

# Terminologieserver- Einsatz in den Niederlanden

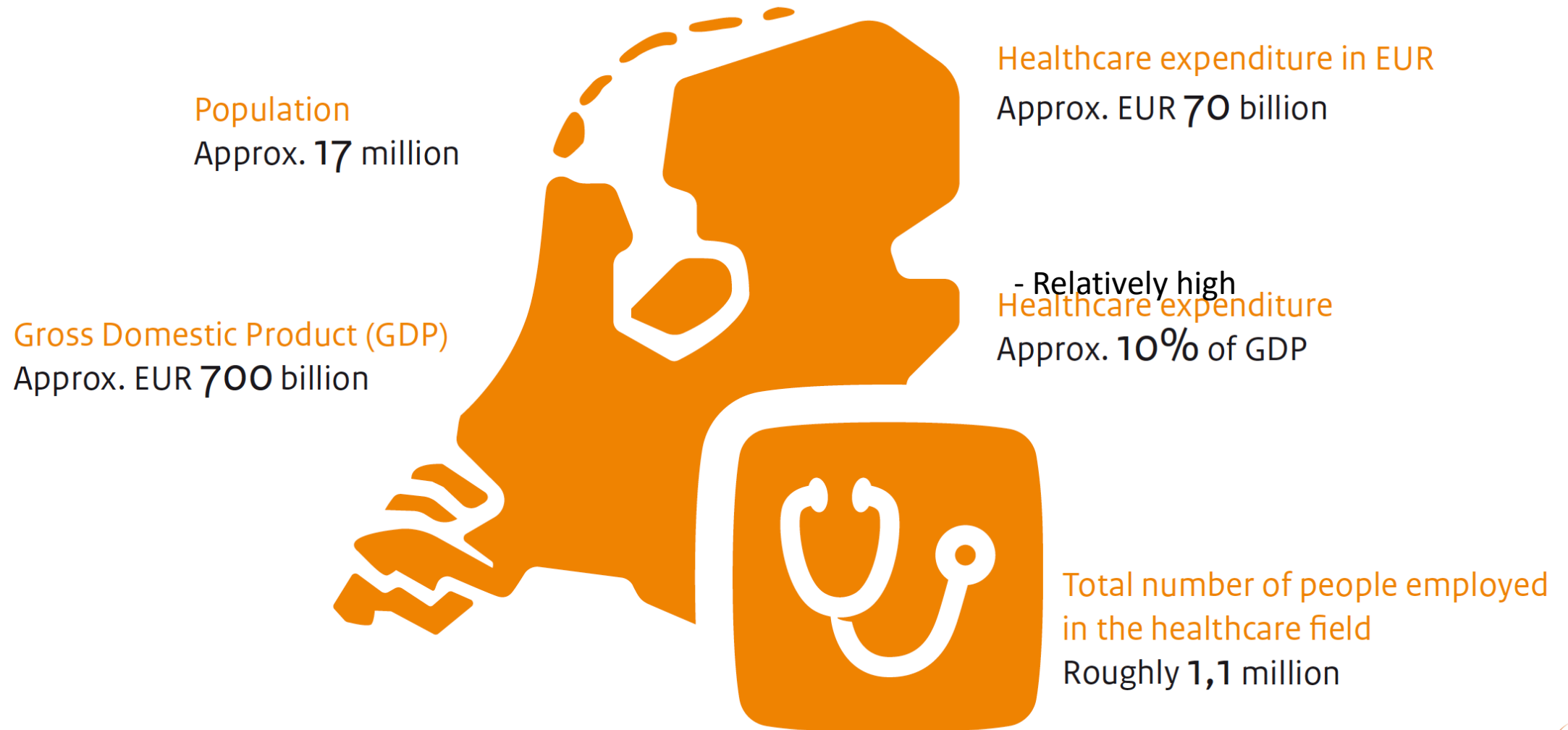
Pim Volkert

Teamlead Terminology Center - Nictiz



| 30-9-2021 |

# Healthcare in the Netherlands



# Tri-partite

## Healthcare in the Netherlands



PRIVATE INDIVIDUAL/  
INSURED PERSON



HEALTHCARE  
PROVIDERS



HEALTH INSURER



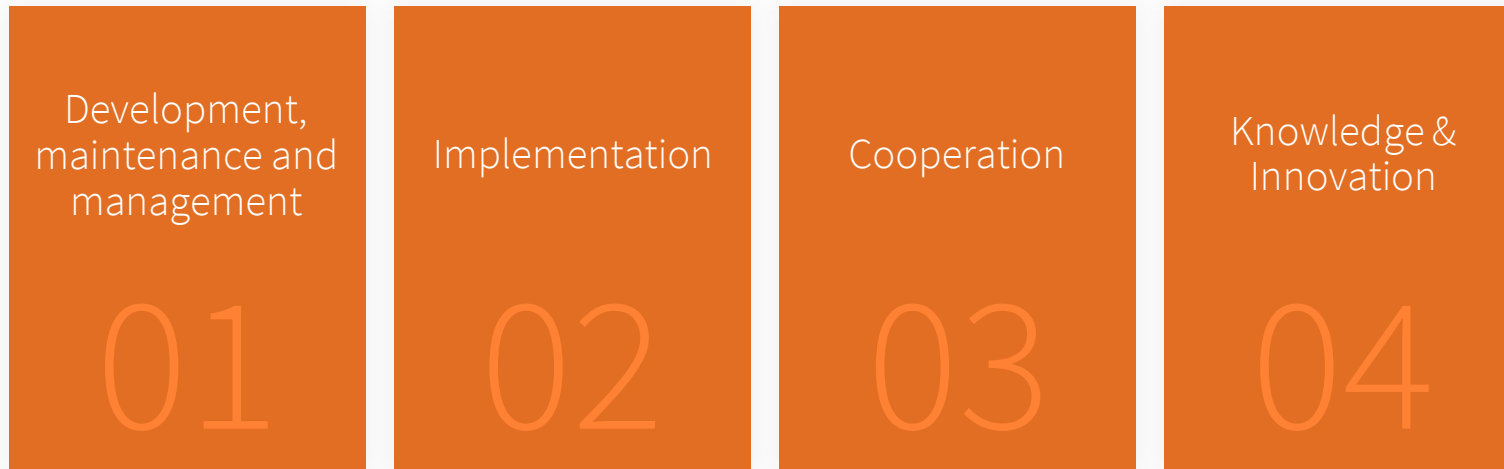
## Dutch (e)Health Challenges

- The **empowered patient** that needs to know and enrich his medical information
- **Continuity of care**, as patients deal with multiple health care providers
- **Closing the quality loop**: knowing, understanding and managing health care better

## Funding Programs – VIPP (>€ 600 Mln)

- Personal Health Environments
- Hospitals (patient portals)
- GPs
- Mental care
- Long term care
- Home care
- Maternity care







# Complex environment

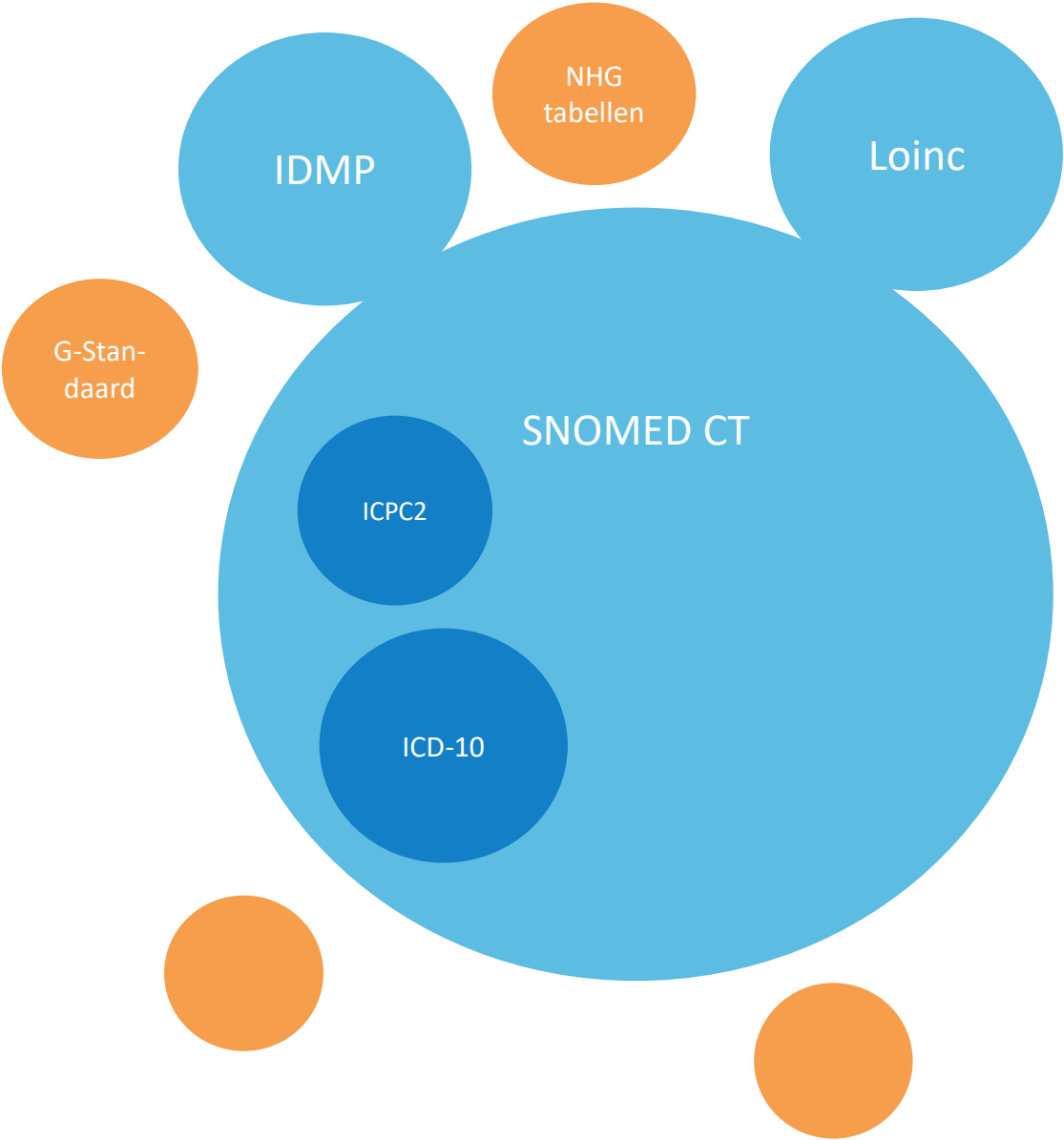


## Also for the Patient



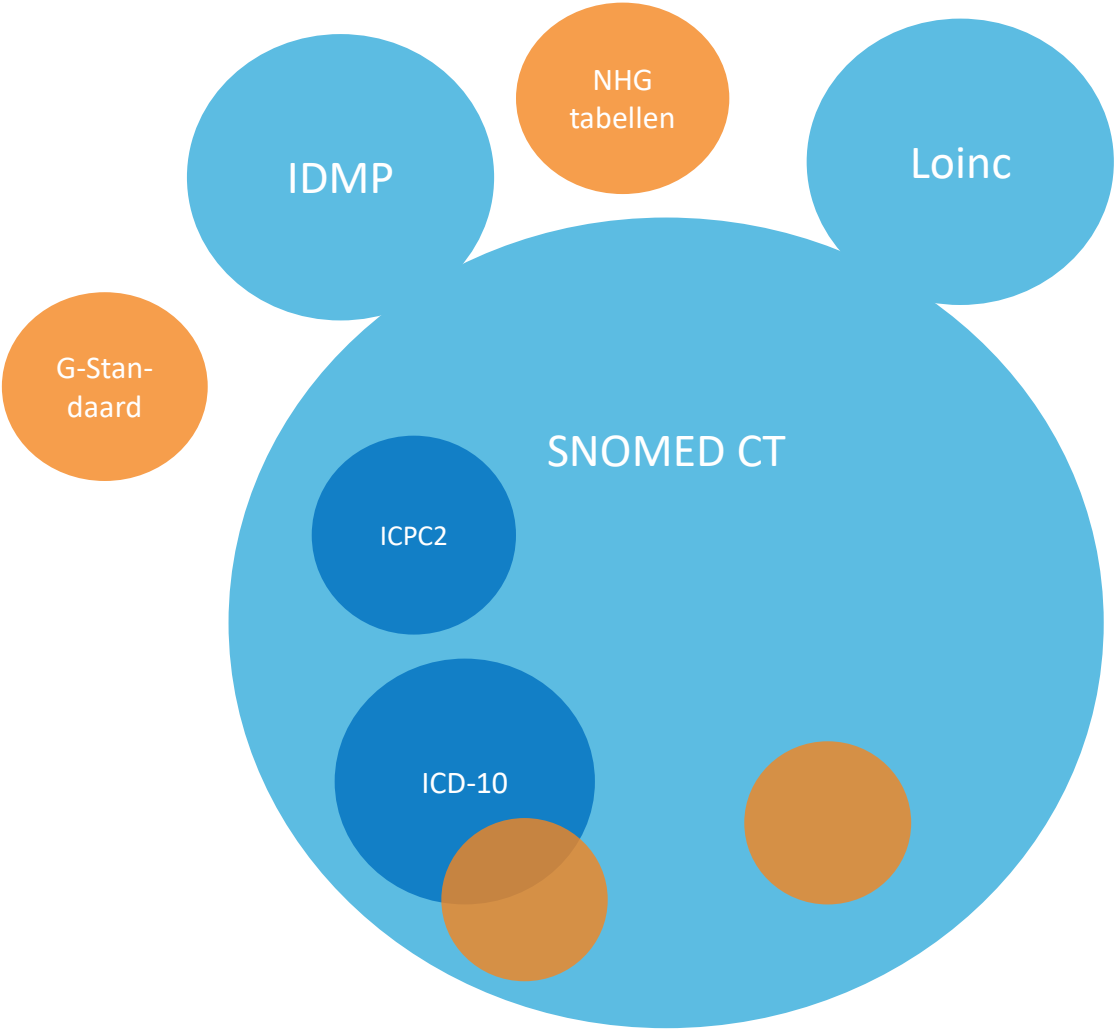


# Model



- RT Reference Terminology
- AT Aggregation Terminology
- NL National Standaard

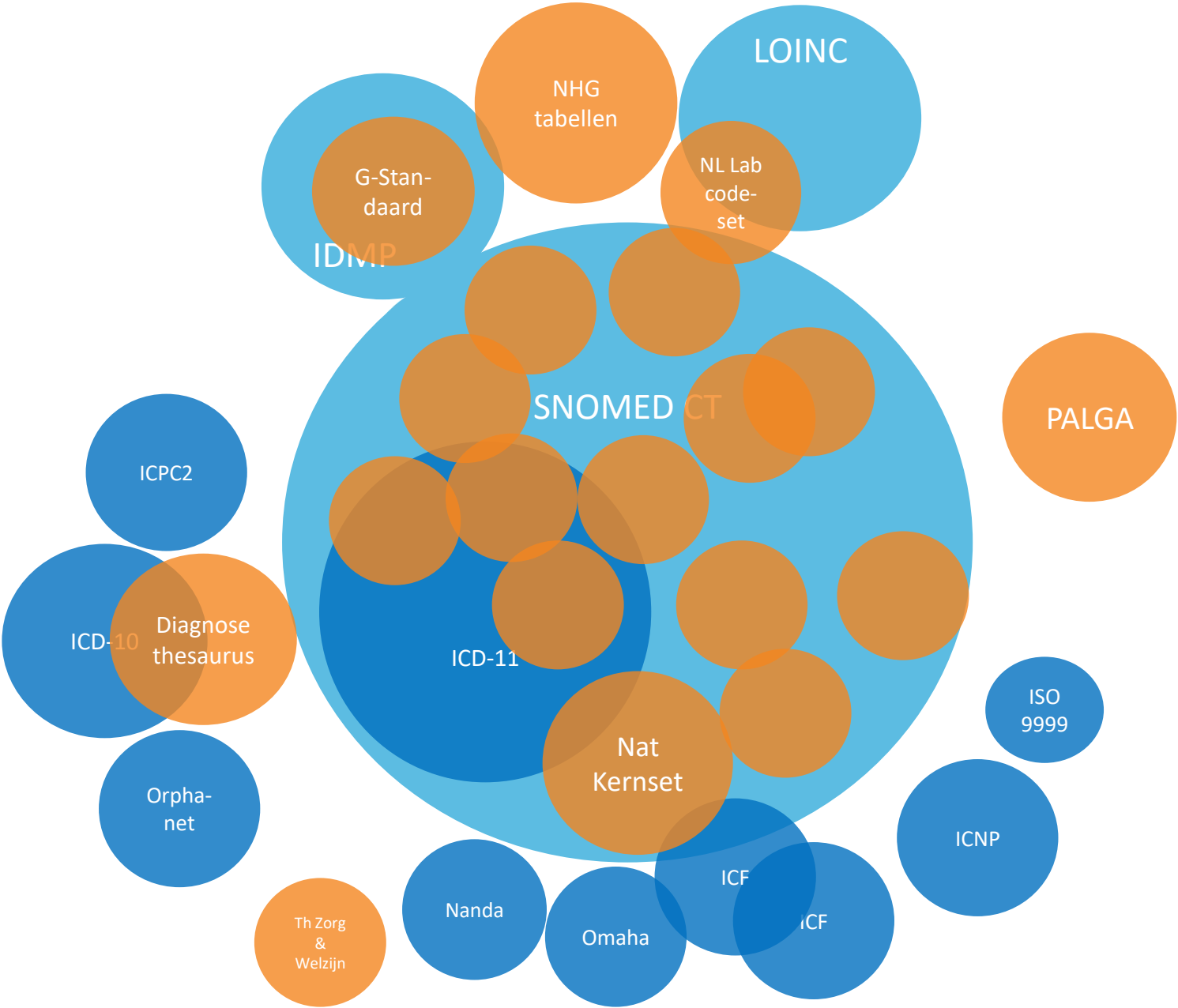
# Model



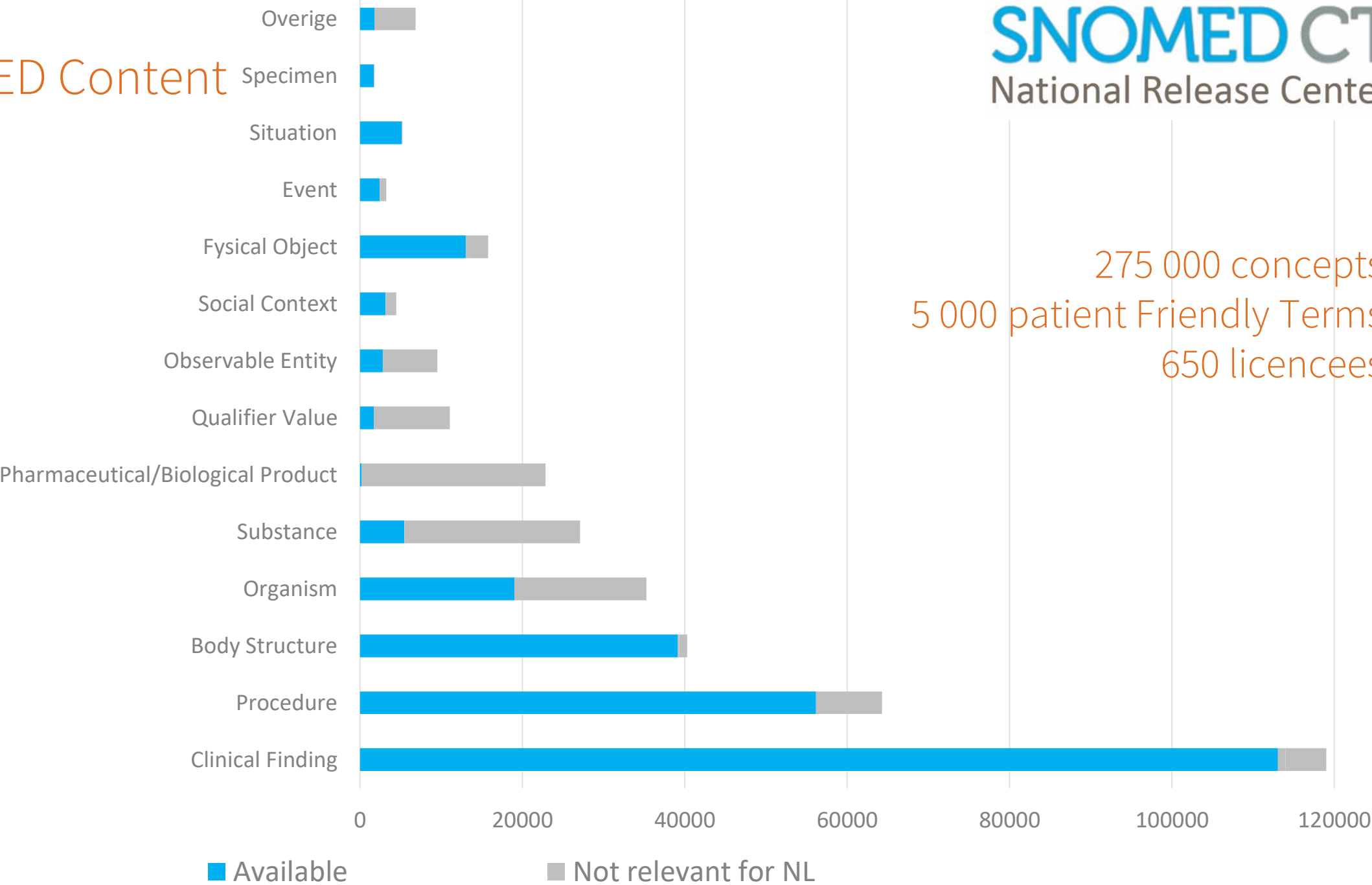
- RT Reference Terminology
- AT Aggregation Terminology
- NL National Content

# Praktijk

Ooit  
2010  
2011  
2012  
2013  
2014  
2015  
2016  
2017  
2018  
2019  
2020  
Later



# SNOMED Content





Zoekterm(en)



bacteriële artritis



SNOMED Clinical Terms version: 20190131 [R] (January 2019 Release)

Help

Licentie

## Resultaten ( 16 van 16 )

## P bacteriële artritis

P acute bacteriële artritis

S bacteriële artritis van SI-gewricht

S acute bacteriële suppuratieve artritis

## Bacterial arthritis (disorder)

Acute bacterial arthritis (disorder)

Bacterial arthritis of sacroiliac joint (disorder)

Acute suppurative arthritis caused by bacteria (disorder)

Super type (parent)

[Bacterial musculoskeletal infection](#)[infectieuze artritis](#)

## bacteriële artritis (aandoening)

bacteriële artritis

ontsteking van gewricht door bacteriële infectie

Bacterial arthritis

Arthritis due to bacterial infection  
Septic arthritis

Medical

Patient friendly

Synonyms

Id

48245008

Status

Defined

Associated morphology

Causative agent

Finding site

Pathological process

[ontsteking](#)[Bacteria](#)[structuur van gewricht](#)[infectieus proces](#)

Morphology

Cause

Location

Process

General Practice / Family Practice reference set

DHD Diagnosethesaurus-referentieset

▶ International Classification of Primary Care, Second edition complex map reference set

▶ ICD-10 complex map reference set

ICD-10

[acute bacteriële artritis](#)

1

[arthritis gonorhoica](#)

2

[arthritis door infectie met spirocheten](#)

3

[arthritis door Pseudomonas](#)[arthritis door Salmonella](#)[arthritis door stafylokokken](#)

1

Sub type (children)



## Resultaten ( 19 van 19 )

## P dehydratie

## Dehydration (disorder)

P matige dehydratie

Moderate dehydration (disorder)

P dehydratie bij neonat

Neonatal dehydration (disorder)

[vochtbalansstoornis](#)

## dehydratie (disorder)

dehydratie

uitdroging

*Tekort aan lichaamsvocht, zowel intra- als extracellulair.*

uitdroging

*Het lichaam heeft te weinig vocht.*

Dehydration

Pure water depletion syndrome

Id	34095006
Status	primitief

referentieset voor pathologie

nationale kernset patiëntproblemen inclusief secties ter ordening op basis van de SNOMED-hiërarchie

nationale kernset patiëntproblemen

referentieset voor huisartsen

Nursing Health Issues Reference Set

DHD Diagnosethesaurus-referentieset

DHD Verrichtingenthesaurus-referentieset

referentieset met eenvoudige 'mapping' naar ICNP-diagnosen 10041882

▶ referentieset met complexe 'mapping' naar ICD-10

▶ referentieset met uitgebreide gecorreleerde 'mapping' van patiëntproblemen van SNOMED CT naar Omaha System

▶ referentieset met uitgebreide gecorreleerde 'mapping' van patiëntproblemen van SNOMED CT naar ICF

[dehydratie bij neonat](#)

1

[dehydratie door straling](#)[dehydratie na inspanning](#)[deprivatie van water](#)[ernstige dehydratie](#)

## Allergene

Um festzustellen, welche Allergene (Substanzen) bei Überempfindlichkeitsreaktionen und / oder Allergien eine Rolle spielen, gibt es fünf verschiedene SNOMED CT-Code-Referenzsätze für Substanzen: Lebensmittelallergene, Inhalationsallergene, Insektengiftallergene, Berufsallergene und Kontaktallergene. Durch Klicken auf die ID-Nummer gelangen Sie zur angezeigten Substanz im SNOMED CT-Browser. Wenn Sie Fragen oder Kommentare haben, senden Sie bitte eine E-Mail an [allergenen@nictiz.nl](mailto:allergenen@nictiz.nl)

## Referenzsatz für Kontaktallergene

### referentieset voor contactallergenen

Omschrijving	Definitie	Id
(dibutylamine)bis(dibutylthiocarbamaat-S,S')zink	Molecuulformule C>26<H>55<N>3<S>4<Zn, CAS-nummer 35884-05-0.	<a href="#">256141008</a>
1,2-benzisothiazolin-3-on		<a href="#">255987009</a>
1,3-butaandiolmethacrylaat		<a href="#">119241000146107</a>
1,3-difenylguanidine		<a href="#">256166007</a>
1,4-butaandiolmethacrylaat		<a href="#">255927007</a>
2,2',2''-(hexahydro-1,3,5-triazine-1,3,5-triyl)tri-ethanol (in water)		<a href="#">255893002</a>
2-(2H-benzotriazool-2-yl)-p-kresol		<a href="#">255880007</a>
2-(morfolinothio)benzothiazool		<a href="#">256155000</a>
2-ethylhexyl-4-methoxycinnamaat		<a href="#">256173002</a>
2-ethylhexylacrylaat		<a href="#">256128009</a>
2-fenylbenzimidazol-5-sulfonzuur		<a href="#">256182008</a>
2-hydroxy-4-methoxy-4-methylbenzophenone		<a href="#">256176005</a>
2-hydroxy-4-methoxybenzofenon		<a href="#">72179002</a>
2-hydroxyethylacrylaat		<a href="#">255912007</a>
2-hydroxyethylmethacrylaat		<a href="#">255913002</a>
2-hydroxypropylmethacrylaat		<a href="#">255914008</a>

## Referenzsatz für Lebensmittelallergene

### Terminologiezentrum

- COVID-19-Terminologie
- Der nationale Terminologieserver
- Niederländisches Labcode-Set
- Referenzlisten
  - Allergene
  - Nationales Kernset
    - Kernsatz von Interventionen
    - Kernbeobachtungen
    - Kernsatz der Patientenprobleme
    - Kernsatz der Pflegeergebnisse
  - Kontraindikationen
  - Einschlussliste LIR
  - Mikroorganismen
  - Optometrie
- Browser-Terminologie und Codesysteme
- Schulungsangebot Terminologiezentrum
- SNOMED National Release Center
- Häufig gestellte Fragen



## SNOMED CT Netherlands/Nederlands Edition [View License](#)

Nederlandse editie geleverd door het [National Release Center](#) bij [Nictiz](#)

(Netherlands Edition delivered bij the [NRC](#) within [Nictiz](#))

Please read the Release notes for more information on the files to be downloaded.

### SNOMED CT Netherlands Edition 30 September 2021

Nederlandse editie geleverd door het [National Release Center](#) bij [Nictiz](#)

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**Published on:** 2021-09-30

#### File

-  [NL\\_Edition\\_20210930\\_Release\\_Notes.pdf](#)
-  [SnomedCT\\_Netherlands\\_EditionRelease\\_PRODUCTION\\_20210930T120000Z.zip](#)
-  [SnomedCT\\_Netherlands\\_PatientFriendlyExtensionRelease\\_PRODUCTION\\_20210930T120000Z.zip](#)
-  [SnomedCT\\_Netherlands\\_ExtensionRelease\\_PRODUCTION\\_20210930T120000Z.zip](#)



## HCIM Release 2020(EN)

### Release 2020

This is a release. More information about prereleases and releases you can find [here](#).

The following summary shows which hcim's are part of this release, including the version numbers.

More information on Release 2020 you can find in the [ReleaseNotes 2020](#)  (in Dutch) and in the [sections below](#).

### Health and care information models release 2020

#### group: Administrative, count: 7

<a href="#">CareTeam-v1.0</a>	<a href="#">Encounter-v4.0.1</a>	<a href="#">HealthProfessional-v3.5</a>	<a href="#">Payer-v3.1.1</a>
<a href="#">ContactPerson-v3.4</a>	<a href="#">HealthcareProvider-v3.4</a>	<a href="#">Patient-v3.2</a>	

#### group: Clinical context, count: 25

<a href="#">Alert-v4.1</a>	<a href="#">FeedingPatternInfant-v1.1</a>	<a href="#">NutritionAdvice-v3.2</a>	<a href="#">Stoma-v3.3</a>
<a href="#">AllergyIntolerance-v3.3</a>	<a href="#">FeedingTubeSystem-v3.3</a>	<a href="#">PainCharacteristics-v1.0</a>	<a href="#">Vaccination-v4.0</a>
<a href="#">BladderFunction-v3.2</a>	<a href="#">FunctionalOrMentalStatus-v3.2</a>	<a href="#">Pregnancy-v4.0</a>	<a href="#">VisualFunction-v3.1</a>
<a href="#">BowelFunction-v3.1.1</a>	<a href="#">HearingFunction-v3.2</a>	<a href="#">PressureUlcer-v3.4</a>	<a href="#">Wound-v3.3</a>
<a href="#">Burnwound-v3.4</a>	<a href="#">Infusion-v3.3</a>	<a href="#">Problem-v4.4</a>	
<a href="#">DevelopmentChild-v1.2</a>	<a href="#">MedicalDevice-v3.3.1</a>	<a href="#">SkinDisorder-v3.3</a>	
<a href="#">EpisodeOfCare-v1.0</a>	<a href="#">MultidisciplinaryTeamMeeting-v1.0</a>	<a href="#">SOAPReport-v1.0</a>	

## ProblemTypeCodelist


Valueset OID: 2.16.840.1.113883.2.4.3.11.60.40.2.5.1.1	Binding: Extensible
--	---------------------

Conceptname	Conceptcode	Codesystem name	Codesystem OID	Description
Diagnosis interpretation	<a href="#">282291009</a>	SNOMED CT	2.16.840.1.113883.6.96	Diagnose
Finding reported by subject or history provider	<a href="#">418799008</a>	SNOMED CT	2.16.840.1.113883.6.96	Symptoom
Clinical finding	<a href="#">404684003</a>	SNOMED CT	2.16.840.1.113883.6.96	Bevinding
Complaint	<a href="#">409586006</a>	SNOMED CT	2.16.840.1.113883.6.96	Klacht
Finding of functional performance and activity	<a href="#">248536006</a>	SNOMED CT	2.16.840.1.113883.6.96	Functionele Beperking
Complication	<a href="#">116223007</a>	SNOMED CT	2.16.840.1.113883.6.96	Complicatie

## VerificationStatusCodelist



Valueset OID: 2.16.840.1.113883.2.4.3.11.60.40.2.5.1.4	Binding: Required
--	-------------------







Conceptname	Conceptcode	Codesystem name	Codesystem OID	Description
Suspected	<a href="#">415684004</a>	SNOMED CT	2.16.840.1.113883.6.96	Werk
Known possible	<a href="#">410590009</a>	SNOMED CT	2.16.840.1.113883.6.96	Differentiaal
Confirmed present	<a href="#">410605003</a>	SNOMED CT	2.16.840.1.113883.6.96	Bevestigd
Known absent	<a href="#">410516002</a>	SNOMED CT	2.16.840.1.113883.6.96	Uitgesloten
Unknown	UNK	NullFlavor	2.16.840.1.113883.5.1008	Onbekend

- 
- OntwikkelingSociaalCodelijst
  - OntwikkelingTaalCodelijst
  - OntwikkelingVerstandelijkCodelijst
  - OrganisatieTypeCodelijst
  - PijnAardCodelijst
  - PijnbeloopCodelijst
  - PijnMeetmethodeCodelijst
  - PijnPatroonCodelijst
  - Pn\_PerineuraleInvasieCodelijst
  - pN\_RegionaleLymfeklierenCodelijst
  - PolsRegelmatigheidCodelijst
  - PositieCodelijst
  - PrimaireTumorCodelijsten
  - ProbleemNaamCodelijst
  - ProbleemStatusCodelijst
  - ProbleemTypeCodelijst**
  - ProductCodeATCCodelijst
  - ProductCodeATCCodelijst
  - ProductCodeCodelijsten
  - ProductCodeCodelijsten
  - ProductCodeGPKCodelijst

## ProbleemTypeCodelijst –

Gebruik (78)

<b>Id</b>	2.16.840.1.113883.2.4.3.11.60.40.2.5.1.1	<b>Ingangsdatum</b>	2020-09-01
<b>Status</b>	 Definitief	<b>Versielabel</b>	
<b>Naam</b>	ProbleemTypeCodelijst	<b>Weergavenaam</b>	ProbleemTypeCodelijst
<b>Copyright</b>	 This artefact includes content from SNOMED Clinical Terms® (SNOMED CT®) which is copyright of the International Health Terminology Standards Development Organisation (IHTSDO). Implementers of these artefacts must have the appropriate SNOMED Affiliate license - for more information contact <a href="http://www.snomed.org/snomed-ct/getsnomed-ct">http://www.snomed.org/snomed-ct/getsnomed-ct</a> or <a href="mailto:info@snomed.org">info@snomed.org</a> .		
<b>Bron codesysteem</b>	2.16.840.1.113883.6.96 - <i>SNOMED Clinical Terms</i> - <a href="http://snomed.info/sct">http://snomed.info/sct</a>		

Niveau/ Type	Code	Weergavenaam	Codesysteem	Benamingen	Omschrijving
0-L	282291009	interpretatie van diagnose	SNOMED Clinical Terms	 Voorkeur: interpretatie van diagnose	Diagnose
0-L	418799008	bevinding gerapporteerd door patiënt of andere bron van voorgeschiedenis	SNOMED Clinical Terms	 Voorkeur: bevinding gerapporteerd door patiënt of andere bron van voorgeschiedenis	Symptoom
0-L	404684003	klinische bevinding	SNOMED Clinical Terms	 Voorkeur: klinische bevinding	Bevinding
0-L	409586006	klacht	SNOMED Clinical Terms	 Voorkeur: klacht	Klacht
0-L	248536006	bevinding van functionele prestatie en activiteit	SNOMED Clinical Terms	 Voorkeur: bevinding van functionele prestatie en activiteit	Functionele Beperking
0-L	116223007	complicatie	SNOMED Clinical Terms	 Voorkeur: complicatie	Complicatie

Legenda: Type L=leaf, S=specializable, A=abstract, D=deprecated. NullFlavors komen in het attribuut @nullFlavor in plaats van in @code. NullFlavor OTH (anders) in een gecodeerd element veronderstelt tekst in originalText.

 [XML](#) [JSON](#) [CSV](#) [SQL](#) [SVS](#) [FHIR \(4.0\)](#)

A CD-ROM is shown with a rainbow-like reflection on its surface. The text on the CD is as follows:

IHTSDO  
SNOMED Clinical Terms  
International Release

Nictiz  
Dutch Extension  
31 July 2014

## The big issue with terminology

- Dozens of codesystems, hundreds of valuesets, information models, etc.
- Little to no overlap in release format
- Little to no overlap in release planning
- Many (small) vendors
- Many new PHR vendors
- Everybody needs it...

## Der Nationale Terminologieserver

Nictiz hat mit der Implementierung des Nationalen Terminologieservers begonnen. [Dazu verwenden wir Ontoserver](#) unseres australischen Partners [CSIRO](#). Dieser Terminologieserver hilft Softwareanbietern und Datenwissenschaftlern, aktuelle nationale Terminologieinhalte wie SNOMED und den niederländischen Laborcodesatz zu aktualisieren.

Der National Terminology [Server von Nictiz](#) ist eine [FHIR-konforme](#) Lösung, die internationale Terminologien und Klassifikationen wie SNOMED und LOINC sowie nationale Terminologien gemäß FHIR-Spezifikationen verfügbar macht.





### Kein manuelles Update mehr nötig

Durch die Verwendung des Terminologieservers entfällt für immer mehr Anwendungen die manuelle Aktualisierung der Systeme mit heruntergeladenen Inhalten von [MLDS](#) oder anderen Quellen. Damit

#### Terminologiezentrum

- COVID-19-Terminologie
- **Der Nationale Terminologieserver**
- Niederländisches Laborcode-Set
- Referenzlisten
- Browserterminologie und Codesysteme
- Schulungsangebot Terminologiezentrum
- Nationales SNOMED-Freigabezentrum

### Bedienungsanleitung

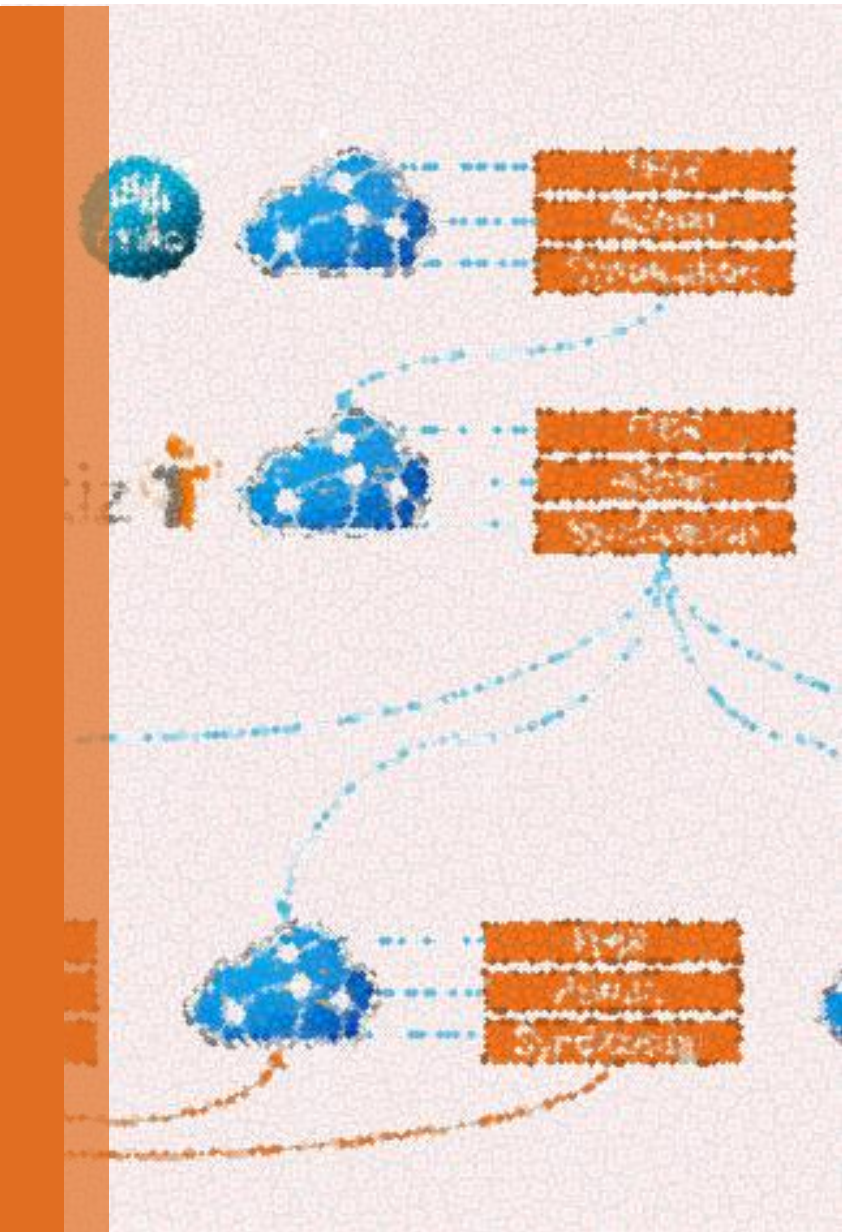
[Leitfaden für neue Benutzer](#)   
[Handbuch für neue Benutzer](#)  
 (Niederländische Version) 



# Goals of the National Terminology Server

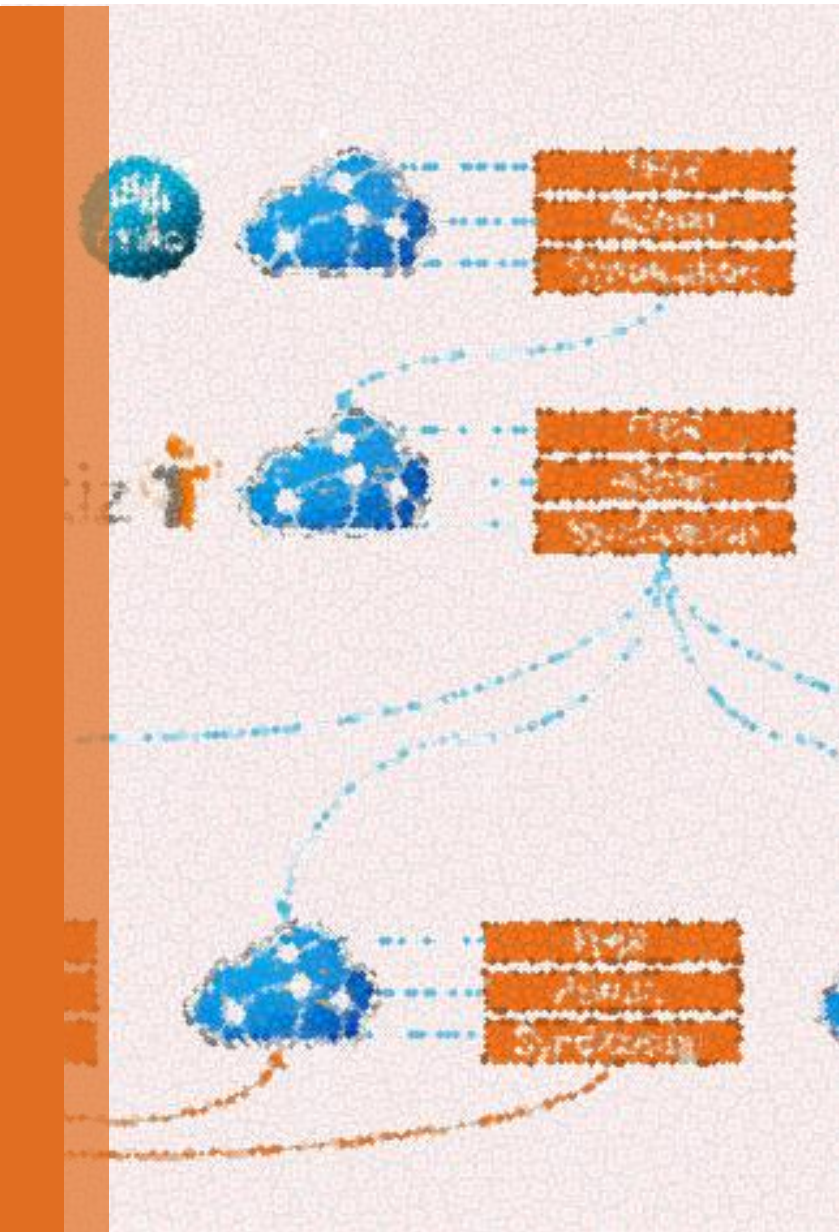
- Ambition: ALL Terminologies/Classifications used in NL
- Creating a 'one stop shop' for terminology while respecting licenses
- Decrease the implementation threshold
- Assist in updating terminologies
- Decrease the complexity of implementing smart capabilities of terminology
  - Postcoordination
  - Mappings
  - Translation
- At no costs





# Content on the National Terminology Server

ART DECOR	
HGNC	
HumanPhenotypeOntology	
ICD10	
LOINC	
Labcodeset	
SNOMED	
NHG2	
ICPC1NL	

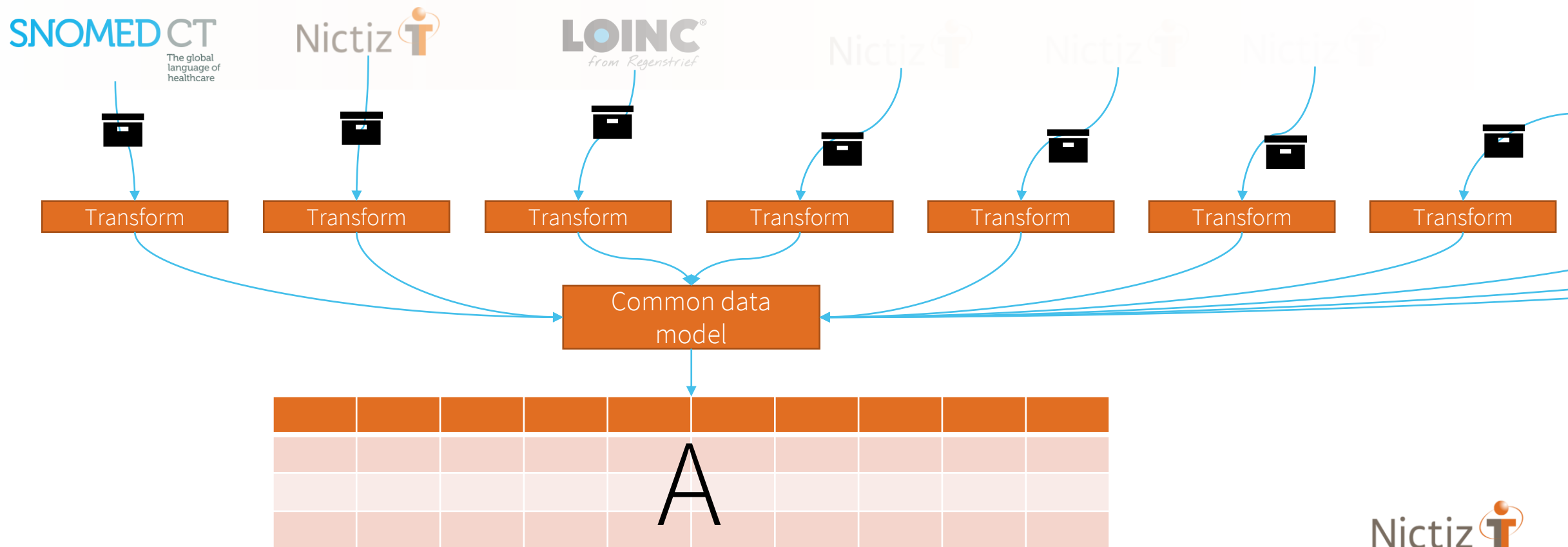


# Use of the National Terminology Server

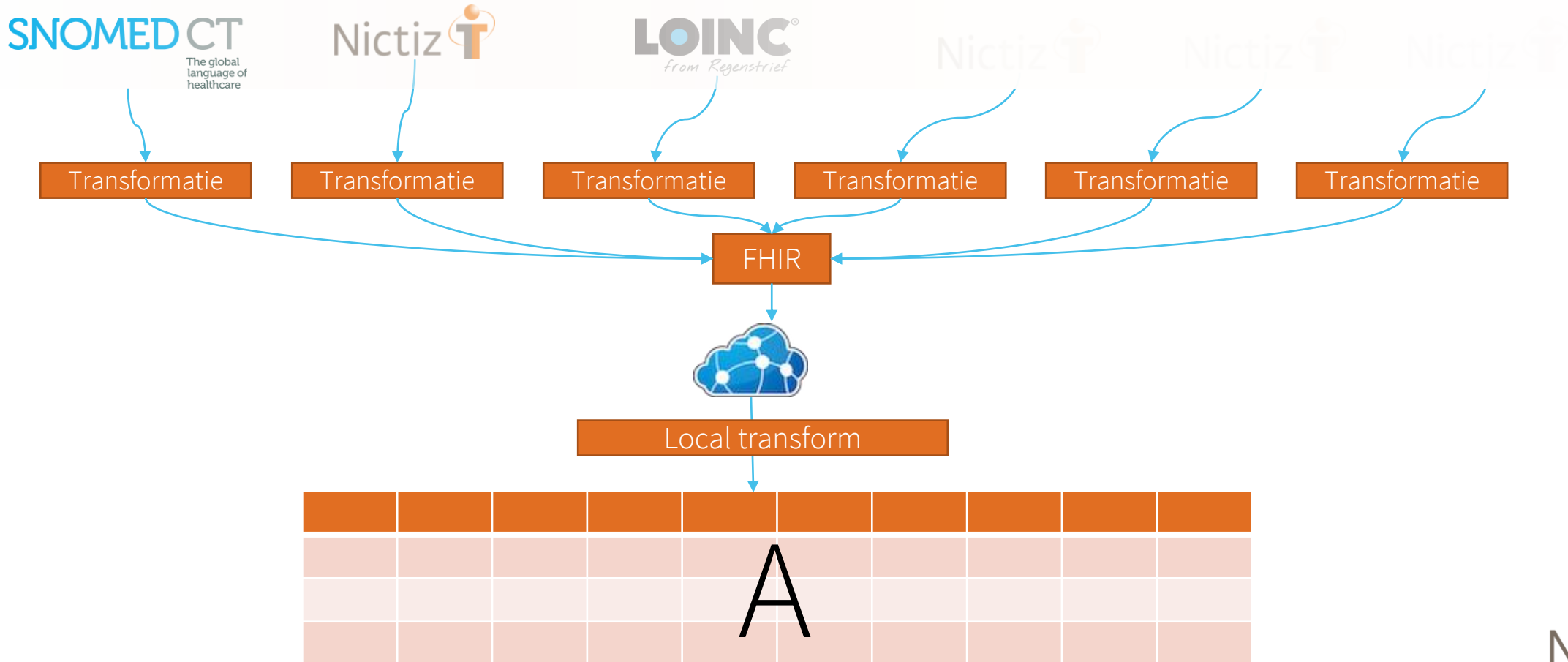
Consumers	67
ART DECOR consumers	69
HGNC consumers	66
HumanPhenotypeOntology consumers	66
ICD10 consumers	65
LOINC consumers	19
Labcodeset consumers	37
SNOMED consumers	38 (5% SCT Lics)
NHG2 consumers	1
ICPC1NL consumers	1
Service desk team	4
NHG authors	1
NHG owners	1

# Why?

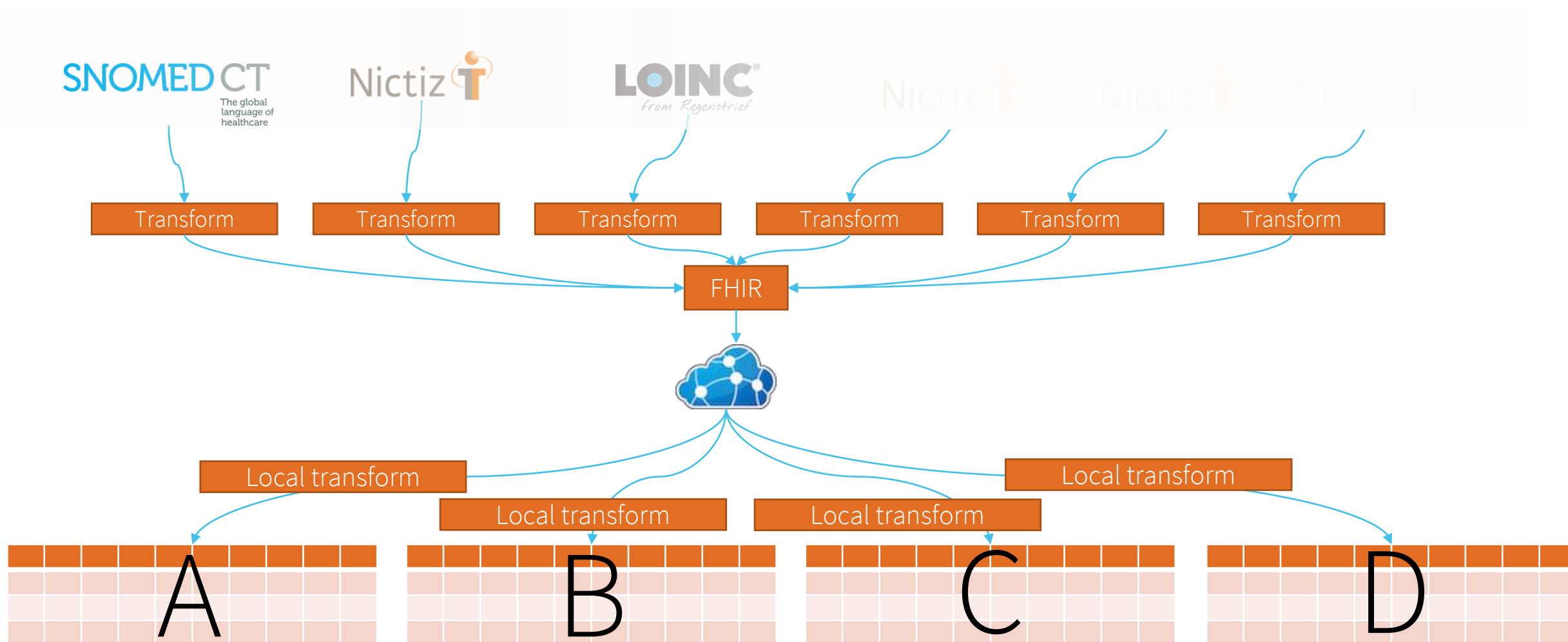
## Current Landscape in the Netherlands



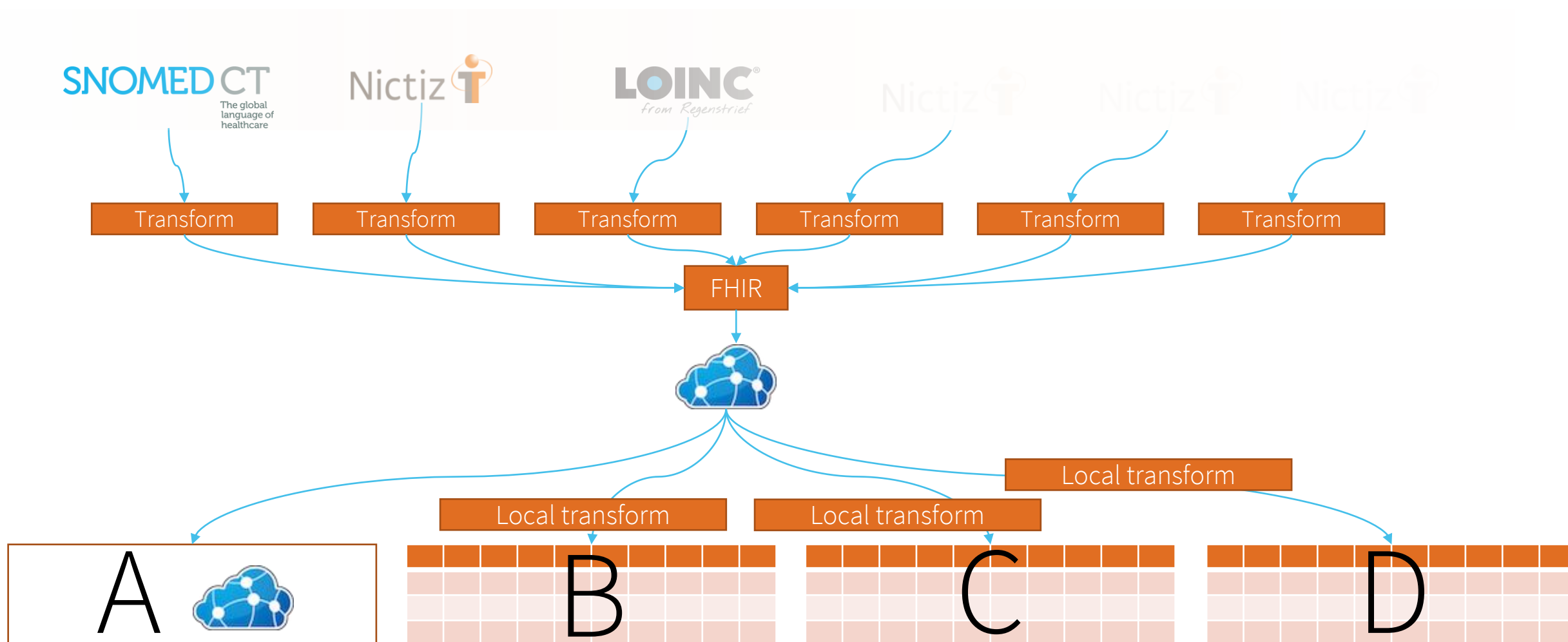
# Advantage of a Central Terminology Service



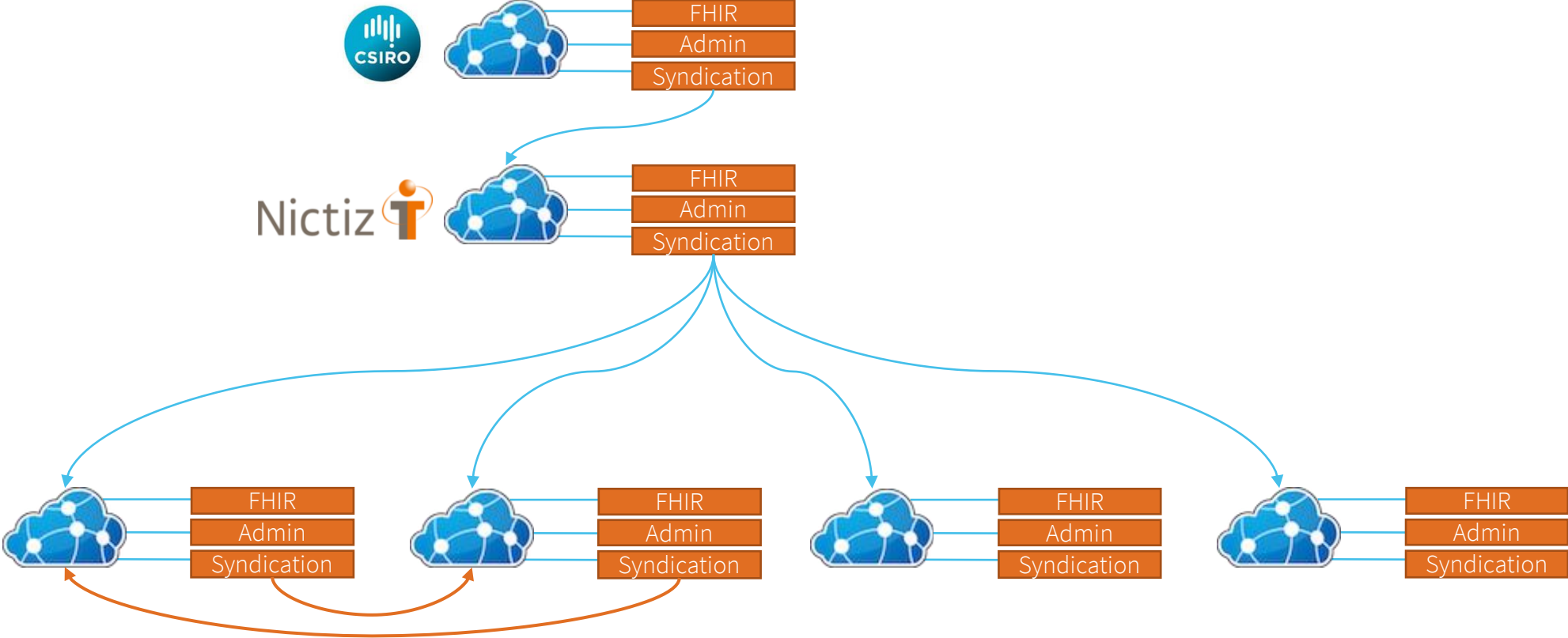
# Advantage of a Central Terminology Service



# Advantage of a Central Terminology service



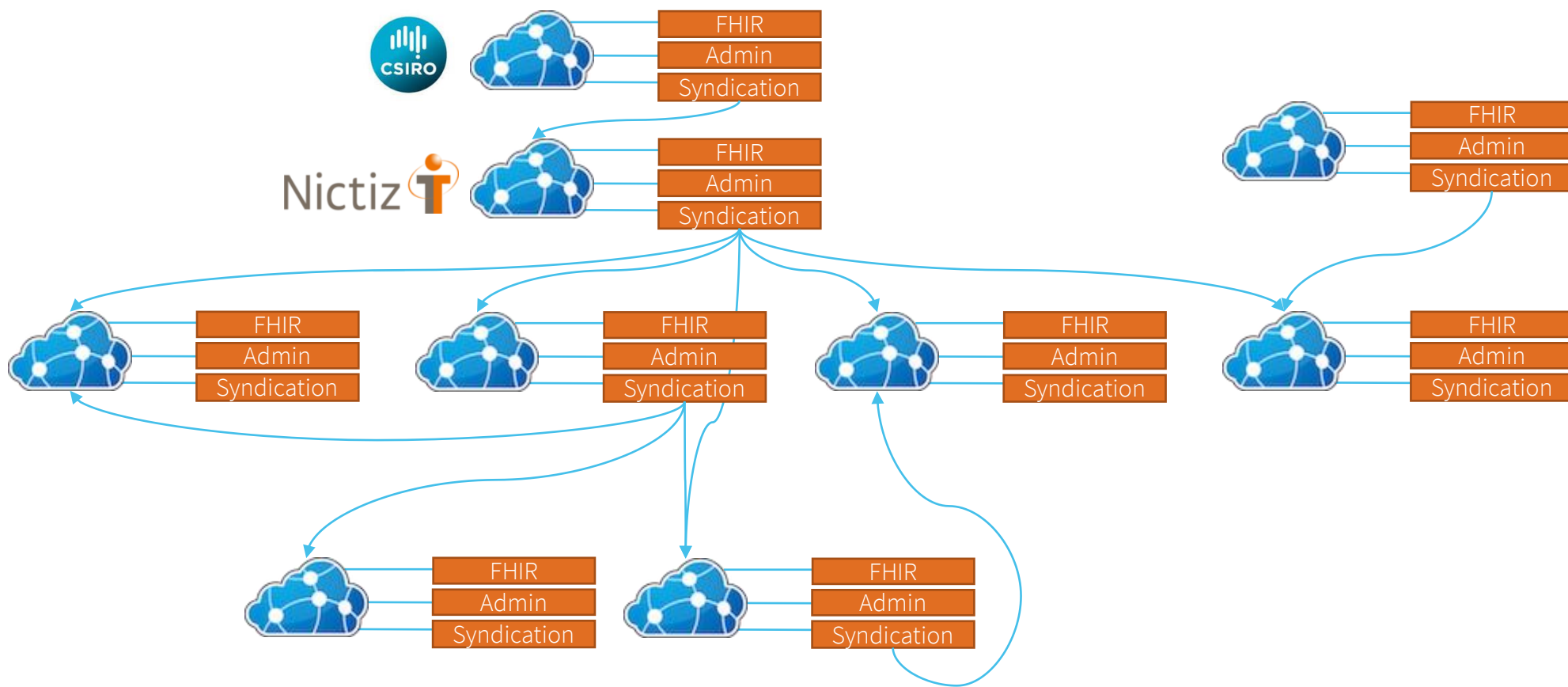
# Terminology Server Ecosystem





# Terminology server ecosystem

## In a few years?



# Getting access to the NTS

<https://www.nictiz.nl/standaardisatie/terminologiecentrum/nationale-terminologieserver/>

or

Google: National Terminology Server Netherlands

or

<https://terminologieserver.nl>



**ONTOSERVER**

Handmatig bijwerken niet meer nodig

Door het gebruik van de terminologieserver is het voor steeds meer toepassingen niet meer nodig om de

• SNOMED National Release Center

## Handleiding

Handleiding voor nieuwe gebruikers 

Manual for new users (English version) 



## Summary

- Standardized terminology can bridge gaps between dialects or even colleagues – this is essential for data warehousing, decision support and analytics
- Keeping up to date on terminology releases is hard: let us help
- Terminology servers assist in easily retrieving translations, performing mapping, etc. Using a standard like FHIR enables interoperability, not just for patient data but also for terminology products!
- NTS is free if you already own a license for a terminology



# Pim Volkert

## Present

- Teamlead Terminology Center at Nictiz
- Staff Member and Tutor at Clinical Informatics department TU Eindhoven

## Past

- EHR Vendor – ALERT Life Science Computing
- Hospital – Rivierenland Tiel
- [volkert@nictiz.nl](mailto:volkert@nictiz.nl)
- <https://www.linkedin.com/in/pimvolkert>