

## 2. FHIR Terminology Resources Authoring Guide

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### FHIR Resources

[FHIR Terminology Resources Authoring Template](#)

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## Editorial guide

### NCTS Content Types Specification

The NCTS Content Types Specification details conformance points that must be satisfied when authoring FHIR resources for use in the NCTS ecosystem.

Ensure conformance against the following when authoring **R4** resources:

- <https://www.healthterminologies.gov.au/specs/v3/content-types/fhir>

### NCTS Complete Code System

Ensure conformance against the following when authoring **R4** CodeSystem resources:

- <https://www.healthterminologies.gov.au/specs/v3/content-types/complete-code-system>
- <https://healthterminologies.gov.au/fhir/StructureDefinition/complete-code-system-4>

### NCTS Composed Value Set

Ensure conformance against the following when authoring **R4** ValueSet resources:

- <https://www.healthterminologies.gov.au/specs/v3/content-types/composed-value-set>
- <https://healthterminologies.gov.au/fhir/StructureDefinition/composed-value-set-4>

### NCTS General Concept Map

Ensure conformance against the following when authoring **R4** ConceptMap resources:

- <https://www.healthterminologies.gov.au/specs/v3/content-types/general-concept-map>
- <https://healthterminologies.gov.au/fhir/StructureDefinition/general-concept-map-4>

### File Naming Conventions:

Filenames are structured as <ResourceType>-<Name>-<Version>.json where:

- <ResourceType> is the FHIR resource type, either CodeSystem, ValueSet or ConceptMap. If the resource is from an external source and not authored locally it should also be suffixed with the owner in parentheses. E.g. ValueSet(HL7)
- <Name> is the name for the resource. Note - if the name contains a commonly recognised acronym that is spelled out, use the acronym in the file name for ease of identification.
- <Version> is the full business version of the resource

### Resource Metadata Conventions

This section describes specific data representation in NCTS FHIR terminology resources for use in national specifications. It lists resource elements and the values that should be associated with them. A general development principle is to follow the conventions used in the FHIR specification where possible and sensible.

Element	Conventions
id	<ol style="list-style-type: none"> <li>1. For internally defined resources:             <ol style="list-style-type: none"> <li>a. id should be a lower case representation of the title followed by the version.</li> <li>b. Contain no whitespace with hyphens separating words and version.</li> <li>c. Versions are represented as resources with unique ids (but same url)                   <ol style="list-style-type: none"> <li>i. The "latest" version is represented by an id ending in the major version number (e.g. relationship-type-1)</li> <li>ii. Previous versions have ids ending in the full version (e.g. relationship-type-1.2.0).</li> </ol> </li> <li>d. title part of the id may be composed of a commonly recognised acronym and also omit minor words such as conjunctions (e.g. "and").</li> </ol> </li> <li>2. Externally originating resources can have any unique id. For HL7 resources we keep the same id as that officially published. If we create a new id, for consistency, we should apply the same as above.</li> <li>3. Character limit of 64.             <ol style="list-style-type: none"> <li>a. Since we change the id of previous versions to include the full version, x.y.z (not just the major version number) this will increase the character count when compared with the latest version. For initial resource development (i.e. latest versions), keep id 60 characters or less to account for this possible future increase. Further abbreviation may be required.</li> </ol> </li> </ol>
meta.profile	<b>R4</b> <ol style="list-style-type: none"> <li>1. For Code Systems:             <pre>"profile": [     "http://hl7.org/fhir/StructureDefinition/shareablecodesystem",     "https://healthterminologies.gov.au/fhir/StructureDefinition/complete-code-system-4" ]</pre> </li> <li>2. For Value Sets:             <pre>"profile": [     "http://hl7.org/fhir/StructureDefinition/shareablevalueset",     "https://healthterminologies.gov.au/fhir/StructureDefinition/composed-value-set-4" ]</pre> </li> <li>3. For Concept Maps:             <pre>"profile": [     "https://healthterminologies.gov.au/fhir/StructureDefinition/general-concept-map-4" ]</pre> </li> </ol>
text.div	<p>Conform to the format below. This format is represented in the authoring templates along with desired HTML tags.</p> <ol style="list-style-type: none"> <li>1. [namespace][title][url][description]</li> </ol>
url	<ol style="list-style-type: none"> <li>1. Internally defined,             <ol style="list-style-type: none"> <li>a. code systems should use the format: <a href="https://healthterminologies.gov.au/fhir/CodeSystem/[id with major version]">https://healthterminologies.gov.au/fhir/CodeSystem/[id with major version]</a></li> <li>b. value sets should use the format: <a href="https://healthterminologies.gov.au/fhir/ValueSet/[id with major version]">https://healthterminologies.gov.au/fhir/ValueSet/[id with major version]</a></li> <li>c. concept maps should use the format: <a href="https://healthterminologies.gov.au/fhir/ConceptMap/[id with major version]">https://healthterminologies.gov.au/fhir/ConceptMap/[id with major version]</a></li> </ol> </li> <li>2. Externally defined code systems should use a stable URI that ideally is determined by the content owners and is in their namespace. A less desirable alternative option is to use a URL that identifies the location of the source codes, but consideration must be given to the likelihood this can change.</li> </ol>

identifier	<ol style="list-style-type: none"> <li>1. Identifier.value should be an OID (represented as a URN).</li> <li>2. Identifier.system must be <a href="urn:ietf:rfc:3986">urn:ietf:rfc:3986</a></li> <li>3. If an OID does not exist, it can be registered in the <a href="#">CT OID Register</a> (email ADHA if you don't have access):           <ol style="list-style-type: none"> <li>a. New Code System OIDs use the arc: 1.2.36.1.2001.1004.200</li> <li>b. New Value Set OIDs use the arc: 1.2.36.1.2001.1004.201</li> <li>c. New Concept Map OIDs use the arc: 1.2.36.1.2001.1004.202</li> </ol> </li> </ol> <p>Request an OID from ADHA via <a href="mailto:NCTS@digitalhealth.gov.au">NCTS@digitalhealth.gov.au</a>.</p>
version	<ol style="list-style-type: none"> <li>1. Versions are preferred in the format x.y.z but may also be YYYYMMDD.</li> <li>2. A resource instance will exist for every version (this is supported by the id guidance above). Technical versioning will not be used.</li> <li>3. Terminology specific semantic versioning interpretation to be:           <ol style="list-style-type: none"> <li>a. patch version (z) incremented when there is an insignificant change e.g. typo change that does not affect codes/display values, copyright update.</li> <li>b. minor version (y) incremented when there is a significant non-breaking change e.g. addition of a new code.</li> <li>c. major version (x) incremented when there is a significant breaking change e.g. removal of a code.</li> </ol> </li> </ol>
name	<ol style="list-style-type: none"> <li>1. Computer friendly version of "title"</li> <li>2. Title value with whitespace removed</li> <li>3. Omit any characters in the title that are not within the permitted character set [A-Z][a-zA-Z0-9_] {0,254}</li> </ol>
title	<ol style="list-style-type: none"> <li>1. Human friendly name that clearly describes the content.</li> <li>2. Do not include special characters</li> <li>3. Singular where possible</li> <li>4. Title Case           <ol style="list-style-type: none"> <li>a. An exception will be made for the reproduction of an external code system, where casing will reflect the published name.</li> </ol> </li> <li>5. No acronyms</li> <li>6. Do not include the name of the resource type (e.g. 'Code System')</li> </ol>
status	Generally all new resources should be set as "active" unless they are clearly in a draft state and not for normal use. This is provided all quality control and review processes have been followed.
experimental	Set as "false" unless they are clearly not for normal use. This is provided all quality control and review processes have been followed.
date	<ol style="list-style-type: none"> <li>1. Will reflect the date that the resource is published onto the NCTS.</li> <li>2. Must change when business version or status changes</li> </ol>
publisher	<pre>"publisher": "Australian Digital Health Agency"</pre>
contact	<pre>"contact": [   {     "telecom": [       {         "system": "email",         "value": "help@digitalhealth.gov.au"       }     ]   } ]</pre>
description	<ol style="list-style-type: none"> <li>1. Sensible and clear description of the resource.</li> <li>2. Where sensible, Code System descriptions should begin as..."The [title of code system] code system defines concepts(or other appropriate word)..."</li> <li>3. Where sensible, Value Set descriptions should begin as..."The [title of value set] value set includes values(or other appropriate word)..."</li> <li>4. Where sensible, Concept Map descriptions should begin as..."The [title of concept map] concept map defines relationships from the concepts in the [x] value set to the concepts in the [y] value set."           <ol style="list-style-type: none"> <li>a. [x] and [y] refer to the title of the source and target value sets respectfully.</li> <li>b. If one of those value sets is the implicit value set of all the codes of a code system, "[x] value set" or "[y] value set" should be replaced by "[x or y] code system (contextualised as the implicit value set of all its codes)".</li> </ol> </li> </ol>

copyright	<ol style="list-style-type: none"> <li>1. Paragraphs and multiple copyright statements will be formatted with a space and 2 newline characters " \n\n" between them.</li> <li>2. Copyright attribution text should be included as per the guideline <a href="#">Attribution text in Agency owned FHIR resources</a>.           <ol style="list-style-type: none"> <li>a. Broader <a href="#">Guidelines on copyright attribution text</a> [BROKEN LINK] were used to develop the succinct guidelines above.</li> </ol> </li> <li>3. Copyright year should be the year copyright is first being claimed (i.e. first published). If there is a substantial revision an additional year may be added. If there are continuous updates a date range may be used. Default is to leave as the year when first published.</li> </ol>
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## Attribution text in Agency owned FHIR resources

Below are the standard attribution texts approved by legal for use in Agency authored FHIR resources:

### Where the entire content is Agency owned:

Copyright © 2025 Australian Digital Health Agency - All rights reserved. This content is licensed under a Creative Commons Attribution 4.0 International License. See <https://creativecommons.org/licenses/by/4.0/>.

### Where the resource includes content from 3<sup>rd</sup> party owners:

Copyright © 2025 Australian Digital Health Agency - All rights reserved. Except for the material identified below, this content is licensed under a Creative Commons Attribution 4.0 International License. See <https://creativecommons.org/licenses/by/4.0/>. \n\nInsert approved statement(s) of 3<sup>rd</sup> party owner(s) from table below\ \n\nAll copies of this resource must include this copyright statement and all information contained in this statement.

Note: If there are multiple 3<sup>rd</sup> party owners, insert each of the owner's statements from the table below, one after the other.

Table: Approved statement for 3<sup>rd</sup> party content owners

3 r d P a r t y O w n er	Attribution
M E T e O R ( C C B Y 3. 0 A U)	<p><b>Preferred Copyright when making a general NCTS resource representing FHIR (as opposed to creating METEOR titled resource)</b></p> <p>This resource includes material that is based on Australian Institute of Health and Welfare material.</p> <p><b>Alternative if using a substantial part of the 3<sup>rd</sup> party's content or particular modifications have been made that need detailing use:</b></p> <p>This resource includes material that is based on [Title of AIHW material] Licensed under <a href="https://creativecommons.org/licenses/by/3.0/au">https://creativecommons.org/licenses/by/3.0/au</a>. This material has been changed by adding, deleting or changing some of the ..... Complete/modify last sentence of attribution as required.</p>

P B S ( H e al th )	<p>This resource includes PBS schedule material © The Commonwealth of Australia as presented by the Department of Health that has been modified with permission from the Department of Health. \n\nThat material may be reproduced in part or in whole for personal use as general reference material only, provided one copy only is reproduced and so long as this copyright notice and the reference to the disclaimer located at <a href="http://www.pbs.gov.au/info/general/disclaimer">http://www.pbs.gov.au/info/general/disclaimer</a> remains intact. Apart from these general uses and the uses permitted under the Copyright Act 1968 (Cth), all rights are reserved.</p> <p><b>D R A F T ( A p p r o v al fr o m H e al t h p e n d i n g)</b></p>
A B S ( C C B Y 2. 5 A U)	<p>This resource includes material that is based on Australian Bureau of Statistics data.</p> <p><b>Alternative if using a substantial part of the 3<sup>rd</sup> party's content or particular modifications have been made that need detailing use:</b></p> <p>This resource includes material that is based on [Title of ABS material] Licensed under <a href="https://creativecommons.org/licenses/by/3.0/au">https://creativecommons.org/licenses/by/3.0/au</a>. This material has been changed by adding, deleting or changing some of the ..... Complete/modify last sentence of attribution as required.</p> <p><b>E.g. [Title of ABS material]</b></p> <p>Standard Australian Classification of Countries (SACC), cat. no. 1269.0, viewed 4 August 2017, <a href="http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/1269.0">http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/1269.0</a>. Licensed under <a href="https://creativecommons.org/licenses/by/2.5/au/legalcode">https://creativecommons.org/licenses/by/2.5/au/legalcode</a>.</p>
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## CodeSystem Conventions

In addition to the [File Naming Conventions](#) and [Resource Metadata Conventions](#), there are specific conventions when authoring CodeSystem resources. Please ensure you take note of applicable version: [CodeSystem\(STU3\)](#), [CodeSystem\(R4\)](#)

Element	Conventions
valueSet	<p>Reference to the implicit value set that contains the entire code system. Reference should be in the form of a URI like:</p> <pre>"valueSet": "&lt;CodeSystem.url&gt;/vs"</pre>
count	<p>Include the number of concepts present.</p> <ol style="list-style-type: none"> <li>Note: do not rely on Snapper for the generation of this number. There was a defect where Snapper overcounts by 1 (bugfix unconfirmed).</li> </ol>
property	<ol style="list-style-type: none"> <li>Concept permanence will be defined where possible and will include the property below. Even if concept permanence is planned, however, this property is not required to be included in a Code System resource until inactive concepts are present.           <pre>"property": [ {             "code": "inactive",             "description": "Whether the code is active or not (defaults to false).",             "type": "boolean"           }]</pre> </li> <li>Additional properties may be added if required.</li> </ol>
concept	<ol style="list-style-type: none"> <li>concept.code           <ol style="list-style-type: none"> <li>Internally defined code systems will use semantic codes rather than numbers as per the FHIR specification (e.g. "carer" =&gt; "Carer" instead of "1" =&gt; "Carer"). Specifically:               <ol style="list-style-type: none"> <li>No white space</li> <li>Words separated by dash "-"</li> <li>All lower case</li> <li>?other conventions</li> </ol> </li> <li>Code Systems from an external source will adopt its conventions without modification.</li> </ol> </li> <li>concept.definition           <ol style="list-style-type: none"> <li>If there is no definition available or the authoring of one is not beneficial, the definition will replicate the display.</li> </ol> </li> </ol>

## ValueSet Conventions

In addition to the [File Naming Conventions](#) and [Resource Metadata Conventions](#), there are specific conventions when authoring ValueSet resources. Please ensure you take note of applicable version: [ValueSet\(STU3\)](#), [ValueSet\(R4\)](#)

Element	Conventions
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compose. include /exclude	<p>If the content definition includes SNOMED CT content, consideration should be given to the development of a reference set for release in RF2. We have agreed on the policy that if the SNOMED CT concepts included in the value set are a complete set and satisfy a distinct data record purpose, a reference set will also be developed. This is compared with SNOMED CT content that is included in a value set definition to supplement values from a different value set or code system.</p> <p>The reference set's concept id will then be used as part of a filter to define the value set content definition. The major benefit of this approach is that any maintenance to the content can be performed in Lingo and the value set definition remains stable. Datachecks will be written as normal for a reference set. If a value set definition includes an enumerated list of SNOMED CT concept ids then a datacheck will be required and a subtask should be created to ensure this is done.</p> <p>Where appropriate, ECL is the preferred filter for SNOMED CT value sets.</p>
compose. include/ex clude. version	<ul style="list-style-type: none"> <li>Internal dependency references will generally be versionless unless there is a requirement for a specific version. Our url conventions ensure no backwards incompatible changes will be introduced and therefore maintenance cost is minimised with versionless references. Versionless references in a definition equate to the latest version available in the server.</li> <li>External dependency references (non-NCTS) shall include version, unless normative in the FHIR standard or known to be stable with no backwards incompatible changes permitted.</li> </ul>
compose. include /exclude. valueSet	A reference to include (or exclude) values from an entire value set may be versionless even if the value set is an external non-normative value set. This is unlike the guidance for compose.include/exclude.version, but if considered appropriate, is permitted.

## ConceptMap Conventions

In addition to the [File Naming Conventions](#) and [Resource Metadata Conventions](#), there are specific conventions when authoring ConceptMap resources. Please ensure you take note of applicable version: [ConceptMap\(STU3\)](#), [ConceptMap\(R4\)](#).

Element	Conventions
sourceUri /sourceCa nonical	<ul style="list-style-type: none"> <li>Source value set reference</li> <li>sourceUri shall be used for versionless references unless target is a versioned reference (i.e. targetCanonical), then sourceCanonical shall be used.</li> <li>sourceCanonical shall be used for all versioned references</li> <li>Internal dependency references will generally be versionless unless there is a requirement for a specific version. Our url conventions ensure no backwards incompatible changes will be introduced and therefore maintenance cost is minimised with versionless references. Versionless references in a definition equate to the latest version available in the server.</li> <li>External dependency references (non-NCTS) shall include version, unless normative in the FHIR standard or known to be stable with no backwards incompatible changes permitted.</li> <li>Where the map references a legacy code system that is not planned to be needed for binding in future Agency specifications the value set URI shall be the implicit value set URI for the entire code system. An explicit value set does not need to be developed for the purpose of the map.</li> </ul>
targetUri /targetCan onical	<ul style="list-style-type: none"> <li>Target value set reference</li> <li>targetUri shall be used for versionless references unless source is a versioned reference (i.e. sourceCanonical) then targetCanonical shall be used.</li> <li>targetCanonical shall be used for all versioned references</li> <li>Internal dependency references will generally be versionless unless there is a requirement for a specific version. Our url conventions ensure no backwards incompatible changes will be introduced and therefore maintenance cost is minimised with versionless references. Versionless references in a definition equate to the latest version available in the server.</li> <li>External dependency references (non-NCTS) shall include version, unless normative in the FHIR standard or known to be stable with no backwards incompatible changes permitted.</li> <li>Where the map references a legacy code system that is not planned to be needed for binding in future Agency specifications the value set URI shall be the implicit value set URI for the entire code system. An explicit value set does not need to be developed for the purpose of the map.</li> </ul>
group. source	<ul style="list-style-type: none"> <li>Source code system URI</li> <li>This may be omitted if the source value set contains concepts from only a single system (and will never in the future), however, we tend to always include for clarity.</li> </ul>
group. sourceVer sion	<ul style="list-style-type: none"> <li>Source code system version.</li> <li>Internal code system references will generally be versionless unless there is a requirement for a specific version. Through concept permanence and our url conventions, we ensure no backwards incompatible changes will be introduced and therefore maintenance cost is minimised with versionless references. Versionless references in a definition equate to the latest version available in the server.</li> <li>External code system references (non-NCTS) shall include version, unless normative in the FHIR standard or known to be stable with no backwards incompatible changes permitted.</li> </ul>

group.target	<ul style="list-style-type: none"> <li>Target code system URI</li> <li>This may be omitted if the target value set contains concepts from only a single system (and will never in the future), however, we tend to always include for clarity.</li> </ul>
group.targetVersion	<ul style="list-style-type: none"> <li>Target code system version.</li> <li>Internal code system references will generally be versionless unless there is a requirement for a specific version. Through concept permanence and our url conventions, we ensure no backwards incompatible changes will be introduced and therefore maintenance cost is minimised with versionless references. Versionless references in a definition equate to the latest version available in the server.</li> <li>External code system references (non-NCTS) shall include version, unless normative in the FHIR standard or known to be stable with no backwards incompatible changes permitted.</li> </ul>
group.element.code	<ul style="list-style-type: none"> <li>Code identifying the concept being mapped (source).</li> </ul>
group.element.target	<ul style="list-style-type: none"> <li>This is a backbone element but the group can be repeated if there are multiple targets.</li> </ul>
group.element.target.code	<ul style="list-style-type: none"> <li>Code identifying the concept being mapped to (target).</li> </ul>
group.element.target.equivalence	<ul style="list-style-type: none"> <li>State the relationship between the concepts (for definitions, see <a href="https://www.hl7.org/fhir/valueset-concept-map-equivalence.html">https://www.hl7.org/fhir/valueset-concept-map-equivalence.html</a>).</li> <li>Use "wider" and "narrower" over "subsumes" and "specializes", respectively. <ul style="list-style-type: none"> <li>There has been feedback through the HL7 Vocab work group that having both pair options is confusing and there is little meaningful difference between them for most users. The choice to prefer the use of "wider" and "narrower" aligns with the relationship concepts available for concept maps in the R5 Preview. "subsumes" and "specializes" will no longer be available and this choice means our concept maps will be more compatible with future FHIR versions.</li> </ul> </li> <li>Use "equals" sparingly. This is reserved for cases where the concepts are identical and as for "subsumes" and "specializes", will not be present in the next FHIR version.</li> </ul>

## Terminology specific editorial rules

### METeOR specific guidelines (not complete)

METeOR content for use in new specifications will utilise "NCTS" code systems (NCTS uri and newly registered OID) that define the appropriate METeOR content. METeOR content should be based on METeOR data elements and **NOT** domains. These will follow the standard guidelines above. Historical specifications, however, reference METeOR content directly and CDA instances have code system identified with existing OIDs. These code systems will be developed with the following exceptions/additions:

1. url
  - a. Will be the OID represented as a URN (exactly the same as identifier.value).
2. name
  - a. should include the term 'METeOR' at the beginning and the METeOR identifier (data element) at the end. For example, "METeOR Indigenous Status 291036".

### Historical binding guidelines (not complete)

If we have a historical value domain defined by codes in a particular code system and we wish to create another code system to supersede the old one and it be used in an updated binding, we will represent the 2 similar value domains/bindings as subsequent major versions of the same value set and therefore will have 2 different URIs.

<https://healthterminologies.gov.au/fhir/ValueSet/australian-state-territory-1>

vs

<https://healthterminologies.gov.au/fhir/ValueSet/australian-state-territory-2>

### AIR code specific guidelines

When updating any resources that reference the Australian Immunisation Register (AIR) codes, ensure that all related code systems and value sets are updated accordingly, in particular, the 'last updated' reference in the AIR/DHS copyright statement.

Data should be sourced from the [AIR vaccine code website](#).

Versioning of the resource when due to an update to the source data should reflect the "page last updated" date at the bottom of the website.

Use the [process](#) that generates a code system from a template and spreadsheet.

## Deprecation editorial rules

Deprecation may involve multiple resources.

Versions are represented as separate resource instances, therefore, deprecating multiple versions involves multiple resources

A FHIR resource to be deprecated (e.g. <https://healthterminologies.gov.au/fhir/CodeSystem/dh-person-name-use-1>) will:

1. have status changed to "retired"
2. maintain the same business version as the previously published "active"/"draft" resource. That means the previous "active"/"draft" state of that resource will not be present in NTS going forward.
3. have a prefix added to the description warning users the resource is no longer suitable for use followed by the reason. Then add a markdown line break, for example

```
"description": "This code system is RETIRED and is not suitable for use. It is retired due a technical defect where caseSensitive is incorrectly stated as false. \n\nThe Australian Digital Health Agency Person Name use code system defines concepts which represent information or specific conditions that may be applied to a name of a person."
```

4. surround the added description prefix represented in text.div element with <strong> tags followed by <br />, for example

```
"div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><h2>Australian Digital Health Agency Person Name Use</h2><tt>https://healthterminologies.gov.au/fhir/CodeSystem/dh-person-name-use-1</tt><p><strong>This code system is RETIRED and is not suitable for use. It is retired due a technical defect where caseSensitive is incorrectly stated as false.</strong><br />The Australian Digital Health Agency Person Name use code system defines concepts which represent information or specific conditions that may be applied to a name of a person.</p></div>"
```

5. update date to new publication date

If a new resource is going to be published to replace the deprecated one, we will follow our existing versioning conventions and create a new major version identified with a new URI suffixed with that major version.

## Externally Sourced Information Monitoring

If a resource is dependent on an external source, it is beneficial to know if the external source changes. In order to determine these changes we have a monitoring service set up. Unfortunately this is solely using an individual account ([Former user \(Deleted\)](#)). The service emails the individual and messages the fhirstation slack channel in the SCTAU workspace.

If you author a resource that is dependent on an external source, please contact [Former user \(Deleted\)](#) to get the source monitored. This includes things like HL7 resources added to the fhirpit.

The sources currently monitored are detailed on [FHIR Terminology Content Monitoring page](#).

A development ticket (

 Unable to locate Jira server for this macro. It may be due to Application Link configuration.

) has been

added to the Tooling backlog for a better solution.