfizer will have an MVX of PFR. Existing records will not be changed.

Business Rules for Creating MVX Codes

BR Number	Circumstance	Outcome
1	New Manufacturer or existing manufacturer that now manufacturers vaccines.	Create a new code. Set to active.
2	Existing vaccine manufacturer ceases to make vaccine.	Set to inactive.
3	Existing manufacturers merge into a new company.	Create a new code. Set to active. Inactivate the previous manufacturers.
4	Existing manufacturer is acquired by another existing manufacturer.	Inactivate acquired manufacturer. Associate vaccines administered after the acquisition with the acquiring manufacturer.
5	Vaccine has a manufacturer and a distributor.	Only the manufacturer has an MVX code.

Other Key Principles of MVX

- Inactive MVX codes are not removed from the MVX table.

Data Mapping of Alternate Codes to CVX and MVX:

CVX and MVX codes have been developed to best meet the needs for recording vaccine history, but not all partner systems can send these in a message. Therefore, it is vital to support mapping from these alternative codes to CVX and MVX. Mapping allows receiving systems to accept these alternative codes and convert them to CVX and MVX. For example, CDC has maintained a mapping from CPT to CVX for a number of years. Tables to map from NDC to CVX and MVX are under development, as is a mapping from trade name to CVX and MVX.

References:

CVX Codes:
https://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=cvx

MVX Codes:
https://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=mvx

CPT to CVX Codes:
https://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=cpt