Product lookup for Patient-Facing Apps
Use Case
Request to renew a medication on the Medication List from a patient from Country A in Country B

Nicole
Use case: Test Lab benefits and value propositions

- **Instrument of Innovation**
  Participants can share (or discover) important insights related to the practical aspects to realize IDMP-empowered digital health workflow
  Thanks to the developed applications
  Ground testing regarding digital health systems in Europe will inform the best directions to reach new solutions

- **Instrument of Implementability:**
  The work of the lab is to move from theory to practice
  For IDMP to go to scale, the change management and related specifications need to be practically implementable
  The lab adds value upstream of conformance testing and helps highlight interoperability specifications

- **Instrument of Governance**
  The lab will provide a trusted conformance-testing service
  Testing capacity enables EU Member States to exercise governance over digital health actors to ensure their ability to interact with each other in the service of patient care workflows that depend on shared health data
The solution provided by the UNICOM project can represent a useful and necessary tool to help and facilitate travelling citizens’ lives and protect their health, eliminating barriers and personal fears of forgetting their medication at home and discontinuing their therapies.

It presents benefits both for patients and healthcare providers.

Patient’s health is safeguarded, since they gain information on the medications they take, no matter where they are. Moreover, their new applications are demonstrably interoperable and meet national and EU specifications. HCPs in foreign countries can see all this information, and so they are put in a position to rationally and safely dispense the medication with awareness about the safety and health of foreign patients.
Use case: purpose and relevance

This use case represents a pilot within the UNICOM Project to test the usefulness of ISO/CEN IDMP standards for the univocal identification of medicinal product in a private sector real-world scenario.

This use case aims to demonstrate the possibility for patients from Country A who are abroad without their medicine to obtain a similar substitute medicine in Country B, in order to safeguard their health and ensure their adherence and continuity of treatment.
Apps Ecosystem and Repository

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 875299
Application for users
Patient-Facing Apps (PFAs)

Three applications are provided to patients:
Pharmawizard4UNICOM, eHealthPass and InfoSAGE

All present the same functionality:

✓ Ability of searching for medicine to gain information about it
✓ Ability of adding medicines to patients’ Medication List
✓ Ability of selecting a medication from the Medication List to be refilled
✓ Ability of creating a medicine data QR code to be shown to the HCPs abroad to make them drug
✓ Ability of adding the identified substituted drug to the Medication List via the QR code generated by the HCP app.
Application for users
Patient-Facing Apps (PFAs)

Patient-Facing Apps aim to **empower patients’ access to medicinal information** and **find substitute drugs abroad**, adding them to their Medication List.

An important purpose of these applications is to provide patients with information about the medications they are taking, put them on their personal medication list, and have a secure tool with them when travelling abroad to find the similar medications in a foreign country.

This is possible because the apps are integrated with the **IDMP Database**, developed in Task 6.1, and the **Substitution Component**, developed in Task 6.2.
The apps carry the **Medication List** and **minimal clinical data** of the patient in the local language and with the local Medicinal Product Dictionary.

The Medication List is **IDMP-compliant**, so that can produce for each medicine on the list:

- ✓ the Pharmaceutical Product Identifier (label PhPID)
- ✓ the substance with the role of precise active ingredient
- ✓ the granular EDQM administrable dose form
- ✓ the normalized expression of strength
With the **Patient-Facing App** the user is able to:

- **Create a Medication List**
  - The patient saves Medicinal Products on his/her mobile device

- **Generate QR codes for the Healthcare Provider App**
  - To communicate with the pharmacist (dispenser) about the drug to be substituted

- **Add substitute drugs to the Medication List**
  - To record pharmacist’s chosen medication on the app
PFAs communication module

- Welcome & onboarding
- List of actions: Medication List, QR code reader
- Medication List: add medications
- Generate QR
- Read QR
- Cam opened with QR code reader
- Add the new drug to the Medication List

- Generated QR code
- Healthcare provider app
Application for users
Healthcare Provider App (HCPA)

One interface is provided to healthcare professionals (physicians, pharmacists..), with the following functionalities:

✓ Scanning the Patient-Facing App generated QR code
✓ Connecting to the Substitution Component of the UNICOM server to get a list of equivalent or similar drugs from which to choose the most appropriate medication
✓ Generating a new QR code containing the substitute drug data and information to be sent back to the Patient-Facing App
Other interesting functionalities present in the interface are:

- Language settings (currently Italian and English)
- Font scaling and contrast management
- Substitution country settings
The HCPA is developed in Flutter and consists of two basic components:

A. **Substitution Manager:** an application module responsible for the integration of APIs with the Substitution Component.

B. **Filter Manager:** an internal component of the Substitution Manager making it possible to filter the results obtained by the Substitution Component.

These two components combined with the UNICOM backend enable drug substitution between different countries.
With the **Healthcare provider app** the dispenser (or prescriber) is able to:

- **Scan FPA-generated QR codes**
  - To obtain a list of similar medications and their characteristics

- **View the medications the patient is currently taking**
  - Thanks to a Medication-IDMP Multilanguage Representation

- **Consult a list of potential substitute medications**
  - To select the best substitute medications for the patient

- **Generate a QR Code to be sent back to the PFA**
  - Improved results with search bar & filters
  - To inform the patient with the chosen medication's characteristics
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**HCPA communication module**

- Welcome & onboarding
  - List of actions: QR code reader
  - Cam opened with QR code reader

**Pharmacist picks Healthcare Provider App and reads qr code of user**

**Drug scanned**

**GENERATED LIST OF EQUIVALENT MEDICATIONS**

- API call to the Substitution Component of UNICOM to get the list of equivalent medications

**List of equivalent medications**

**Scroll through similar medications with the help of filters**

**Substitute medications overview**

**MEDICATION CHOICE & QR CODE GENERATION**

**User-Facing App**
**Back-end**

The system back-end architecture consists of two main systems:

A. **FHIR server** exposes the APIs for:
   - ✔️ the IDMP to get medicinal data
   - ✔️ Medication suggestion component

B. **Substitution component module** to get data on substitutions of the identified drug for different countries
Use Case basic scenario

A. A patient from Country A, travelling to Country B can select a medication from the Medication List that needs refilling and present the corresponding QR code to the healthcare provider in Country B

B. The HealthCare Provider Application (HCPA) can read the PFA-generated QR code, to send information via API to the UNICOM T6.1 database and receive back a list of similar medications available in Country B, applying the local substitution rules

C. The healthcare provider makes an informed choice and provides the patient with the identifier of the chosen medication (and its labelling information) via an HCPA-generated QR code to be sent back to the PFA

D. The patient from Country A can now gain information about the similar medication available in Country B
Communication via QRcode

Data represented via JSON (JavaScript Object Notation) format provide Patient-Facing and Healthcare Provider Applications with the ability to read or generate medication identification.

The medication key will correspond to the PhPID label of the user-selected medication.
The substitution key will correspond to the PhPID label of the substitute medication selected by the healthcare provider.

```
{
"medication": "NORVASC-tablet-5mg--65-ITA-MPD",
"substitution": null
}
```

```
{
"medication": "NORVASC-tablet-5mg--65-ITA-MPD",
"substitution": "amlodipine-maleate GENERICS-TAB-10MG-TAB-173-GRC-MPD"
}
```
Use Case basic scenario – participants

A. **Patient from Country A**: a user with the Patient-Facing Application (PFA) in need for a medication refill in Country B

B. **Healthcare provider (HCP) from Country B**: a dispenser (pharmacist) able to hand over the information of the equivalent medication to the patient and possibly dispense an OTC medication or a prescriber (physician) who can prescribe an equivalent medication, according to the local rules (Country B local rules)
Use Case basic scenario – patient's journey

A. Selection of the medicinal product for which a refill is needed
B. The PFA connects through an API with the IDMP database and retrieves the IDMP description of the national Medicinal Product from Country A.
C. PFA-generated QR code
D. Capture of the request for refill by the HealthCare Provider App (HCPA), which sends an API request to the FHIR server, requesting equivalent medicinal products from Country B
E. The FHIR server sends back the information to the HCPA
F. List of similar medicinal products, described both with national identifiers and labels and with international IDMP Ids and labels
G. After the selection of the best equivalent medication, the HCPA generates a QR code to be sent back to the PFA
H. PFA reads the HCPA-generated QR code and integrates the equivalent medicinal product to the existing Medication List
Our patient

The use case presented involves Haris

- Male
- 45 years old
- 90 kg
- 175 cm
- Hypertension

Patient medication list:
Amlodipine 5mg 1DDD (Brand Zocor) to treat hypertension
During an unexpectedly extended stay in a foreign country, the patient is in need of a refill of amlodipine. He shows the pharmacist the QR code for the drug needed.
During an unexpectedly extended stay in a foreign country, the patient is in need of a refill of amlodipine. He shows the pharmacist the QR code for the drug needed.
The pharmacist recognizes that the medicine comes from a foreign country. Thanks to the HCPA, he/she can identify the similar medicine marketed in his/her country. He/she shows the patient the new drug.
The patient scans the pharmacist's QR code and add this drug to the Medication List.
The patient scans the pharmacist’s QR code and add this drug to the Medication List.
Questions and next steps

**T8.3**
IDMP and Patient Empowerment Apps

25 PATIENTS

**PILOT**

4 ACTIVE INGREDIENTS

- AMLODIPINE
- CARBAMAZEPIN
- IBUPROFEN
- SIMVASTATIN

**D8.6**
DEMONSTRATION OF PATIENT EMPOWERMENT APPLICATION

**T7.5**
Pilot deployment and operation (ARIA)

**D8.10**
RESULTS OF PERSONALISED MEDICINE PILOT (T8.5) (FORTH)

Patient Empowerment Application validated with about 500 patients
Questions and Answers – further discussion