

Lille university hospital, France

Lab : ULR Metrics 2694



Transforming Primary Care Data Into the Observational Medical Outcomes Partnership Common Data Model: Development and Usability Study

Published in JMIR - doi: 10.2196/49542

Dr. Mathilde FRUCHART

Data

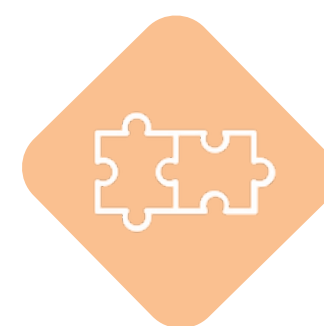
- 77% of the French population²
- Beneficiaries of the general health insurance scheme for employees and senior citizens²



Specificities



Claims data



Completeness



No clinical data



¹ DRESS, 2016
² Tournier, 2023



Hospital

Data

- Administrative
- **Clinical** (measurements, diagnoses, procedures)
- **Drug administration**
- **Biological**

- Patients hospitalized in the hospital
- **Several software** in one hospital



Specificities



Clinical data



Completeness



No external data



Health center

Multi-professional health centers

- **National level :**

2,501 Multi-professional health centres^{1,2}

- **Hauts-de-France :**

231 Multi-professional health centers²

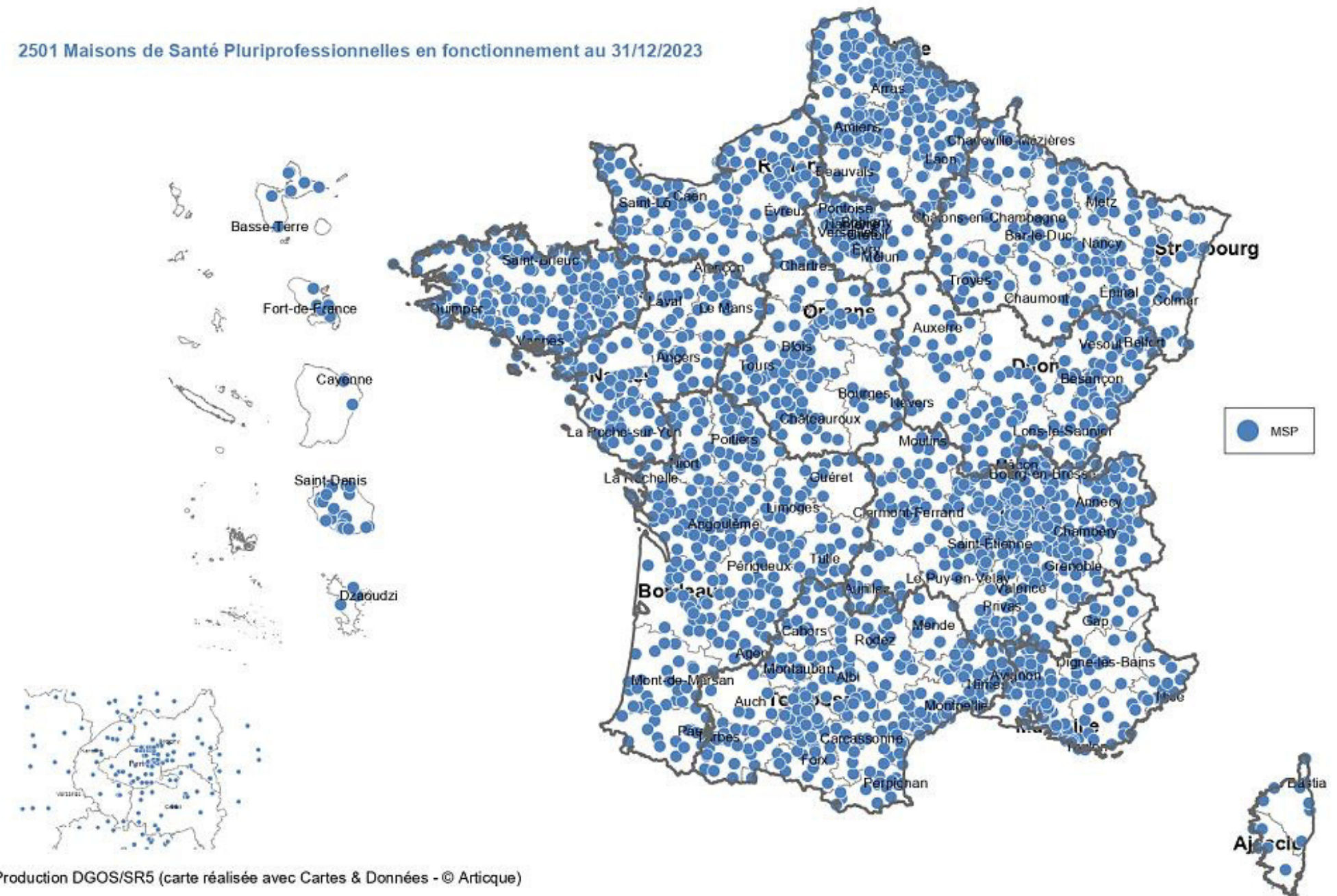
3,000 healthcare professionals²

857 general practitioners²

Maisons de Santé Pluriprofessionnelles en fonctionnement au 31/12/2023

Source : ATIH/observatoire des recompositions/retraitement DGOS - Extraction au 31/01/2024 - France entière

2501 Maisons de Santé Pluriprofessionnelles en fonctionnement au 31/12/2023

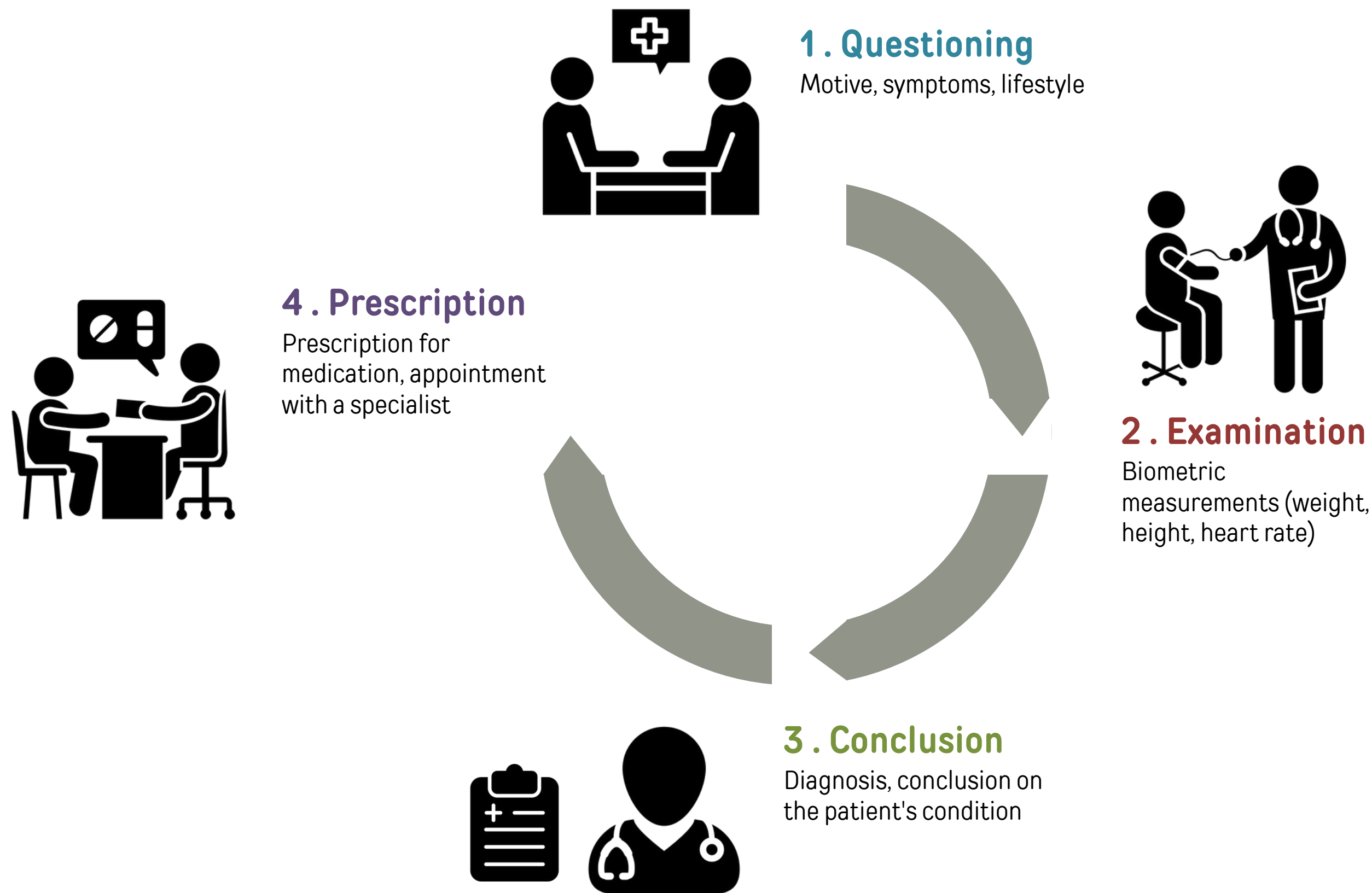


¹ ARS, 2023

² DGOS, 2024



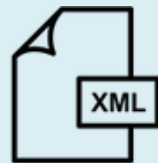
Health Center



EXTRACT



Health center



TRANSFORM

Structural transformation

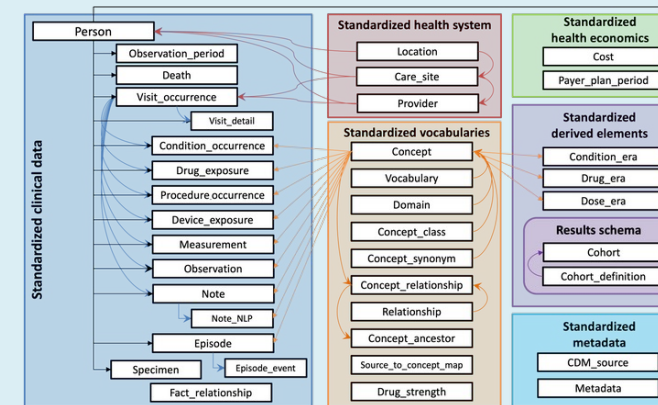


Semantic transformation



LOAD

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REUSE

Visualization



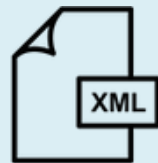
Retrospective studies



EXTRACT



Health center



TRANSFORM

Structural transformation

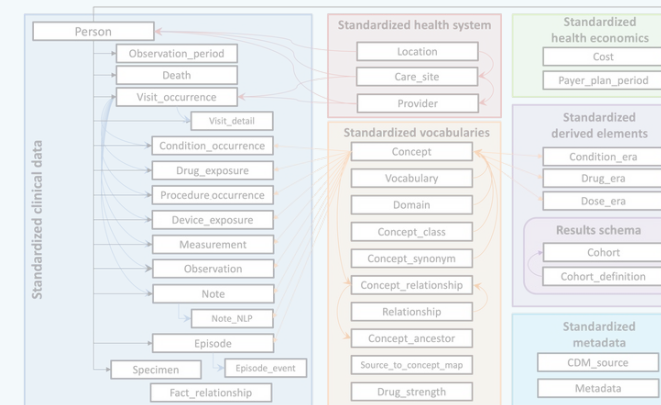
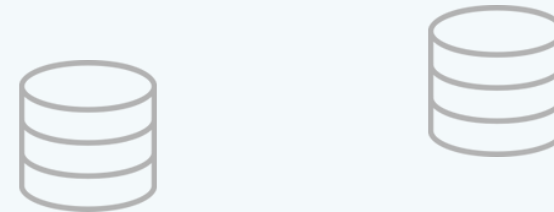


Semantic transformation



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REUSE

Visualization



Retrospective studies



EXTRACT



- Health center
- WEDA software



Enregistrer Consultation

Date : 11/01/2021 Cabinet Lié : Important Privé Episode :

Titre : + ATCD

Sous-titre : + HISTORIQUE

Histoire de la maladie Interrogatoire Examen Clinique

Police Taille **B** *I* U **A** **ab2**

04/03/2017: since 2013 1 **daily crisis for 2 weeks**
anxious context at her ex-partner to drop the
 children off at school
Hba1c correct

04/24/2017: **1 bulimia crisis**, less crying (no
 insomnia, goes back to sleep right away). renewal of
seroplex and stresam. and usual ttt = and sent to
 center

Conclusion

Police Taille **B** *I* U **A** **ab2**

Utiliser le suivi défini dans mes préférences

Question	Réponse et unité	
Poids	<input type="text"/>	<input type="text"/>
Taille	<input type="text"/>	<input type="text"/>
IMC	<input type="text"/>	<input type="text"/>
PAS	<input type="text"/>	<input type="text"/>
PAD	<input type="text"/>	<input type="text"/>
HbA1C	<input type="text"/>	<input type="text"/>

Supprimer toutes les valeurs du suivi

[Ajouter des diagnostics CIM10](#)
[Ajouter des diagnostics CIM10 via base CISP](#)

Point de vigilance (si coché, cela alimentera la variable [PointVigilance]) Origine externe.

Weda software interface - consultation

EXTRACT

Extraction of data entered in the software in XML format



1 file / patient

The screenshot shows the WEDA software interface for a consultation. At the top, there's a header with 'Enregistrer' and 'Consultation'. Below it, there are fields for 'Date' (11/01/2021), 'Cabinet', and 'Lieu'. There are also checkboxes for 'Important' and 'Privé', and an 'Episode' field. Below this, there are sections for 'Histoire de la maladie Interrogatoire', 'Examen Clinique', and 'Conclusion'. The 'Examen Clinique' section contains a table with columns 'Question' and 'Réponse et unité', listing various clinical parameters like Poids, Taille, IMC, PAS, PAD, and HbA1C. There are also buttons for 'Ajouter des diagnostics CIM10' and 'Ajouter des diagnostics CIM10 via base CISP'.

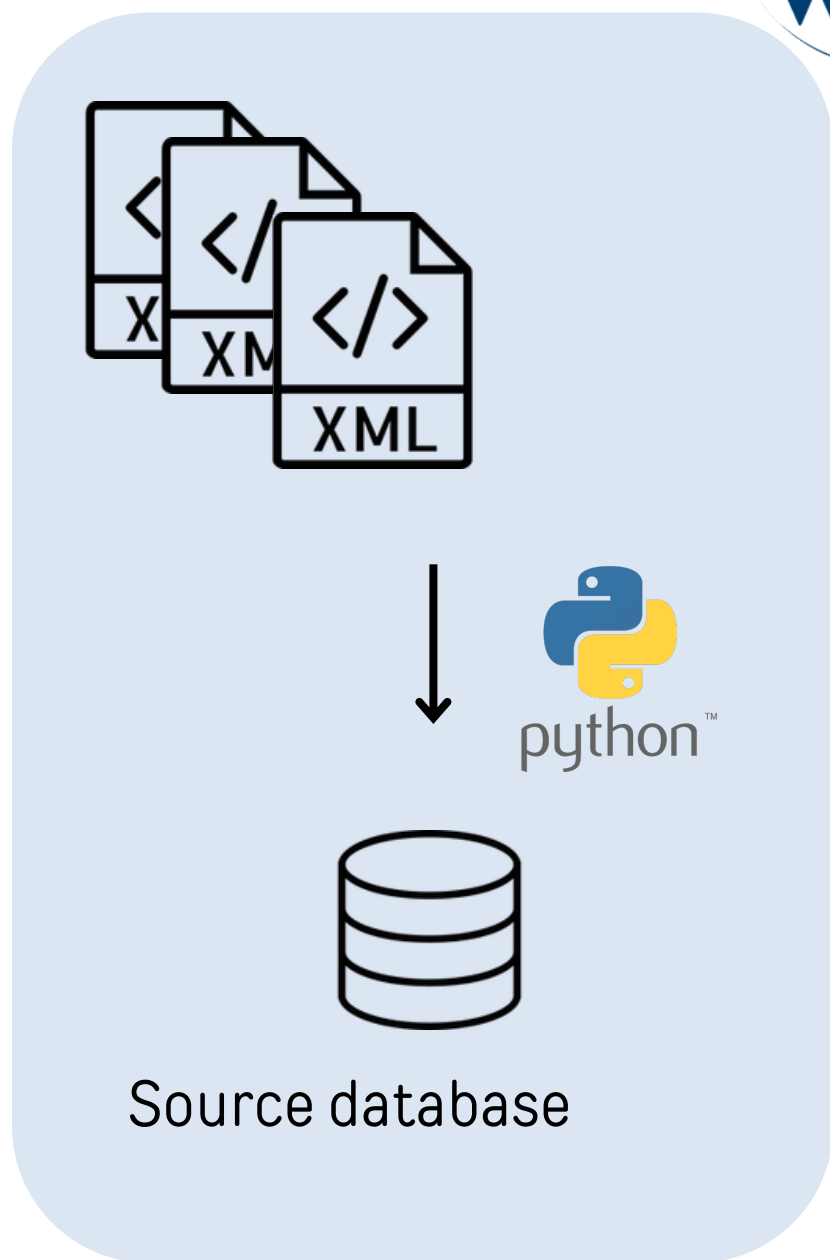
Software interface



```
<Patient version="1">
  <PatientDataKey>4819985 | 12798 | 688 | 1</PatientDataKey>
  <ID>4819985</ID>
  <DateCreated>15/03/2016</DateCreated>
  <DateModifier>12/02/2020 16:20:43</DateModifier>
  <LabelSexe>1</LabelSexe>
  <LabelCivilite>1</LabelCivilite>
  <Nom> </Nom>
  <NomJeuneFille> </NomJeuneFille>
  <Prenom> </Prenom>
  <NomPrenom> </NomPrenom>
  <IsDateNaissanceLunaire>False</IsDateNaissanceLunaire>
  <DateNaissance> </DateNaissance>
  <DateNaissanceLunaire/>
  <RangNaissance>0</RangNaissance>
  <Nir> </Nir>
  <NirCle> </NirCle>
  <Profession>ens
  <LabelSituationFamille>1</LabelSituationFamille>
  <IsDecede>False</IsDecede>
  <DateDecede>01/01/0001</DateDecede>
  <NewIsAbort>False</NewIsAbort>
```

EXTRACT

- 18,395 patient files
- 1997 - 2021



```

< Patient > 1 Element
  2 < Date de naissance > 01/01/1995 </Date de naissance>
  Attribut < Sexe> Femme </Sexe>
  < Consultation >
    < Date> 01/01/2022 </Date>
    < Mesures > 3 Texte
      < Question> Poids </Question>
      < Valeur> 76 </Valeur>
      < Question> Taille </Question>
      < Valeur> 1.64 </Valeur>
    </Mesure>
  </Consultation>
  < Consultation >
    < Date> 01/04/2023 </Date>
  </Consultation>
</Patient>

< Patient >
  < Date de naissance > 01/11/1990 </Date de naissance>
  < Sexe> Femme </Sexe>
  < Consultation >
    < Date> 15/05/2022 </Date>
    < Mesures >
      < Question> Poids </Question>
      < Valeur> 82 </Valeur>
    </Mesure>
  </Consultation>
</Patient>
    
```



Source database

Identifiant	2 Date de naissance	Sexe	1 P A T I E N T
1	01/01/1995	Femme	
2	01/11/1990	Femme	

Identifiant consultation	Identifiant patient	Date de naissance	V I S I T E S
1	1	3 01/01/2022	
2	1	01/04/2023	
3	2	15/05/2022	

Identifiant mesure	Identifiant consultation	Concept	Valeur	M E S U R E S
1	1	Poids	76	
2	1	Taille	1.64	
3	3	Poids	82	

EXTRACT



MSP



TRANSFORM

Structural transformation

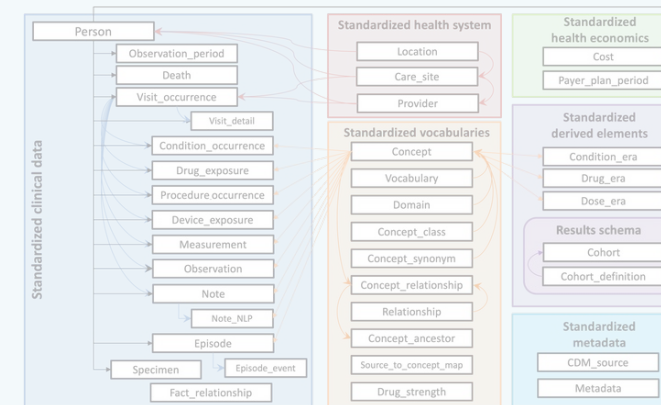


Semantic transformation



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Visualization

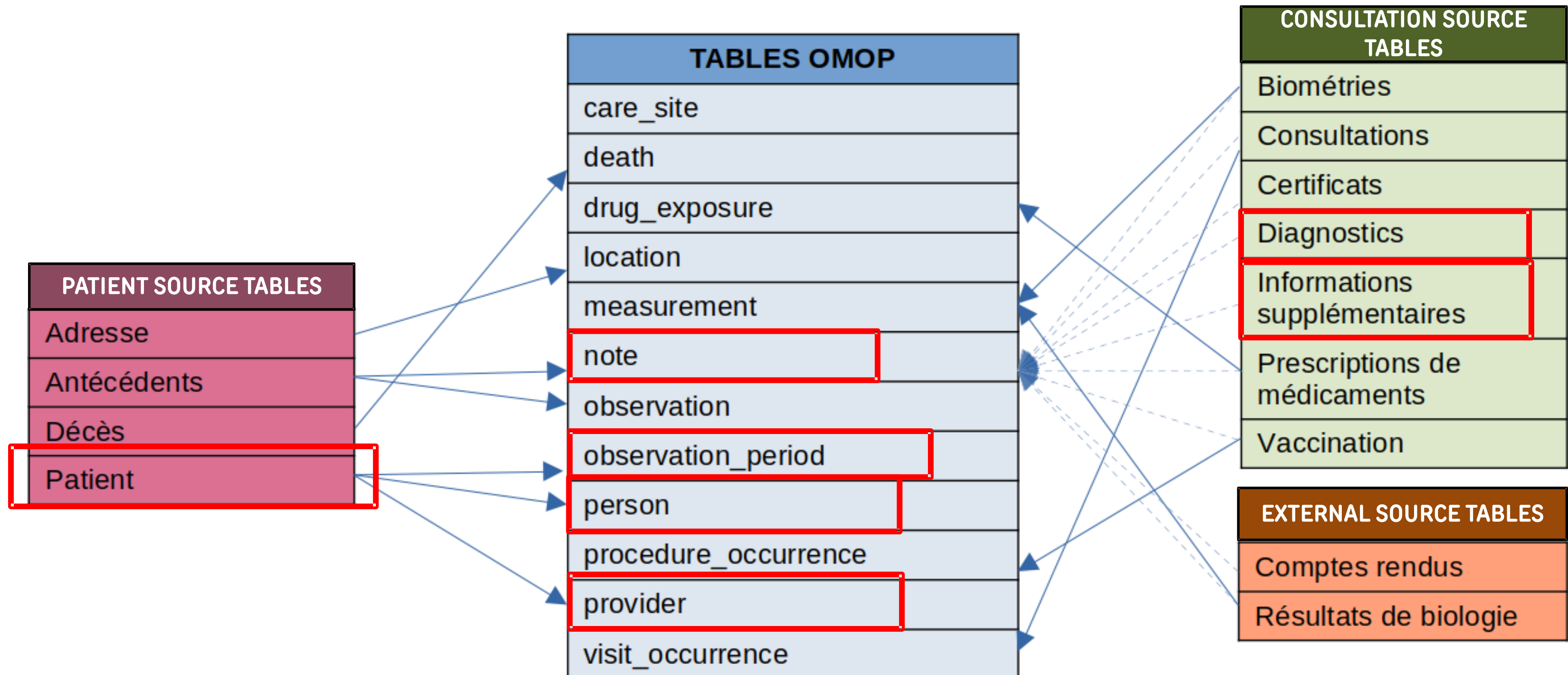


Retrospective studies



TRANSFORM**Structural transformation**

Table and column mapping



TRANSFORMSemantic transformation**CONCEPT LOCAL**

concept_id	concept_name	vocabulary_id
2000000000	weight	5
2000000001	HEIGHT	5
2000000002	glycated hemoglobin	6
2000000003	hba1c	6

CONCEPT STANDARD

concept_id	concept_name	concept_code	vocabulary_id
37111521	Weight	726527001	SNOMED
607590	Body height	1153637007	SNOMED
3034639	Hemoglobin A1c [Mass/volume] in Blood	41995-2	LOINC



VOCABULARY

vocabulary_id	vocabulary_name
5	biometrie_weda

3

MEASUREMENT

measurement_concept_id	measurement_source_concept_id
???	2000000000

STANDARD

LOCAL

1

CONCEPT

concept_id	concept_name	vocabulary_id
2058	weight	SNOMED
2000000000	poids	5

STANDARD

LOCAL

2

CONCEPT_RELATIONSHIP

concept_1	concept_2	relationship_id
2058	2000000000	4

STANDARD

LOCAL

RELATIONSHIP

relationship_id	relationship_name
4	SNOMED- biometrie_weda

TRANSFORM

Semantic transformation

● **10,221** aligned local concepts



double validation

ICD10



Medical history

Level 1

96% of concepts aligned

98% of recordings

Medicines

Level 2

96% of concepts aligned

98% of recordings

Biology

Level 3

7% of aligned concepts

88% of recordings

Biometrics

Level 3

4.9% of aligned concepts

96% of recordings

Unit of measurement

Level 3

30% of concepts aligned

77% of recordings

EXTRACT

TRANSFORM

LOAD

REUSE



Health center



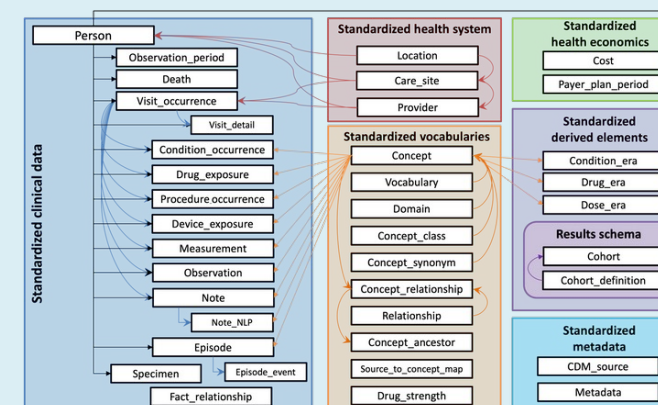
Structural transformation



Semantic transformation



LOADING



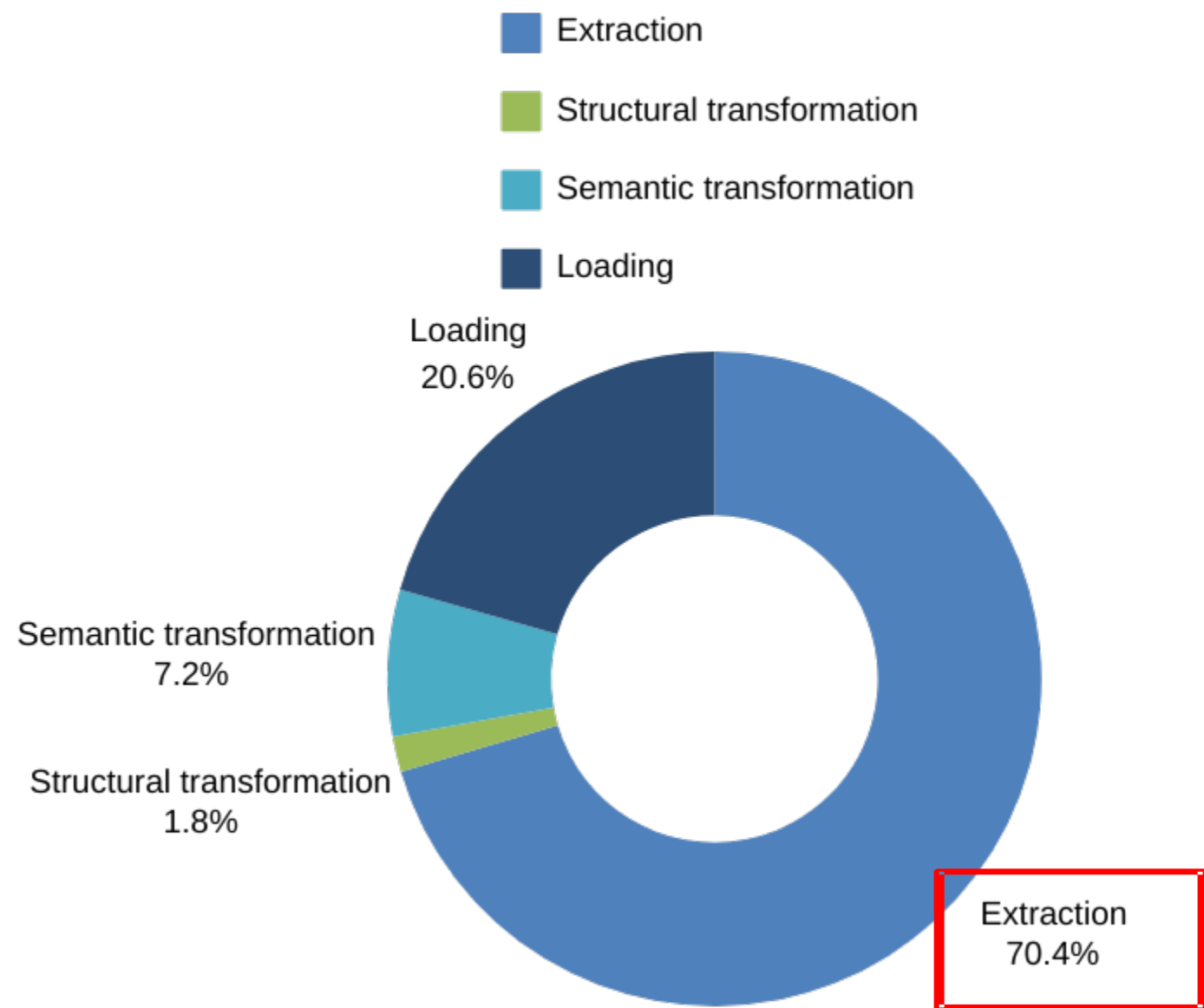
Visualization



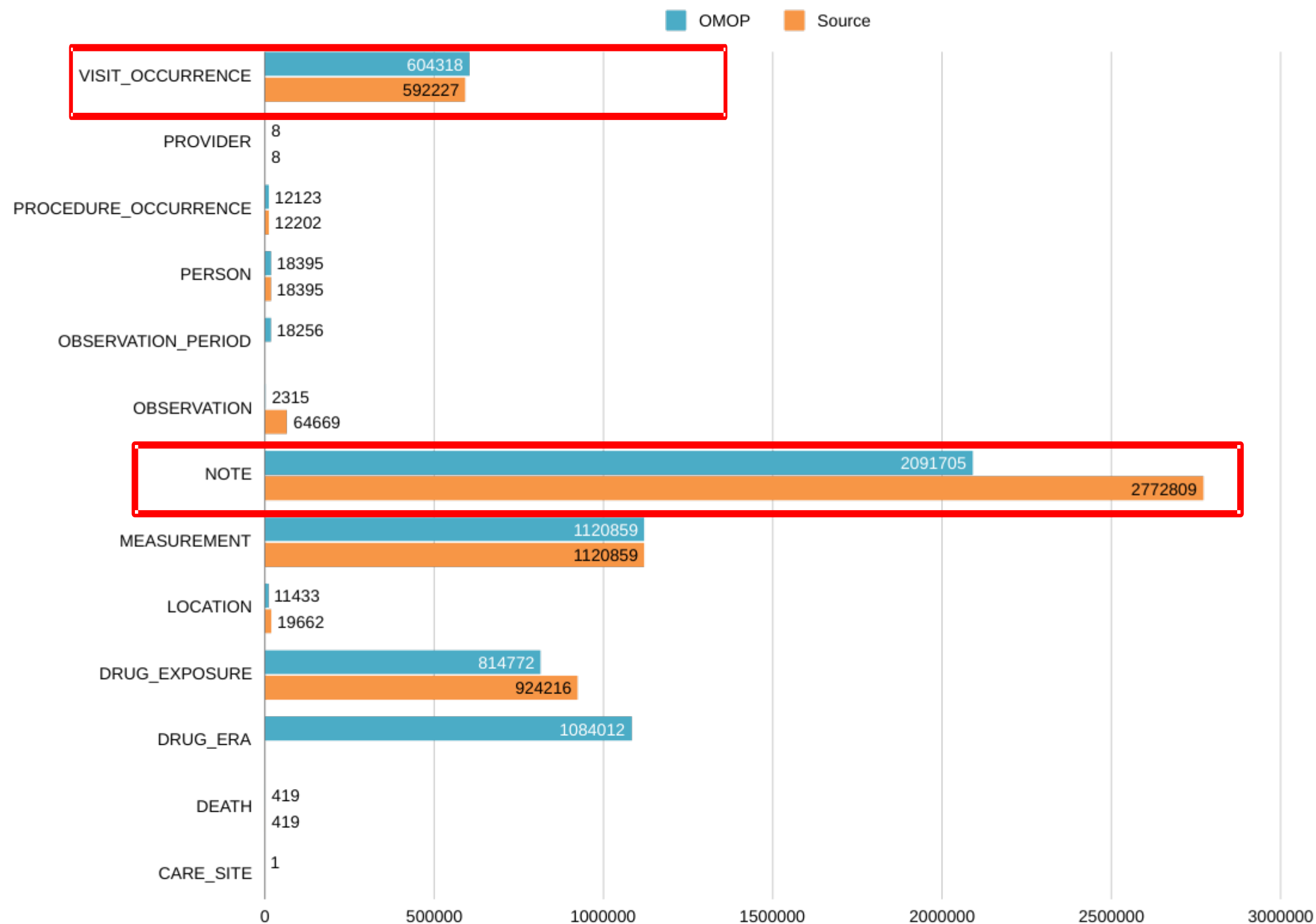
Retrospective studies



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Breakdown of execution time (minutes) by ETL step*



Number of records per table

EXTRACT



Health center



TRANSFORM

Structural transformation

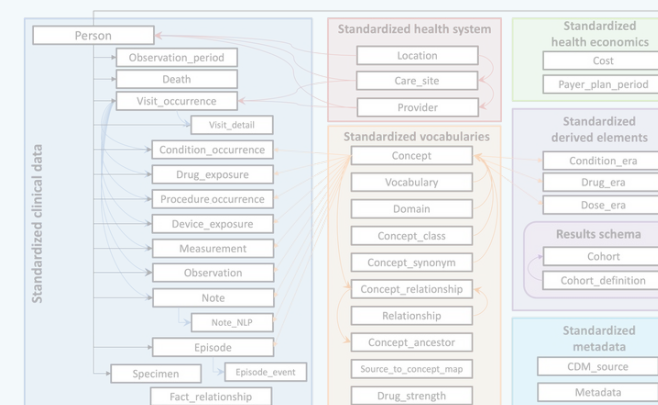


Semantic transformation



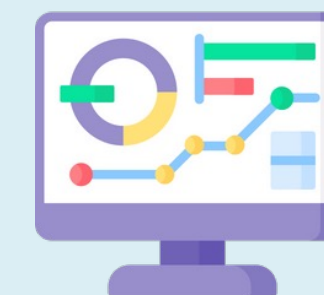
LOAD

LOADING



REUSE

Visualization



Retrospective studies



WORK — IN — PROGRESS



Publications in
progress

- Development of an **optimization strategy**,
- Development of **algorithm** for the detection of gap in care,
- **Descriptive analysis** of diabetes,
- Integration of the **dashboard** into the WEDA software.



One of the dashboard panels

Limitations

Scope:

Lack of information on patient monitoring outside the health center.

Format:

Free text

Information spoken orally

Data saved in different places in the software

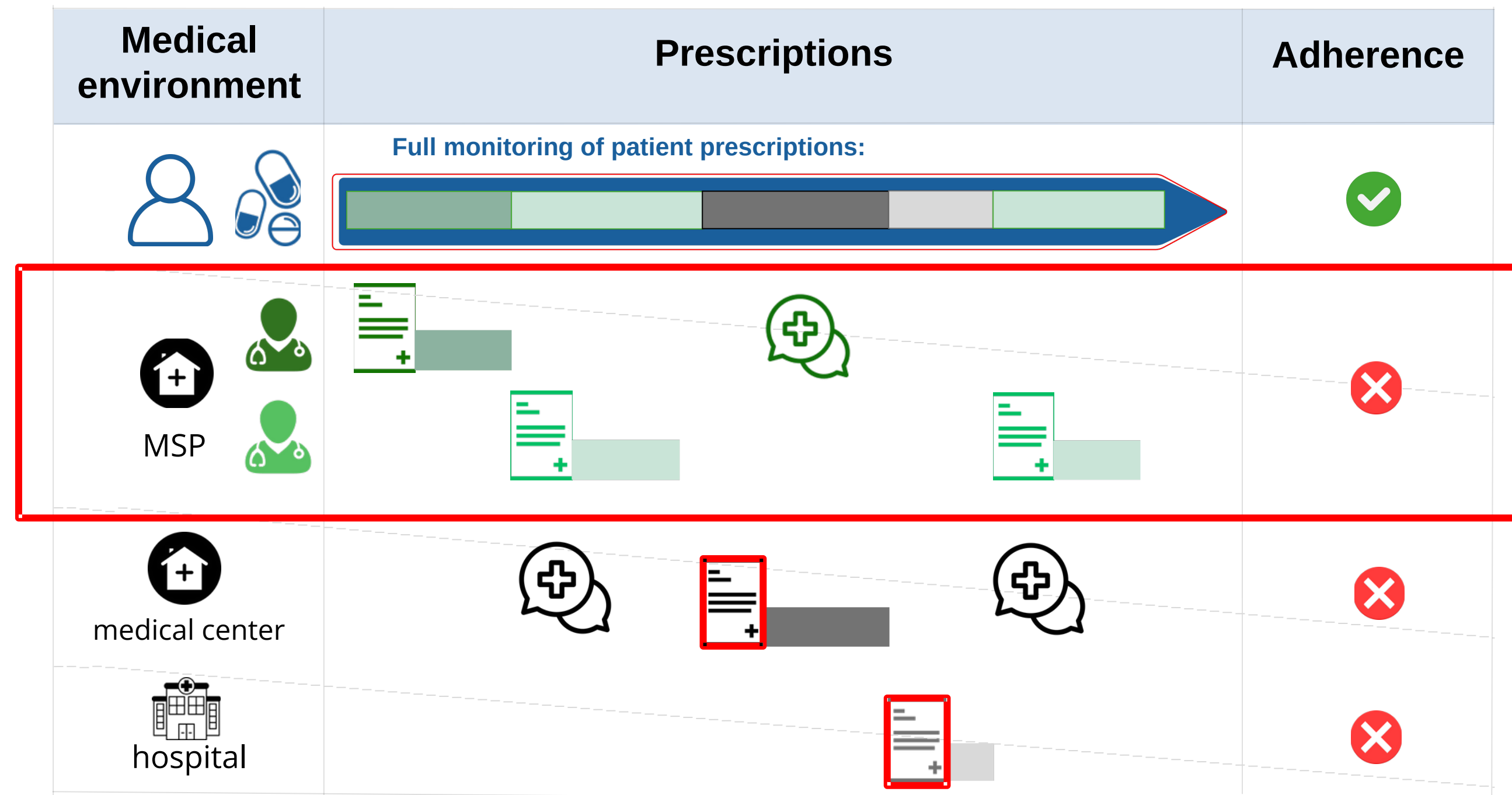
Spelling depends on the doctor



visits



prescriptions



Example of monitoring perseverance for a patient in different institutions

THANK YOU!



Do you have any questions?

