

A solid, sector-wide enterprise architecture
as an important asset for an adequate use of ICT
in the fight against the COVID-19 pandemic

Webinar SAI

15/02/2022

Abstract

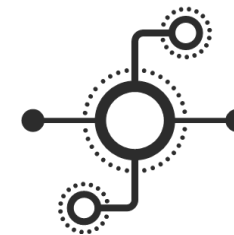
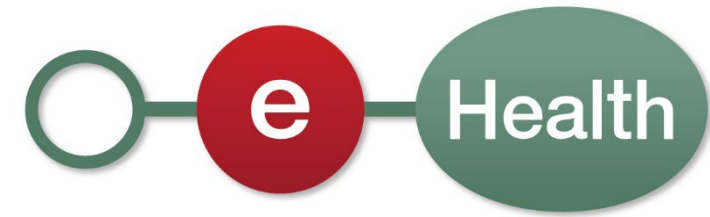
- *In the development of information systems in the social and health sector, the emphasis has been placed for years on a solid, sector-wide enterprise architecture*
 - *sharing of infrastructure and platforms*
 - *reuse of data, services and components described in a publicly accessible catalogue*
 - *an integrated service to end users, supported by APIs*
 - *participatory governance in the development of the systems, up to the level of policy makers.*
- *Through this approach, the information systems and apps set up in the fight against the COVID-19 pandemic (contact tracing, organization of tests, organization of vaccination, teleconsultation, policy support, ...) can be developed very quickly and agile, and can be adjusted very flexibly and at low cost in function of the changing situation and evolving scientific insights.*

Short history

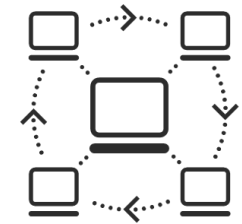
- 2008: basic services eHealth-platform
- 2016: G-Cloud as a sound synergy program
- 2018: shifting focus towards synergies in the area of business components: ReUse initiative
- 2020: COVID-19 pandemic

eHealth-platform

- Public Federal institution founded in 2008 for facilitating well-organized, mutual electronic service and information exchange between all actors in health care
- The e-Health platform provides necessary guarantees with regard to information security, privacy protection and professional secrecy



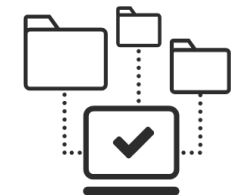
Connectors



Standards

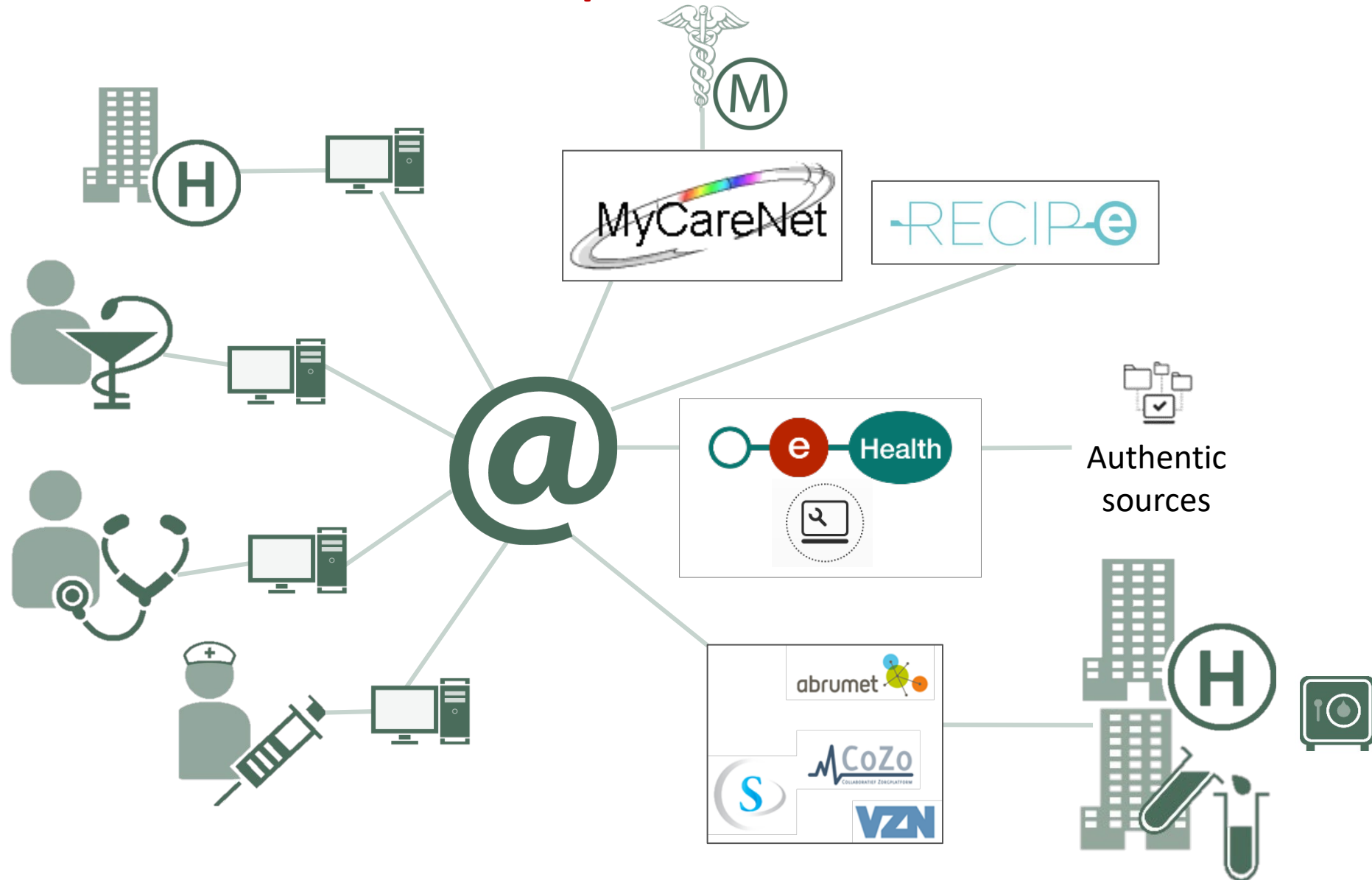


Online services



Authentic sources

eHealth-platform actors



eHealth-platform: basic services & API's



Coordination of the electronic processes & API gateway



Portal



Integrated user and access management system (IUAM)



Management of loggings



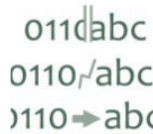
System for end-to-end encryption (ETEE)



eHealthBox



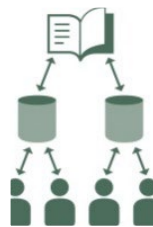
Timestamping



Coding and anonymising



Consultation of National register and CBSS registers (ConsultRN)



Reference directories (hub-metahub system)

Some results



> 88,5 %
of Belgian citizens have given
an informed consent for data sharing



+97%
of GPs make use
of eHealth services



193 millions
messages/year
via eHealthBox

Electronic prescriptions



13,4 millions/month



19.600.000.000
digital transactions



4.346.796
Belgian patients with
Summary Electronic Health Records in
health vaults



215 millions
electronic documents available
at hospitals and clinical labs

What is G-Cloud ?

A program including synergy projects



For existing as well as for new services



For public services



Managed by public services



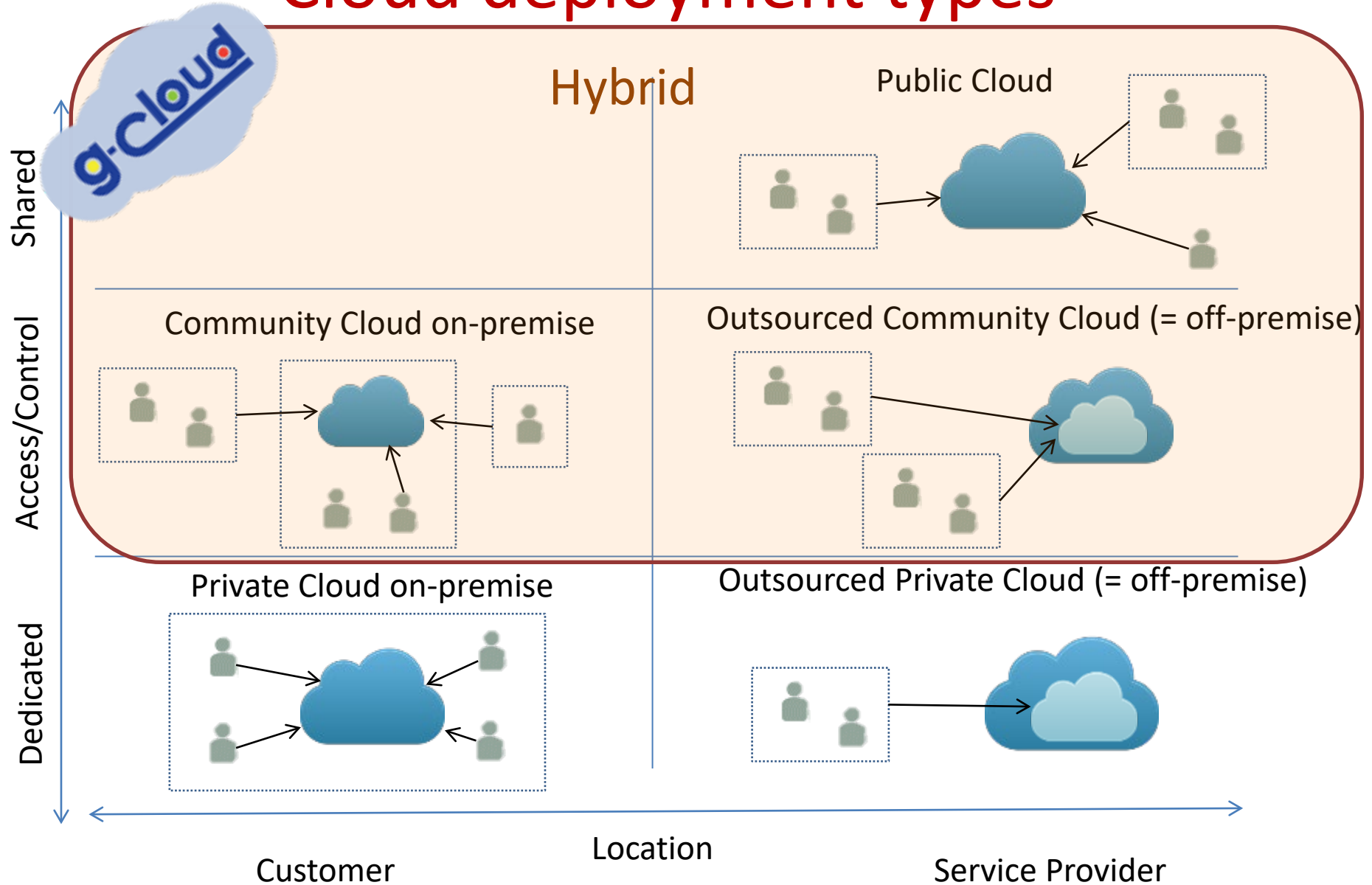
In cooperation with the **private sector**



What is G-Cloud ?

- Shared public ICT platform
 - current target: federal state (FPS, PPS, public institutions of social security, institutions of public benefit)
 - can be extended to other interested authorities
- Hybrid community cloud model
 - use of public cloud if possible
 - private community cloud hosted in data centers, managed by the government
 - operational implementation with strong involvement of the private sector

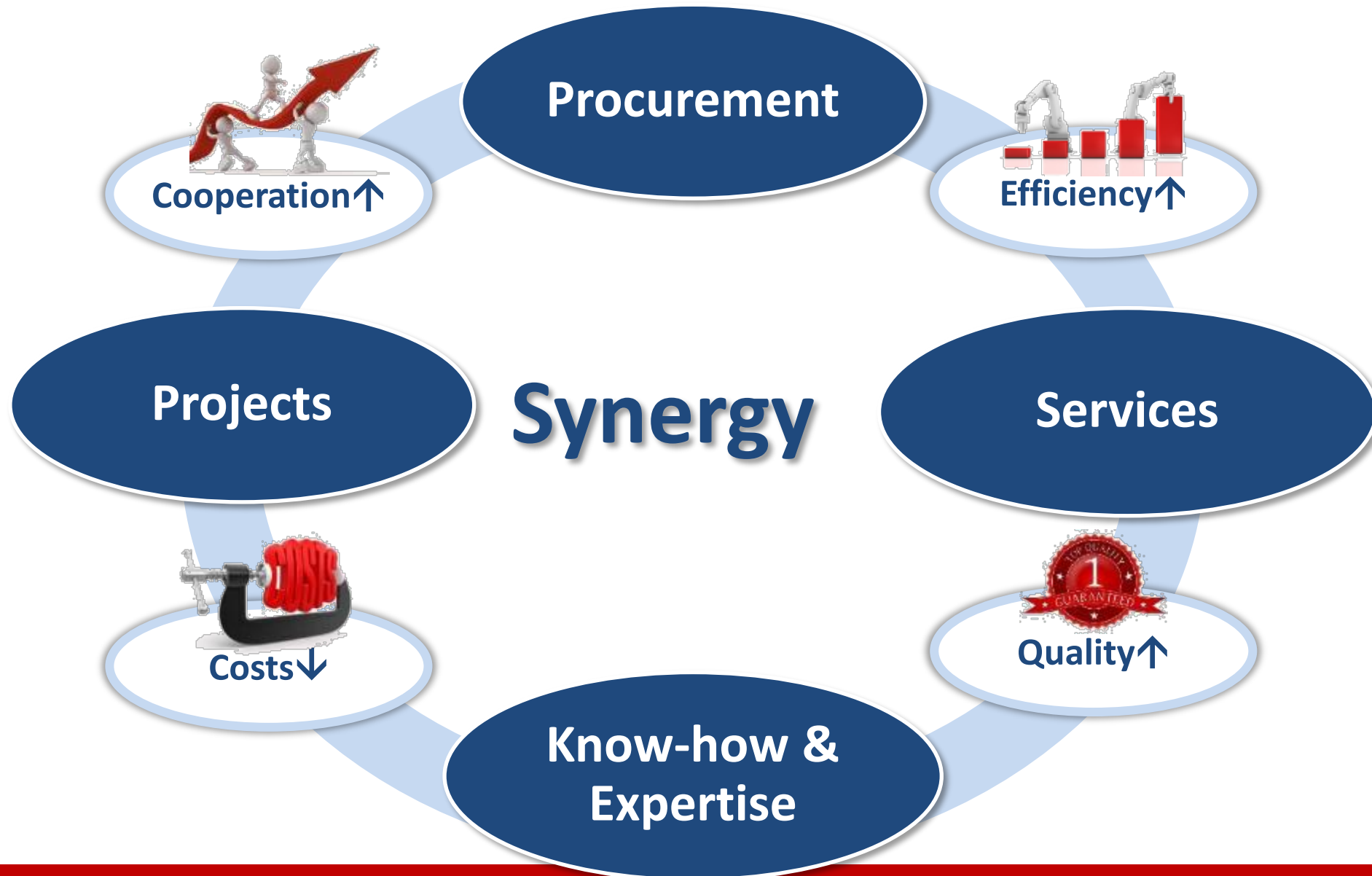
Cloud deployment types



Basic principles

- Maximum synergy when possible and when generating efficiency gains and/or savings while maintaining or improving the quality of the services provided to the customer
- In line with the synergy program: assignment to the one who is the most capable of proposing a form of shared services
- Synergy based on result orientation, sense of responsibility and trust

G-Cloud 'products'



Why G-Cloud?



Creation of **economies of scale**: efficiency and high quality/availability

Respect of **confidentiality** and **data protection**

Bigger **focus on business applications and flexibility** in order to realize them



Why G-Cloud?

Greater weight
during negotiations
with suppliers



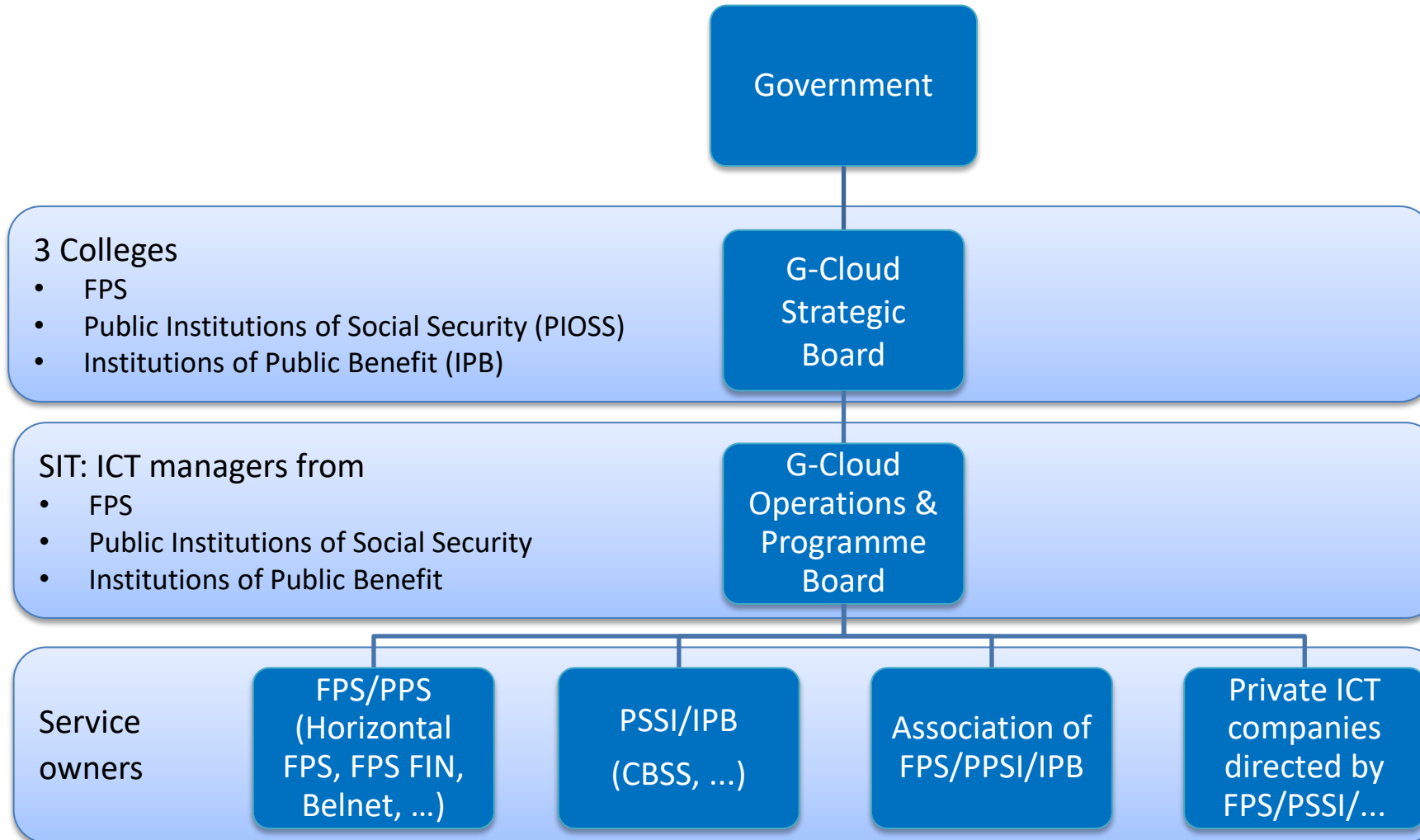
Pooling of
knowledge and
resources



Technological
evolution faster
available for
everyone



G-Cloud organization



G-Cloud organization



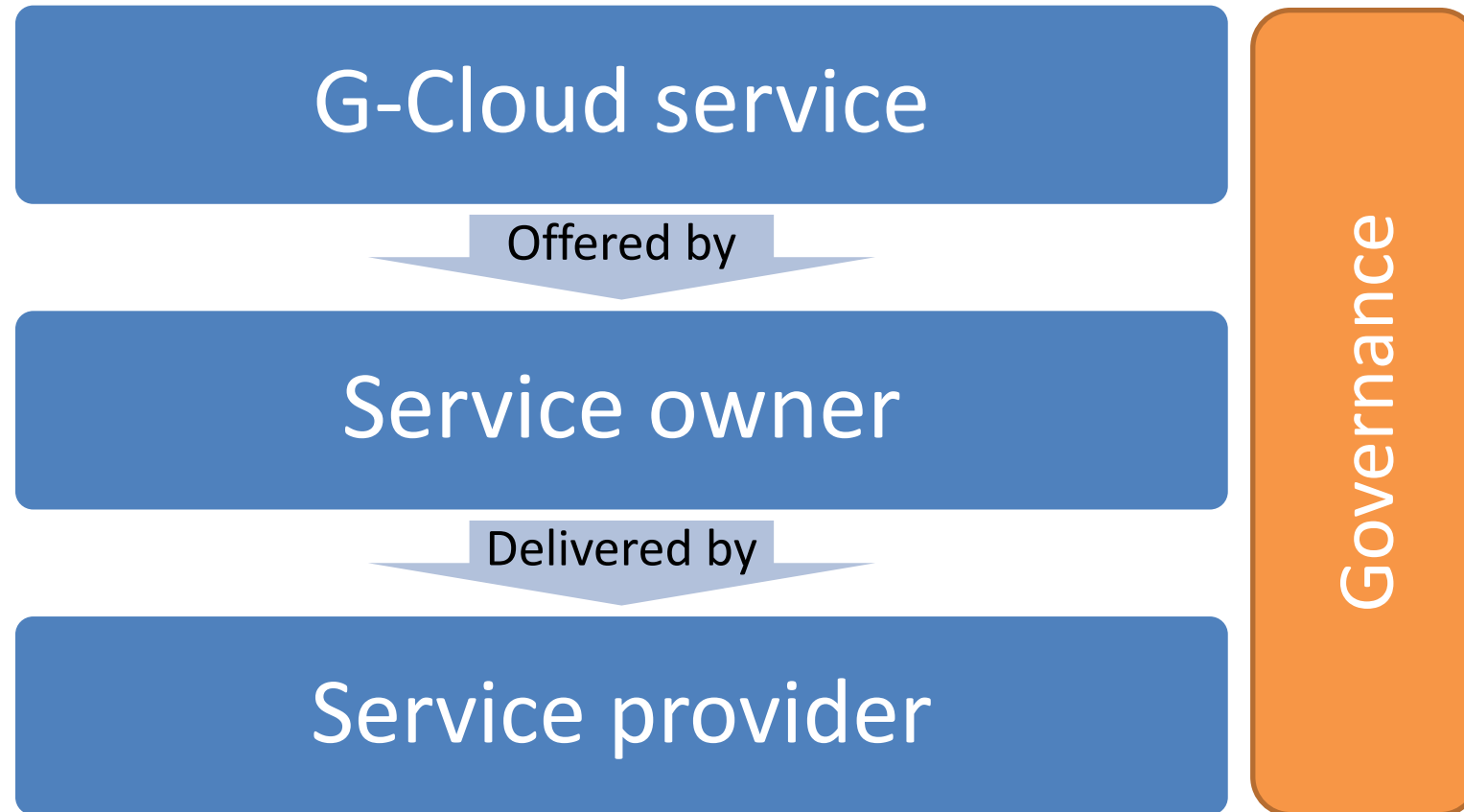
G-Cloud Strategic Board: strategic direction by senior officials



G-Cloud Operations & Program Board: CIOs for operational direction

G-Cloud service model

- G-Cloud = coalition
- G-Cloud ≠ central organization



G-Cloud portfolio (www.gcloud.belgium.be)

SOFTWARE - STANDARD COMPONENTS AND APPLICATIONS

BABELFED 	UCC SHAREPOINT BASIC O365 	REGISTER 	IT SERVICE MANAGEMENT 
BECONNECTED 	GOVSHARE SHAREPOINT PLATFORM 	CSAM AANMELDEN, BTB, SSM 	IWF INTELLIGENT WEB FORMS 
WEB CONTENT MANAGEMENT 	WEB - ANALYTICS 	WEB - COOKIES 	

PLATFORM - DEVELOPMENT AND SPECIALIZED TECHNICAL TOOLS

GREENSHIFT OPEN SOURCE PAAS 	YELLOWSHIFT MICROSOFT PAAS 	BLUE STACK DB IBM DB 	SERVICE PLATFORM 
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INFRASTRUCTURE - SERVICES ("SOFT" INFRA)

UCC VOICE/IM 	UCC EXCHANGE ON PREMISE 	SHAD SHARED DIRECTORY 	ARCHIVING 
UCC CONTACT CENTER 	UCC EXCHANGE O365 	INTERNET ACCESS PROTECTION SECURITY AS A SERVICE 	BACKUP 
UCC MOBILE DEVICE MANAGEMENT 			

INFRASTRUCTURE- FOUNDATION ("HARD" INFRA)

COMPUTE VIRTUAL MACHINE 	HOUSING 	FEDWAN 	STORAGE 
COMPUTE HYPERVISOR 		FEDMAN 	

Data classification

- Information classification model drafted within « Federal Information Security Policy » (FISP)
 - [https://dt.bosa.be/nl/federaal beleid voor informatiebeveiliging fisp](https://dt.bosa.be/nl/federaal%20beleid%20voor%20informatiebeveiliging%20fisp)

- Definition of levels



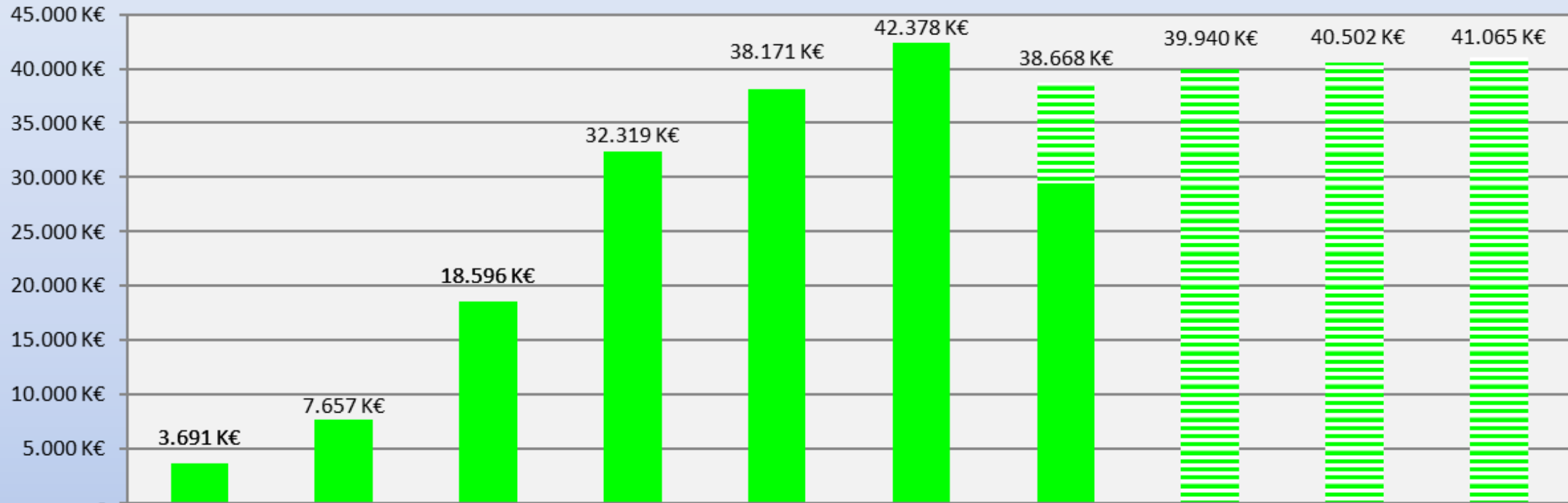
- Classification based on the impact of the loss or dissemination of information
 - impact for government (agencies)
 - impact on privacy rights
- Practical classification explained in privacy vademecum
 - [https://dt.bosa.be/sites/default/files/fisp - privacy vademecum nl.pdf](https://dt.bosa.be/sites/default/files/fisp%20-%20privacy%20vademecum%20nl.pdf)

G-Cloud and the private sector

- G-Cloud ≠ ICT insourcing
- Public procurement
translation tool, converged infrastructure, unified communications, network security, storage, back-up, ...
- In consultation with the sector for several specific platforms
IBM, Microsoft, Oracle, RedHat, SAS, ...

G-Cloud ROI

Geschatte minderkost (federaal)



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Forecast	3.691 K€	7.657 K€	18.596 K€	32.319 K€	38.171 K€	42.378 K€	38.668 K€	39.940 K€	40.502 K€	41.065 K€
Actuals	3.691 K€	7.657 K€	18.596 K€	32.319 K€	38.171 K€	42.378 K€	29.418 K€			

Business components

SOFTWARE - STANDARD COMPONENTS AND APPLICATIONS

BABELFED	UCC SHAREPOINT BASIC O365	REGISTER	IT SERVICE MANAGEMENT
RECONNECTED	SHAREPOINT COMMUNITY PLATFORM	CSAM AANMELDEN	IWI INTELLIGENT WEB FORMS
WEB CONTENT MANAGEMENT			

Shifting focus
towards synergies in the area of business
components

PLATFORM - DEVELOPMENT AND SPECIALIZED TECHNICAL TOOLS

GREENSHIFT OPEN SOURCE PAAS	YELLOWSHIFT MICROSOFT PAAS	BLUE STACK DB IBM DB	SERVICE PLATFORM
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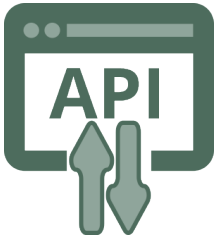
INFRASTRUCTURE - SERVICES ("SOFT" INFRA)

UCC VOICE/IM	UCC EXCHANGE ON-PREMISE	SHAD V1 FEDERATION SERVICES	ARCHIVING
UCC CONTACT CENTER	UCC EXCHANGE O365	SHAD V2 DOMAIN SERVICES	BACKUP
UCC MOBILE DEVICE MANAGEMENT	INTERNET ACCESS PROTECTION	SHAD V3 ONLINE	

Stronger centrally coordinated
approach to offering platforms

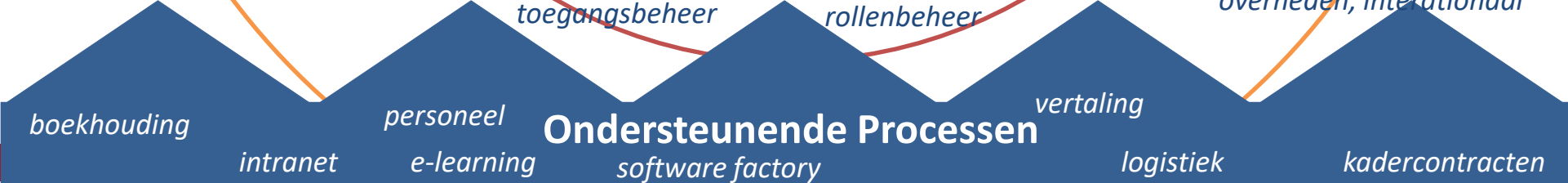
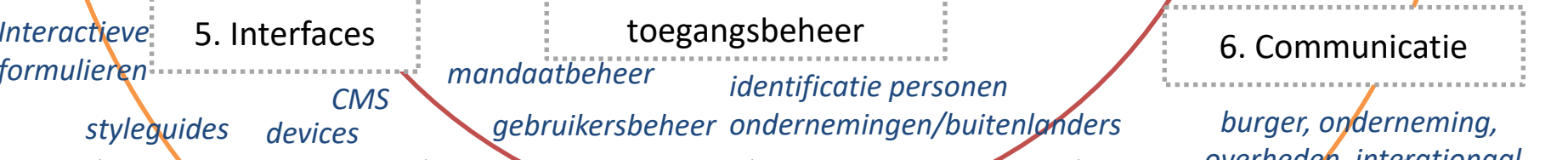
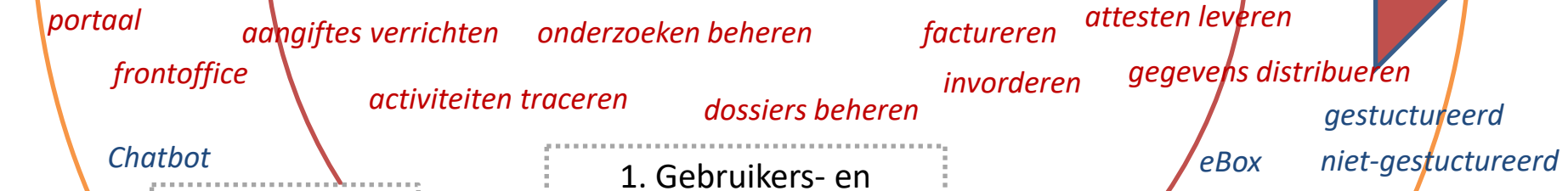
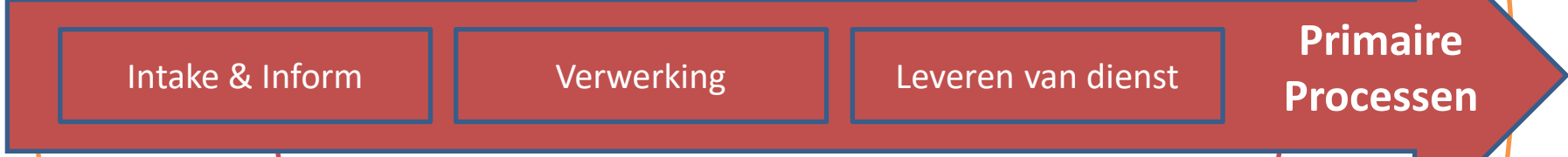
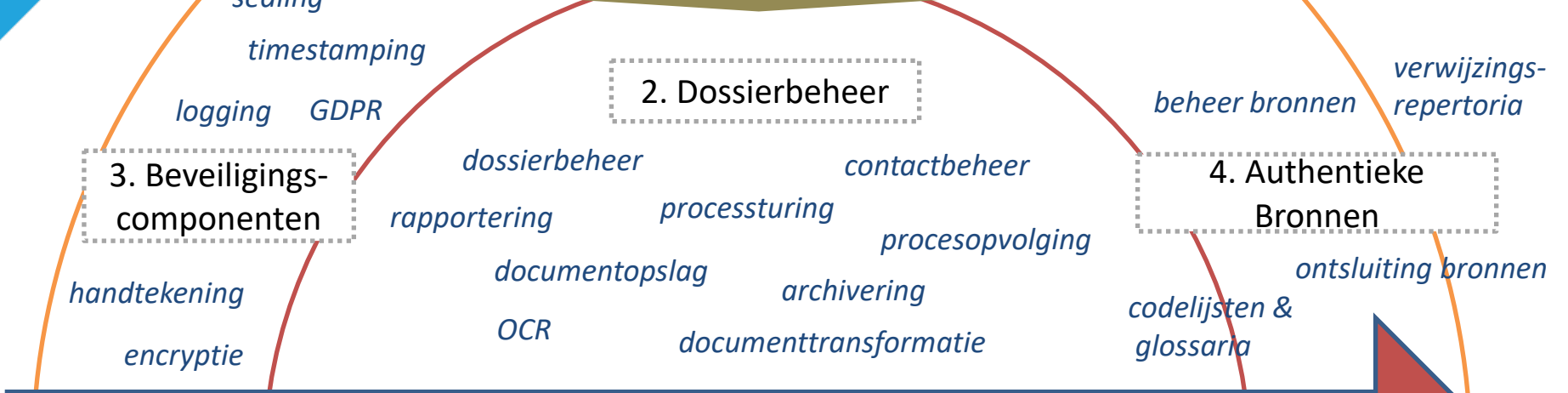
INFRASTRUCTURE- FOUNDATION ("HARD" INFRA)

COMPUTE VIRTUAL MACHINE	HOUSING	FEDWAN	STORAGE
COMPUTE HYPERVISOR		FEDMAN	



activiteitsrapporten *beheer van comités* *parlementaire vragen*

Besturingprocessen

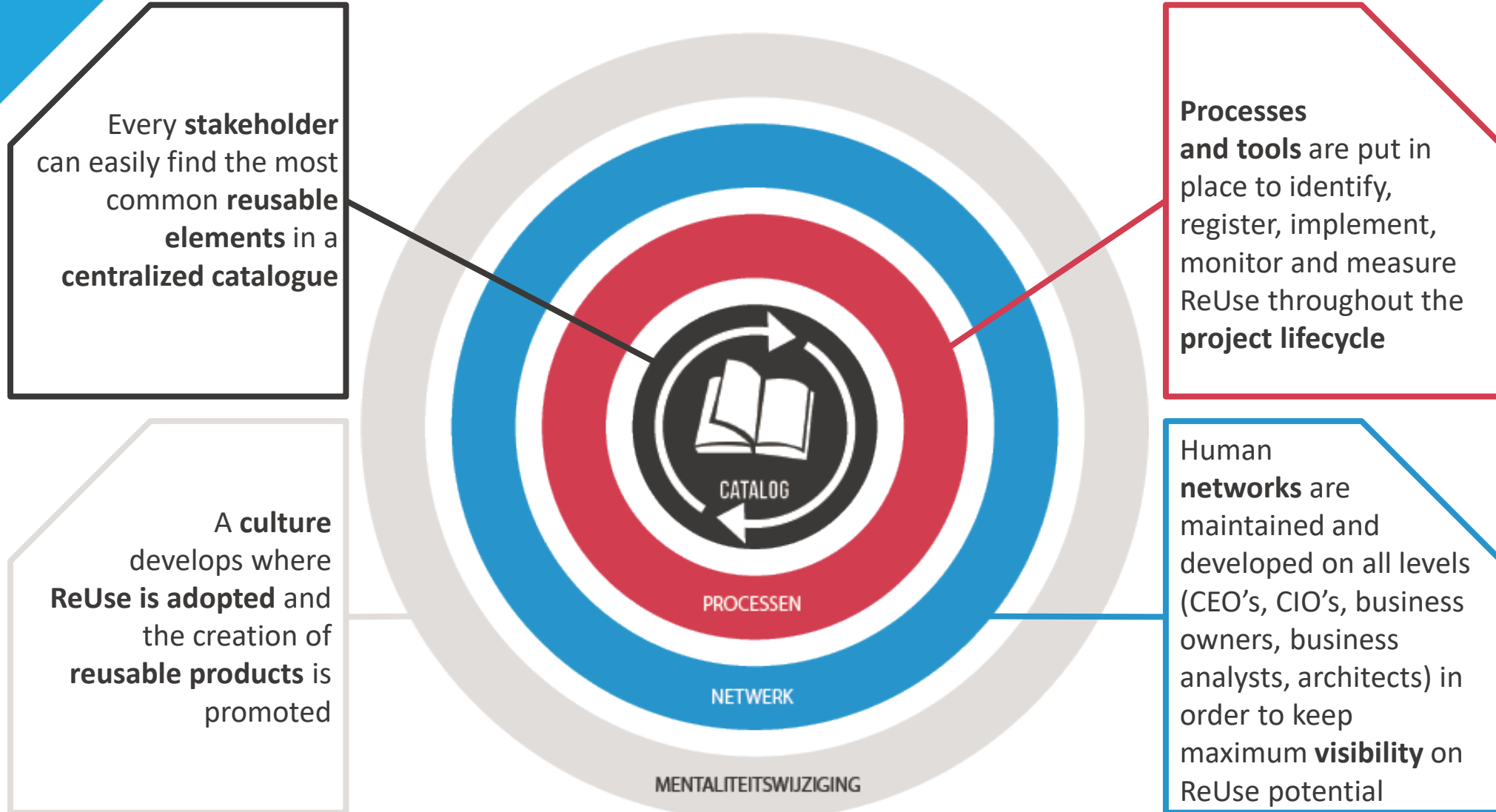


About the ReUse initiative



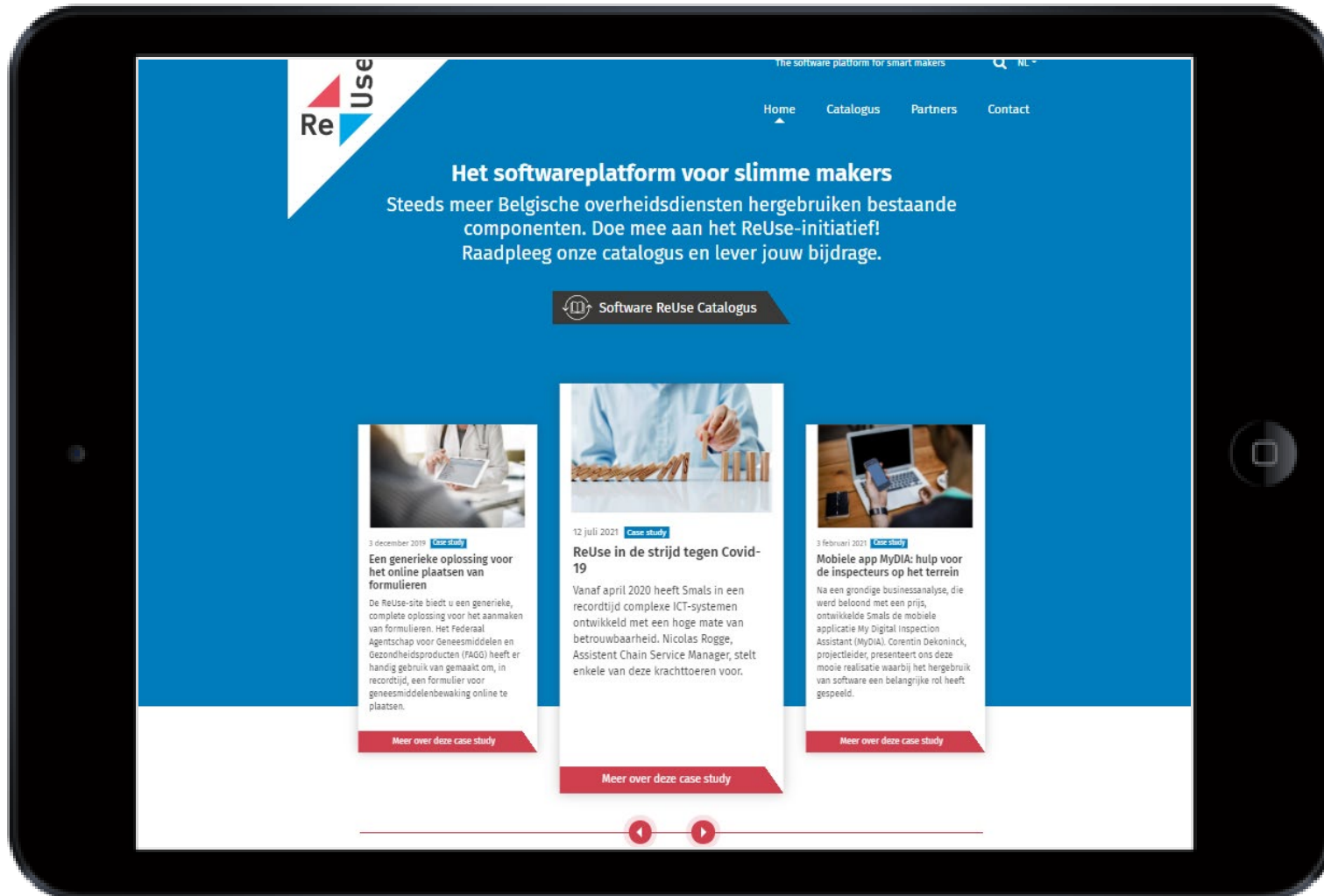
- ▶ Initiative within the public social security & health institutions & Smals
- ▶ Purpose
 - ▶ synergy around (technical) business components
 - ▶ and thus save costs by avoiding multiple development of components
- ▶ Regardless of whether development takes place by
 - ▶ the institution's own ICT department
 - ▶ SMALS
 - ▶ subcontractors
- ▶ A competence center within Smals aims to maximally integrate and support the ReUse of business components within Smals, its members, partners and domains in which Smals is active

ReUse – Vision



How? With Software ReUse Platform!

<https://www.ict-reuse.be>



Software ReUse Catalogus

Smals en haar leden streven naar hergebruik van software-onderdelen en het herbruikbaar maken van nieuwe ontwikkelingen. Deze catalogus bevat een overzicht van bestaande herbruikbare componenten.

New project? Consult the Software ReUse Catalogue

Zoek op trefwoord, of kijk in de categorieën hieronder.

 Zoeken

Authentieke bron

Componenten gerelateerd aan referentiedatabases beheerd door de eigenaar van de betreffende gegevens.

[Toon de gerelateerde componenten](#)

Communicatie

Componenten gerelateerd aan technieken voor communicatie, toegang tot informatiebronnen en opslag, manipulatie, productie en verzending van informatie.

[Toon de gerelateerde componenten](#)

Interfaces

Componenten gerelateerd aan interactie tussen gebruikers en systemen.

[Toon de gerelateerde componenten](#)

Gebruikers- en toegangsbeheer

Componenten gerelateerd aan het beheer van bevoegdheden van gebruikers voor toegang tot een informaticasysteem of toepassing.

[Toon de gerelateerde componenten](#)

Veiligheid

Componenten gerelateerd aan de bescherming van de integriteit en vertrouwelijkheid van informatie opgeslagen in een informaticasysteem.

[Toon de gerelateerde componenten](#)

Dossierbeheer

ReUse in de strijd tegen Covid-19

Vanaf april 2020 heeft Smals in een recordtijd complexe ICT-systemen ontwikkeld met een hoge mate van betrouwbaarheid. Nicolas Rogge, Assistent Chain Service Manager, stelt enkele van deze krachttoeren voor.

Publish

Your Success Stories !

De uitdaging

Smals is sterk betrokken bij de strijd tegen Covid-19. De pandemie heeft ons gedwongen om binnen een zeer kort tijdsbestek in te spelen op veranderende behoeften. Zonder de strategie voor hergebruik die we al enkele jaren voeren, zou dit niet mogelijk zijn geweest.

In de projecten die we zullen vermelden, moest aan verschillende eisen voldoen:

- **Flexibiliteit:** in een paar dagen tijd moesten we kunnen inspelen op de voortdurend veranderende businessseisen.
- **Performantie en robuustheid:** de ontwikkelde toepassingen moesten een groot aantal gelijktijdige gebruikers en de dialoog met talrijke systemen ondersteunen.
- **Betrouwbaarheid:** gezien de uitdagingen verbonden aan de gezondheids crisis, was het van essentieel belang dat de voorgestelde tools een zeer hoog kwaliteitsniveau zouden bieden.
- **Beveiliging:** de gevoelige gegevens moesten afdoende worden beschermd.

Smals heeft ontwikkeld met al deze kwaliteiten in slechts enkele weken tijd zou ondenkbaar geweest zijn zonder intensief hergebruik, gebaseerd op de grote inzet van onze medewerkers. Dankzij het hergebruik hebben wij die systemen snel en efficiënt kunnen digitaliseren.

Smals medewerker heeft Smals er nauwlettend op toegezien dat alle informatiesystemen ingezet werden in overeenstemming met de nieuwe Verordening Gegevensbescherming en met de strikte toepassing van de samenwerkingsovereenkomsten en koninklijke besluiten betreffende gegevensuitwisseling en -verwerking.

1. Scripts & Forms: een app voor de medewerkers van de callcenters

Gerelateerde componenten

Communicatie

> [eHealthBox](#)

Interfaces

> [Forms](#)

Gebruikers- en toegangsbeheer

> [IAM - Identity & Access Management - VAS](#)

> [IAM - Identity & Access Management - eHealth](#)

> [CSAM - Zich aanmelden bij de online overheid](#)

Veiligheid

> [seals Integration - Codering, anonimisering en TTP \(Trusted Third Parties\)](#)

> [dataEncryptor](#)

Share your success stories...and become an ambassador for ReUse!

<https://www.ict-reuse.be>



Hoe neem jij deel aan ons project?

Vul de catalogus aan

Heb je een herbruikbare component die voor een andere instelling van pas kan komen?

Leg hem aan ons voor!

Ontdek onze getuigenissen

Neem deel aan onze evenementen

Ideeën uitwisselen over hergebruik? Dat kan op onze evenementen. We organiseren er regelmatig!

Schrijf je zeker in!

Abonneer je op de nieuwsbrief

Schrijf je in op onze nieuwsbrief en blijf op de hoogte van de laatste ontwikkelingen in hergebruik.

Abonneer je

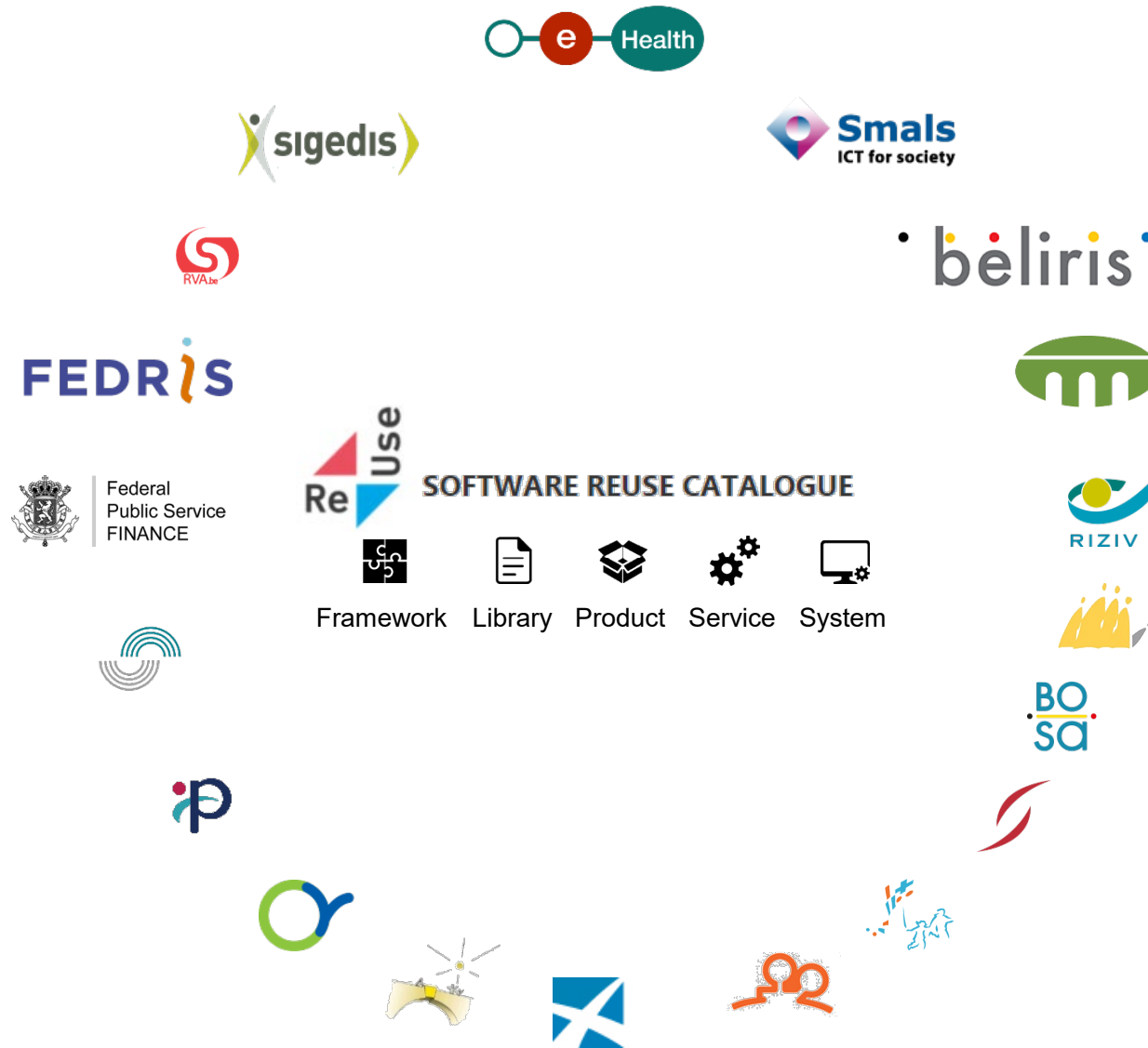
Deel je ervaringen

Is jouw project een succes geworden dankzij een hergebruikte component?

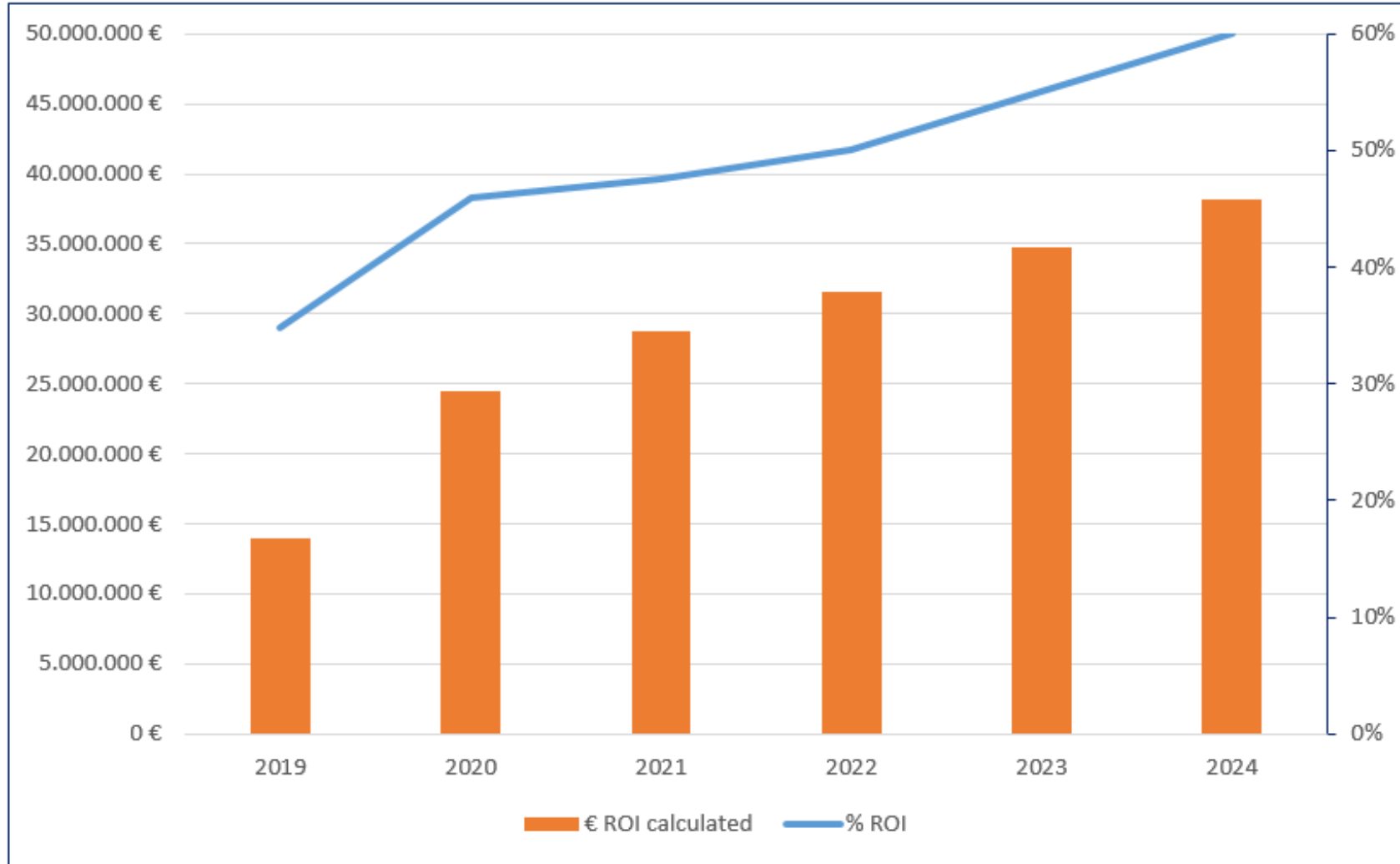
Laat het ons weten!

Ontdek onze getuigenissen

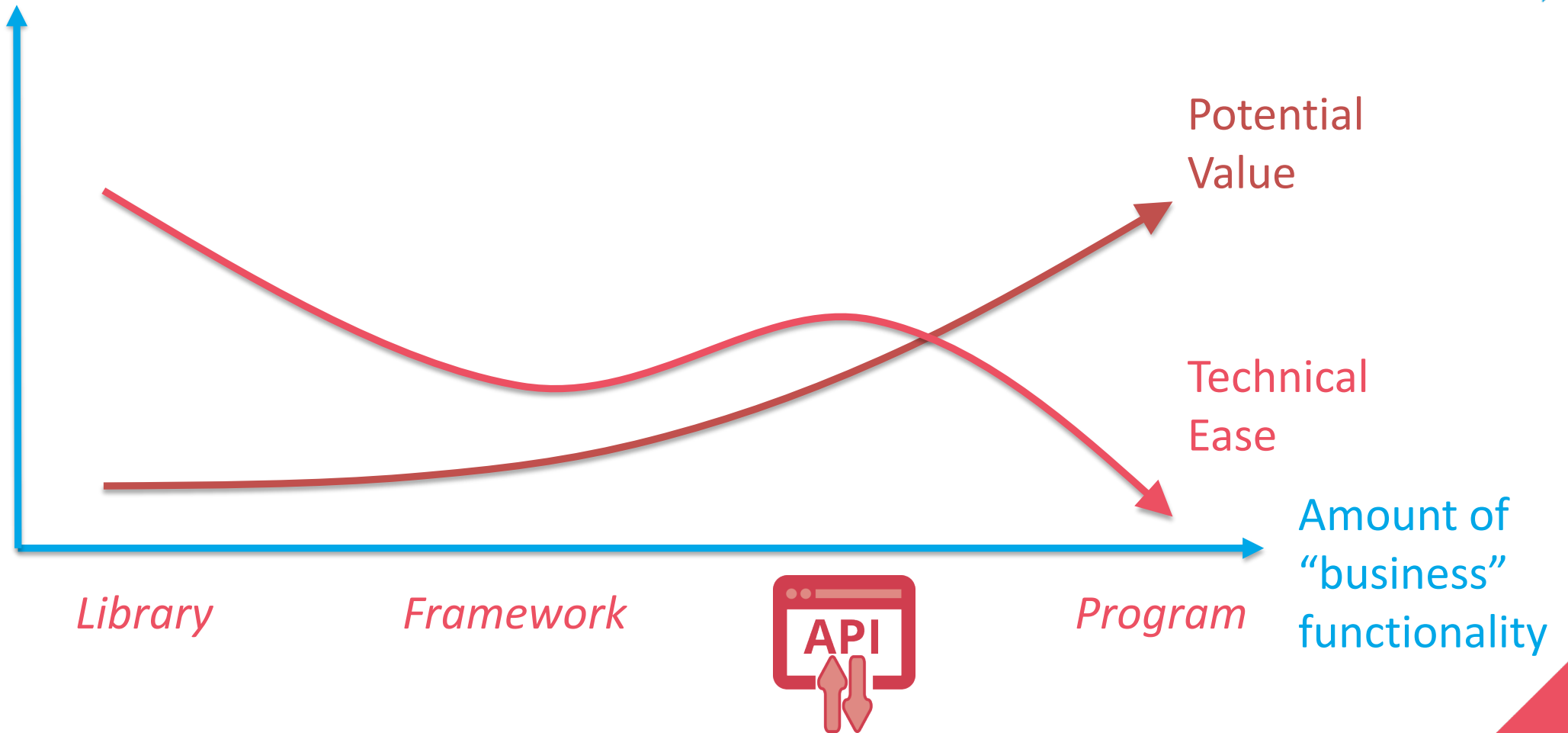
Dare to share!



Reuse ROI



Good API ReUse = business ReUse (and also ideal from a technical perspective)



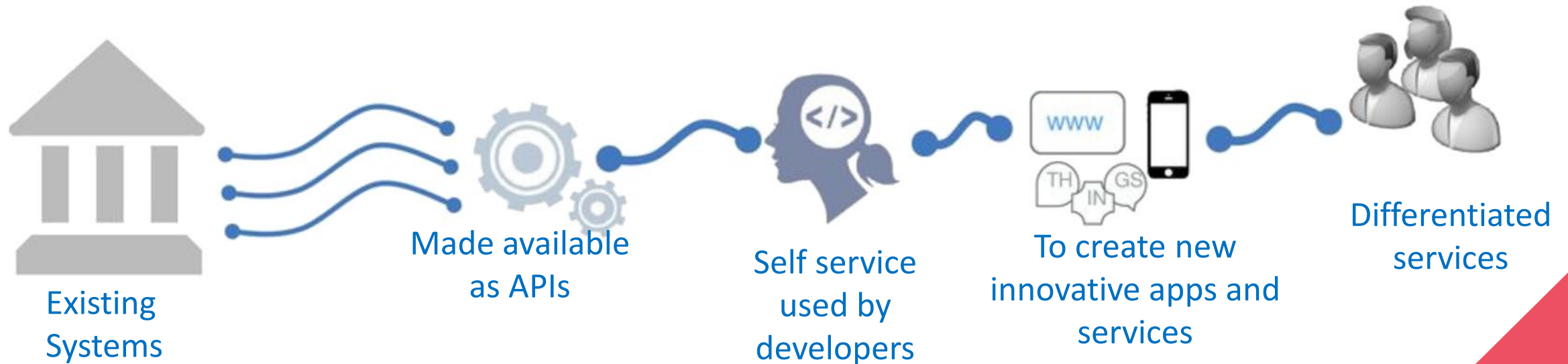
Why are API's important?



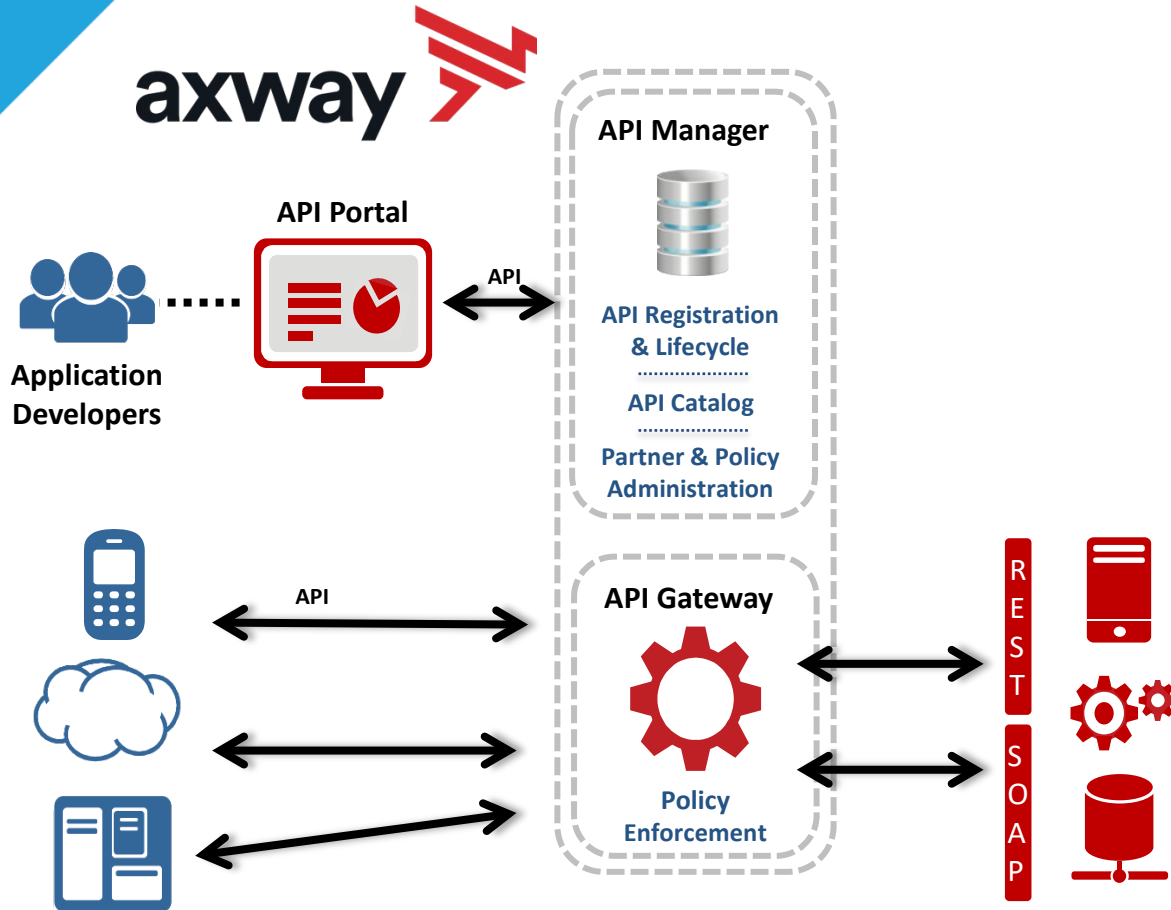
- ▶ Cost reduction by reusability: consumers don't need to rewrite what already exists!
- ▶ Complexity reduction: no more big, monolithic systems
- ▶ Decoupling: consumers and providers can continue to connect as long as the technical contract is followed → ex. less impact in case of migrations
- ▶ Driver of innovation: new products raise, based on existing API capability
- ▶ Stimulation of partnerships
- ▶ Stimulation of standardization

Shifting to an API economy: the value chain

- APIs drive today's business processes in e-Government
- APIs are key in real-time information exchange between public - private sector & citizens



API Management Solution



- From ESB-technology to API Gateway
 - parallel platform
 - zero-impact migration
- Ready for today's technology, but supports our legacy as well
- Flexible to extend and customize
- Accelerates time-to-market

Beyond tooling: API management throughout the organization's soul

API Ecosystem eHealth

- ✓ 100+ APIs
- ✓ 1.200M transactions / month

API Communication

- ✓ reUse Catalogue
- ✓ various Presentations

API Management

- ✓ API Catalogue

API Governance

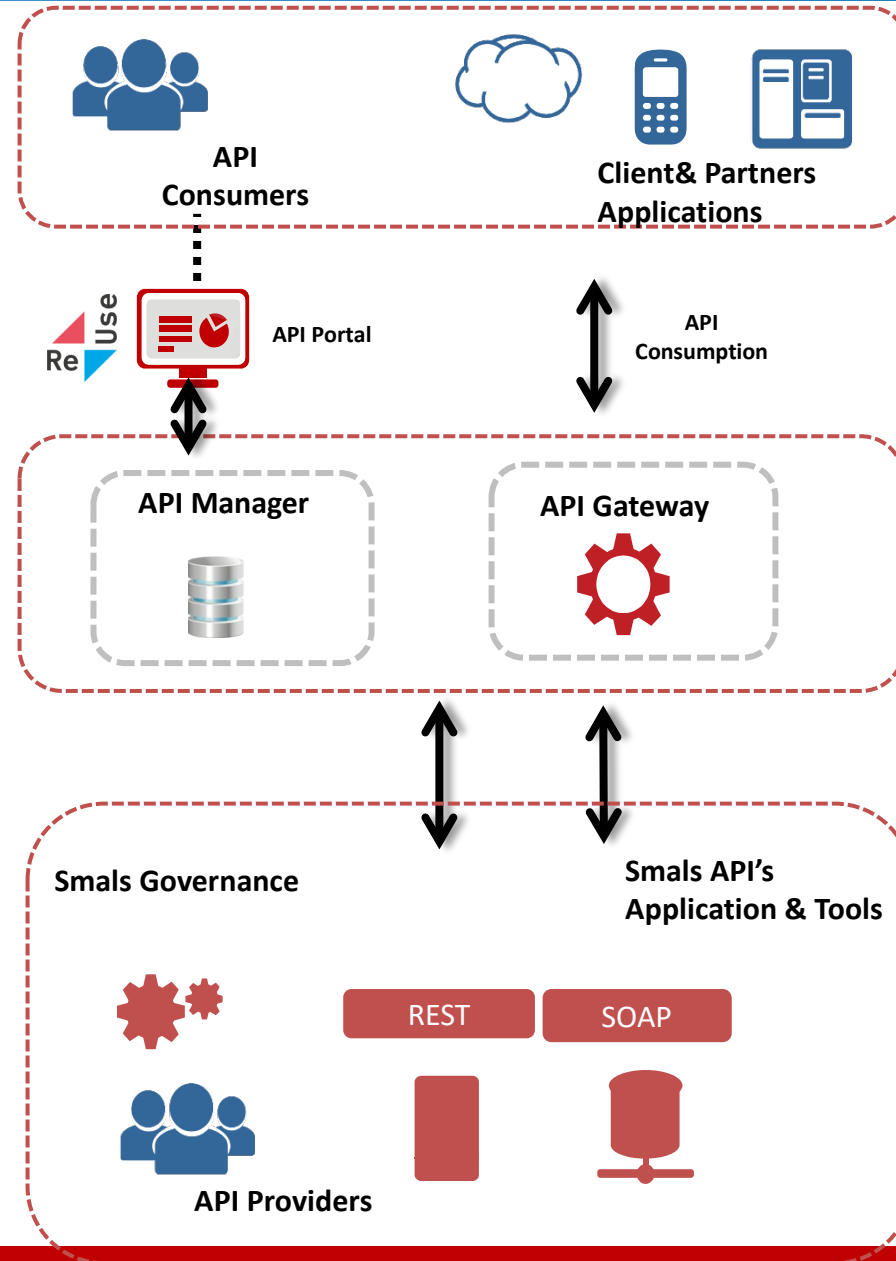
- ✓ REST Board
- ✓ Integration Competency Center (ICC)

API Reporting

- ✓ API Metrics

API Operations

- ✓ Help Center



API Ecosystem Soc Sec

- ✓ 250+ APIs
- ✓ 600M transactions / month

API Gateway

- ✓ tool API Gateway

API Architecture

- ✓ G-Cloud Platform is the reference

API Development

- ✓ development Guidelines
- ✓ API Trainings

API Challenges

- ▶ More Top Management Involvement, across Government
 - ▶ establish A **Shared Vision**, followed by a Strategy to achieve it
- ▶ Don't just ask yourself "*What services and data do I need in my project / agency*", also consider "*What can I offer the Governmental API Economy for the benefit of all (i.e., both institutions and citizens)*"?
- ▶ Use the power of the network of institutions
- ▶ Deal with interdependencies
- ▶ Focus on the essence, not on "bells and whistles"
- ▶ Deal with the (un)availability of (critical) services
- ▶ Strive for uniformity of technological solutions / use of site licenses

Fighting the COVID-19 pandemic

- Some basic concepts
- Testing
- Contact tracing & cluster detection
- Passenger locator form (PLF)
- Vaccination
- Big data analysis

Some basic concepts

- Incubation period
 - the time between the exposure to the virus and the onset of symptoms
 - COVID-19: on average 5-6 days, but can be as long as 10-14 days
 - thus, quarantine should be in place for 10-14 days from the last exposure to an infected person
- Contagiousness
 - the period during which an infected person can transmit the virus to other persons
 - COVID-19: on average 2 days before the onset of symptoms and up to 7-10 days after the onset of symptoms
 - thus, isolation should be respected for 7-10 days from the onset of symptoms

Some basic concepts

- High risk contact
 - cumulative contact with a COVID-19 patient for at least 15 minutes within a distance of <1.5 m without the correct use of a mouth mask (covering mouth and nose completely) by at least one of the persons and without complete separation by a wall of plexiglass
 - direct physical contact with a COVID-19 patient
 - direct contact with excretions or bodily fluids of a COVID-19 patient
 - travel with a COVID-19 patient for more than 15 minutes, in any mode of transport, sitting within two seats (in either direction) of the patient, even if everyone involved was correctly wearing a mask

Some basic concepts

- Low risk contact
 - cumulative contact with a confirmed COVID-19 case for at least 15 minutes within a distance of <1.5 m, but where both have adequately used a mouth mask (covering mouth and nose completely) or with complete separation by a wall of plexiglass
 - cumulative contact for less than 15 minutes contact with a COVID-19 patient within a distance of <1.5 m, without the correct use of a mouth mask (covering mouth and nose completely) by at least one of the persons and without complete separation by a wall of plexiglass
 - being in the same room/closed environment with a COVID-19 patient for more than 15 minutes, but respecting a distance of > 1.5 m (eg people working in the same room or sitting together in a waiting room)

Testing

- Ever changing testing strategy in function of
 - evolving scientific insights
 - available types of tests
 - capacity
 - sampling material
 - test material
 - personnel
- Many actors involved
 - GPs, collectivity doctors, company doctors
 - sample collection points
 - hospitals
 - labs
 - ...

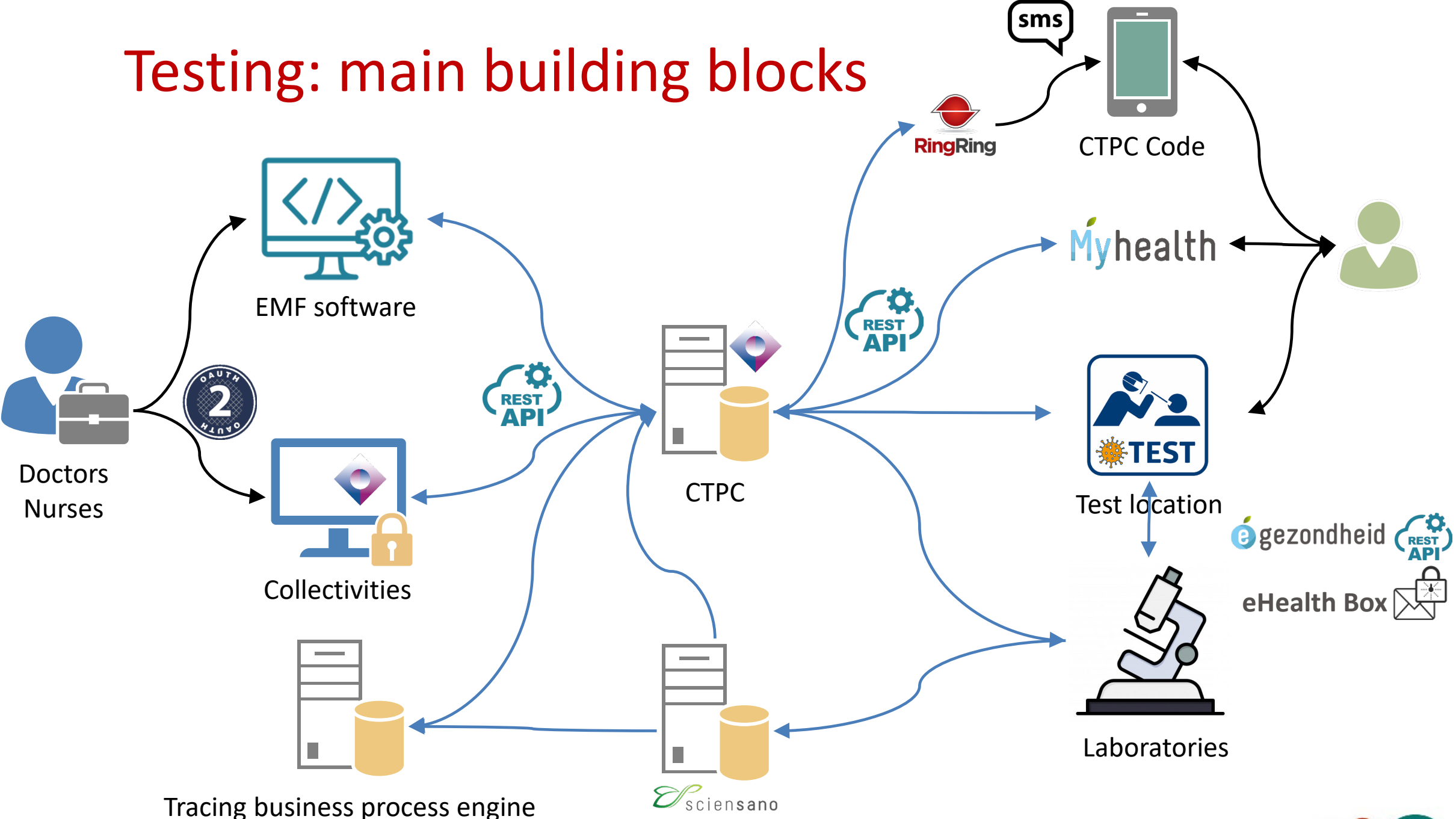
Testing: types of tests

	MOLECULAR TEST	ANTIGEN TEST	ANTIBODY TEST
Also known as...	Diagnostic test, viral test, molecular test, nucleic acid amplification tests (NAAT), RT-PCR tests	Rapid diagnostic test*	Serological test, serology, blood test, serology test
How the sample is taken...	Nasal or throat swab (most tests) Saliva (a few tests)	Nasal or throat swab	Finger stick or blood draw
How long it takes to get results...	Same day (some locations) or up to a week	One hour or less	Same day (many locations) or 1-3 days
Is another test needed...	This test is typically highly accurate and usually does not need to be repeated.	Positive results are usually highly accurate but negative results may need to be confirmed with a molecular test.	Sometimes a second antibody test is needed for accurate results.
What it shows...	Diagnoses active coronavirus infection	Diagnoses active coronavirus infection	Shows if you've been infected by coronavirus in the past
What it can't do...	Show if you ever had COVID-19 or were infected with the coronavirus in the past	Definitively rule out active coronavirus infection. Antigen tests are more likely to miss an active coronavirus infection compared to molecular tests. Your health care provider may order a molecular test if your antigen test shows a negative result but you have symptoms of COVID-19.	Diagnose active coronavirus infection at the time of the test or show that you do not have COVID-19

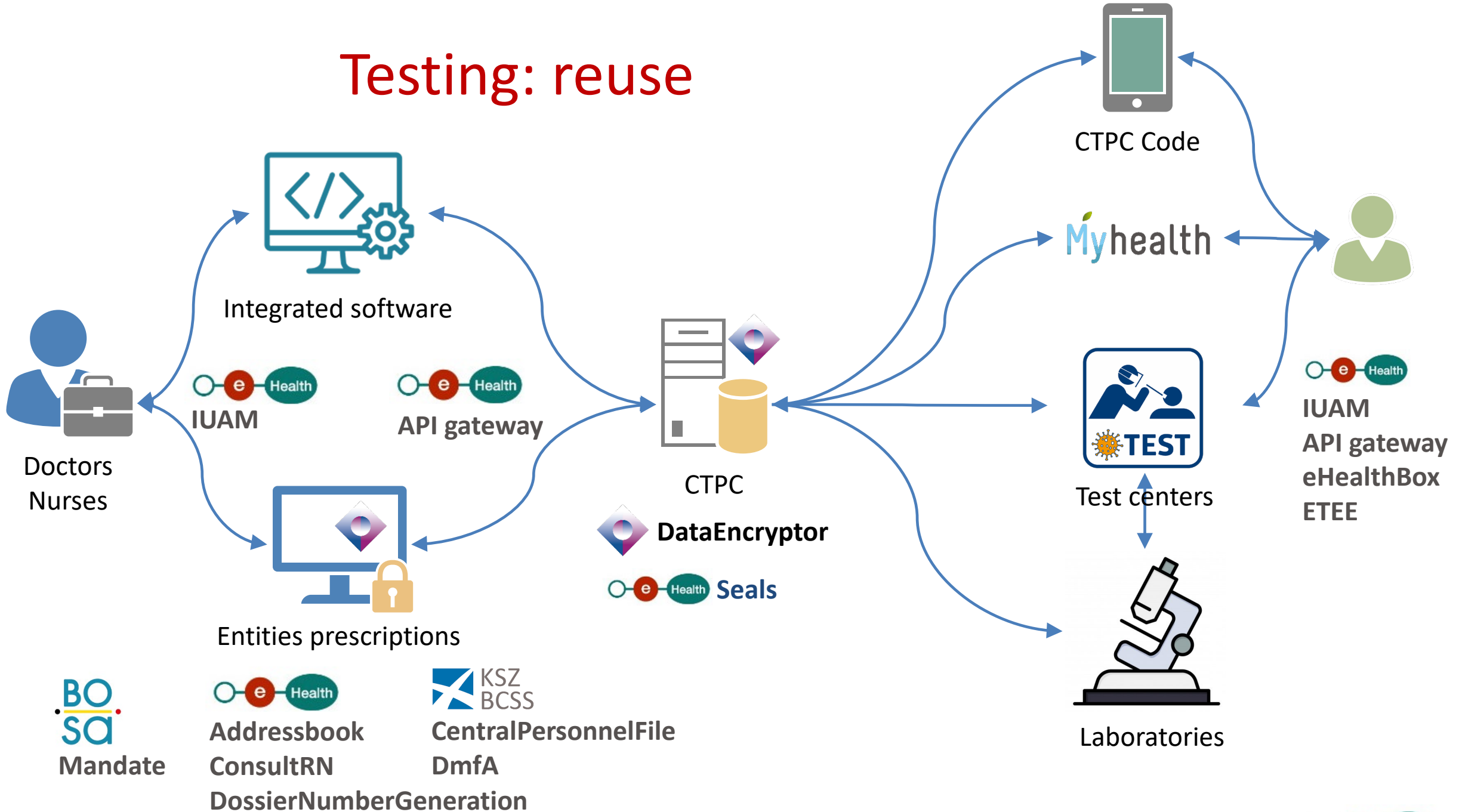
Testing: happy flow

- 5 phases
 - determination of a cause for performing a COVID-19 test on a patient and delivery of a corona test prescription code (CTPC) from a central database CTPC
 - reservation of a sampling moment
 - sampling
 - execution of the test and analysis of the test result
 - making the test results available
- Very modular, event driven and rule based information system

Testing: main building blocks



Testing: reuse



**BO
SA**
Mandate

e Health
Addressbook
ConsultRN
DossierNumberGeneration

**KSZ
BCSS**
CentralPersonnelFile
DmfA

Testing: some numbers

- Since 06/2021
 - 15,4 M Corona Test Prescription Codes requested
 - 12,5 M requested by tracing or health professionals
 - 2,9 M requested by citizens
 - 950 k after a self assessment tool
 - 130 k after a positive auto test
 - 1.250 k vacation free tests
 - 630 k paid tests
- API Calls : ~600k per day on working days

eForm COVID-19 lab request (1/2)

Ja Nee

3 Klinische gegevens

Type contact met de zorgverlener

Contact type

De datum en het tijdstip waarop het contact heeft plaatsgevonden - verplicht

25-08-2020 08:50

Vertoont de patiënt symptomen - verplicht

Ja Nee

Reden van aanvraag analyse - verplicht

Screening ziekenhuisopname (non-COVID) en dagziekenhuis

Is de patiënt opgenomen in het ziekenhuis - verplicht

Ja Nee

Aantal afnames per ziekteperiode - verplicht

1e afname 2e afname >2e afname

4 Gegevens over het staal

Werd er een staal afgenomen? - verplicht

Ja Nee

Waarom werd er geen staal afgenomen? - verplicht

Doorverwezen naar laboratorium

Naam laboratorium - verplicht

Zoek een labo

eForm COVID-19 lab request (2/2)

4 Coronalert mobiele app

Deze sectie is reeds toegevoegd in het kader van de app CoronAlert. Deze app zal beschikbaar zijn in september en deze velden moeten dus nog niet ingevuld worden.

Heeft de patiënt de Coronalert-app geïnstalleerd op zijn/haar smartphone? - verplicht

Ja Nee

Identificatiecode (17 cijfers) gegenereerd in de Coronalert-app op de telefoon van de patient en door de patiënt aan de arts doorgegeven. Koppelt een test aan een telefoon - verplicht

Bevat de datum waarop de patiënt besmettelijk werd en wordt weergegeven in de Coronalert-app van de patient. - verplicht

01-01-1970




Patiënt heeft een waarschuwing voor hoog risico ontvangen in de Coronalert-app. - verplicht

Ja Nee

Altijd op "**versturen**" drukken voor de melding bij vermoeden van COVID-19, anders kan er géén contact opvolging opgestart worden indien nodig. Er is een pdf van het formulier beschikbaar in uw elektronisch medisch dossier dat afgeprint kan worden.

Entities prescriptions

Zoeken Dashboard Voorschriftaanvra(a)g(en) Aangemeld voor: Crèche de la Dodaine Veranderen

 **CORONA**
TEST PRESCRIPTION & CONSULTATION

Voorschriftaanvra(a)g(en)

Rijksregisternummer/TER-nummer/COVID-ID *
|xx.xx.xx-xxx.xx

De patiënt beschikt niet over een rijksregisternummer (creatie van een TER-nummer/COVID-ID)


Naam * Voornaam *

Telefoonnummer * Telefoonnummer 2

De patiënt is een gezondheidsmedewerker of een ouderenzorgmedewerker

Reden waarom de test voorgeschreven wordt *

Informatie van het laatste ingediend contact met een hoog risico hergebruiken

Datum van het laatste besmettelijke contact * 

Valt de patiënt onder een uitzondering?

Nee

De patiënt is een kind van minder dan 12 jaar in een crèche, kleuter/lagere school of een gelijkaardige situatie (buitenschoolse activiteit) en kan de quarantaine beëindigen na een eerste negatieve test.

Arts(en) die de resultaten ontvang(t)(en) :

Soort test *
PCR

De afname onmiddellijk uitvoeren

Testing: reservation of a sampling location and moment

Doctr Covid test nl Powered by doctr Help

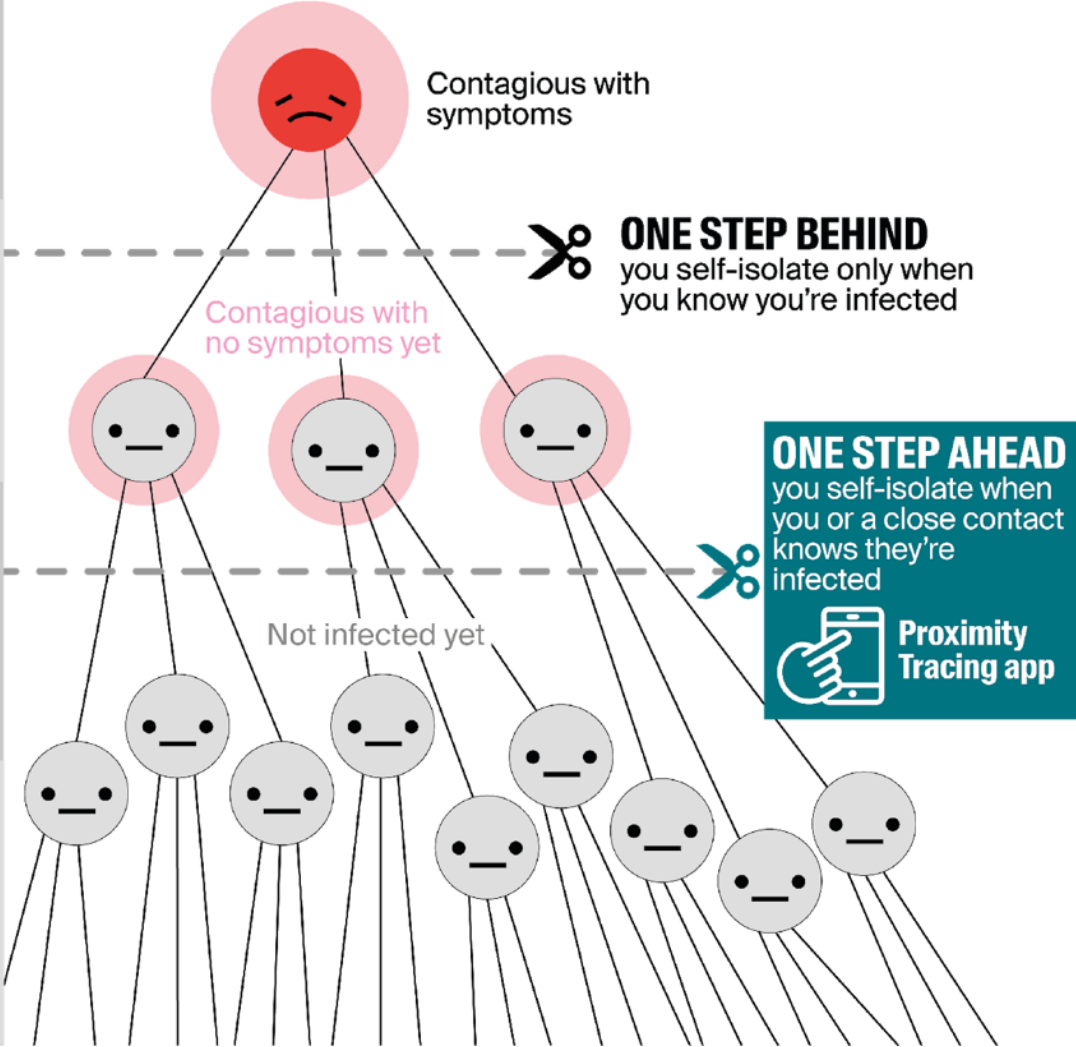
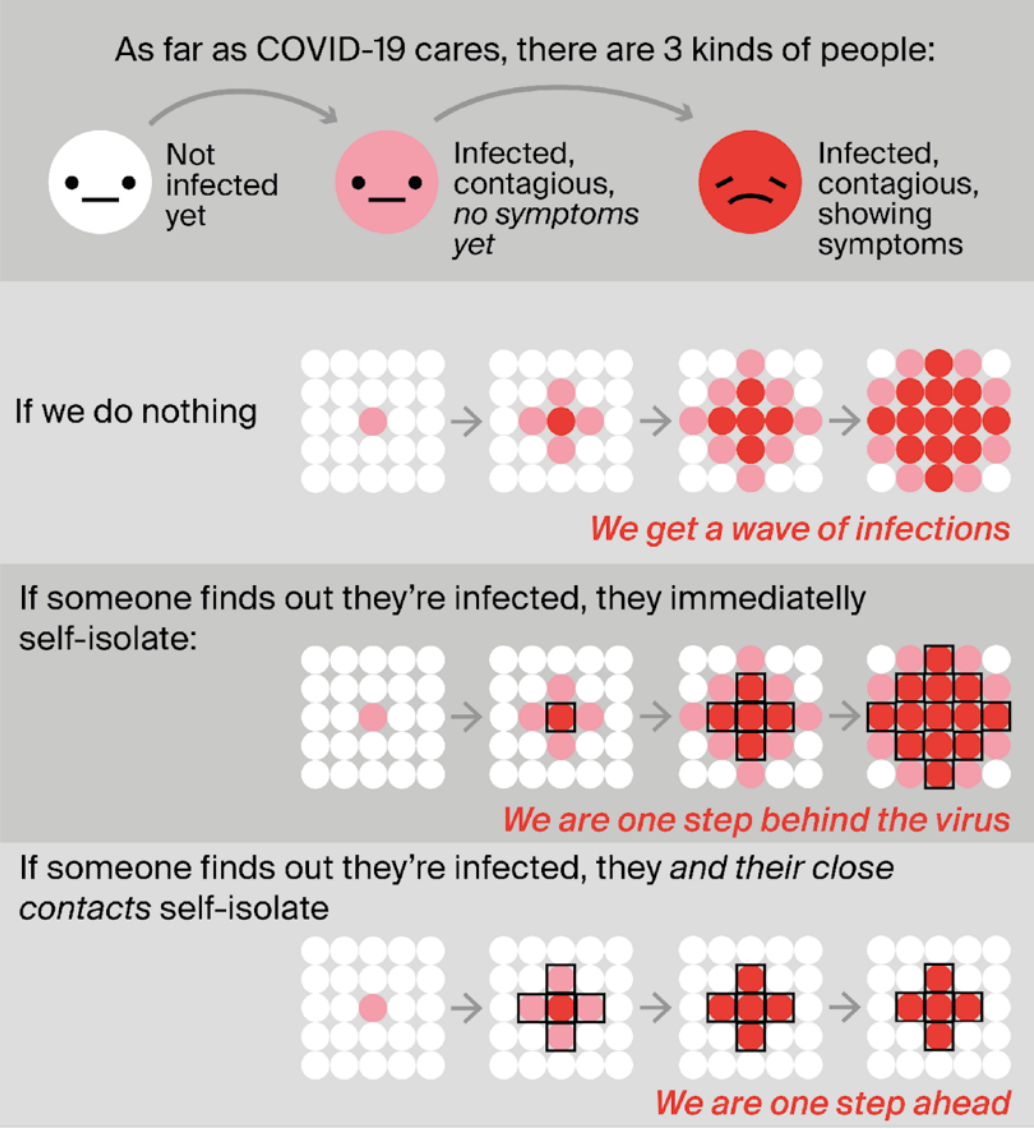
Kies een staalafnamepost

- Triageposten huisartsen Oost-Brabant
- Triagepost OHL 2
- STUDENTS Leuven - Van Dalecollege
- CHIREC - DELTA

Staalafnamecentra
Andere plaatsen met staalafname (bv. labo, ziekenhuis,...)

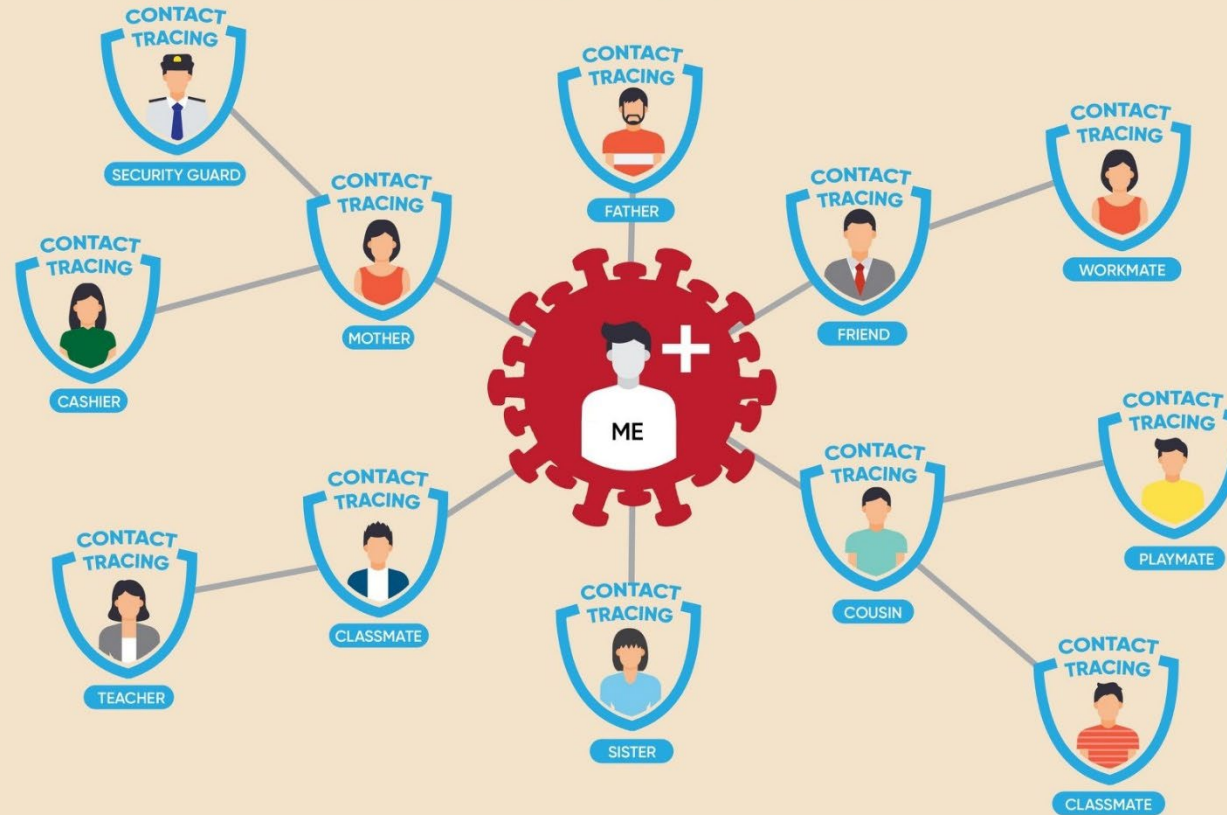
Map showing the Leuven region with sampling locations marked. The map includes labels for various towns and roads.

Contact tracing: why ?



Contact tracing: what ?

Contact tracing means identifying everyone who has come in close with someone who has COVID-19.



It is an effective way to stop the spread of the virus by immediately checking if these close contacts are infected and managing these cases to prevent onward transmission of **#coronavirus**.

How contact tracing is put in place ?

- Contact tracing by health care providers
- Contact tracing by contact centers
 - see <https://www.corona-tracking.info/>
- Contact tracing within companies and collectivities
 - see <https://co-prev.be/nl/covid-19-informatie/> or <https://co-prev.be/fr/covid-19-information/>
- Contact tracing via app Coronalert
 - see <https://coronalert.be/>

Tracing: enterprise architectural view

Tracing is a very reactive customer relationship management process in a campaign management context

A simple yet powerful CRM process

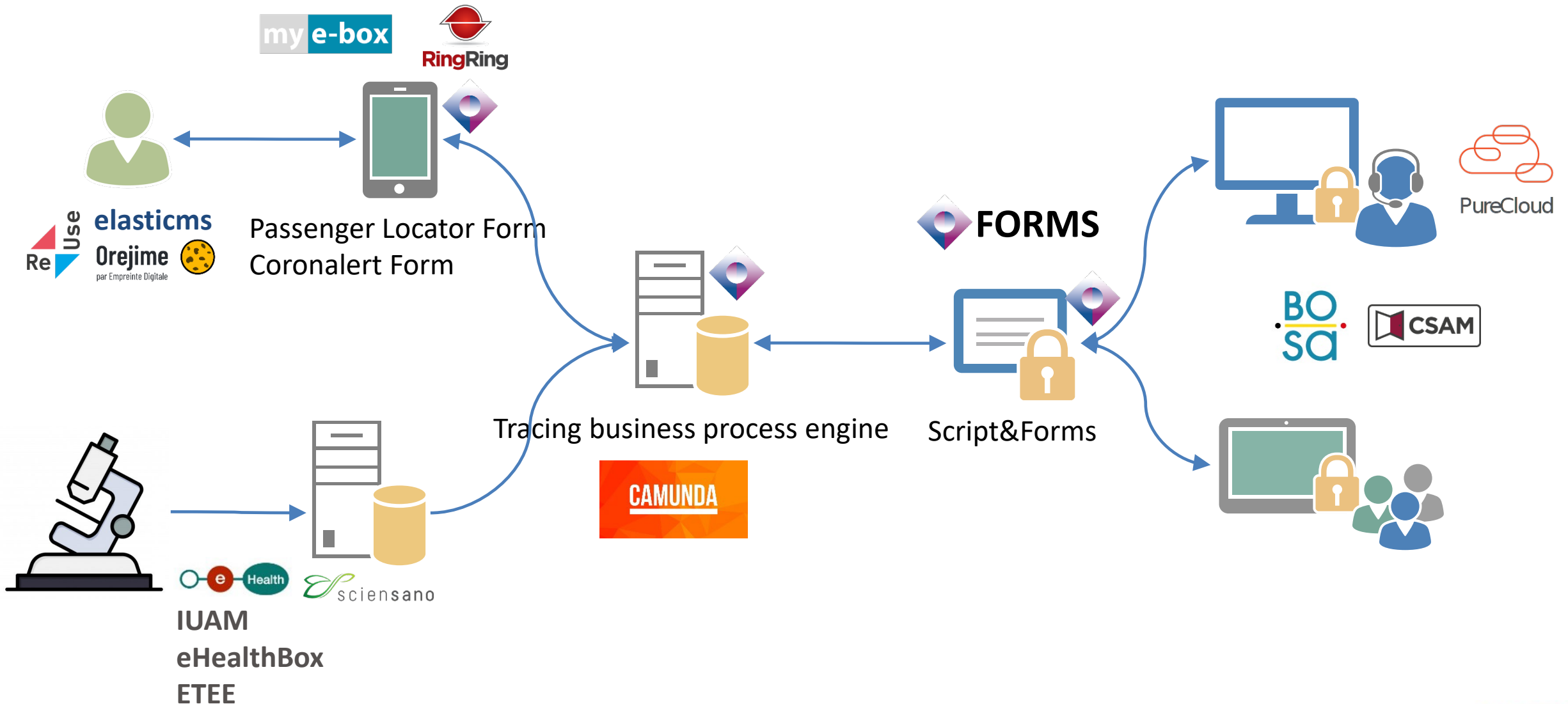
1. I want to reach a specific target group
2. Filter the target group in the CRM
3. Select the communication channels depending on profession, age, place of living, ...
4. The platform simulates the effect of the choices on reachability, call center capacity, ...
5. The platform optimizes the different channels



CRM for contact tracing

- ✓ 1. I want to reach infected persons (index persons)
- ✓ 2. I receive a list of index persons from Sciansano
- ✓ 3. I communicate via SMS, email, telephone and field agents depending on the country of origin
- ✗ 4. The platform uses historic data to simulate the effect on reachability, call center capacity, ...
- 5. Regions optimize the communication channels to prevent call center meltdown

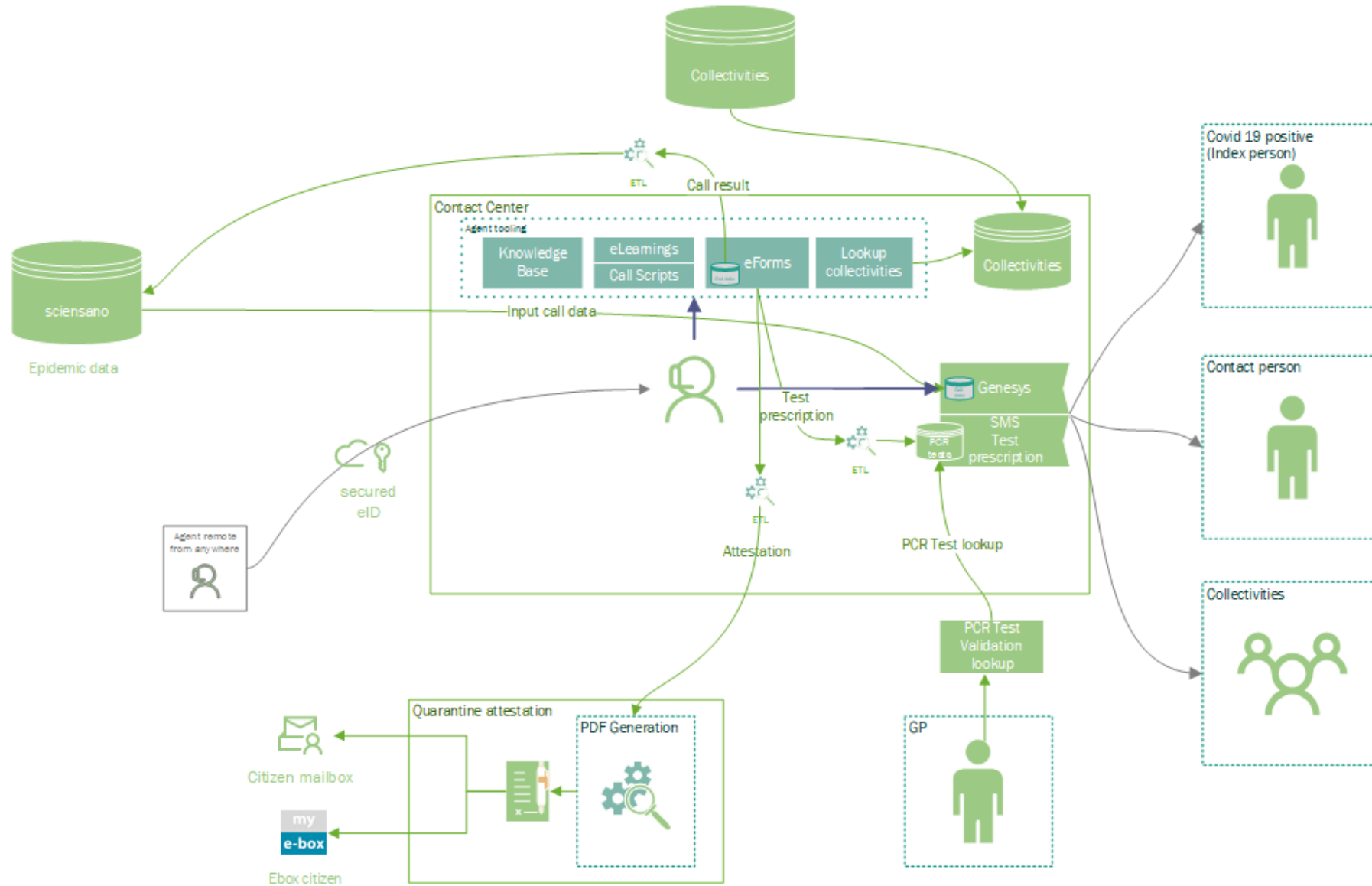
Tracing: main building blocks and reuse



Tracing: service mode

- Quick modification of decision tables to reflect business changes
- Self documenting and high transparency of the operational BPMN processes
- Business decision points in the process are clearly identified and unique
- Same scripts serve for tracing as well as websites (citizen form)
- Challenges for the (near) future
 - support of the more fine grained tracing approaches (e.g. demographic zones in large cities).
 - feedback loop to enable simulation of campaign management decisions.

Contact tracing by contact centers



Contact tracing within companies and collectivities

- Call by contact center
- Identification of infected person (index case)
- Risk analysis
- Identification and triage of contacts (high risk – low risk)
- Contacting contacts
- Measures for contacts
 - high risk: quarantine – telework/unemployment – vigilance for symptoms
 - low risk: social distancing – vigilance for symptoms
- Resumption of work

App Coronalert

The image shows a screenshot of the Coronalert website and its mobile application interface. The website has a green background with a navigation bar at the top containing social media icons and language options (EN, FR, NL, DE). The main content area features a smartphone displaying the app's interface, which includes a status bar, a toggle for 'Exposure Logging Active', a 'Statistics' section for the period Sep 05 - Sep 11, and a 'Low Risk' section. The statistics are as follows:

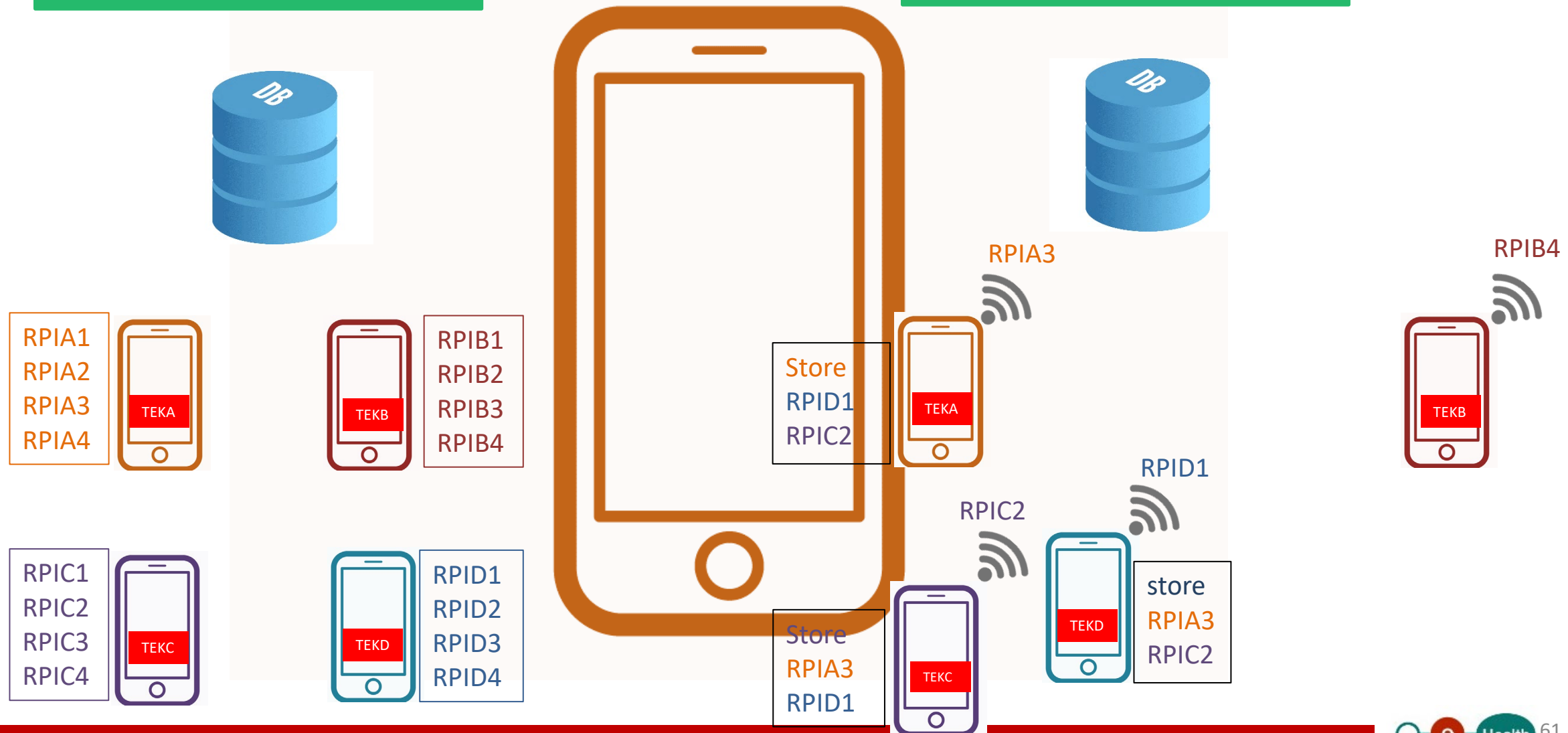
Category	Value	Change
Daily infections	746	+51%
Hospitalisations	23	+50%
Deaths	2	-9%

The 'Low Risk' section indicates 'No exposure up to now' and 'Exposure logging permanently active'. Below the app interface, the website text reads: 'Protect each other. Coronalert is a free application. Download the application. You remain anonymous.' There are buttons for 'Download on the App Store' and 'GET IT ON Google Play'. An illustration of a man and a woman with signal waves around them is also present.

App Coronalert

installation

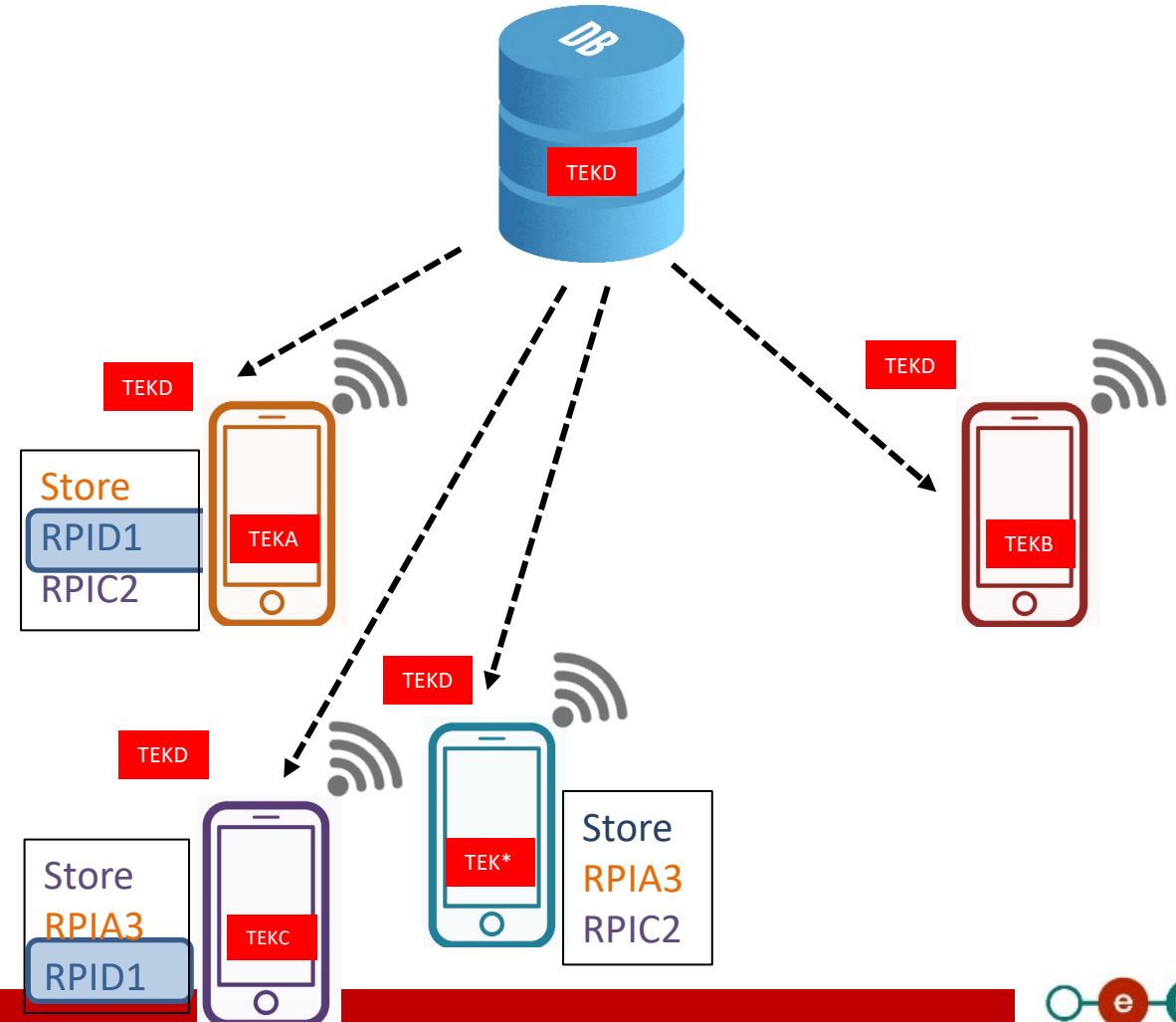
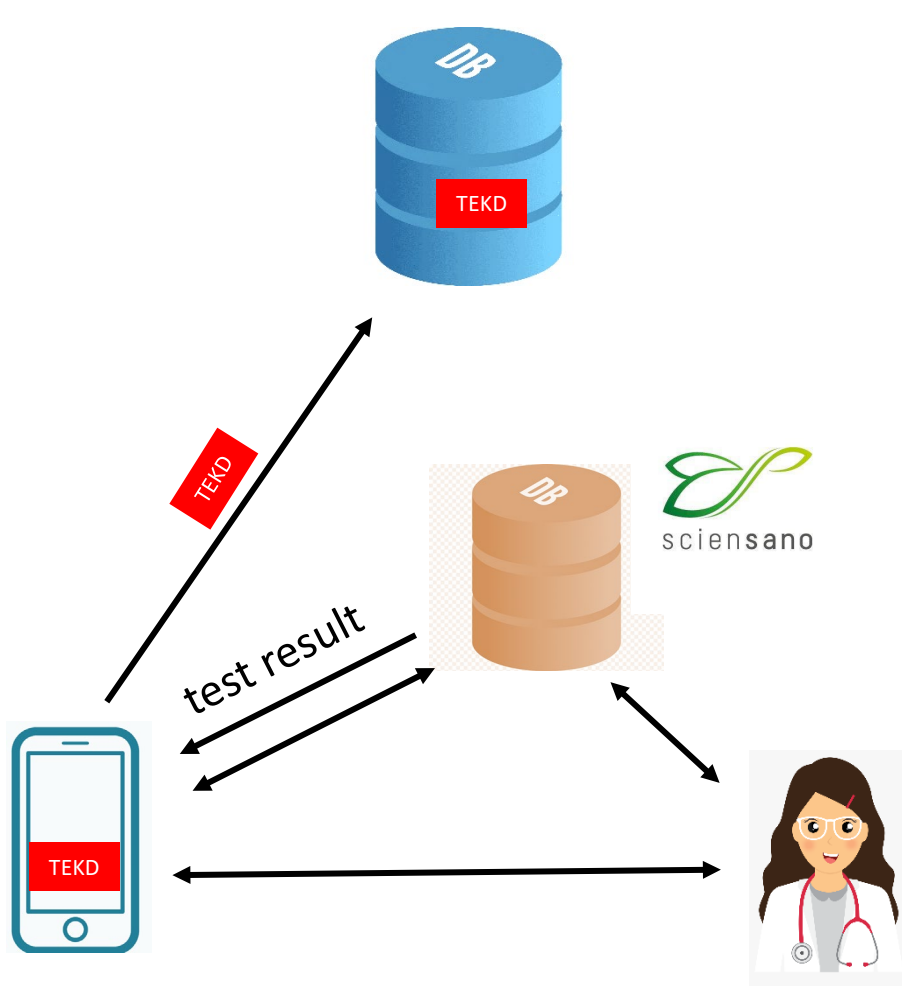
operation



App Coronalert

test

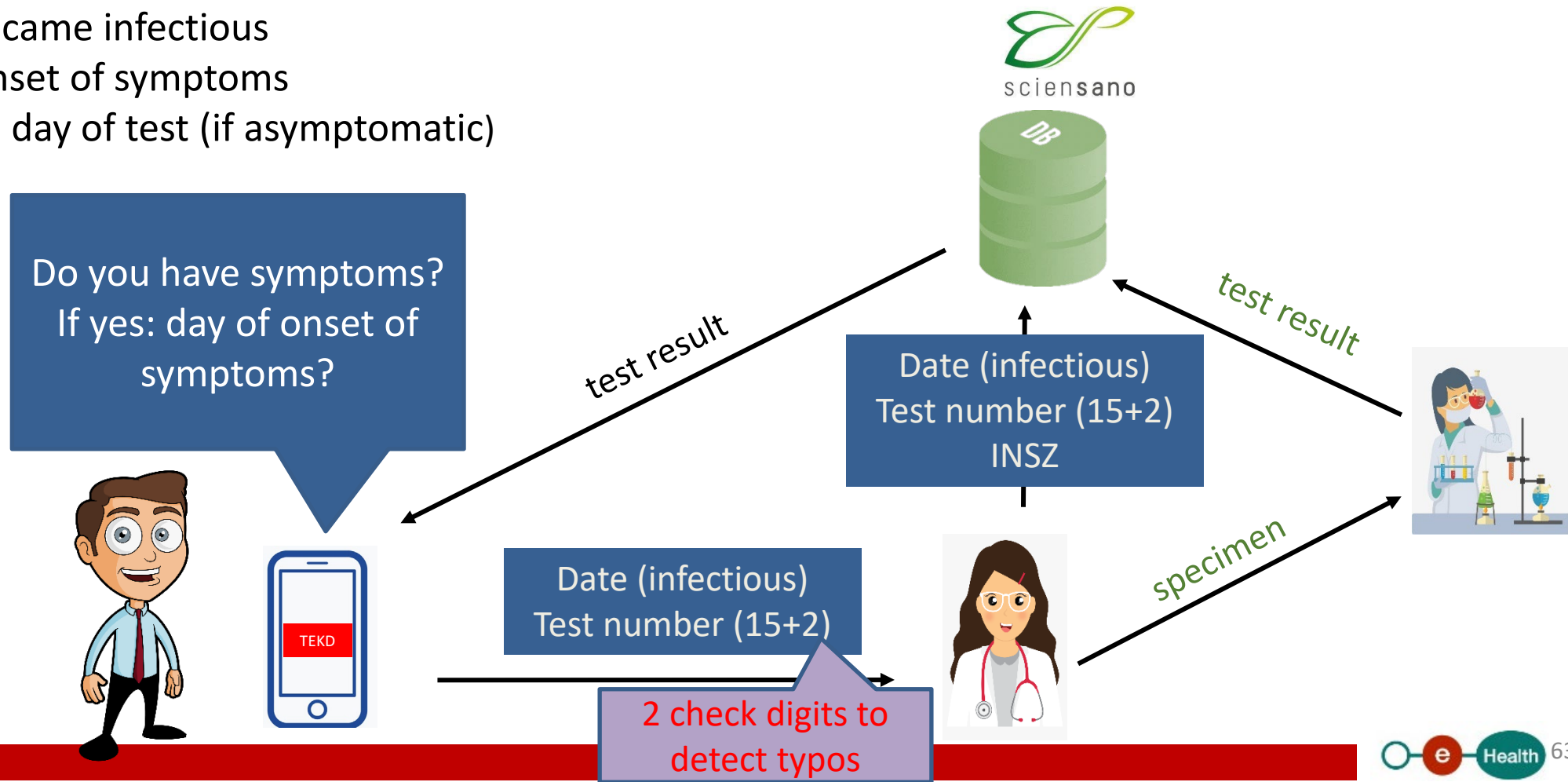
proximity tracing



App Coronalert

Details: GP visit

RAG: Date patient became infectious
= two days before onset of symptoms
or = two days before day of test (if asymptomatic)



App Coronalert

Details:
webform
for user

The screenshot shows a web browser window displaying the 'Coronalert form' page. The browser's address bar shows 'staging.coronalert.be'. The page header includes the 'Coronalert' logo and navigation links for 'How does it work?', 'Privacy and Data', 'FAQ', and 'Community'. The main heading is 'Coronalert form' with a sub-heading 'Coronalert > Coronalert form'. Below this is a section titled 'How to fill in this form?' with four icons and instructions: 1. National register number, 2. PCR activation code, 3. Code from the app, and 4. Date of birth. The form fields are: 'Belgian national number' (with placeholder 'YY.MM.DD-sss-PC'), 'Activation code PCR' (with placeholder 'xxxx-xxxx-xxxx-xxxx'), 'Code generated by the corona-alert app' (with placeholder 'xxxx-xxxx-xxxx-xxxx-x'), and 'Date (dd/mm/yyyy)' (with a calendar icon). There is also a 'Notification via contact tracking app' section with 'Yes' and 'No' radio buttons, and a 'SUBMIT' button at the bottom.

Coronalert

How does it work? Privacy and Data FAQ Community

Coronalert form

Coronalert > Coronalert form

How to fill in this form?

- Enter your national register number found on your identity card.
- Enter your PCR activation code received through the call centre or the *Public Health Passenger Locator Form*.
- Enter the code generated in your Coronalert application.
- Enter your date of birth and submit the form.

Belgian national number

YY.MM.DD-sss-PC

Activation code PCR

xxxx-xxxx-xxxx-xxxx

Code generated by the corona-alert app

xxxx-xxxx-xxxx-xxxx-x

Date (dd/mm/yyyy)

Notification via contact tracking app

Yes No

SUBMIT

App Coronalert

- Recommend the use of the app
- Exchange of anonymous codes by the app can be deactivated and reactivated
- Generate a test code with the app if you are tested and ensure that it ends up at Sciensano together with your social security identification number => you will receive your test result on the app as soon as it is available
 - general practitioner via eForm LaboratoryTestPrescription
 - person to be tested via webform (see <https://coronalert.be/nl/coronalert-formulier/>)
- Publish the transmitted anonymous codes if you test positively

Passenger Locator Form

Passenger Locator Form

If you plan to travel to Belgium **or return to Belgium after a stay abroad, you are required to:**

- read the latest travel advice.
- fill in a Passenger Locator Form (**within 6 months of your scheduled arrival in Belgium**)

Who has to fill in this questionnaire?

This form has to be completed by:







- all persons travelling to Belgium, except:
 - if you stay in Belgium for less than 48 hours
 - if you were abroad for less than 48 hours
- Are you traveling to Belgium by plane or boat? Then you must **always** fill in the PLF, even if you are staying in Belgium for less than 48 hours or were abroad for less than 48 hours.
- Are you travelling by train or bus from a country outside the EU or Schengen area? Then you must **always** fill in the PLF, even if you are staying in Belgium for less than 48 hours or were abroad for less than 48 hours.
- If you have stayed in a very high-risk country for the past 14 days, you need to fill in the PLF at all times, regardless of the length of your stay.

In case there is a change in your place of residence

If, upon arrival in Belgium, you are invited to get a COVID-19 test and would change your place of residence during the next 14 days, please inform us of this change by e-mail at PLFBelgium@health.fgov.be.

Information regarding the Covid-19 health guidelines is available on www.info-coronavirus.be .

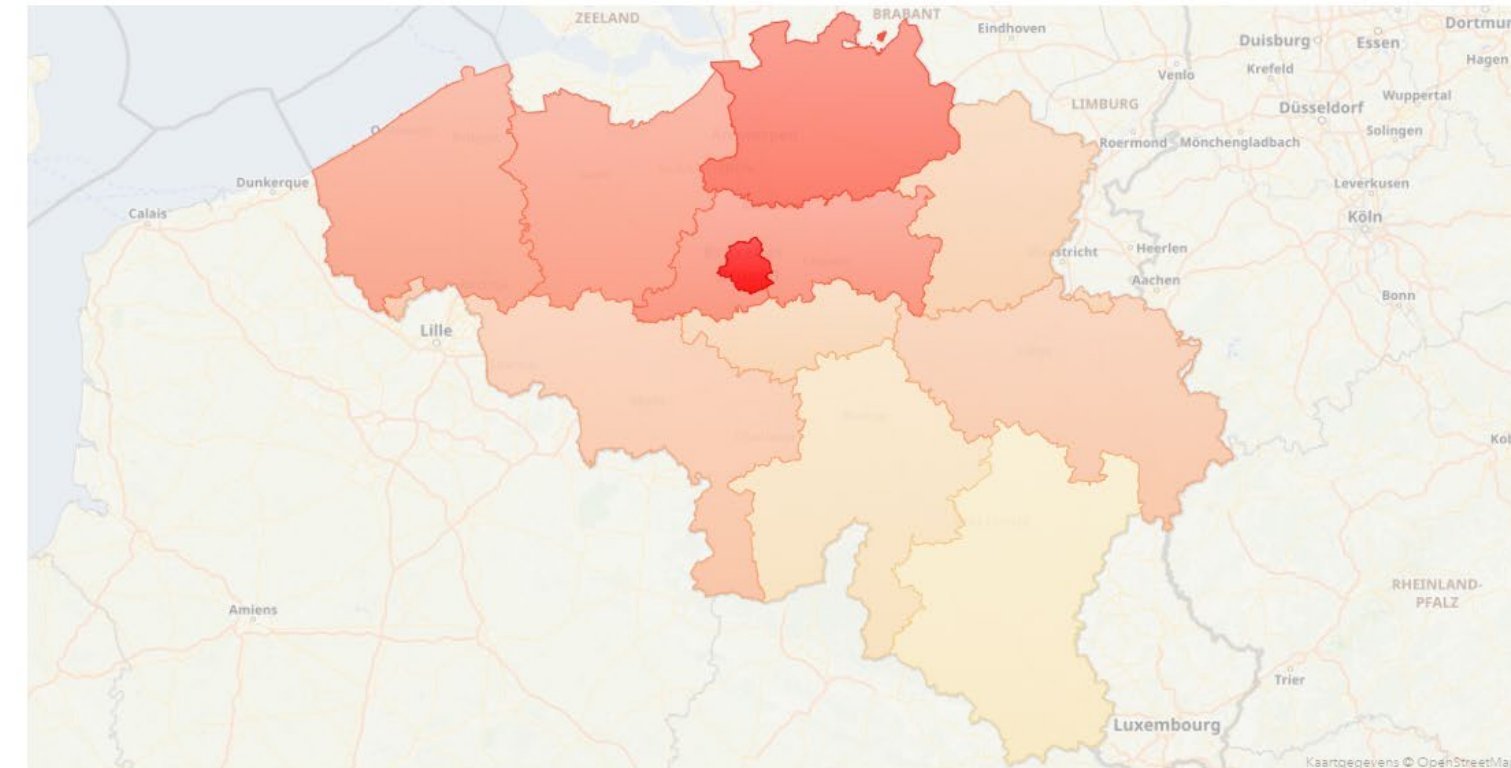
Your information

 Family Name *	 First Name *	 Gender *
<input type="text"/>	<input type="text"/>	<input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Other
 Date of birth (dd/mm/yyyy) *	 Nationality *	 Are you a resident of Belgium? *
<input type="text"/>	<input type="text"/>	<input type="radio"/> Yes <input type="radio"/> No

Paloma


 Arrival date: 1 augustus 2020 - 1 januari 2022 - 17 februari 2022
 Covid risk zone: Covid risk zone
 Triggered: Triggered
 Country (from): Country
 Filters: Filters

Arrivals : 1011661
 COVID_RED;COVID_ORANGE



Province	Arrivals	Arrivals RED zone	Arrivals ORANGE zone
Totaal	1011661	986481	25180
Provincie Antwerpen	152676	149264	3412
Provincie Henegouwen	59901	58346	1555
Provincie Limburg	44613	43684	929
Provincie Luik	55645	54466	1179
Provincie Luxemburg	13241	12904	337
Provincie Namen	24238	23648	590
Provincie Oost-Vlaanderen	107228	104924	2304
Provincie Vlaams-Brabant	119955	116880	3075
Provincie Waals-Brabant	41053	39867	1186
Provincie West-Vlaanderen	99896	97887	2009
[Brussels Hoofdstedelijk Gewest]	282693	274422	8271
(ontbreekt)	10522	10189	333

Paloma

Paloma Dashboard



Arrivals by transport type Arrivals by province Arrivals by municipality **Volume PLF** Tests Risk zones DCC Validation status Documentation and export



Arrival date

1 augustus 2020 tot 17 februari 2022

1 augustus 2020

17 februari 2022

Covid risk zone

Covid risk zone

Triggered

Triggered

Country (from)

Country

Filters

Filters

Creation date

30 juli 2020 tot 14 februari 2022

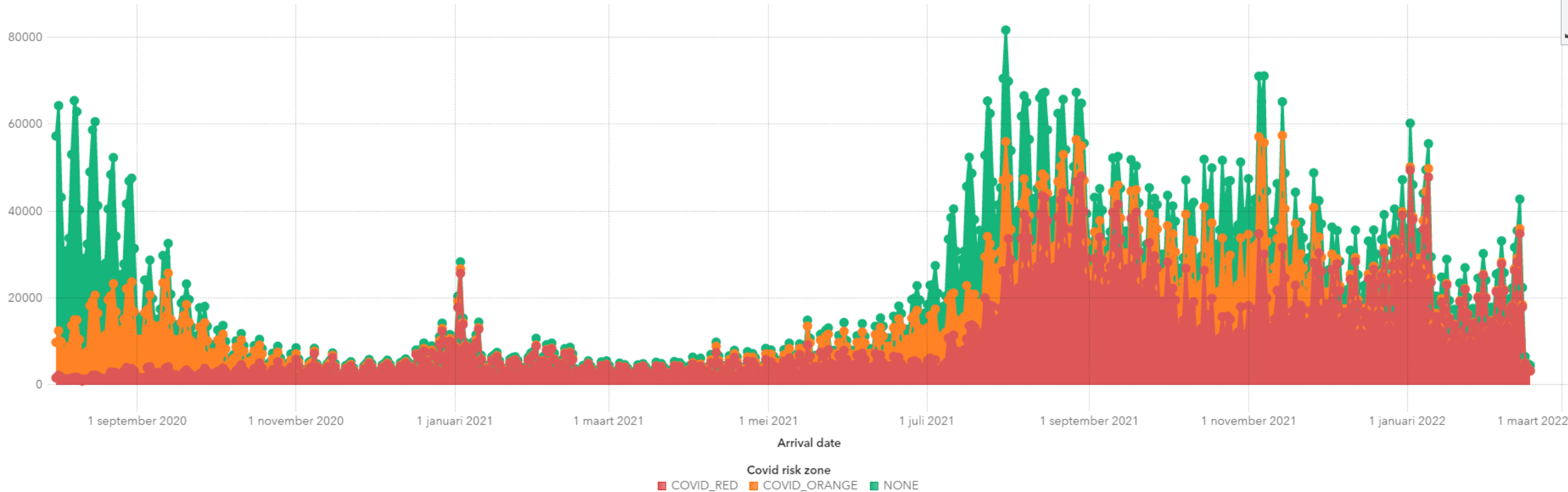
30 juli 2020

14 februari 2022

Volume of passenger locator forms received : 12334883

COVID_RED;COVID_ORANGE;NONE

< ARRIVAL LINE ARRIVAL BAR CREATION DATE CROSSTAB VIEW TABLE VIEW FUNCTION VIEW TRIGGERED VIEW >



Paloma

Paloma Dashboard



Arrivals by transport type Arrivals by province Arrivals by municipality Volume PLF Tests Risk zones DCC Validation status Documentation and export



Arrival date

15 januari 2022 tot 17 februari 2022

Covid risk zone

Covid risk zone

Triggered

Triggered

Country (from)

Country

Filters

Filters

Param: top geo rank #

1

20

150

COVID_RED

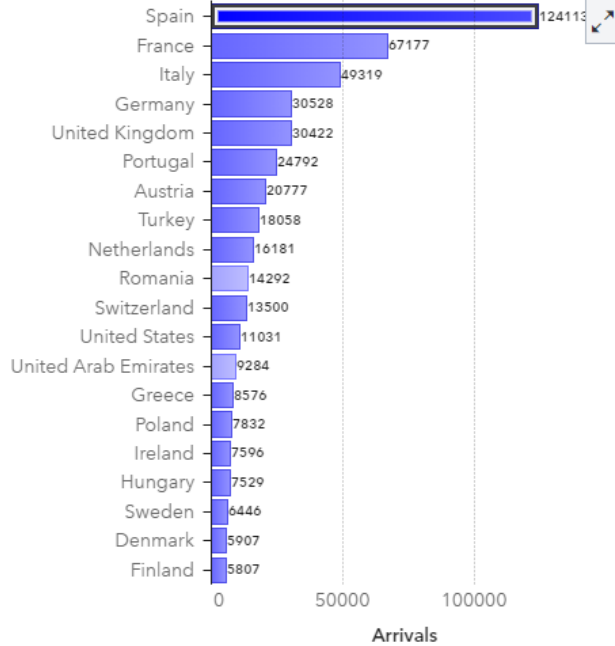
< TOP REGIONS VIEW [MAP VIEW](#) [TABLE VIEW](#) >

Arrivals by Country/Region

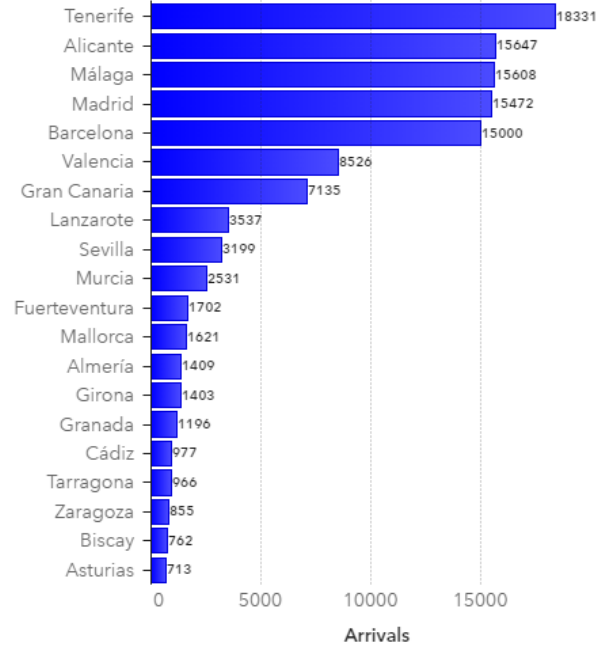
Country invoeren...

Region invoeren...

Country



Region



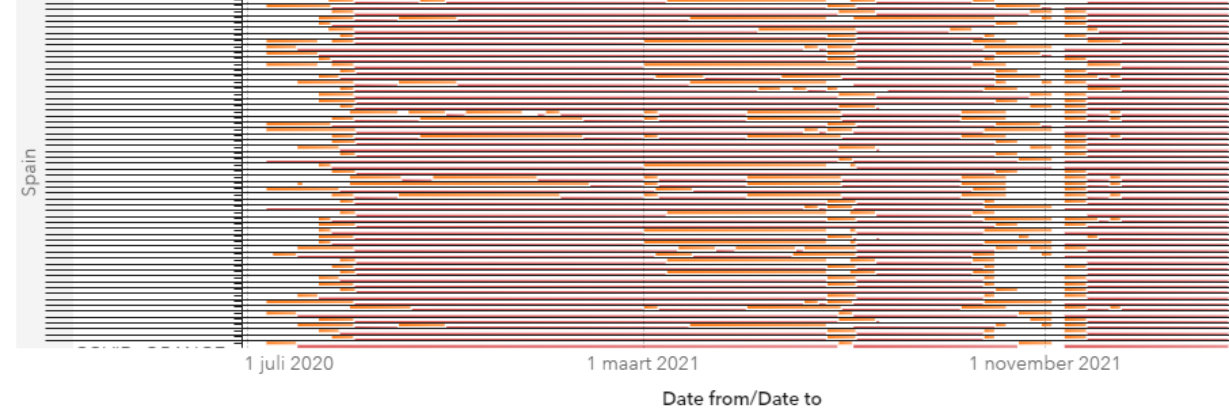
< Covid risk by zone Region & Date Return destination Tests >

select Country/Region on the left (otherwise the results below are invalid)

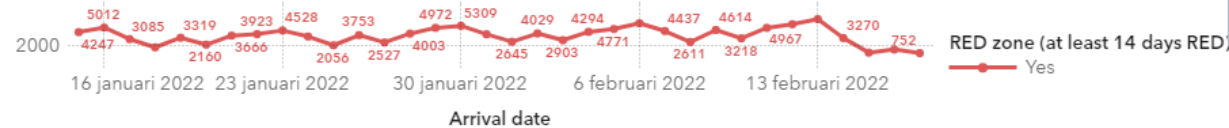
Country

Region

Covid risk



Arrivals



< Arrivals Positive tests >

Integrated citizen portal



NEWS

- 2022.01.22: [Form after positive self-test \(not available in English\)](#)
- 2021.12.02: [Form for notification of high-risk contacts \(not available in English\)](#)
- 2021.12.02: [Registration on the reserve list for a booster vaccine against Covid-19](#)
- 2021.11.03: [I feel ill. Do I have to do a test? \(questionnaire - not available in English => French\)](#)
- 2021.08.13: [COVID Safe Ticket/European COVID Digital Certificate](#)
- 2021.07.15: [Overview of my COVID tests](#)
- 2021.07.08: [Test result and Certificate from a CTPC code](#)

Call Centres COVID

By region/community

Brussels: 02 214 19 19
Wallonia: 071 31 34 93
Flanders: 078 78 78 50
German-speaking community: 0800 23 0 32



What is MyHealth.be?

MyHealth is an online health portal, also known as "Personal Health Viewer". Through this central gateway you gain insight into various personal data about your health and about health in general.

- FAQ (under construction)
- Tutorials:
 - Identification to the MyHealth portal (FR)
 - What is MyHealth? (FR)
 - My health file summary (FR)
 - My medicines (FR)
 - Digital prescribing: what benefits does it offer me? (FR)
 - Digital prescribing: what are the possibilities? (FR)
 - Digital prescribing: what are the new features? (FR)
 - My implants (FR)
- Contact



COVID-19 – Tests, vaccination, PLF, certificates

Tests and results

- [Test: for myself or my child](#)
- [Appointment with test code](#)
- [Result: for myself or my child](#)

Tracing - contact tracking

- [High risk contacts: form](#)

Quarantine

- [Quarantine certificate](#)

Vaccination

- [Vaccines received](#)
- [Extra dose: registration](#)
- [Adverse reaction: reporting \(FR\)](#)

EU Digital COVID Certificates / COVID Safe Ticket

- [Covid Safe Ticket](#)
- [European COVID Digital Certificates](#)

Travel



COVID 19 - Information

In this section you will find information about the Coronavirus.
General information: info-coronavirus.be

Vaccination COVID-19

- Flanders: laa7evaccineren.be
- Wallonia: jemevaccine.be
- Brussels: coronavirus.brussels.be
- German-speaking Community: ichlassemiohimpfen.be

[Who can be tested? How to make an appointment?](#)

[Map with triage and collection centers](#)

[Positive test result](#)

[Vaccination: for whom, why, where, how?](#)

[App Coronalert](#)

[Form for the return to Belgium - PLF](#)

[Belgium Epidemiological Situation](#)

[Current measures](#)


Integrated citizen portal

COVID-19 - Aanvraag van een quarantainegetuigschrift


Met dit formulier kunt u uw quarantainegetuigschrift aanvragen door uw persoonlijke gegevens in te voeren.

In het veld "Mobiële telefoon" dient u het nummer in te vullen waarop u de sms hebt ontvangen met de uitnodiging om uw quarantainegetuigschrift op te halen.


Meer informatie vindt u op de [volgende pagina](#).

 Belgisch rijksregisternummer *


JJ.MM.DD-sss.PC

 Code Quarantaine *

xxxx-xxxx-xxxx-xxxx

 Mobiële telefoon *

+32477123123

 Confirmation code *

Stuur mij een bevestigingscode (per SMS)

De bevestigingscode bestaat uit 6 cijfers. Bijvoorbeeld: 123456

 E-mail adres *

Bevestig e-mail adres *

Verzenden

Integrated citizen portal



Formulier positieve zelftest

Door dit formulier in te vullen kan U een code aanvragen om een positieve zelftest te bevestigen door een test afgenomen door een zorgverstrekker.

Heeft u recent een zelftest uitgevoerd die positief* was?

- Ja
 Nee

*positief => U ziet een lijntje langs de letter 'C' en je ziet een lijntje langs de letter 'T'. Voor meer informatie <https://www.info-coronavirus.be/nl/zelftest/>

Wanneer heeft U deze test uitgevoerd?

06/02/2022

Heeft U symptomen die mogelijks kunnen wijzen op besmetting met het coronavirus (bv. koorts, hoesten, hoofdpijn, vermoeidheid)?

- Ja
 Nee

Wanneer zijn uw symptomen ontstaan?

05/02/2022

Zie advies

Advies

U heeft een recente positieve zelftest afgelegd en u heeft symptomen die mogelijk kunnen wijzen op besmetting met het coronavirus (COVID-19). Het is belangrijk dat u zo snel mogelijk een test laat afnemen door een zorgverstrekker om deze positieve zelftest te bevestigen.

Integrated citizen portal

nl fr de en

AAA Other government information and services: www.belgium.be **be**

Myhealth

Connected as: [avatar] - as Citizen | [Log out](#)

[Health data](#) | [Access management](#) | [Other](#) | [FAQ](#) | [Contact](#)



Request a CTPC test code on the basis of a positive self-test

Based on your positive self test, you can obtain a CTPC test code to do a confirmation test. Please fill in the different details below. Attention: a recovery certificate can only be obtained based on the result of a PCR test

Request for a CTPC code

Phone number*

Email address*

Request

Result

Please enter the CTPC code below when making an appointment for a PCR test or rapid test

CTPC Code

[Plan your test via doclr \(Brussels, Flanders, Wallonia, German-speaking Community\)](#)

[Find a pharmacy to do a test](#)

Integrated portal for health care providers

Nieuws

[Meer nieuws](#)

Het medicatieschema: het overzicht van geneesmiddelen die de patiënt moet nemen

01/09/2021

Het medicatieschema dient om het overzicht te bewaren van de geneesmiddelen die de patiënt moet nemen. Het helpt de patiënt en is een belangrijk hulpmiddel voor zorgverleners. Meer info ...

Telematicapremie voor vroedvrouwen

21/06/2021

De voorwaarden voor de telematicapremie 2020 zijn vastgelegd. U kunt uw telematicapremie 2020 aanvragen van 1 juli tot en met 31 oktober 2021. De voorwaarden voor de telematicapremie 2021 en 2022 zijn ook (onder voorbehoud) beschikbaar. Meer info ...

Dank aan de verpleegkundigen

12/05/2021

Al meer dan een jaar leven we in een situatie die onze manier van leven radicaal veranderd heeft. De COVID-19-crisis is een ongekende gezondheids crisis die zowel qua duur, als qua omvang uitzonderlijke is. Ze beïnvloedt radicaal het dagelijkse werk van de verpleegkundigen en gezondheidsbeoefenaars. Sinds het begin van de pandemie zitten ...

Onlinediensten (toegankelijk zonder softwarepakket)

In ontwikkeling Beschikbaar

Hoedanigheid

+ CEBAM Digital Library for Health	 
+ Centraal reservatiesysteem COVID-19 NEW	 
+ CIVARS	 
+ Corona Test prescription & Consultation NEW	 
+ Corona Vaccination - App voor aangifte van patiënten met zeldzame/complexere aandoeningen NEW	 
+ CTR - Centraal Traceringregister	 
+ Domino - Dossier Minderjarigen Opvolgingssysteem	 
+ eBirth - Elektronische geboorteaangifte	 
+ eCare TARDIS - Tool for Administrative Reimbursement Drugs Information Sharing	 
+ eHealthBox - Webapp NEW	 
+ eHealthCrisis - Automatische aanmaak van een RIS-nummer (INSZ) NEW	 

Registratie van de medische softwarepakketten

Gelieve een hoedanigheid te kiezen om de betreffende softwarepakketten te raadplegen

Toegang tot de eGezondheidstoepassingen

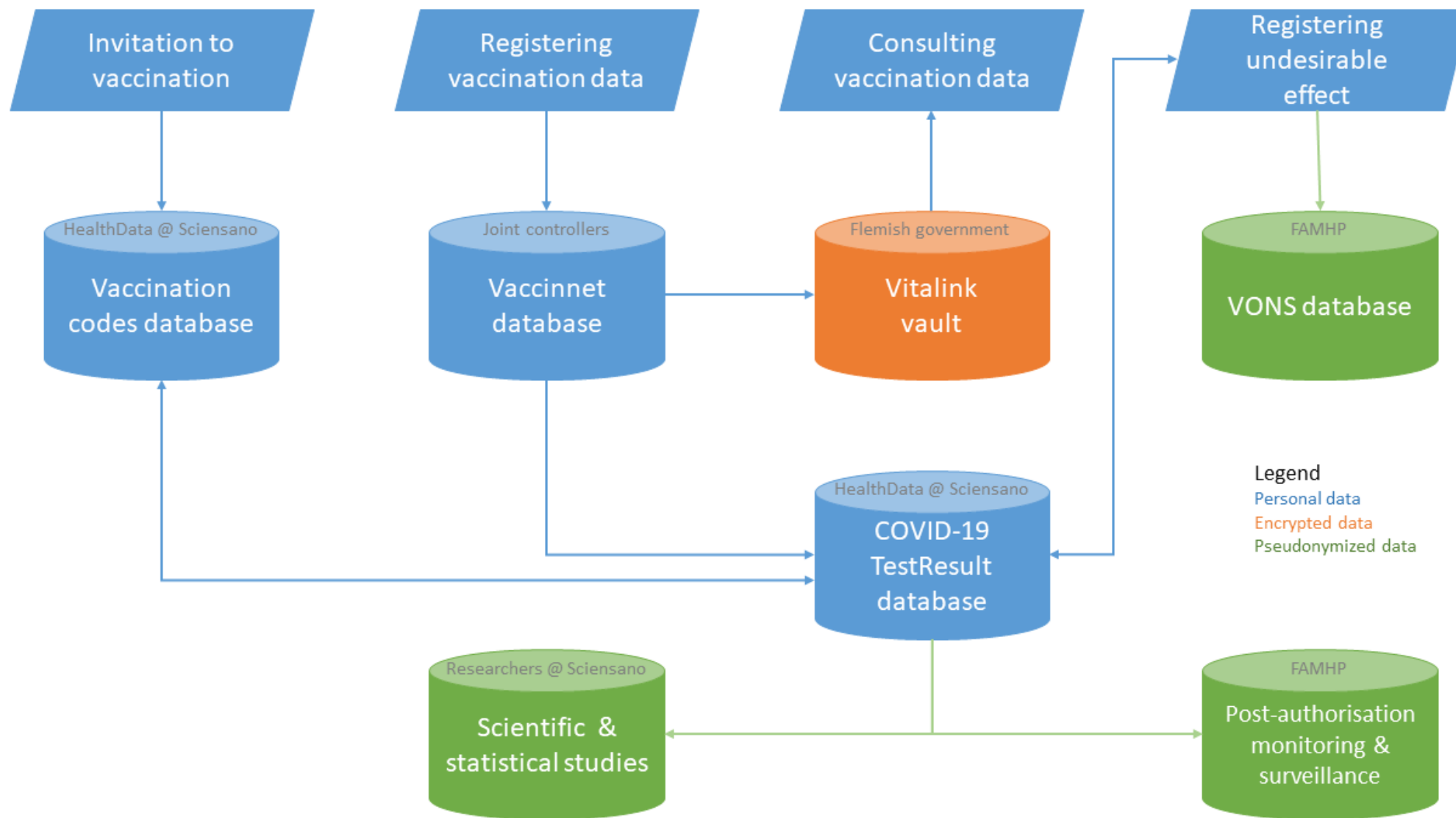
NIEUWSBRIEF

Blijf op de hoogte van onze laatste nieuwtjes!

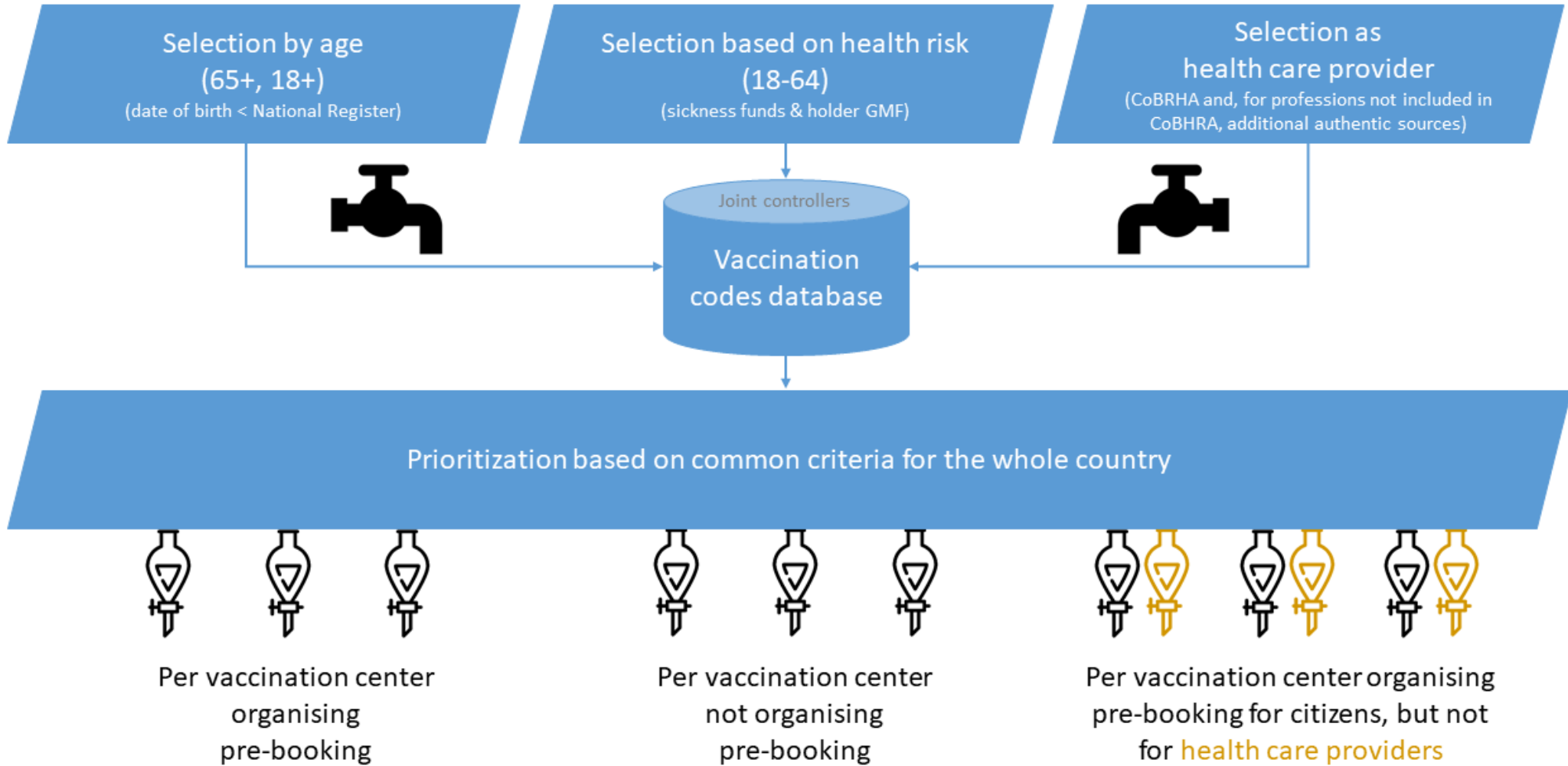
E-mail

> [Raadpleeg onze nieuwsbrieven](#)

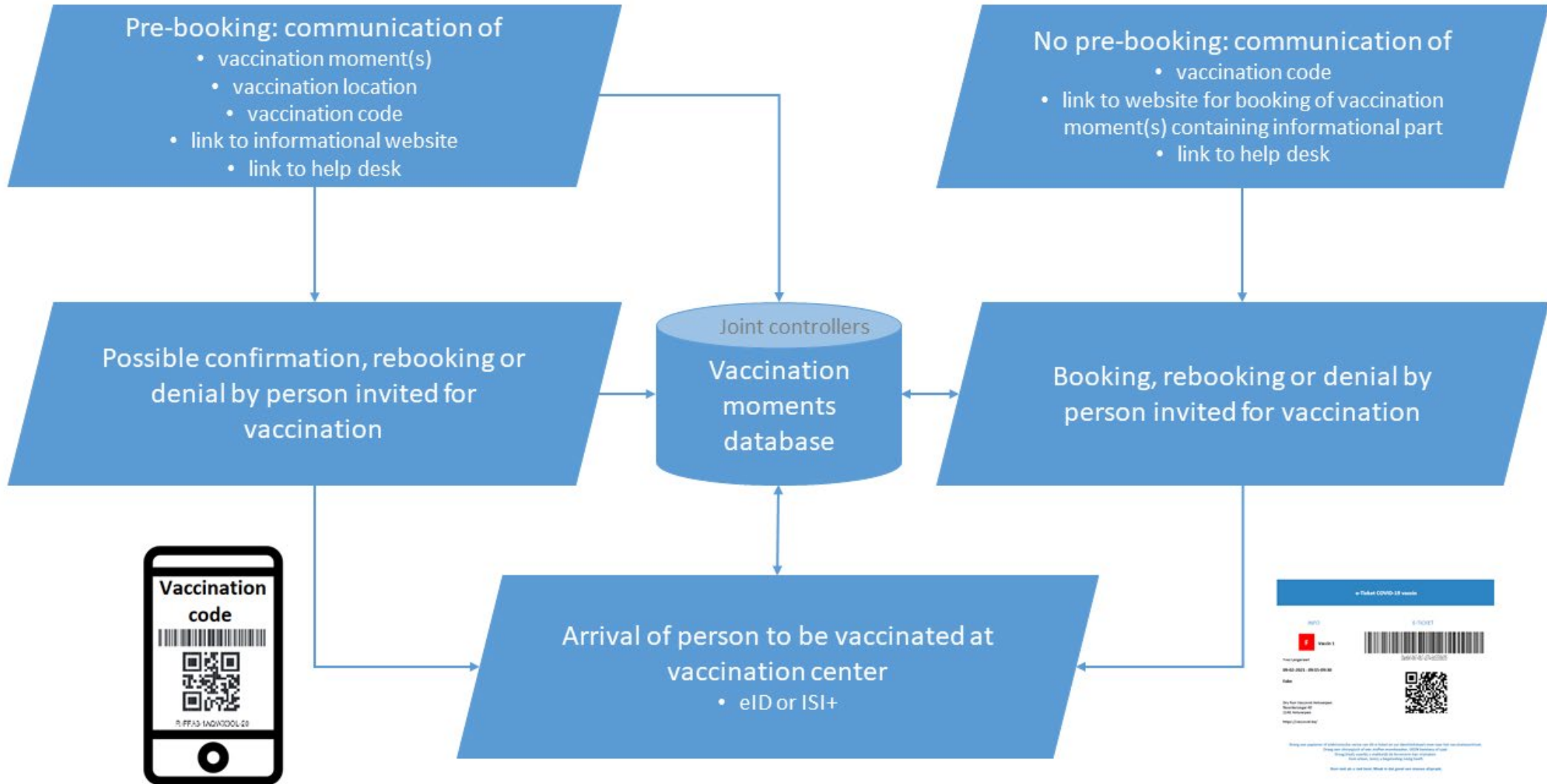
Vaccination



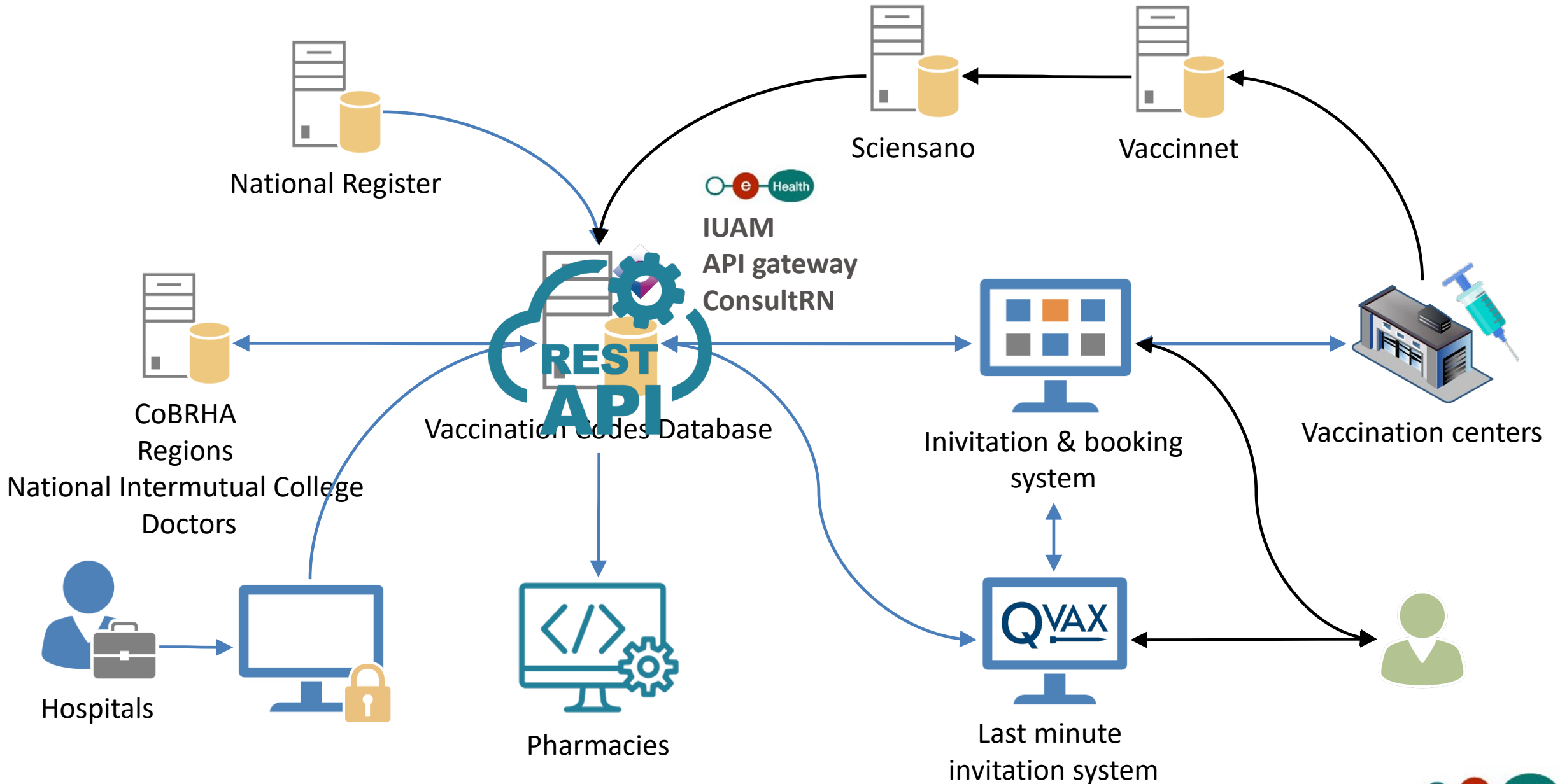
Vaccination



Vaccination



Vaccination: (Simplified) Integration

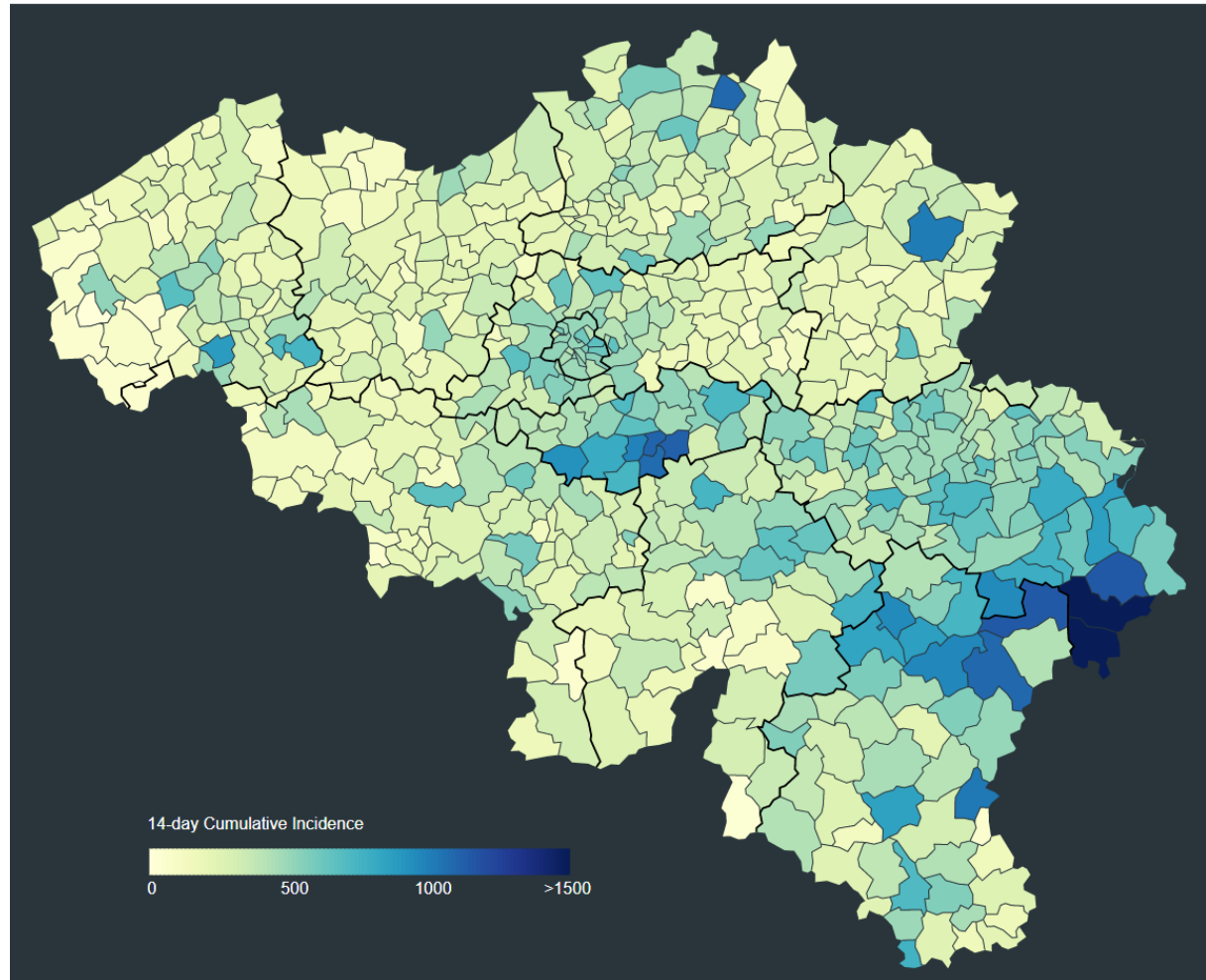


Vaccination: some numbers

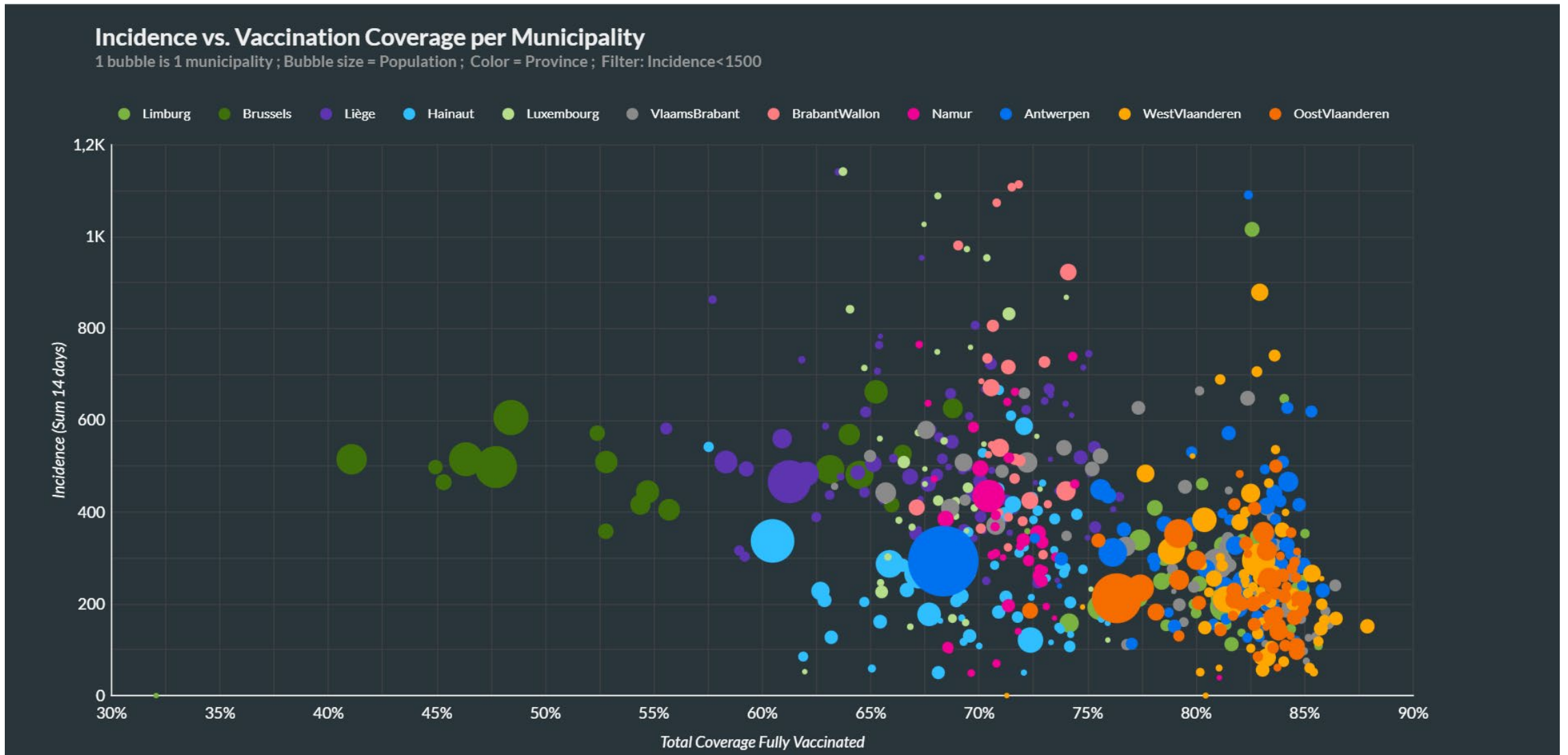
- Vaccination Codes Database
 - primary vaccination
 - 10,1 M citizens invited
 - 8,9 M citizens vaccinated
 - of whom 6,7 M were invited
 - 38,3 M notifications sent in total
 - multiple canals : Letters, e-mails, SMS
 - first invitation & reminder
 - multiple campaigns : Primary vaccination, Extra dose & Booster
- API Calls : ~1.1M per day on working days

Dashboards

COVID-19 Epidemiological Situation per municipality



Dashboards



Big data analysis

FAIR Healthdata V1

About Sciensano | Log in

Datasets | How-it-works | Sources | FAIR Principles | Roadmap

ADD YOUR PROJECT

LUCAS, Centrum voor zorgonderzoek en consultancy
Private medical practices
Epidemiology
Zorg en Gezondheid
Laboratories: clinical biology
Physicians
Nurses
Laboratory Workers
National Institute for Health and Disability Insurance
Quality of care research
General Hospitals
Psychiatric Hospitals
Paramedical professionals
Federal Public Service Health, Food Chain Safety and Environment en National Institute for Health and Disability Insurance

The banner features a teal background with various medical and data-related icons. On the left, the text 'Laboratory Workers', 'Nurses', and 'Physicians' is written vertically. The central text includes 'National Institute for Health and Disability Insurance' and 'Quality of care research'. On the right, there is an illustration of a laptop displaying a heart rate monitor, a clipboard with a red cross, a test tube, and a pill bottle. The background also contains several plus signs and a large grey cross.

<https://fair.healthdata.be/>

Abstract

- *In the development of information systems in the social and health sector, the emphasis has been placed for years on a solid, sector-wide enterprise architecture*
 - *sharing of infrastructure and platforms*
 - *reuse of data, services and components described in a publicly accessible catalogue*
 - *an integrated service to end users, supported by APIs*
 - *participatory governance in the development of the systems, up to the level of policy makers.*
- *Through this approach, the information systems and apps set up in the fight against the COVID-19 pandemic (contact tracing, organization of tests, organization of vaccination, teleconsultation, policy support, ...) can be developed very quickly and agile, and can be adjusted very flexibly and at low cost in function of the changing situation and evolving scientific insights.*



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