

National E-Health Transition Authority
Project #2

NEHTA Specification
Template Reference Guide

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Title	Description
Priority Event Summaries and Code Sets, and Jurisdictional Gap Analysis	Final report for NEHTA Projects #1 to #4, and summary of jurisdictional analysis of clinical information requirements.
Index of NEHTA Specifications	Structured hierarchy of the priority data groups for use as an index.
Priority Event Summaries - Descriptions	For each of the event summaries identified as priorities for national standardisation, a description of the context, together with an indication of the clinical data groups that might be expected, and some indication of implementation considerations.
NEHTA Technical Specifications	Technical specification of the completed data groups using the NEHTA specification template (based on ISO/IEC 11179).
NEHTA Specification Template Reference Guide	User guide for the interpretation of NEHTA specifications. Defines and further clarifies the concepts in the NEHTA specification template.
NEHTA Specifications - Guide for Use	User guide to assist with the interpretation and use of NEHTA specifications by those involved in development, implementation or operation of systems.
NEHTA Specifications - Summarised Format	Extract of key elements from the NEHTA technical specifications that provide a high level view of content without the technical detail.
Draft NEHTA Specifications - Summarised Format	Provides a high level view of content for the draft data groups that are near completion.
Adverse Reaction and Alert Archetype Representations	Archetype representations of the Adverse Reaction and Alert data groups. Archetypes allow for direct use by software systems.

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1 INTRODUCTION

1.1 Purpose of this Document

The focus of the NEHTA Clinical Data Standards (CDS) has been to define the clinical information content for electronic health system developments in Australia

This document is a user guide for the interpretation of National E-Health Transition Authority (NEHTA) clinical data specifications. It provides an introduction to the concepts, format and language used to describe the underlying metamodel, together with specifications for the definitions of the specific meta-data attributes used.

2 METAMODEL FOR DATA SPECIFICATION

The metamodel is used to specify the overall structure of an event summary. In general, clinical information is organised hierarchically according to event summary, data group, data element and value domain. Figure 1 (below) illustrates the relationships between the various metamodel components used in the NEHTA data specifications, shown with two clinical examples.

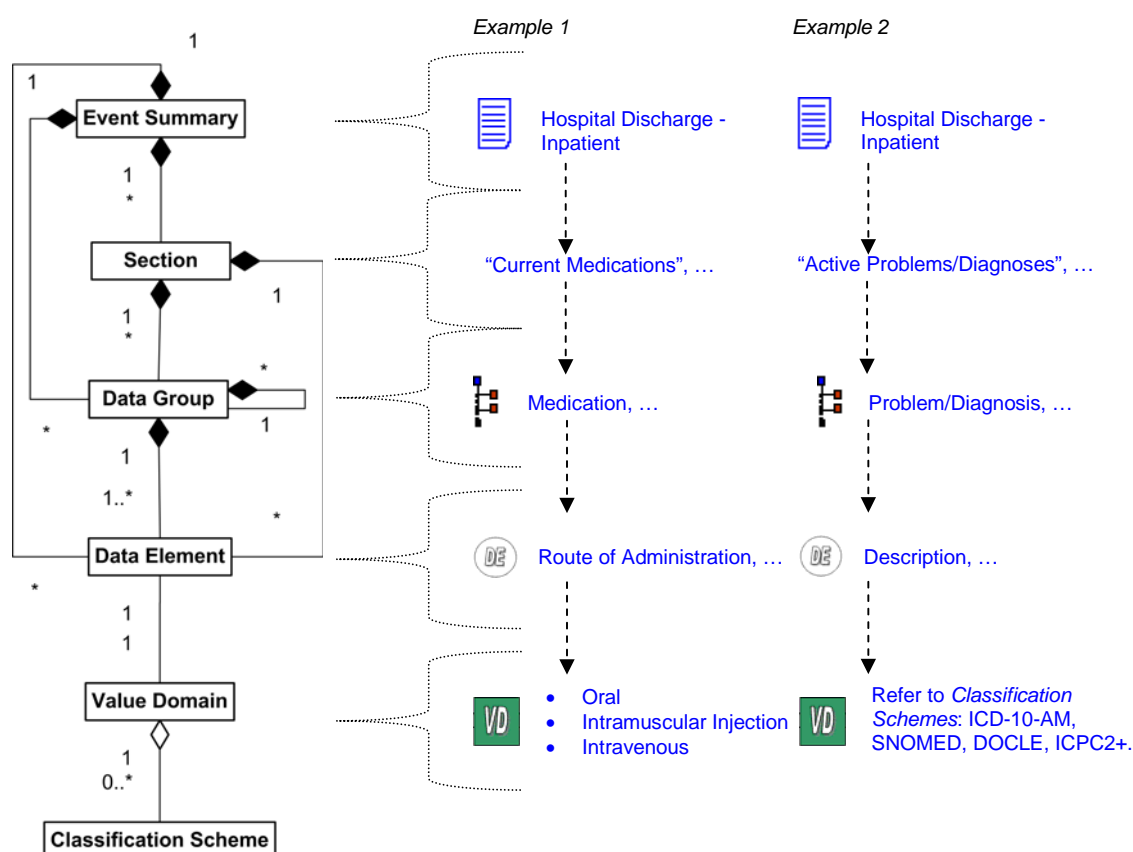


Figure 1 - High level metamodel and examples.

The original format of the data specifications was based on the Australian Institute of Health and Welfare (AIHW) National Health Data Dictionary (NHDD), using the international ISO/IEC 11179 Information Technology: Metadata Registries standard. However, due to additional requirements for specifying clinical information, NEHTA has developed data specifications according to a redesigned metadata specification template. This redesigned template retains the relevant metadata attributes from the ISO/IEC 11179 standard, and adds other required attributes (see section 3 for discussion).

The NEHTA metamodel elements (Event Summary, Section, Data Group, Data Element, Value Domain, Data Type, Classification Scheme) will be described.

2.1 Event Summary

Definition: An event summary is a collection of consumer/patient health information derived from a healthcare event that is relevant to the ongoing care of that individual.

Note: These event summaries are composed of one or more data groups and/or possibly data elements, which are organised into Section(s) (see section 2.2 below).

Examples of event summaries are *Hospital Discharge - Inpatient* and *Pathology Results*.

2.2 Section

Definition: A Section is an organising 'container'. Its purpose is to organise information in the manner that is suitable for the primary purpose it is collected, and that is useful for health care providers. It should also ensure that it can safely be reused for secondary purposes. A Section also provides a way to navigate through the data items within an Event Summary - thereby enabling more efficient querying to be made.

A Section may contain:

- the further set of allowable Section classes or 'sub-sections'; or
- the set of allowable Data Groups and/or Data Elements that may be populated at run-time.

Further Section constraints include the occurrence and obligation of these sub-sections, Data Groups and Data Elements. The default ordering of Section components is as they appear in the specification.

Note: a Section does not alter the semantics or meaning of any of the Data Groups and/or Data Elements it contains.

Examples of sections are "*Active Problems/Diagnoses*" and "*Current Medications*".

2.3 Data Group

Definition: A data group is a composite data structure (a collection of data elements or smaller data groups) for holding related items of information.

Notes: Values of all the component data elements are often required to provide unambiguous meaning in a given context. A data group "organises" the data it holds. A data group can only be assigned values through the data elements that are contained within it.

Examples of data groups are Adverse Reaction, Organisation, and Medication Item.

Hierarchical Data Groups

Whilst a data group may simply consist of data elements, it may also be hierarchical such that it can contain nested data groups as well as data elements. For example, an adverse reaction data group may contain a provider identification data group, that has data elements such as ID, name, contact details, etc, for recording information about the provider who reported the adverse reaction. The figure below illustrates a hierarchical group structure and the hierarchical depth of the nodes within it. The table below the figure shows the hierarchical depth, and related parent(s) and children of specific nodes in the hierarchy.

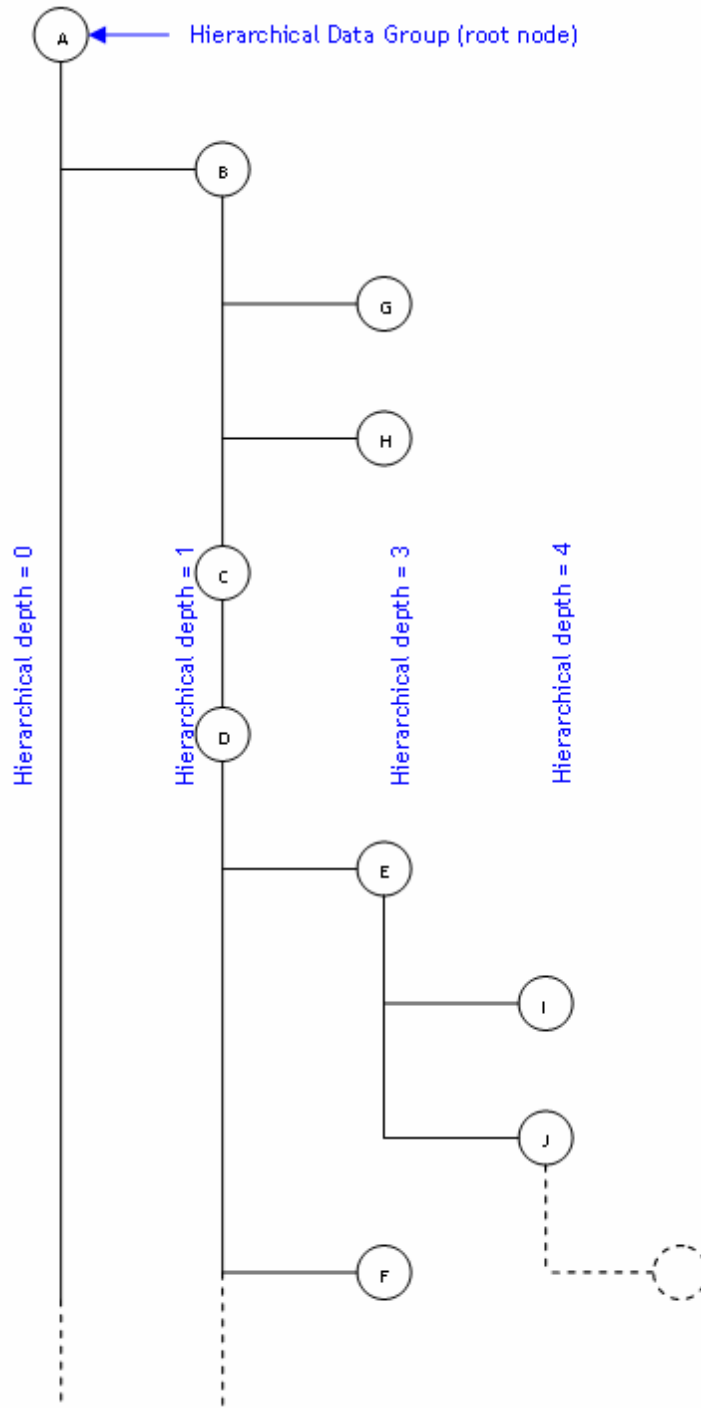


Figure 2 - Hierarchical data group structure.

Examples

Node	Parent(s)	Children	Hierarchical Depth
A	-	B, C, D	0
B	A	G, H	1
C	A	-	1
I	E	-	3

2.4 Data Element

Definition: The data element is the smallest named unit of information in the model that can be assigned a value.

Notes: Data elements are identified as either simple or component. A data element that occurs as a member of a composite data structure (see below) is identified as a component data element. A data element that occurs in a segment outside the defined boundaries of a composite data structure is identified as a simple data element. The distinction between simple and component data elements is strictly a matter of context since a data element can be used in either capacity¹.

2.5 Value Domain

Definition: A value domain constrains a data element's permissible values to a subset of those of its generic datatype (see section 2.6).

Notes: Value domains typically constrain by either specifying a lower and/or an upper bound on the range of permissible values or else specifying a finite set of prescribed values. Such a set of prescribed values can be specified directly with the definition of the data element, or in a separate, but associated specification, or else by reference to one or more external vocabulary/terminology sets (see section 2.7). Table 1 shows examples of value domains.


Table 1 - Value domain examples.

Data element	Datatype	Value Domain
severity	coded text	"mild", "disabling", "life threatening"
diagnosis	coded text	Refer to classification scheme: ICD-10-AM Fourth Edition

Some potential sources for value domain within data elements have been identified and listed. These potential sources are also work in progress. NEHTA value domain specifications have been defined for data elements where the values come from an agreed, enumerated, predefined set.

2.6 Data Type

Definition: A data type can refer to a specific datatype, e.g. Date/Time, or can refer to more complex structures such as a named Data Group, e.g. *Adverse Reaction*, or even a named Event Summary type, e.g. *Medical-Consultation-GP*.

Notes: A datatype² defines characteristics that are common to a set of distinct values. The data type is visually represented as an icon within the specification templates (see Table 2 & Table 3). Where a specification has been sourced externally, the following icon has been used  as it is not always possible to exactly match the data type.

The data type options used in the data specifications is draft as a concurrent project on data types is finalising options.

¹ Adapted from the Texas Department of State Health Services, *THCIC Hospital Discharge Data Collection, THCIC 837 Technical Specifications* (version 13), November 19, 2004.

² Note the different semantics of "data type" and "datatype" (with no space).

2.7 Classification Scheme

Definition³: A terminological system used to classify objects. It is organised in some specified structure, limited in content by a scope, and designed for assigning objects to concepts defined within it. Concepts are usually assigned to an object by linking the terms representing those concepts in the terminological system to the object. This process is called classification, and the terms assigned through classification are used for retrieval. In general, any terminological system is a classification scheme if its intent is to classifying objects.

Notes: A classification scheme is used to encompass terminologies and vocabularies used for various uses such as direct clinical use and statistical analysis. Classification schemes are referred to in the NEHTA data specifications where they exist externally and are required in value domains.

Table 2 - Metadata types














<i>Icon</i>	<i>Metadata type Name</i>
	Event Summary
	Data Group
	Data Element
	Value Domain

Table 3 - Datatypes

<i>Icon</i>	<i>Datatype Name</i>	<i>Explanation</i>
T	Text	Character strings (with optional language). Unless otherwise constrained by an implementation, can be any combination of alpha, numeric or symbols from the Unicode character set. (Sometimes referred to as free text).
T ₀₁₀	CodedText	Coded text <i>without</i> exceptions; text with code mappings. It is viewed that a CodedText value should consist of both the text or term value, its corresponding code value, the name of the terminology and the terminology version number from which it is sourced.
T/T ₀₁₀	CodeableText	Coded text with exceptions; flexible datatype to support various ways of holding text - both free text, CodedText and combinations of free text and CodedText. CodeableText allows users to potentially add a new term where the existing terminology does not yet currently support. It also allows for values of the data element to be sourced from a terminology that may be able to support it in future and can supply the appropriate code values for them. The latter is known as 'late-binding' of values to codes/terminology.
	DateTime	Used for specifying a single date and/or time. Has the ability to indicate a level of precision, as well as an indication that the date/time is estimated. String representations of known dates should conform to ISO 8601.
	Duration	The period of time during which something continues. Usage/Example: "3 hours"; "6 months"; "1 year"
123	Number	A whole number or positive integer, and where (according to ISO 11404) - <ul style="list-style-type: none"> <i>Integer</i> is the mathematical datatype comprising the exact integral values (Usage/Examples: 1; 50; 125).
	Boolean	A value of true or false. Usage/Example: An actual value entered by the user might be "yes", or could be chosen by a mouse click on an icon such as <input checked="" type="checkbox"/>

³ As defined by ISO/IEC 11179.

	UniquelIdentifier	A general unique identifier to identify a physical or virtual object or concept.
	TimeInterval	Two Date/Time values that define the initial and later points in time. Usage/Examples: 12:00 - 18:00; 1:30 a.m. - 6:00 p.m.
	Quantity	Used for recording many real world measurements and observations. Such a data type needs not only to provide for a magnitude value to be recorded, but also for units, precision and number of decimal places to be recorded.
	QuantityRange	Two <i>Quantity</i> values that define the minimum and maximum values, i.e. lower and upper bounds. This is typically used for defining the valid range of values for a particular measurement or observation. Usage/Examples: Temperature range of -20 to 100 °C; 30-50 mg of a prescribed drug.
	EncapsulatedData	Used to specify how to supply metadata such as the type of data encapsulated (such as JPEG images, HTML, etc. using RFC 1521 MIME types), whether the data is inline or passed by reference, what character set is used to encode the data, any low resolution "thumbnail" representation included, any compression algorithm or integrity check information included.
	Link	This is a general link, reference or pointer to an object, data, or application that exists logically or stored electronically in a computer system. Usage/Example: URL (Uniform Resource Locator) - the World Wide Web address of a site on the Internet, such as the URL for the Google Internet search engine - " http://www.google.com ". An absolute or relative path within a file/directory structure - e.g. in Windows operating system, the 'link' or absolute path to a particular letter (Word document) may be: "C:\Documents and Settings\guestUser\My Documents\Letter.doc".
A/B	Ratio	The relative magnitudes of two <i>Quantity</i> values (usually expressed as a quotient). Usage/Example: 1/3; 1:3
a,b,c...	Sequence	Ordered collection of items. Usage/Example: A person's given names, e.g. "David Phillip Andrew" would be held as 3 items grouped in order to form a single entity.
{b,a,c...}	Set	Unordered collection of items with values that must be unique within the set.

3 KEY ASPECTS OF THE NEHTA DATA SPECIFICATION TEMPLATE

3.1 Data Specification Templates

The following key aspects are supported by the NEHTA data specification template:

1. Application and implementation independent specifications;
2. Support for existing terminologies in value domains;
3. Explicit definitions for metadata components;
4. Support for reuse;
5. Human-readable presentation;
6. Specifying relationships;
7. Specifying data flows; and
8. Support for capturing change history.

3.1.1 Application and Implementation Independent Specifications

The semantics or meaning of data should be unambiguous and this property maintained when implemented and used in information exchange. In general, data specification should not constrain the way the data is stored and used in systems. Therefore, the NEHTA specification template has been redesigned and generalised for the health domain, independent of any implementation approach, and does not target specific applications, databases, or business documents.

As an example, the NEHTA data specification does not specify the lexical representation of data as is currently being specified in the NHDD. Specifying at such a detailed level assumes that the data specifications are to be mapped to an implementation, typically a relational database where the data type and its format need to be known in advance. For instance, the date format should not only be constrained to 'dd/mm/yyyy' as this limits the flexibility of the use of the data. Furthermore, the difference between what is specified and what is required or exchanged at run-time between systems that potentially have different underlying data models is difficult to predict.

The NEHTA specifications do not specify the format of data items such as the valid characters and protocol, and it does not specify the maximum character length. NEHTA is monitoring a concurrent project funded by the Department of Health and Ageing (DoHA) that aims to deliver a datatype specification. This specification is likely to include primitive and complex datatypes, which go above and beyond, for example, those currently used in the NHDD. A subset of these datatypes, currently being drafted is used in the NEHTA data specifications (shown in Table 3). The NEHTA complex datatypes will specify as part of the relevant datatype, available constraints such as maximum and minimum size and precision.

3.1.2 Support for Existing Terminologies in Value Domains

NEHTA views that higher level taxonomies can be provided by existing terminologies such as Systemised Nomenclature of Medicine - Clinical Terms (SNOMED-CT) and do not need to be re-created within value domains. NEHTA Value Domain specifications have, therefore, included an external reference to terminologies, as well as references to external data specifications where they exist. For example, NEHTA is using an external reference for the Provider Identification data group since this is specified using Standards Australia's AS5017 and AS4846. There may be situations where a value domain may refer to multiple classification schemes since the set of permissible values may not entirely be supported by a single classification scheme. In addition, there may be a requirement to support backwards compatibility where older versions/releases of the classification schemes are used.

3.1.3 Explicit Definitions for Metadata Components

NEHTA data specifications also include explicit “definition” metadata attributes for event summaries, data groups, data elements and value domains. The definition describes the meaning of the data in a simple, clear and concise statement. For data group specifications, this may be supplemented with a “scope” in which the data is used and, for data element specifications, a “context” attribute to state the specific context or application in which the data is used. Many terminologies do not often provide explicit definitions of terms in natural language form, but rather remain implicit within the term’s position or ‘path’ within its classification hierarchy. For example the different meaning of ‘severity’ is implicitly attained because the term may appear in two classification hierarchies as shown in Figure 3.

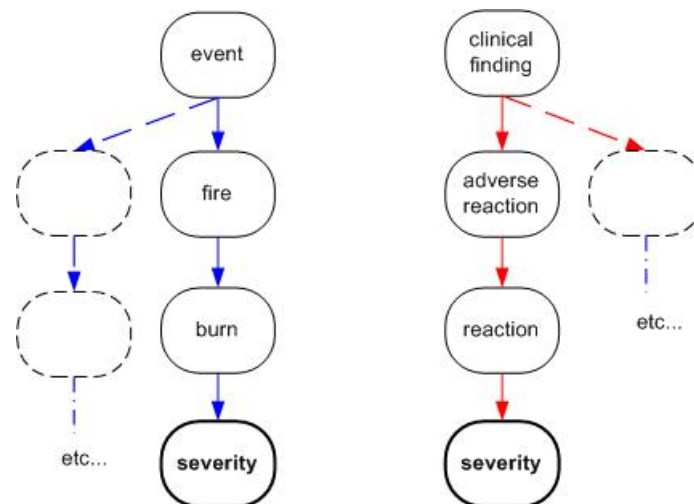


Figure 3 - Example showing ‘severity’ in different classification hierarchies.

3.1.4 Support for Reuse

NEHTA data specifications have also been designed to support reuse of data components⁴ so:

- a data element can be reused in more than one data group;
- a sub-data group can be reused in more than one data group; and
- a value domain can be reused by more than one data element.

3.1.5 Human-readable Presentation

The NEHTA template specification has been designed to represent the specifications in a human-readable format, e.g. for clinical consultations.

1. Documents/publications - persistent records created for business purposes, e.g. clinicians and managers.
2. Data transactions (possibly transient data/information for query and response).

Thus, specification components should support:

- Presentation of hierarchical structured information - NEHTA data specifications provision of a visual representation of hierarchical structures and use of icons also improve human-readability;
- Presentation on paper (for human reference) - requires a summarised version of the data specification; and.
- Relationship metadata.

⁴ Any of Data Group, Data Element or Value Domain is referred to as a data component.

Although it is important that the NEHTA data specifications be in a format that can be agreed upon by clinicians, the ultimate aim of these specifications will be to assist developers and vendors of systems to ensure new information systems comply with these specifications.

3.1.6 Specifying Relationships

Relationships between information objects are included so that they are understood and recognised globally. Relationships are important because they provide the context that turns data into information, and ultimately, information into knowledge. This is a key aspect of the NEHTA data specifications as they provide the metadata required to group related information items together. In particular, relationships provide an explicit means to define complex data structures which are hierarchical (see section 2.3 for discussion on hierarchical data groups). Explicit information about relationships also enables more efficient querying of data and can assist in the presentation of data, e.g. providing hypertext links within HTML.

Relationships can also have different properties such as the type (parents, children, and instances) and hierarchical depth. Provision of example related instances of data are included as part of the documentation to add further real-world context, clarity of meaning and use. Hence, the data specification language must be able to specify definitions as well as specify instantiations.

3.1.7 Specifying Data Flows

NEHTA data specifications allow 'data flows' to be specified explicitly. This provides further context of the source and target of the data when it is exchanged in the real world. These data flows are important when trying to fit the data in the business process or 'workflow' of healthcare providers. Furthermore, the senders and receivers may be different types of users, e.g. it may be a system or human, or they may be different types of healthcare providers or organisations. This information provides further context to both non-technical and technical audiences.

3.1.8 Support for Capturing Change History

Metadata relating to the history of changes made to data specifications is particularly important for data developers. NEHTA views that the changes committed to the data specification repository result in a new version of the data specification, and is therefore assigned a new version number. The version number along with the data identifier itself (which may be alphanumeric, or simply the data's name) is important for uniquely identifying a single data specification. Versioning avoids loss of data, enables developers to simply revise an existing data specification without having to re-create the entire specification, and to refer back to older versions as required. This is particularly important for longitudinal electronic health records, where data captured many years ago, will need to be interpreted against metadata relevant at the time of capture, not metadata current at the time of access.

The data specification is considered as 'final' and does not require any further change where we will have a version number which can essentially be used to uniquely identify the data specification by other external parties when published or released, i.e. its release number.

4 NEHTA METADATA ATTRIBUTE DEFINITIONS

This section describes each individual metadata attribute for the data specifications.

1. Identification

Name	Name of the data.
Meta-data Type	Type of metadata, which may be 'Event Summary', 'Data Group', 'Data Element', or 'Value Domain'.
Identifier	<p>Unique identifier of this data specification that can be uniquely referenced externally. The identifier is typically attained from its primary key within the data specification repository. The NEHTA data specification identifiers are prefixed according to their metadata type.</p> <p>ES = Event Summary</p> <p>DG = Data Group</p> <p>DE = Data Element</p> <p>VD = Value Domain</p>
Version	Version number of the data component (ES, DG, DE or VD) specification.
External Identifier	Unique identifier that refers to an external specification (if used).





2. Definition

Definition	Definition that describes the data.
Definition Source	Name of the organisation, e.g. NEHTA, AIHW or artefact/standard, or NHDD, from which the definition was sourced.
Synonymous Name(s)	List of any synonyms for the data name.
Scope	Description of the scope within which this data may be used. This attribute is relevant only to Event Summaries and Data Groups.
Scope Source	Name of the organisation or standard/artefact from which the scope is sourced. This attribute is relevant only to Event Summaries and Data Groups.
Context	Description of the context (application environment, discipline) within which this data may be used. This attribute is relevant only to Data Elements.
Context Source	Name of the organisation or standard/artefact from which the context is sourced. This attribute is relevant only to Data Elements.
Assumptions	Any assumptions made about this data specification.
Value Domain Source	The name of the terminology or vocabulary from which the value domains permissible values are sourced. For example, NEHTA, NHDD, SNOMED-CT.
Value Domain Source Version	Version number of the value domain source.
Value Domain Permissible Values	List of permissible values in the value domain.

Hierarchical Structure

This shows the complete hierarchical representation (in a human-readable format) of a composite data structure showing the data type (represented as icons - see Table 2 & Table 3), the name of its data components, and their occurrence within the hierarchical structure. Sub-components are indicated using indentations. This 'Hierarchical Structure' section is only specified within the top-level or root data group, and is not included in the specifications of its *component* data items.

Legend

Icon	Explanation
	"Choice data group" - a single data group to be chosen from a set of data groups. Data groups of the same hierarchical depth within a hierarchical data group that make up a 'choice set' are indicated using this icon.
	Multiple occurrences
	Externally sourced specification
	Externally sourced Data Group specification

3. Usage

Default Value	Default value from the list of permissible values from the Value Domain.
Conditions of Use	Condition(s) under which the data may be used.
Conditions of Use Source	Name of the organisation, standard/artefact from which the conditions of use are sourced.
Misuse	Situations or conditions where the data is considered to be misused.
Examples	Example(s) of values for the data. This attribute is generally used only for data elements where their values are not constrained by an agreed value domain. This may be because the value domain is still to be developed or is under development. Moreover, not every data element will have a value domain defined for it. These include data elements whose individual permissible values cannot be predefined, e.g. various data elements of datatype Quantity, or Date/Time. However, for the purposes of providing further information where data elements may potentially be accessed/distributed as 'stand-alone' specifications (i.e. without their corresponding value domain specifications), a few example values will be sourced from their value domains where they have been defined.
Trigger Event(s)	Set of trigger events that result in the event summary being recorded.
Validation Rules	Set of rules that ensures that the correct data is used, i.e. to satisfy the system requirements.
Verification Rules	Set of rules that ensures that the correct data is used in the correct manner and via a correct method, i.e. to satisfy the system specification. This helps to maintain the quality and consistency in the data.

Note the *Validation* and *Verification Rules* (see shaded rows above) will be specified as part of the CDS future work. These fields will be populated as NEHTA data specifications undergo trial implementations in the next phase of development (post June 2005).

4. Data Flow

(Additional explanation, see section 3.1)

Sender Type	May be 'system', 'human', 'either system or human'.
Sender Role(s)/Organisation(s)/Jurisdiction(s)	The primary role(s) and/or organisation(s) and/or jurisdiction(s) that send the data. Any or all of role, organisation and jurisdiction may be filled-in AND it may list one or more possible senders of the data.
Recipient Type	May be 'system', 'human', 'either system or human'.
Recipient Role(s) / Organisation(s) / Jurisdiction(s)	The primary role(s) and/or organisation(s) and/or jurisdiction(s) that receive the data. Any or all of role, organisation and jurisdiction may be filled-in AND it may list one or more possible recipients of the data.

5. Relationships

This section specifies the hierarchical metadata, i.e. the parents and children of the data. Ancestors, descendants and siblings and hierarchical depth may also be included. The top of the hierarchy (root data item) has a hierarchical depth of 0. Children have a hierarchical depth of 1, etc. (see section 2.2). Since the obligation, condition and cardinality of the data can vary depending on the context it is used, e.g. the data element 'date/time' data element may be 'essential' and appear only once within the 'legal' data group, but may be optional and appear several times within the 'medication' data group since the medication data group will have 'start date/time', 'administered date/time' and 'cease date/time' data elements). The hierarchical metadata can also assist in efficient querying and presentation of clinical content.

Parents

This section contains metadata attributes relating to the parent data structures of the data. The parent metadata attributes are repeated for each parent. In general, value domains will have one-to-many data groups as parents, data elements will have a parent of metadata type 'data group' (or multiple parents if they belong/reused in more than one data group); data groups may have parents of metadata type 'data group' if they are within hierarchical data structures, or 'event summary'⁵ (see also Figure 1). Parent relationships do not apply to event summaries since they are considered the top-level data structures (as shown in Figure 1).

Data Type	Represented as an icon (see Table 2 & Table 3). For parent relationships only, the data type refers to the metadata type 'data group' for hierarchical data groups that have data groups within data groups, or 'event summary' metadata type for parents of non-hierarchical data groups, and top-level data groups. For an additional explanation (see section 2.6).
Name	Name of the parent data.
Version	Version number of the parent data's specification.
Obligation within parent	The obligation of the data being specified within the parent, which may be: <ul style="list-style-type: none"> - 'Essential': Indicates that the data item is considered to be a core component of information and required in order for the entry to make sense, e.g. Alert without an Alert description does not make sense; - 'Desirable': Indicates that the data item is considered worthy of being supplied where the data is known. The data item is deemed important in terms of providing additional or supplementary information in conjunction with essential data items. The data item should be supplied to provide as much context as possible for users to make informed decisions and/or to support various implementation requirements such as efficient indexing, querying and electronic decision support;

⁵ NEHTA is not currently specifying Event Summaries as a deliverable for June 2005.

- 'Optional': The data item may be supplied if required within a context and if the data is available, but it is not necessary for the data entry to make sense. It is recognised that for more complex or specialised healthcare provider settings, some items deemed optional may be viewed essential to them; or
- 'Conditional': The data item is required on the condition of some other data item(s) being supplied, or based on the value(s) of another data item(s).

Condition within parent The condition expression if the obligation is 'conditional'.

Occurrence within parent The occurrence of the data being specified within its parent. This may be 'Single' or 'Multiple'.

Children

This section contains metadata attributes relating to the children data structures of the data (where the child 'nodes' share the same parent). The children metadata attributes are repeated for each child. In general, data elements may have a single child of metadata type 'value domain', data groups may have children of metadata type 'data elements' and/or 'data groups' if they are hierarchical data structures (see also Figure 1). 'Event summaries'² may have 'data groups' and possibly 'data elements' as children. Children relationships do not apply to value domains since they are considered the lowest-level data structure (as shown in Figure 1).

Data Type Represented as an icon (see Table 2 & Table 3). For children relationships, the data type refers to the metadata type 'data group' for hierarchical data groups that have data groups within data groups, or specific datatypes (see Table 3 for a list of possible data types) for data element children. (Additional explanation, see section 2.6)

Name Name of the child data.

Version Version number of the child data's specification.

Obligation The obligation of the child within the parent, which may be 'Essential', 'Desirable', 'Optional', or 'Conditional' (see 'Obligation within parent' under the 'Parents' section above for explanation).

Condition The condition expression if the obligation is 'conditional'.

Occurrence The cardinality of the child within its parent. This may be 'Single' or 'Multiple'.

Instances

The same data component may be reused in various contexts. When a context is incompletely specified, the data structure is referred to as a basic instance, e.g. the HEALTH CARE PROVIDER IDENTIFICATION of any health care provider. When fully qualified (see Table 4) it is referred to as a specific instance. A specific instance is specified in the same way as its basic instance, however its definition is more specific to a particular context. The definition of a specific instance is referred to as a context definition. The hierarchical depth of the instance (beginning from '0' which is the root or top-level data group) is also specified.

Basic Instance Name and Hierarchical Path - the convention:

All names of basic instances are constructed using only the base names of their component data structures.

For flat data structures, the data element base name is constructed using the data group base name and the data element base name itself delimited by a period with the data group name capitalised, e.g. DATAGROUP.Data element.

For hierarchical data structures, the base name is constructed beginning with its root data group base name, followed by the set of sub-data group base names (for data group specifications) up to and including the data element base name (for data element specifications). Each base name is delimited by a period, e.g. DATAGROUP.SUB-DATAGROUP.Data element.

The convention is to begin a name with its root data structure followed by its component data structures. This gives its absolute path within the hierarchy.

Specific Instance Name and Hierarchical Path - the convention:

All names of specific instances are constructed using a combination of their base name(s) and contextual name(s) depending on how specific the instances are. The contextual names are also constructed using their absolute hierarchical path. Each single contextual name itself is constructed using its base name and the specific name delimited by a colon, e.g. DATAGROUP.SUB-DATAGROUP.Data element:Instance.

Instance names within a value domain specification follow the above conventions with the value domain name being listed immediately after the data element or data element instance and is enclosed within parentheses, e.g. DATAGROUP.SUB-DATAGROUP.Data element(Value domain) or DATAGROUP.SUB-DATAGROUP.Data element:Instance(Value domain).

Example: The basic instance HEALTH CARE PROVIDER IDENTIFICATION data group may have a specific instance (shown in Table 4) when used in the context of the Health Care Provider reporting the IMMUNISATION.

Table 4 - Example Instances Relationships for HEALTH CARE PROVIDER IDENTIFICATION Data Group.

Instance Name	Context Definition	Hierarchical Depth
<[DATAGROUP].[SUB-DATAGROUP]*.[Data element]:[Instance].([VDName])>	<This must be populated if this is a specific or contextualised instance, otherwise it is left blank and uses the generic definition in Section 2 of the specification>	<Default = 0 for flat structure data group and root/top-level data group>
IMMUNISATION.HEALTH CARE PROVIDER IDENTIFICATION:Reporting	Details pertaining to the health care provider or organisation who is reporting the event.	1

Legend

Notation	Description
<>	The details enclosed in these brackets are the potential value(s) for the metadata attribute.
[]	A placeholder for the actual name/value.
[]*	The detail enclosed in the square brackets may be repeated more than once depending on the data item's position within the hierarchy.
Data Group/Data Element/Value Domain Name	All clinical concepts (i.e. names of event summaries, data groups [DGName], data elements [DName] and value domains [VDName]) are distinguished using a blue font throughout the specifications.

The following metadata attributes from sections 6-10 are generally not included as part of the template for data specifications distributed to non-technical audiences (as these are not considered relevant for clinical consultations).

6. Administrative

This section contains metadata attributes relating to the administration of data items (specific to the data development body, e.g. NEHTA, AIHW-NDDU), which can involve the justification for the development of data, project, i.e. data development, time frames, data developer details, etc.

Primary Developer	The name of primary developer of the data.
Consulting Developer	The name of the developer to consult during data development.

Assisting Developer	The name of the developer who assists the primary developer in developing the data.
External Developer	The name of any developer who is external to the data development body, e.g. via secondment used for the development of the data (usually in the assisting role).
Responsible for Sign-off	The name of the person who is responsible for signing-off or endorsing of the data.
Administrative Status	The status of the data indicating its stage in the <i>development</i> process, e.g. proposed, working, peer reviewed, under consultation, superseded, final (data is ready to undergo the endorsement and standardisation process), obsolete.
Priority	The level of priority for development and endorsement assigned to the data.
Business Justification	Underlying business rationale for the development and endorsement of the data.
Degree of Support	Description of the level of support from various jurisdictions.
Time Frame	This section describes the time frame in which the data must be developed and/or endorsed.
Jurisdiction requirement	Describes the relevant specific jurisdiction(s) that require the data.
Sign-off Date	Date for the data to be signed-off for endorsement.
Key Issues	Any major issues with the development, endorsement and/or implementation of this data that require resolution.
Comments	Any administrative comments about this data.
Date Issued	Date that this data was issued, e.g. for consultation, review, endorsement, standardisation.
Valid Until	Date that this data remains valid until from the date it was issued, e.g. for consultation, review.

7. Registration

This section contains metadata attributes relating to the formal registration of each metadata item in a metadata registry such as AIHWs METeOR.

Type of Registration	For example, single, subset or entire set of data specifications.
Registry	The information and communications technology system that implements a register, e.g. METeOR.
Registration Authority	An approved organisation that performs the registration, e.g. Health Data Standards Committee (HDSC).
Registration Status	The status of the data indicating its stage in the <i>endorsement</i> and <i>standardisation</i> process, e.g. candidate, approved/endorsed, review (a systematic review is pending), draft, superseded, standardisation pending, stabilised (no longer requires maintenance or review), standard, retired.
Consensus Level	The category that characterises the level of consensus reached to produce the data, e.g. jurisdictional, committee, private (intended for private use and consensus is not needed), other.
Level of Standardisation	The category that characterises the level of standardisation associated, e.g. international, regional, national, and other.
Responsible Organisation	Name of the organisation that is responsible for the data.
Type of Responsible Organisation	The category that characterises the kind of organisation the data development body is, e.g. standards body, other body, other entity.
Submitting Organisation	Name of the organisation who submitted the data for registration.

Type of Endorsement	The category that characterises the consensus process used to endorse the data, e.g. international, regional, national, other, or none.
Endorsing Organisation	Name of the organisation who endorses the data, e.g. National Health Information Group (NHIG).
Comments	Any comments regarding the registration of the data.

8. Consultation

This section contains metadata attributes relating to the feedback received from consultation undertaken for the development of the data. The consultation metadata attributes are repeated for each feedback received.

Feedback Date	The date that the feedback was received.
Feedback	Description of the feedback.
Feedback Source	Source of the feedback, e.g. consultations, survey.
Feedback Source Discipline	The discipline of the source from which feedback was received, e.g. General Practice, Allied Health.
Outcome of Feedback	Details the actual outcome or resolution of any feedback that required further consultation, and/or for any conflicting feedback. For example, future consideration, resolved, out of scope.
Feedback Type	The type of feedback, which may for instance, either be: "Trivial" - no outcome to be populated; "General" - contains feedback and outcome; or "Authority" - requires testing or follow-up to be taken to an authority such as the clinical body - College of Physicians.

9. Sources Used

Source Type	Type of source used, e.g. electronic, book, journal article, conference proceedings, personal communication, audiovisual material.
Source Organisation	Name of the organisation of the source.
Source Document Identifier	ISBN.
Source Document Version	Version of the source document.
Source Document Title	The given title of the source document.
Source Document Type Description	Description of the source document type, e.g. PDF, HTML, MS Word document.
Source Document Location	This may be a URL, directory path, etc.
Source Last Accessed Date	Date that the source was last accessed (applicable to web pages).
Source Document Last Updated	Date when the source document was last updated.
Comments	Any comments about the source used. This may include comments about which metadata attribute(s) that required the source; how the source was used, e.g. in the data item proposal/creation, modification, etc.

10. Change History

Version	Version of the data specification, where the change(s) committed, i.e. one or more changes may be made and committed altogether, typically results in a new version of the entire data specification. This helps to ensure that no data whether irrelevant or not is ever lost in case a previous version ever needs to be retrieved at some point.
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Date/Time Committed	Date/time that the set of data specification change(s) was committed into the database repository.
Changes Made	Details of the set of changes made to the data specification. Each change made details the 'change type', 'metadata item affected' and 'change reason'. Note that these change details may be tracked down and recorded automatically if a change and version management system, e.g. CVS was used, otherwise, a committer may manually detail the set of changes made as a whole rather than each individual change.
Change Type	Type of change made, e.g. creation, update, deletion.
Metadata Item Affected	Name of the metadata attribute within the data specification affected by the change.
Change Reason	Justification for the change made. Tracking of all the changes made and the reasons for the changes may also assist in more informed decision making during data development.
Committer	Name of the person/individual who committed the set of change(s).
Committer Organisation	Name of the organisation that committed the set of change(s) (this is usually the organisation that the committing individual is affiliated with).

5 EXAMPLE - DATA GROUP SPECIFICATION

CLINICAL SYNOPSIS







1. Identification

<i>Name</i>	CLINICAL SYNOPSIS	
<i>Meta-data Type</i>	Data Group	
<i>Identifier</i>	DG-013	<i>External Identifier</i>
<i>Version</i>	0.1	

2. Definition

<i>Definition</i>	Comments on relevant health related issues pertinent to the subject of care.
<i>Definition Source</i>	NEHTA
<i>Synonymous Names</i>	Clinical comment, Clinical note, Clinical summary
<i>Scope</i>	Narrative information is captured or entered here by a healthcare provider from the focus of a healthcare provider, carer, subject of care and/or others unrelated to the subject of care .
<i>Scope Source</i>	NEHTA
<i>Assumptions</i>	

Hierarchical Structure

 CLINICAL SYNOPSIS 
 Information provided by
 Clinical synopsis comment
 HEALTH CARE PROVIDER IDENTIFICATION (see external reference for full specification KBIDtba):Reporter
 DateTime:Recorded

3. Usage





<i>Conditions of Use</i>	Used to capture a contextual summary that may not otherwise be available in other individual data items.
<i>Conditions of Use Source</i>	NEHTA
<i>Misuse</i>	Used in place of other individual data items.

4. Data Flow

<i>Sender Type</i>	Either system or human
<i>Sender Role(s)/Organisation(s)/Jurisdiction(s)</i>	Sender Role(s) can include: Healthcare provider Sender Organisation(s) can include: Healthcare institution, Medical practice
<i>Recipient Type</i>	Either system or human
<i>Recipient Role(s)/Organisation(s)/Jurisdiction(s)</i>	Recipient Role(s) can include: Healthcare provider Recipient Organisation Role(s) can include: Healthcare institution, Medical practice

5. Relationships

Children

Data Type	Name	Version	Obligation	Condition	Occurrence
 T ₀₁₀	Information provided by	0.1	Essential		Single
 T	Clinical synopsis comment	0.1	Essential		Single
	HEALTH CARE PROVIDER IDENTIFICATION:Reporter	0.1	Essential		Single
	DateTime:Recorded	0.1	Essential		Single

Instances

Instance Name	Context Definition	Hierarchical Depth
CLINICAL SYNOPSIS		0

 Information provided by

1. Identification

<i>Name</i>	Information provided by	
<i>Meta-data Type</i>	Data Element	
<i>Identifier</i>	DE-503	<i>External Identifier</i>
<i>Version</i>	0.1	

2. Definition

<i>Definition</i>	A category specifying the source of the subject of care's health information.
<i>Definition Source</i>	NEHTA
<i>Synonymous Names</i>	
<i>Context</i>	
<i>Context Source</i>	
<i>Assumptions</i>	
<i>Data Type</i>	CodedText
<i>Value Domain</i>	Information provided by values

3. Usage


<i>Conditions of Use</i>	To specify the source of the subject of care's health information when information is being captured by a healthcare provider.
<i>Conditions of Use Source</i>	NEHTA
<i>Examples</i>	Example 1) Healthcare provider Example 2) Carer Example 3) Subject of care Example 4) Unrelated person
<i>Misuse</i>	

4. Data Flow


<i>Sender Type</i>	Either system or human
<i>Sender Role(s)/Organisation(s)/Jurisdiction(s)</i>	Sender Role(s) can include: Healthcare provider Sender Organisation(s) can include: Healthcare institution, Medical practice
<i>Recipient Type</i>	Either system or human
<i>Recipient Role(s)/Organisation(s)/Jurisdiction(s)</i>	Recipient Role(s) can include: Healthcare provider Recipient Organisation Role(s) can include: Healthcare institution, Medical practice

5. Relationships

Parents

Data Type	Name	Version	Obligation within parent	Condition within parent	Occurrence within parent
	CLINICAL SYNOPSIS	0.1	Essential		Single

Child

Data Type	Name	Version
	CLINICAL SYNOPSIS.Information provided by(Information provided by values)	0.1

Instances

Instance Name	Context Definition	Hierarchical Depth
CLINICAL SYNOPSIS.Information provided by		1
REASON FOR PRESENTATION.Information provided by		1

7 EXAMPLE - VALUE DOMAIN SPECIFICATION

Information provided by values

1. Identification

<i>Name</i>	Information provided by values
<i>Meta-data Type</i>	Value Domain
<i>Identifier</i>	VD-050
<i>Version</i>	0.1

2. Definition

<i>Definition</i>	A category which specifies the source of the information.
<i>Definition Source</i>	NEHTA

Value Domain


<i>Source</i>	
<i>Version Number</i>	
<i>Permissible Values</i>	Carer Healthcare provider Subject of care Unrelated person

3. Usage

<i>Default Value</i>	Healthcare provider
<i>Conditions of Use</i>	<p>The value domain options are mutually exclusive and cannot be used in conjunction with each other.</p> <p>Carer: An individual who provides regular and sustained care and/or assistance to the subject of care.</p> <p>Unrelated person: An individual who does not provide regular and sustained care and/or assistance to the subject of care.</p>
<i>Conditions of Use Source</i>	
<i>Misuse</i>	

4. Relationships

Parents

Data Type	Name	Version
	Information provided by	0.1

Instances

Instance Name	Context Definition
CLINICAL SYNOPSIS.Information provided by (Information provided by values)	