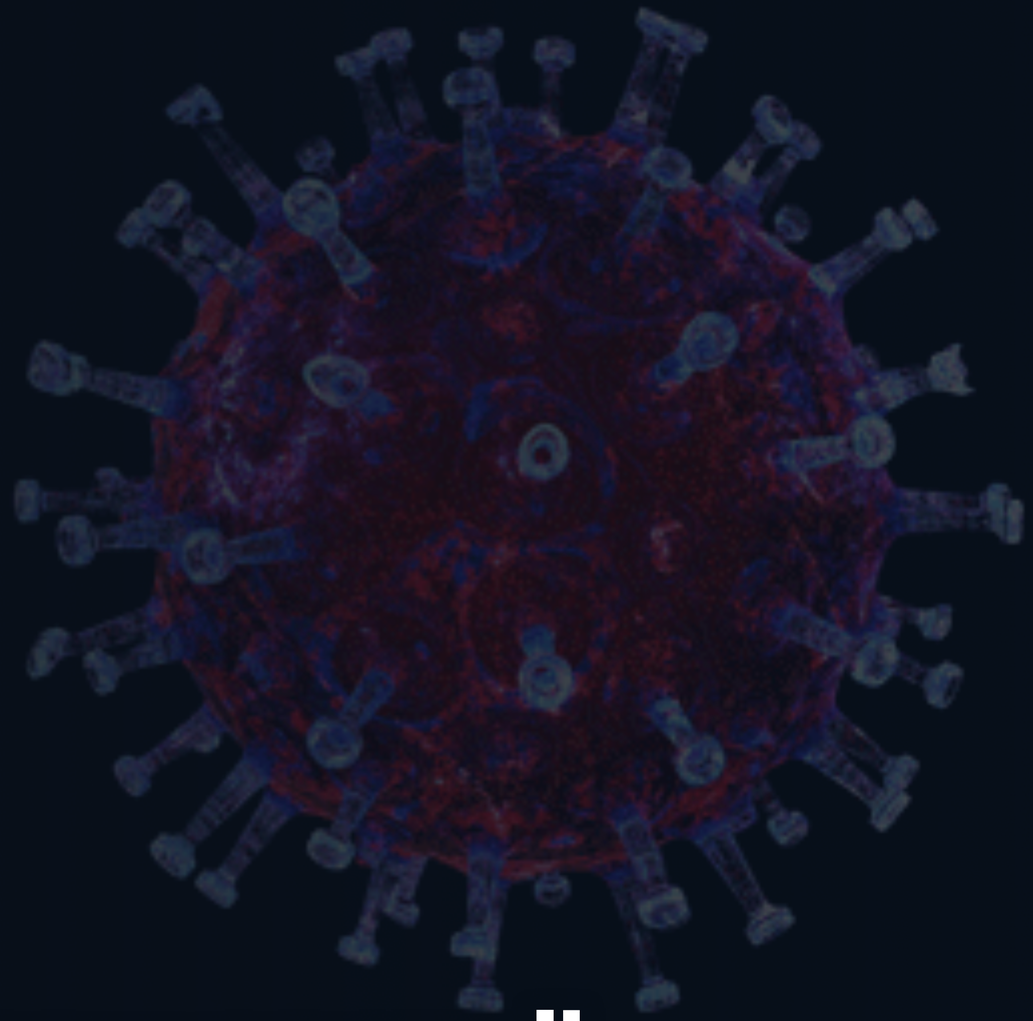


COVID-19 and the ‘new normal’

Diógenes Firmiano

2020-05-15

The ‘new normal’ transforms the future into present. Our present is, now, past and will never comeback.

Challenges

Pandemic and healthcare

Brazil’s scenario

Brazil is a continental country with federated states, 209M population and different conditions in each state.

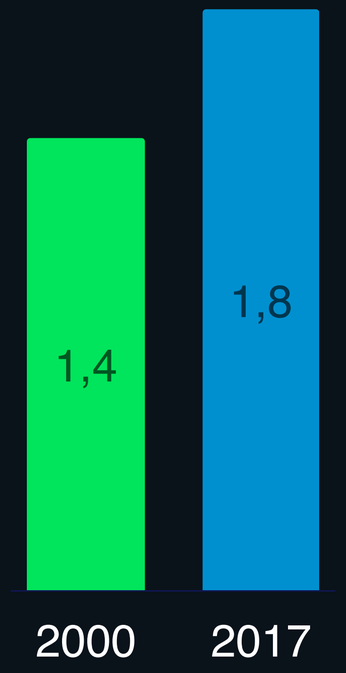
COVID in Brazil

NOTIFICATIONS

Brazil has fewer physicians per person than most developed countries

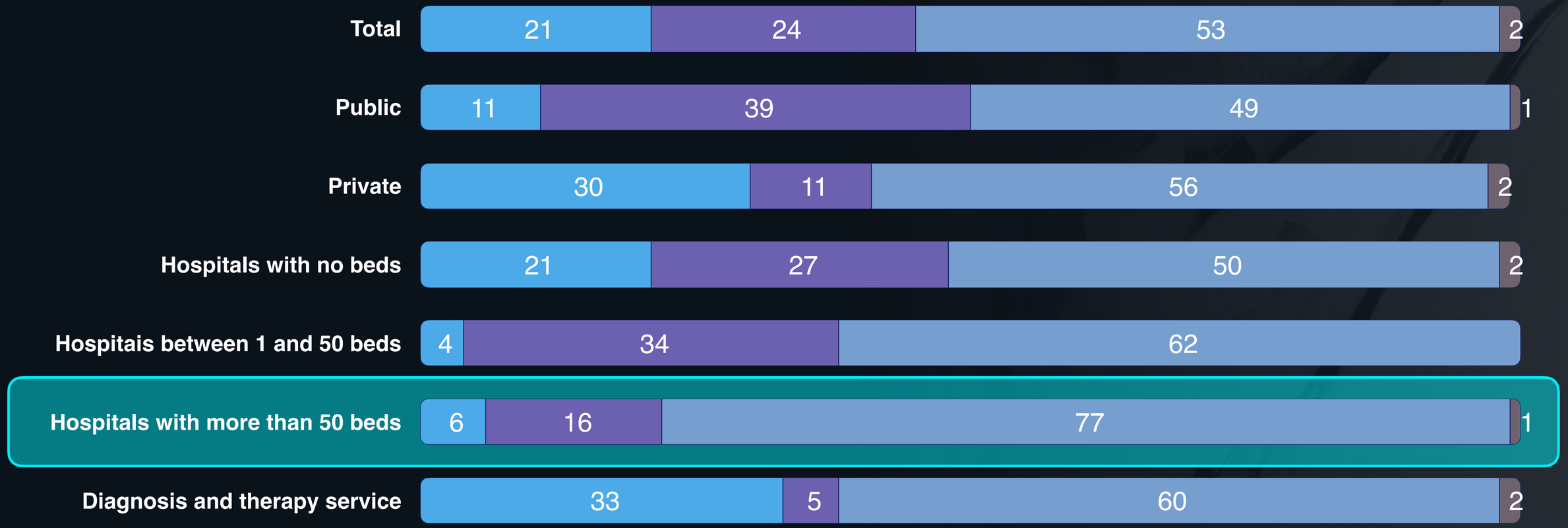
Physicians

Per thousand inhabitants



Source: OECD 2017 - McKinsey & Company

Health facilities, by use of electronic health records - 2017



5 Bi

RECORDS/YEAR

50K+

LABS

8K+

HOSPITALS

SOURCE: BRAZILIANS MINISTRY OF HEALTH

Interoperability and silos

Distributed Timeline and federated clinical documents

Patterns and guidelines

INTEROPERABILITY
NEW STANDARDS

Medical Standards

SNOMED-CT, TISS, DICOM, LOINC, ISBT 128, CID, CIAP-2, TUSS, CBHPM.

Architectural guidelines

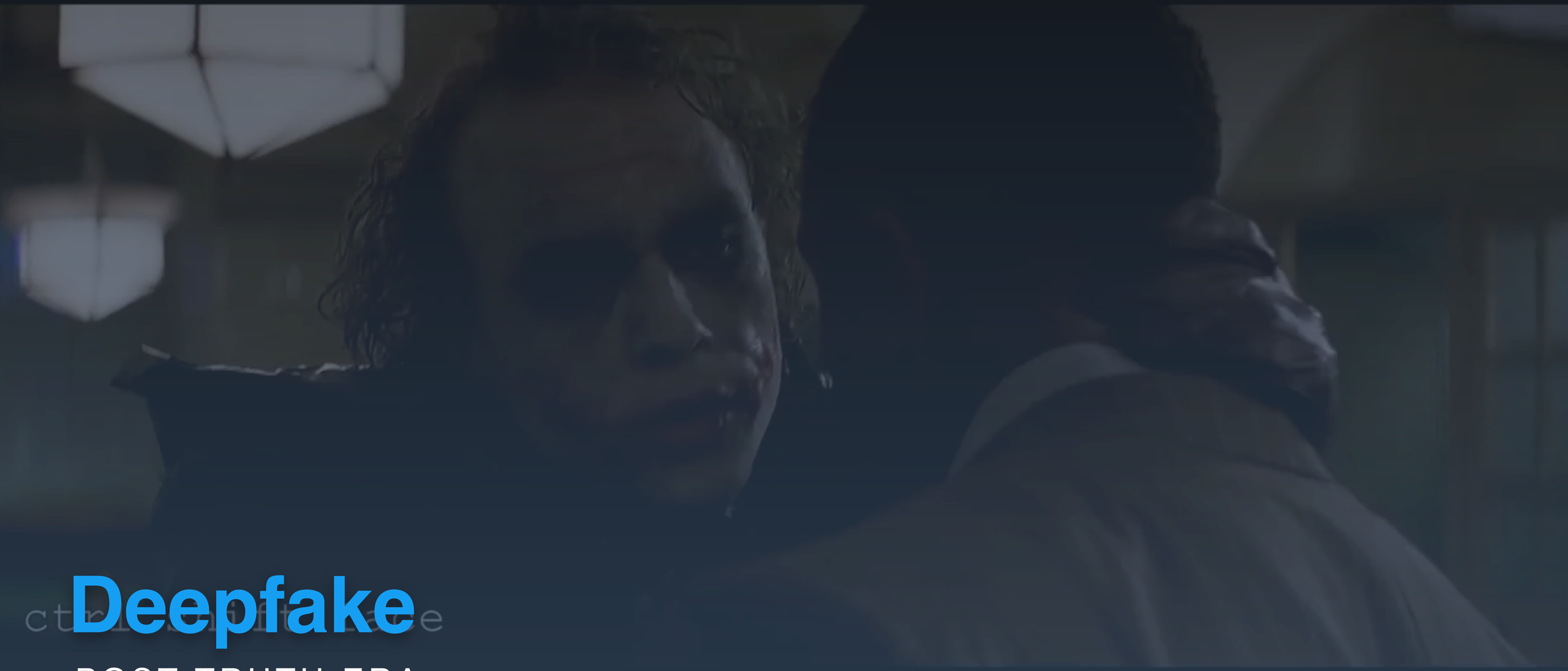
FHIR - RES
REST(Communication)
JSON(Document)

Interoperability Standards

HL7 FHIR - Integration

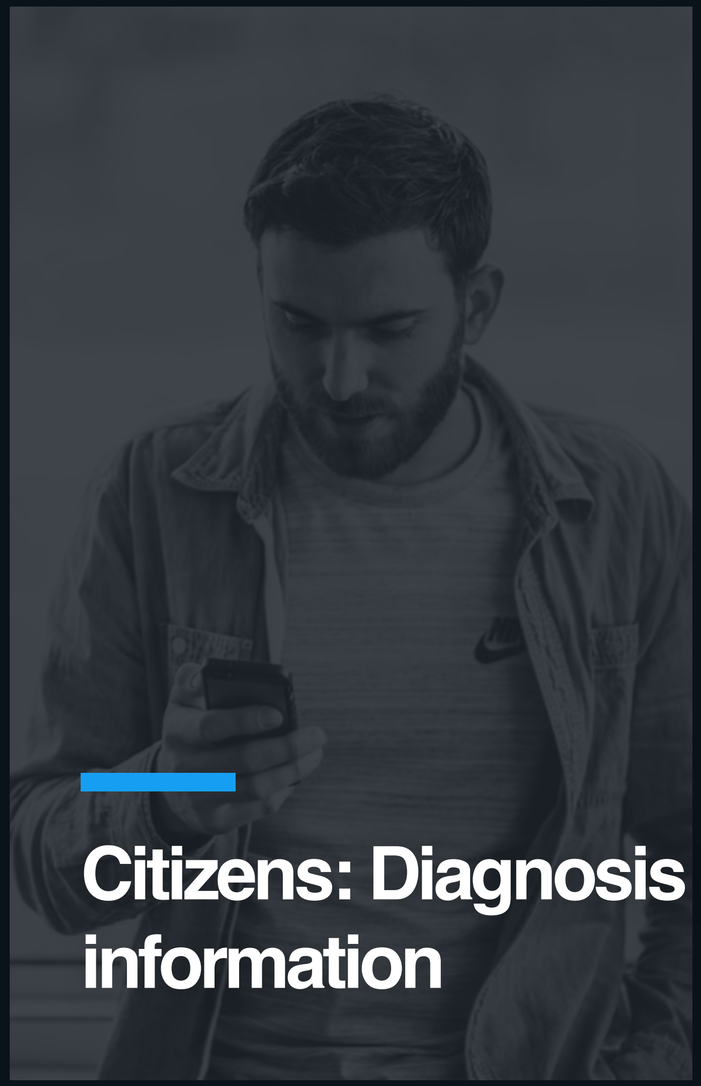
Standard patient data

IHE PIX



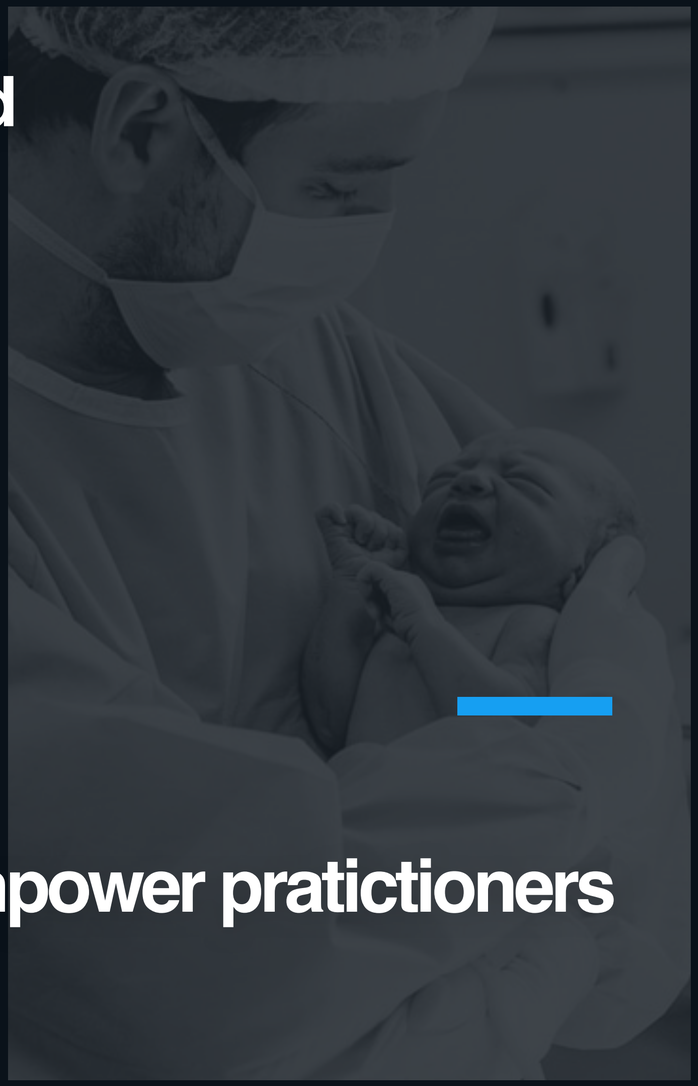
Deepfake

POST TRUTH ERA



Citizens: Diagnosis and information

Test population, notify and monitor cases and beds



Empower pratictioners

FIGHTING AGAINST COVID-19

Coronavirus SUS

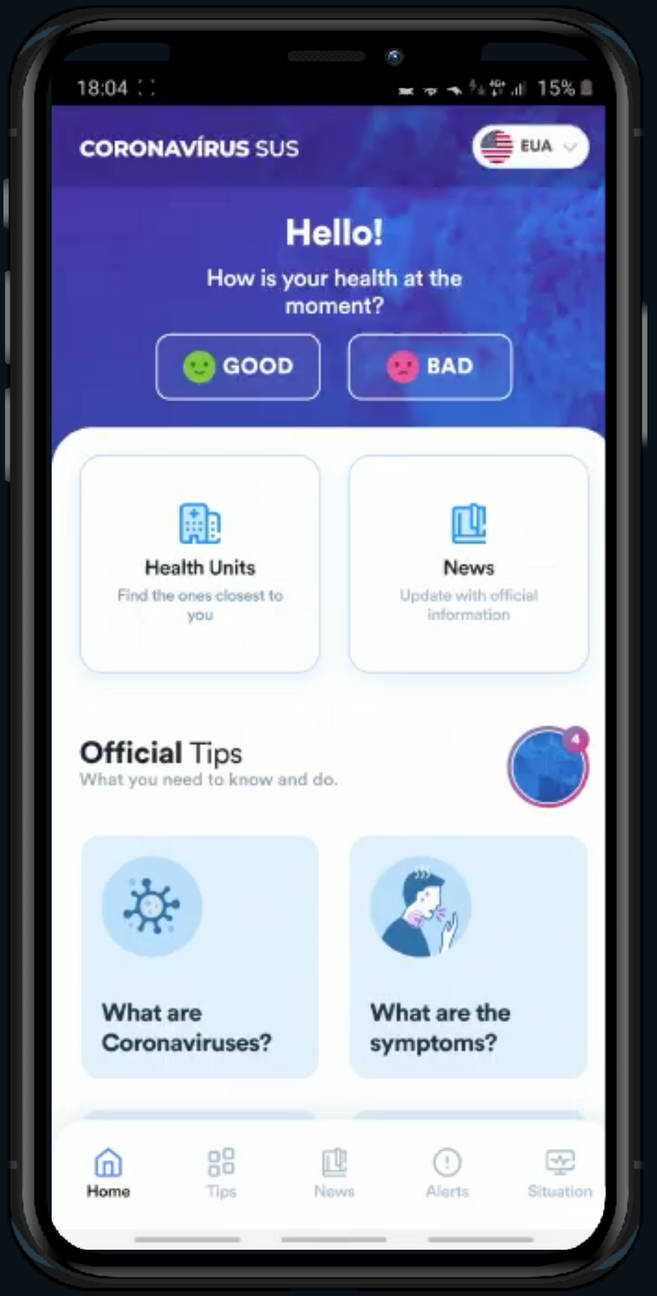
Diagnosis App/PWA

Chatbot

Calling robot

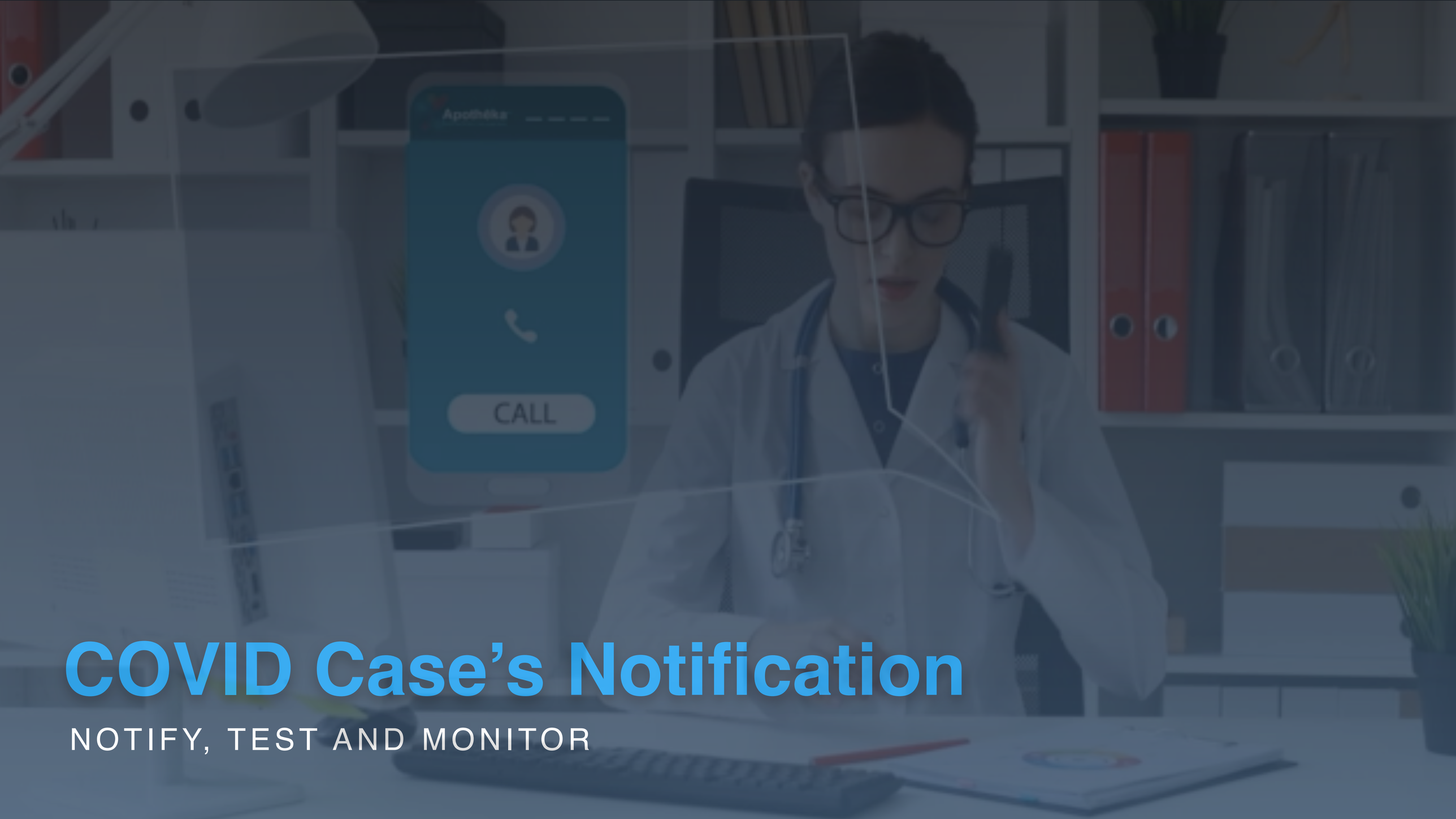
Coronavirus SUS

CITIZENS



TeleSUS

SOCIAL INCLUSION

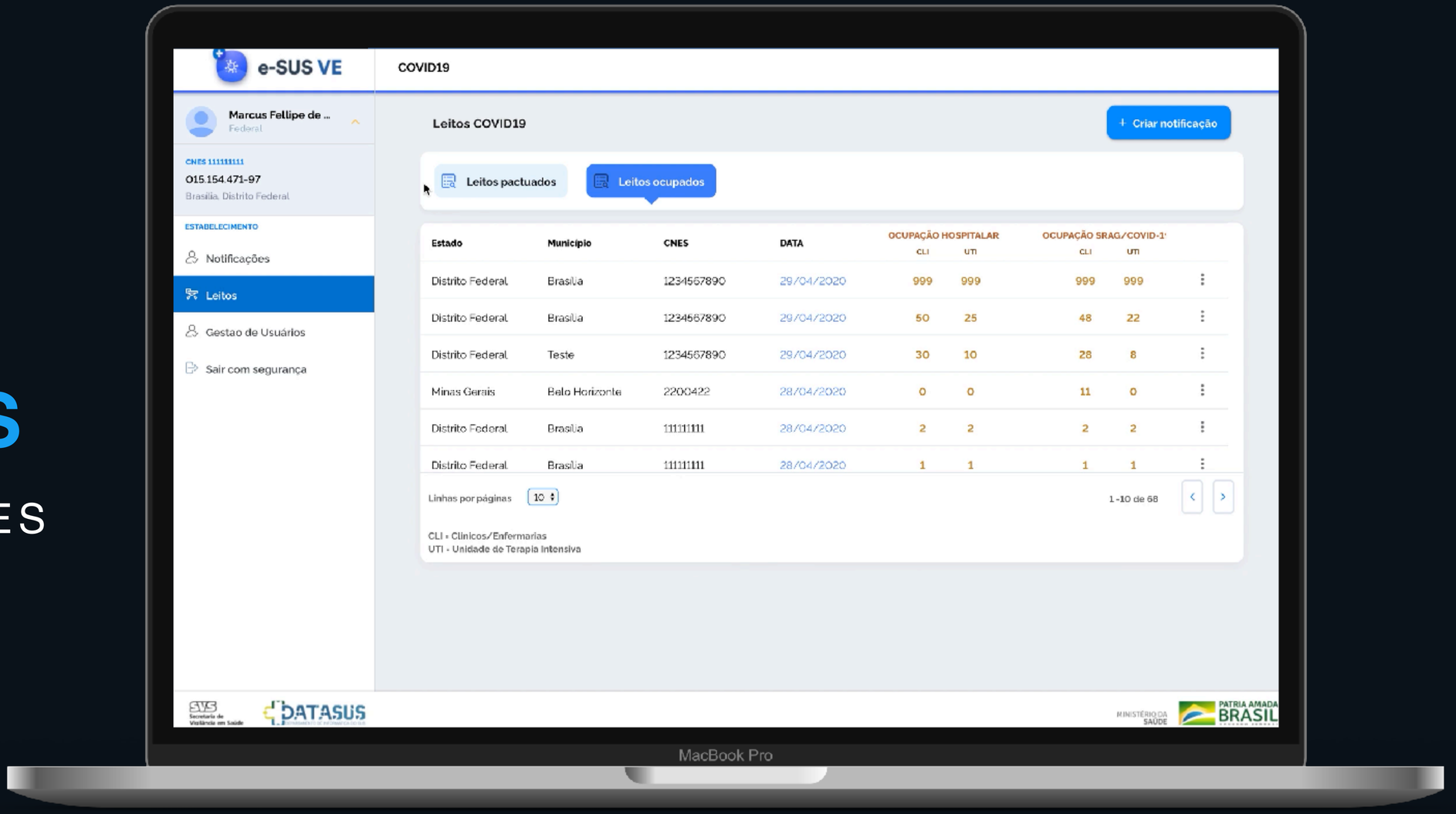


COVID Case’s Notification

NOTIFY, TEST AND MONITOR

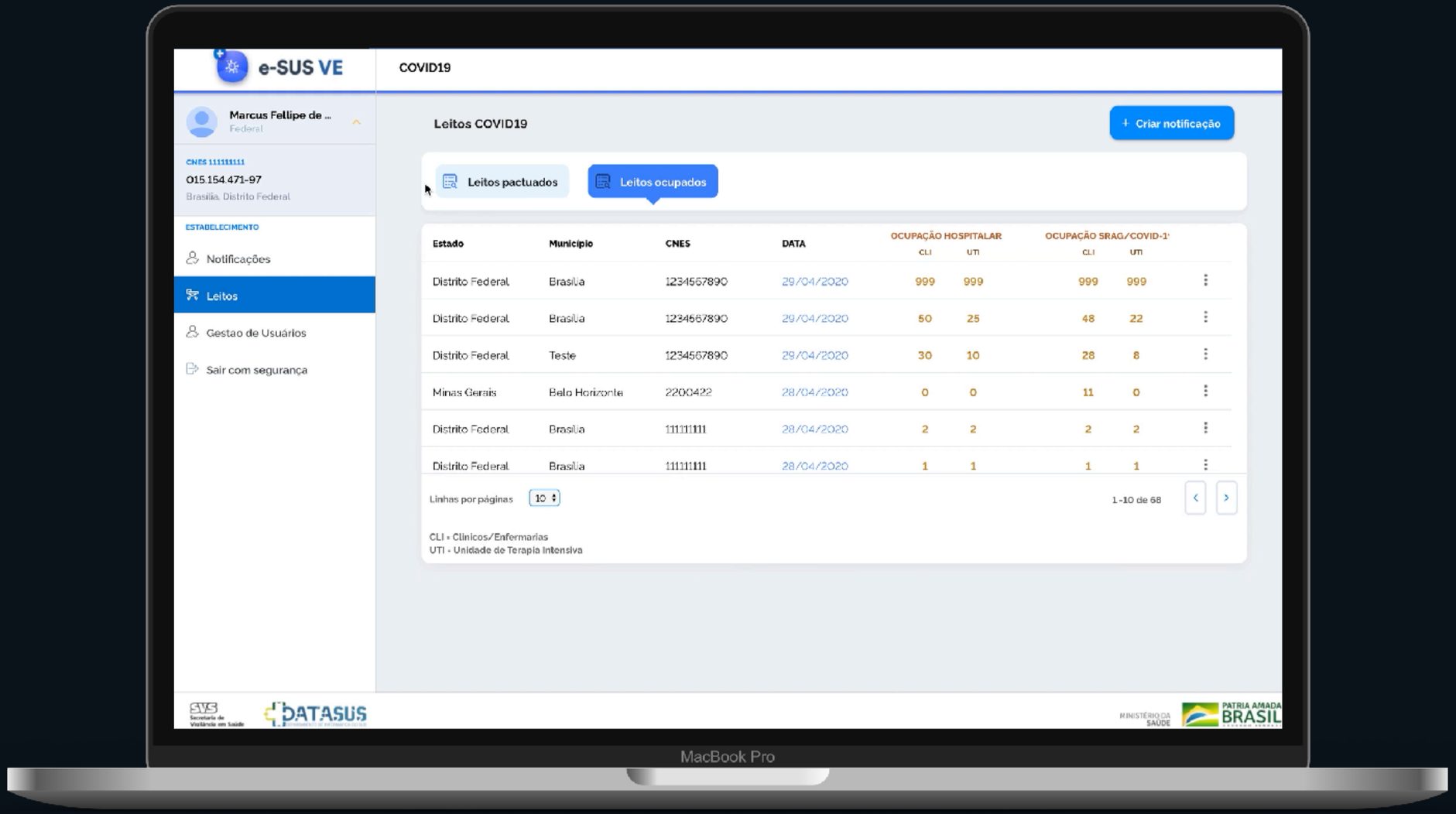
Notifica SUS

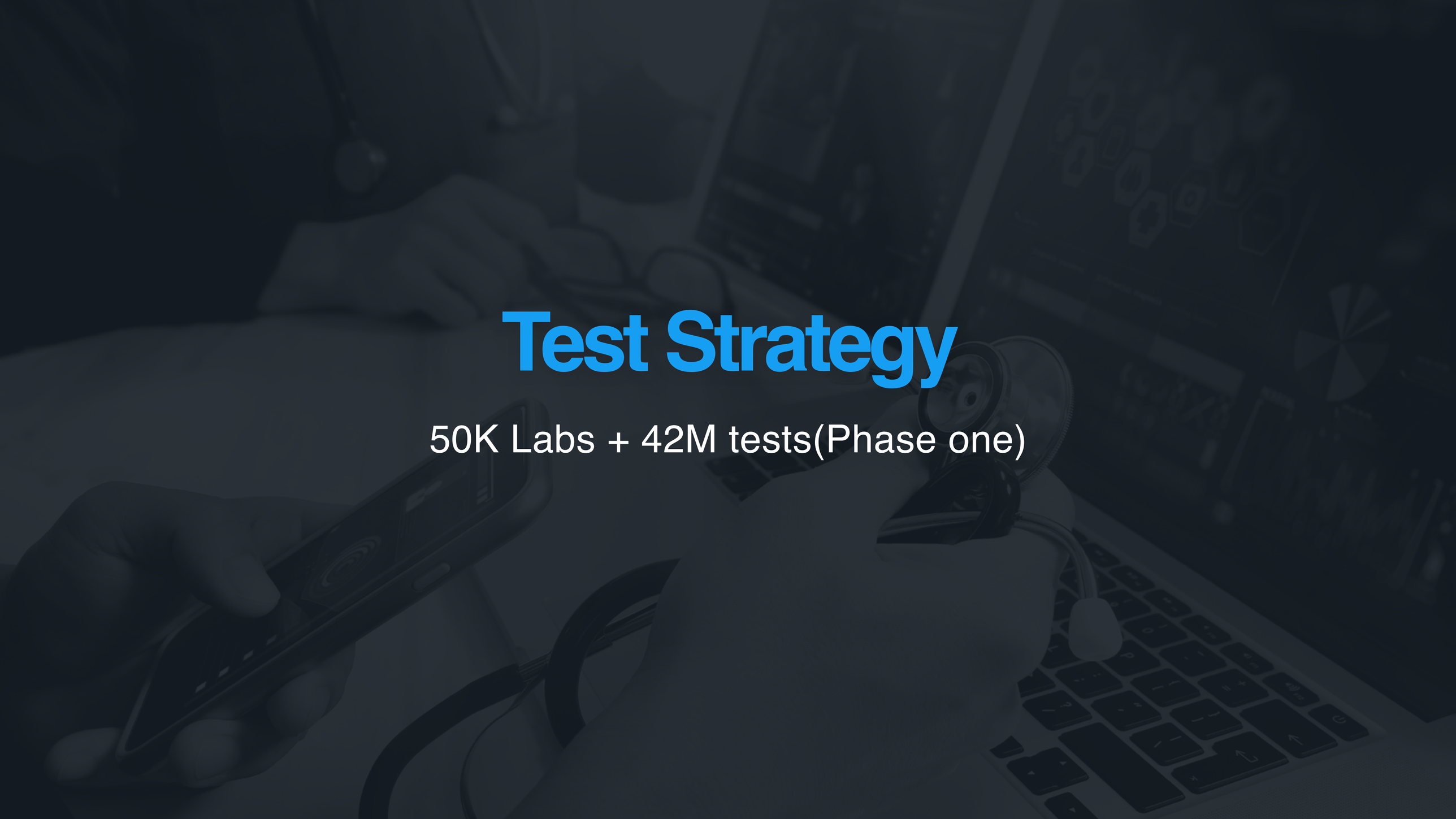
MONITOR CASES AND BEDS



Dashboard

CASES AND RESOURCES



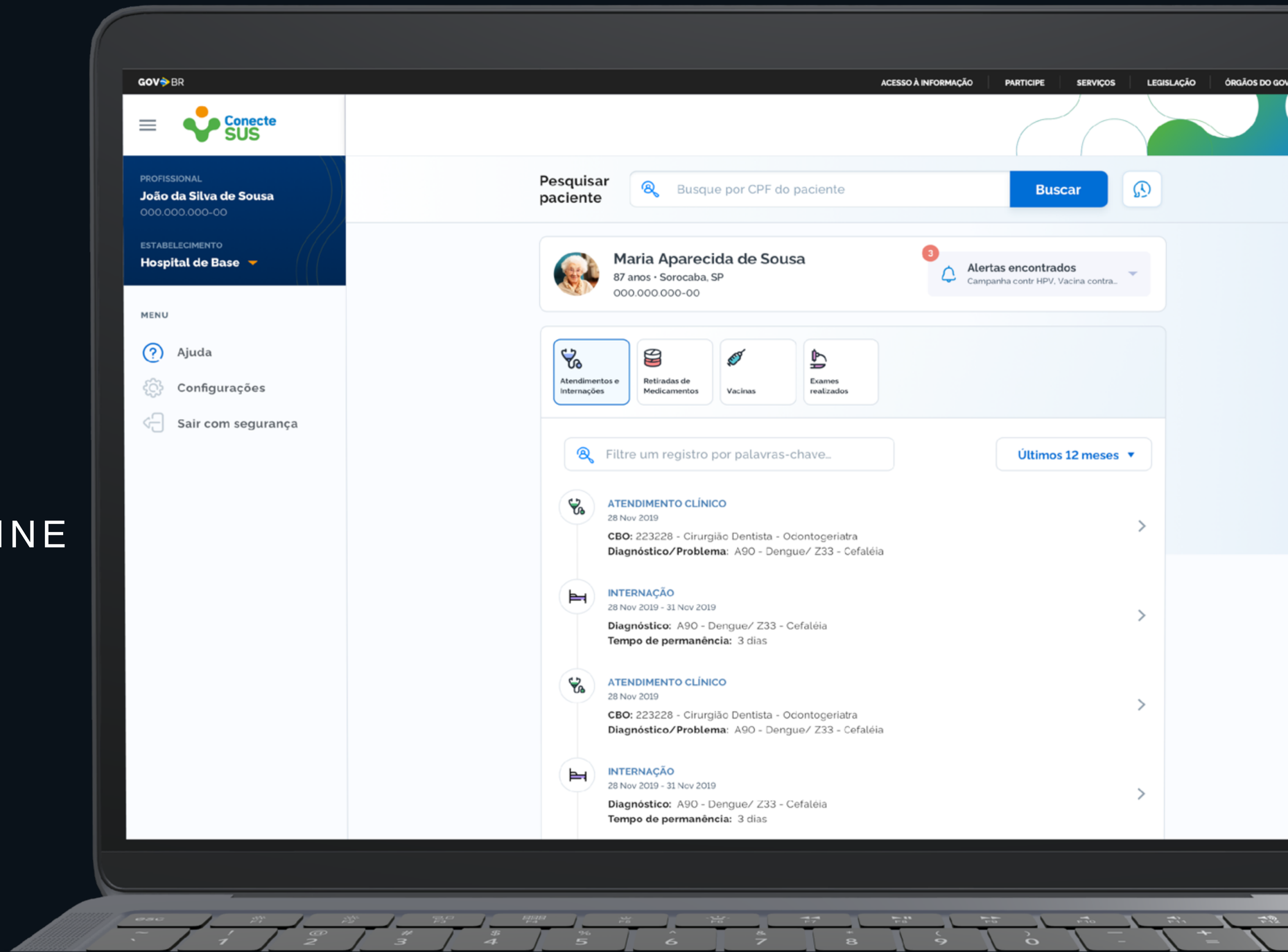


Test Strategy

50K Labs + 42M tests(Phase one)

ConecteSUS

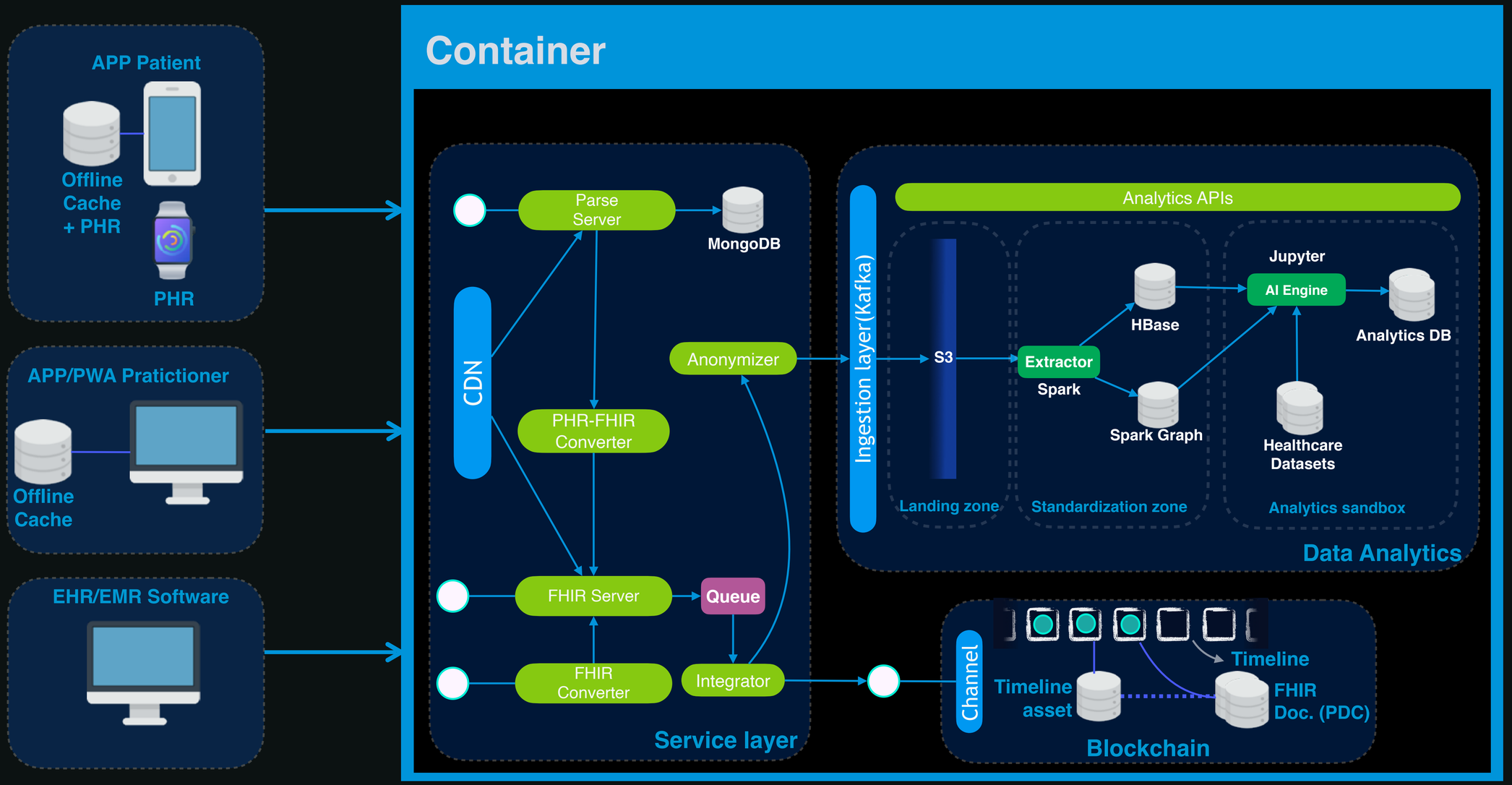
COVID'S EXAM RESULT + TIMELINE



Blockchain

Shared Timeline

Healthcare Architecture



Private Data Collection and GDPR*

Patient consent access to his data
in Smart Contract

Performance

2000 TPS(read and write) on AWS Cloud

RAFT Consensus(5 nodes)

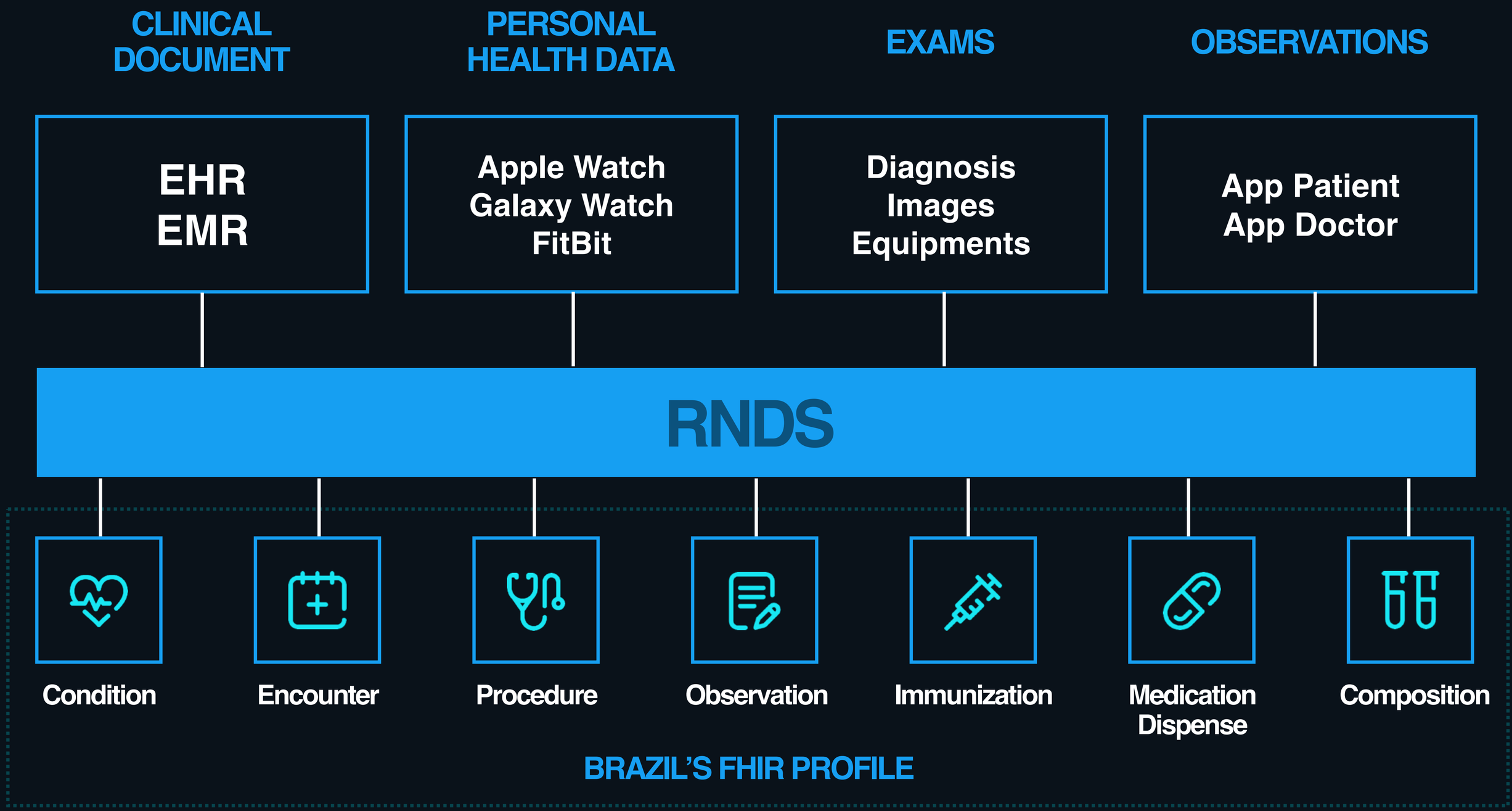
Timeline channel and Log channel

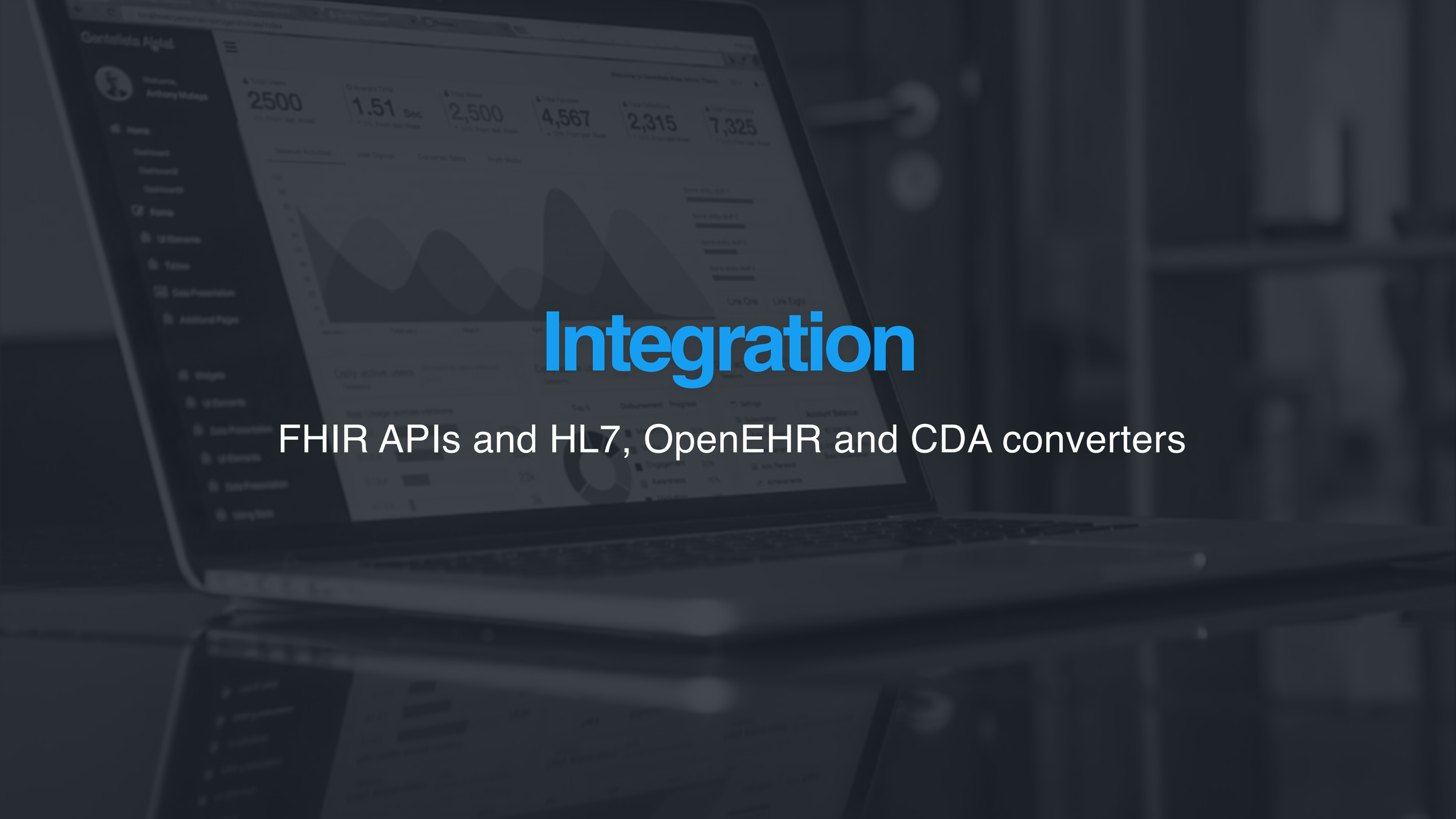
3 private data collections

CouchDB

FHIR Standard

Services ready for packaging messages in Brazilian standard


CLINICAL DOCUMENT
PERSONAL HEALTH DATA
EXAMS
OBSERVATIONS
EHR
EMR
Apple Watch
Galaxy Watch
FitBit
Diagnosis
Images
Equipments
App Patient
App Doctor
RNDS
Condition
Encounter
Procedure
Observation
Immunization
Medication Dispense
Composition
BRAZIL'S FHIR PROFILE



Integration

FHIR APIs and HL7, OpenEHR and CDA converters

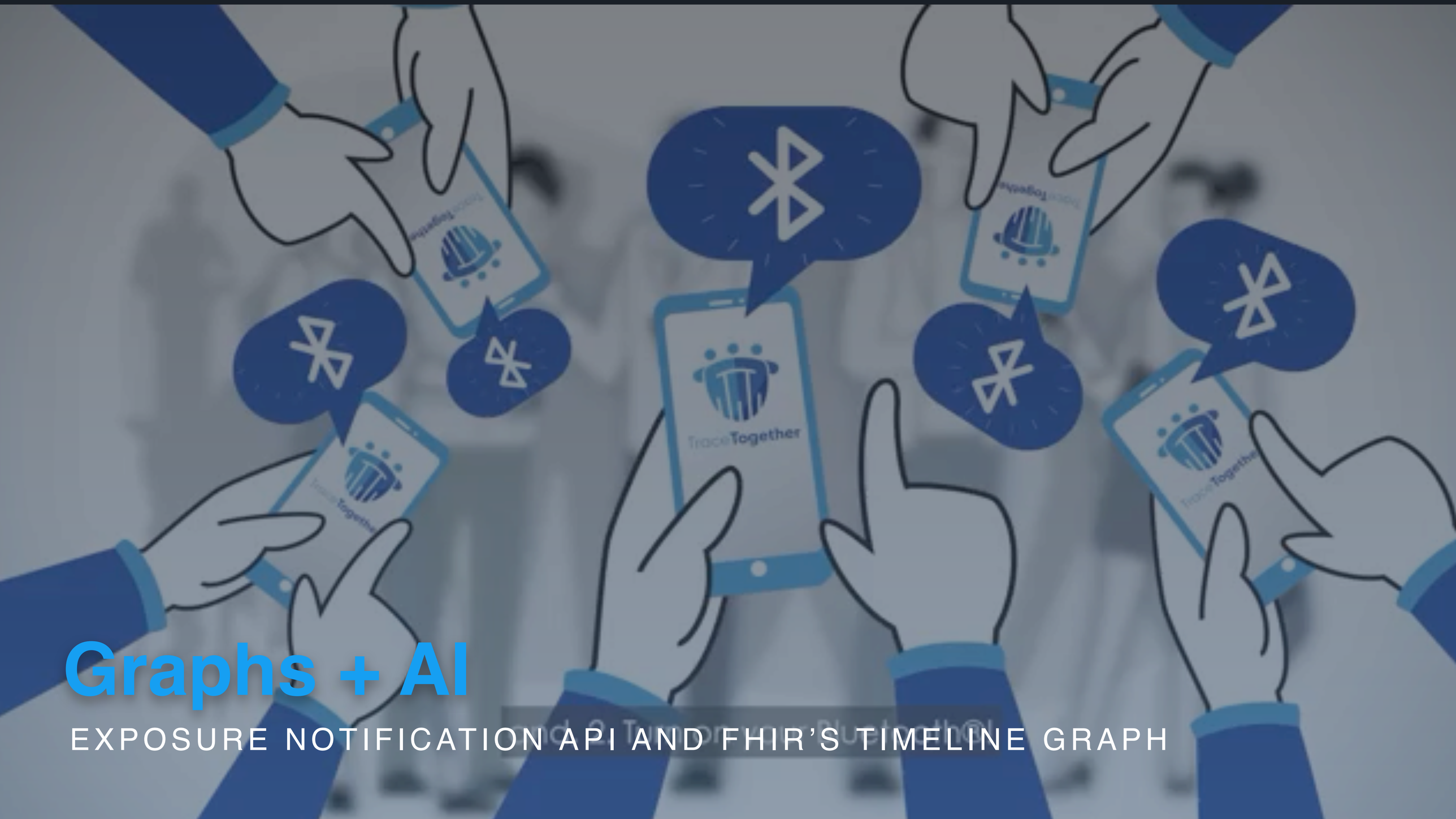
After the Pandemic

‘NEW NORMAL’: ARE WE PREPARED?

Blockchain + AI
Intelligent patient summary, Prognosis, Drug recommendation,…

Patient’s summary

USING AI WITH BLOCKCHAIN'S TIMELINE

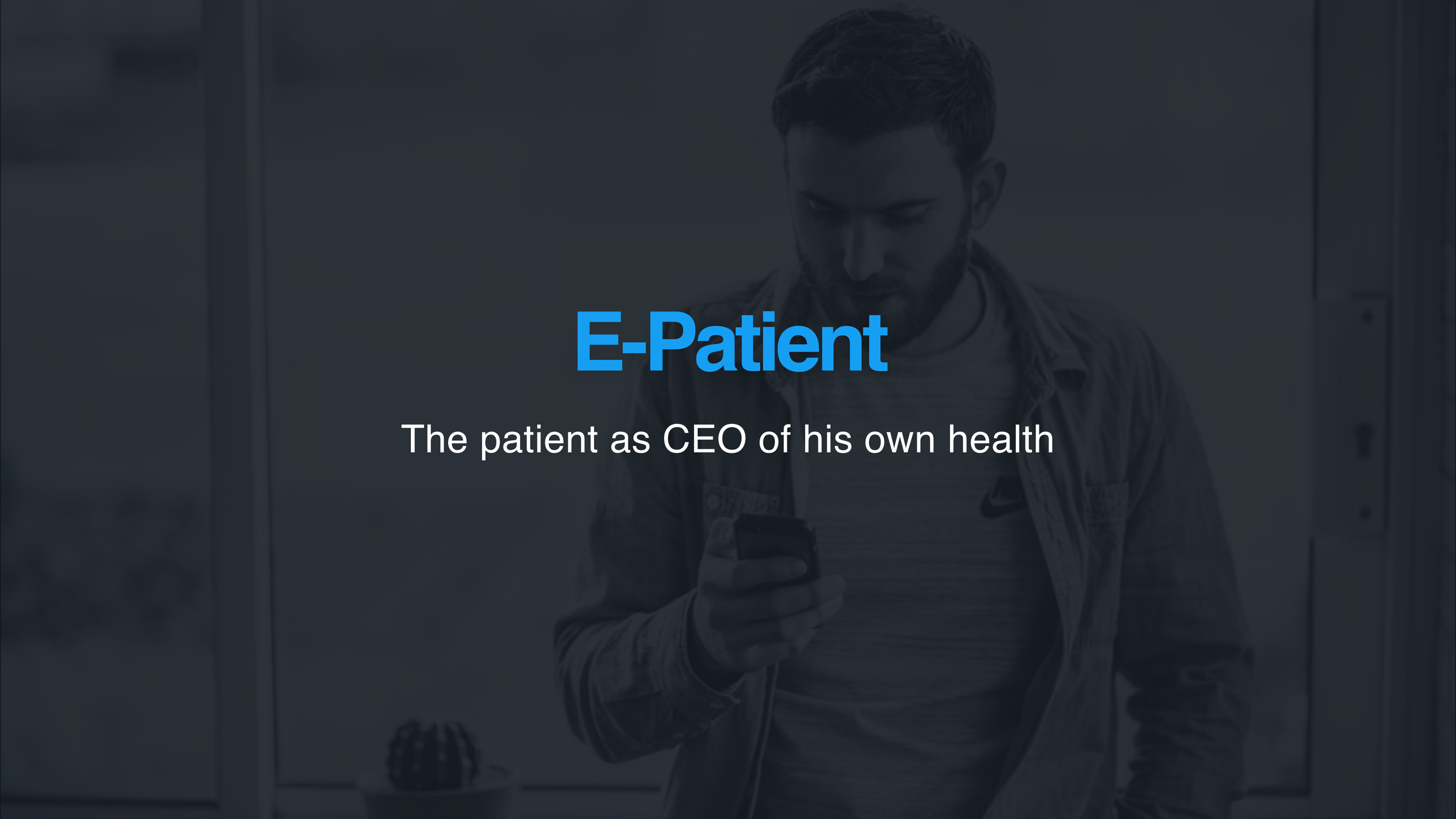


Graphs + AI

EXPOSURE NOTIFICATION API AND FHIR'S TIMELINE GRAPH

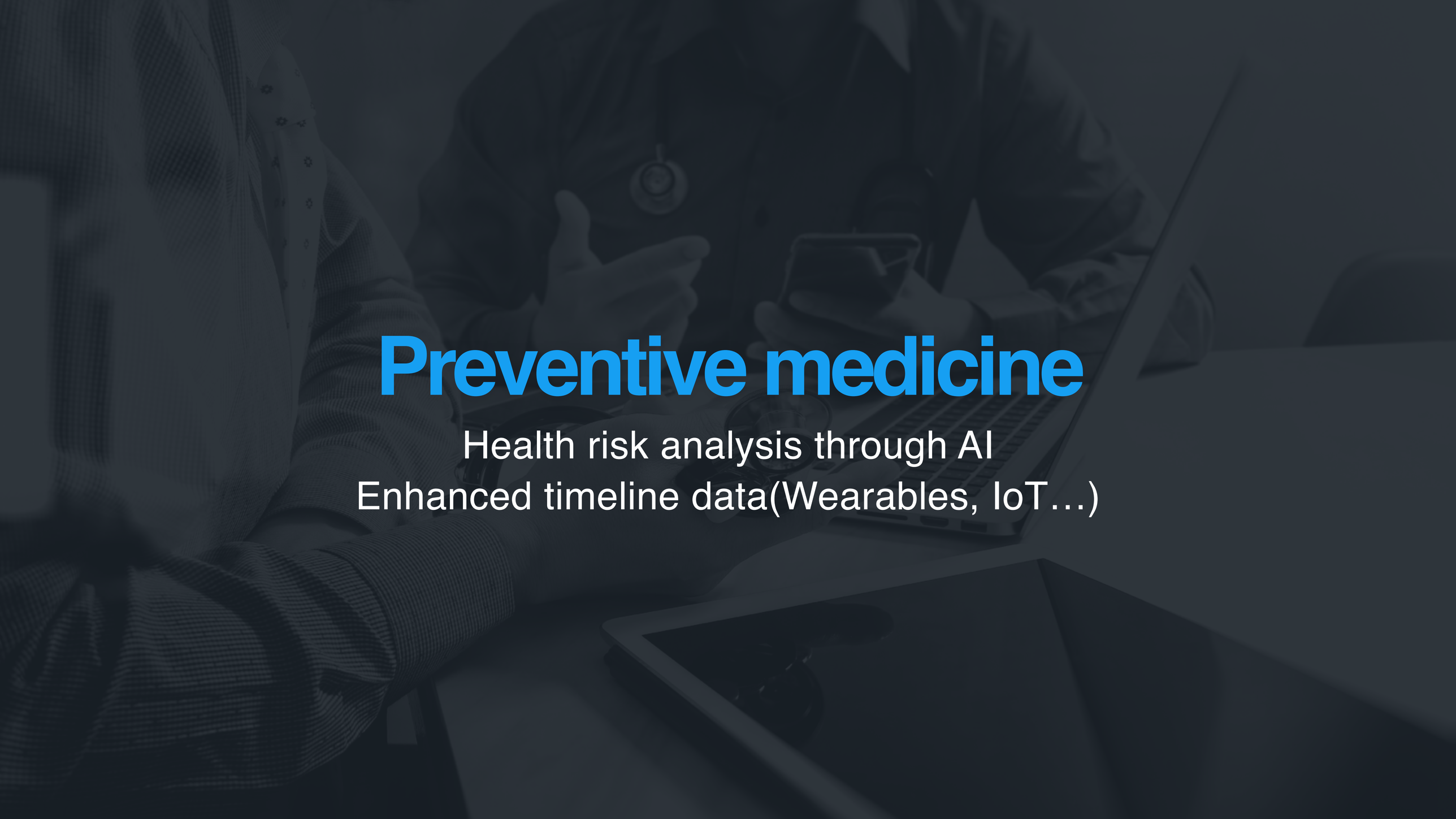
Rethinking Healthcare

Telemedicine, rapid tests, new approach on hospitals,…



E-Patient

The patient as CEO of his own health



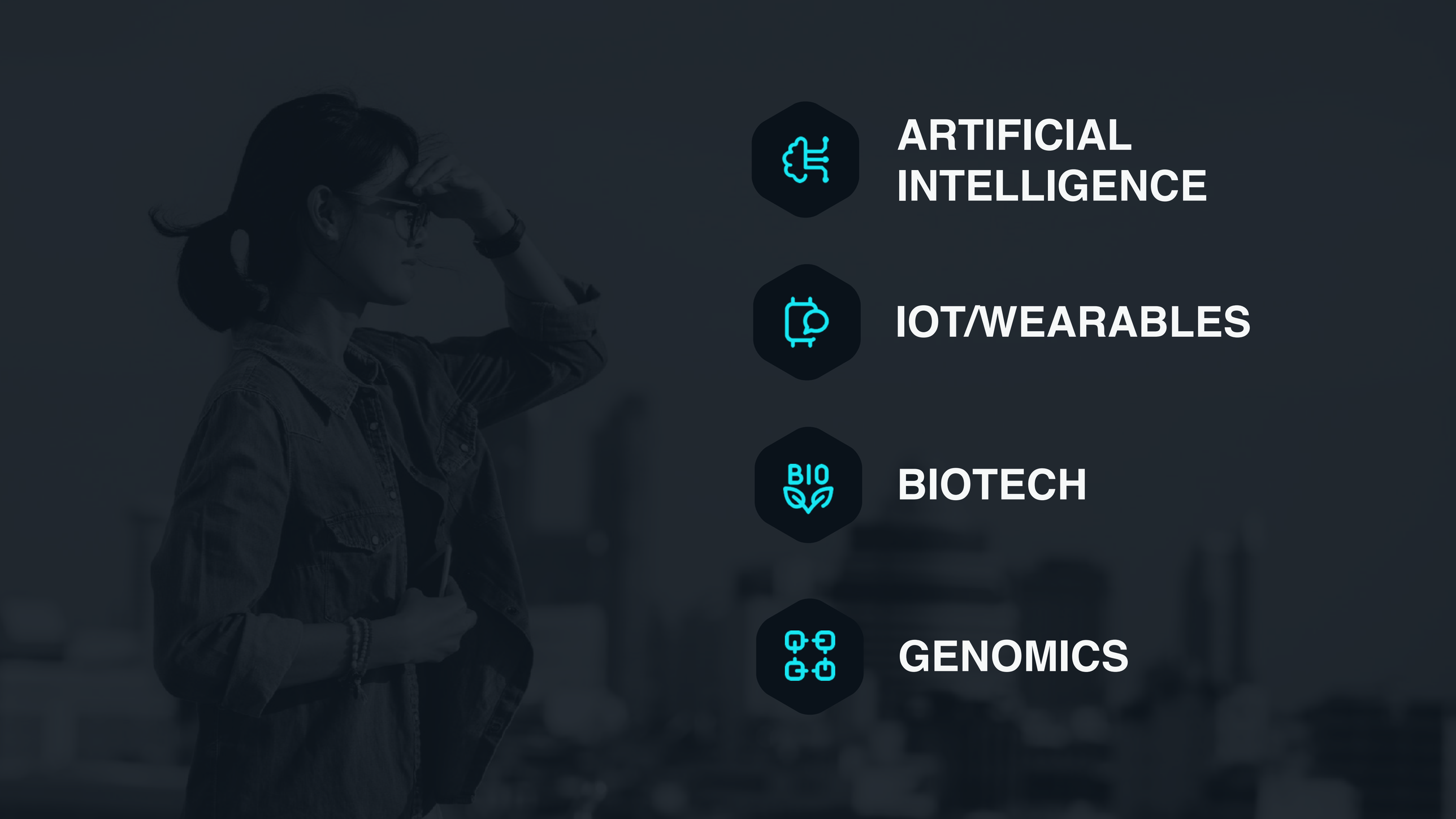
Preventive medicine

Health risk analysis through AI

Enhanced timeline data(Wearables, IoT…)

Longevity escape velocity

HEALTH MAINTENANCE: PROGNOSIS + PREVENTION + HEALTH MANAGER


ARTIFICIAL INTELLIGENCE
IOT/WEARABLES
BIO
BIOTECH
GENOMICS

Thank you!

Diógenes Firmiano
diogenesjf@gmail.com
+55 61 99426-4048