

Il tempo della Human Data Science

Big Data & AI per l'ottimizzazione della governace sanitaria

Luca Pinto – Principal RWI
Motore Sanità
Milano, 5 Dicembre 2019

Per molti anni l'efficienza ha dettato l'agenda del SSN

Fondo Sanitario Nazionale



nel 2017
112,6
Mld Euro

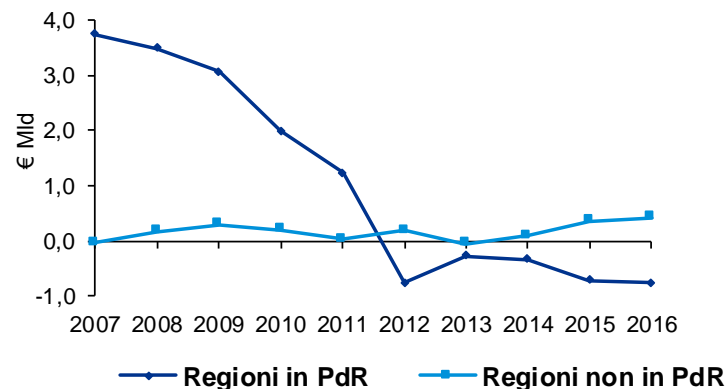
CAGR¹ = **+ 0,8%**

Evoluzione del deficit

... i Piani di Rientro hanno aiutato la riduzione del deficit complessivo



Variatione spesa per Regioni in PdR vs non in PdR



Costi del personale



nel 2017
34,3
Mld Euro

CAGR¹ = **- 0,9%**

Riqualificazione Ospedaliera



1.159
Ospedali
pubblici
e privati

Agenda

- Perseguire Piani di Rientro
- Lavorare Iso Risorse
- Riqualificare la Rete Ospedaliera
- Attivare un piano cronicità integrato



Fonte: Rapporto OASI 2016, Il Sole24Ore Sanità, Tavole SDO 2016, L'uso dei farmaci in Italia - Rapporto nazionale 2016, Monitoraggio della spesa sanitaria - Rapporto nazionale anno 2016

(1) Dal 2012

(2) Il divario tra il livello di finanziamento di «Patto per la Salute 2014-2016» e dopo il decreto di cui all'art. 1, co. 394, L'232/2016 è pari a 8,95 MLD di Euro nel 2018 e sarà pari a 10,94 MLD nel 2019

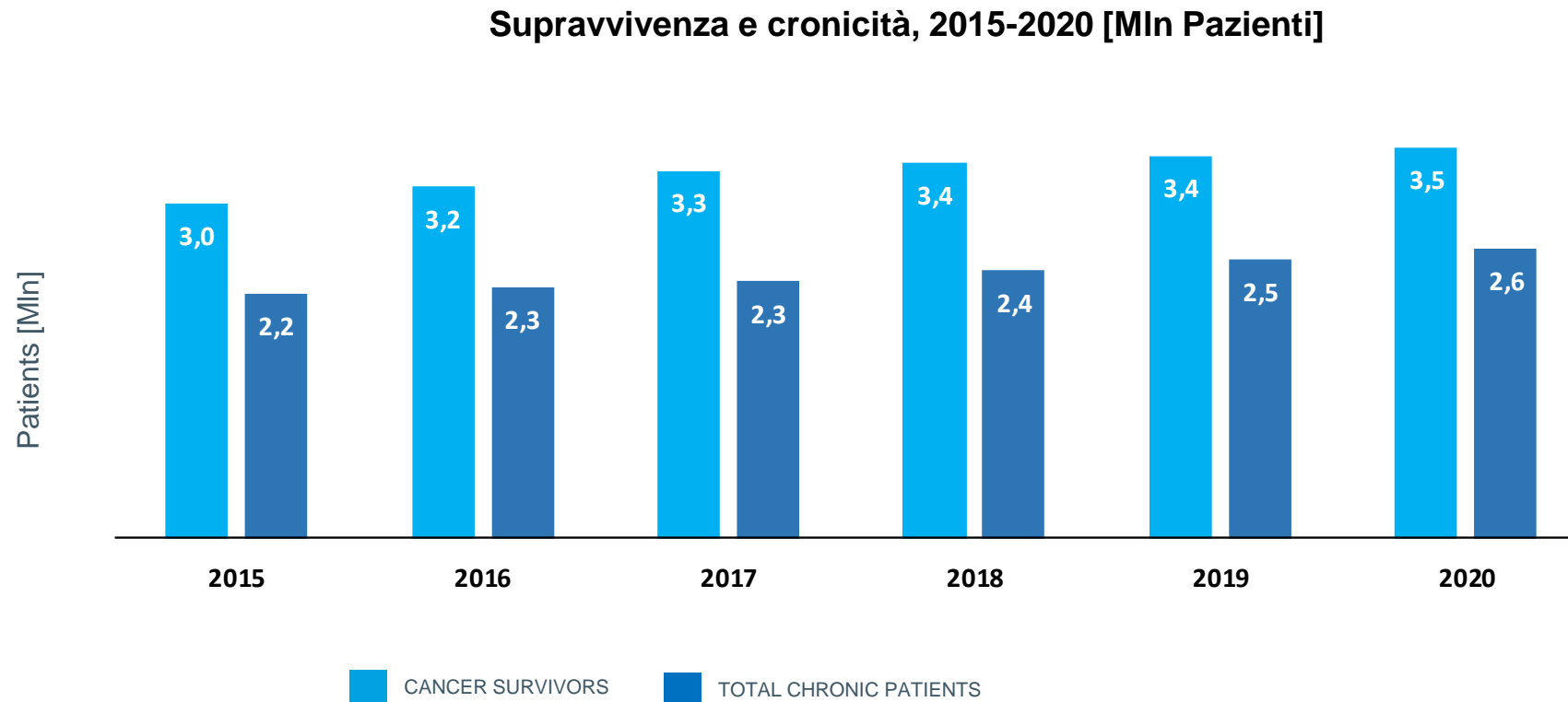
This presentation is confidential and must not be used for purposes other than those for which has been drawn up and must not be disclosed, reproduced and/or revealed to third parties without the prior written consent of IQVIA

Il futuro richiede un cambio di paradigma volto al Valore



La dinamica demografica assorbirà risorse crescenti anche associata a crescente cronicità e co-morbidità

La mortalità è diminuita in misura significativa anche nel caso di diagnosi di tumore



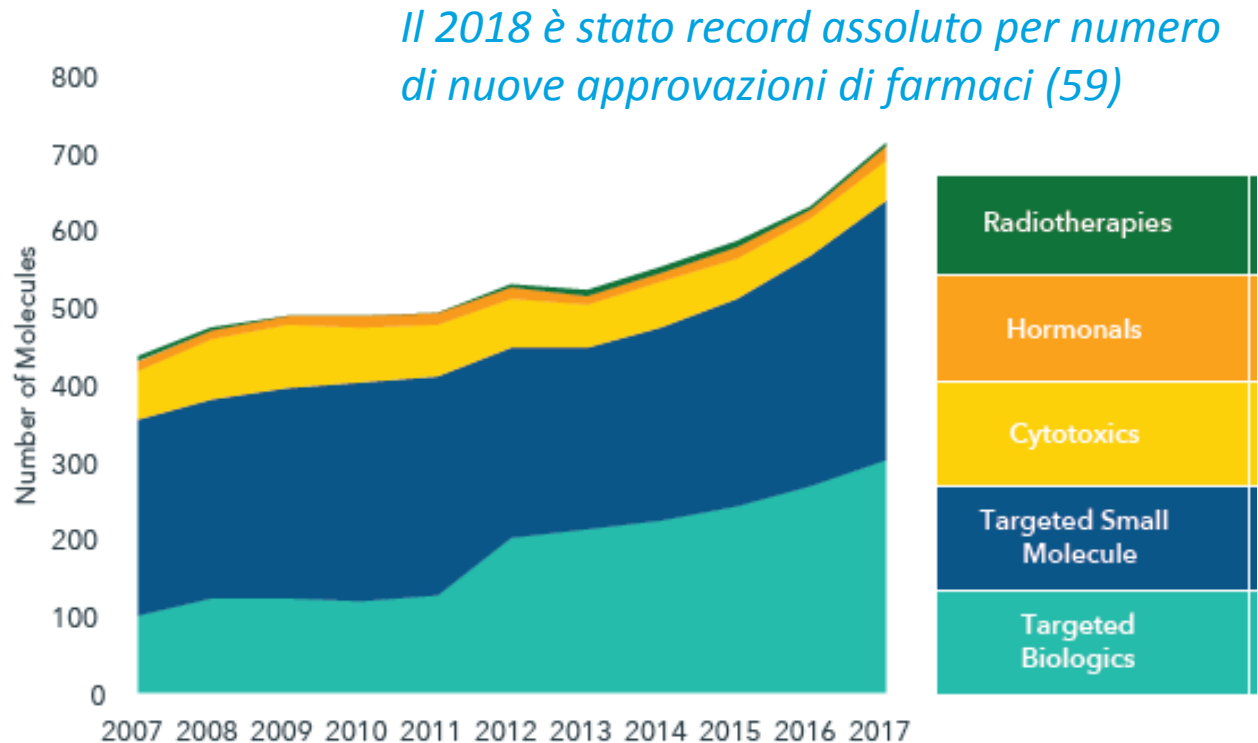
Source: AIRTUM - AIFA, Analysis IQVIA

This presentation is confidential and must not be used for purposes other than those for which has been drawn up and must not be disclosed, reproduced and/or revealed to third parties without the prior written consent of IQVIA

L'innovazione clinica accelera, a costi crescenti

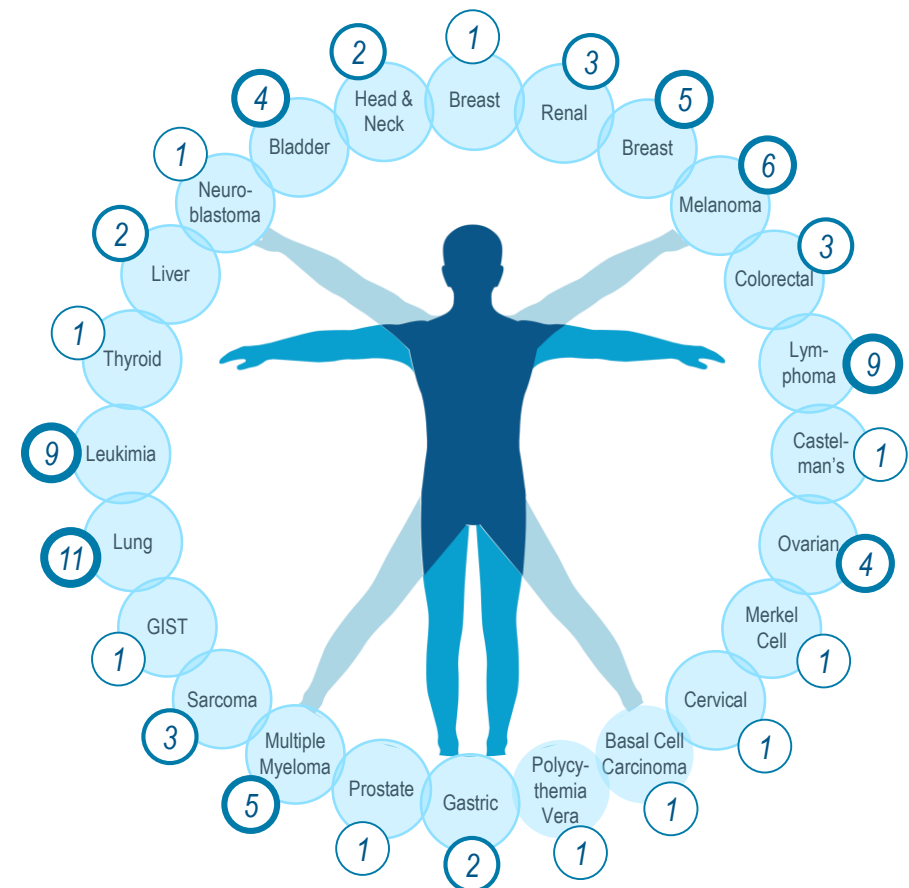
La pipeline in fase avanzata è cresciuta del 60% negli ultimi 10 anni

Numero Molecole in Sviluppo Clinico (2007-2017)



Source: IQVIA Oncology Global Trends 2018; IQVIA Institute April 2018

Nuovi Agenti in Sviluppo per Indicazione (2013-2017)



Gestione di cronicità e aderenza liberano risorse importanti

La gestione del paziente con patologie croniche

	Prevalenza	Trattati*	Aderenza
Iperensione	27,6%	67,5%	55,1%
Ipercolesterolemia	7,2%	36,5%	43,1%
Ischemia	7,6%	50,0%	77,0%
Diabete	5,5%	100,0%	62,1%
Asma-BPCO	5,9%	30,5%	14,2%
Depressione	7,5%	31,0%	38,4%
Osteoporosi	5,2%	39,0%	46,3%

*In trattamento regolare

Fonte: OSMED; *In trattamento regolare



Solo il **41%** dei cittadini affetti da una patologia è regolarmente in cura

Il grado di aderenza terapeutica è media è del **45%**

Il **60%** dei cittadini non si sente seguito nella gestione della patologia



11-12 miliardi, il possibile risparmio derivante da una maggiore presa in carico e maggiore aderenza terapeutica, in termini di minori costi sanitari di ricadute

	Forme farmaceutiche assunte giornalmente	Media numero/giorno	
	%	n.	
Pillole	92	4,07	1-2 pillole 40%
Gocce	22	10,79	3-4 pillole 26%
Bustine	17	1,23	5-9 pillole 28%
Iniezioni	8	1,89	10> pillole 6%
Supposte	2	1,08	
Sciroppo	3	1,62	
Cerotto	5	--	

Source: IQVIA, 2016, involving more than 700 people >65 years old

Source: IQVIA
© IQVIA 2018. All rights reserved.

In questo scenario, Big Data e l'AI accelerano l'innovazione di processo

Can accelerate the

4.8yrs to diagnosis

from onset of symptoms to first diagnosis of a rare disease

Can help find the

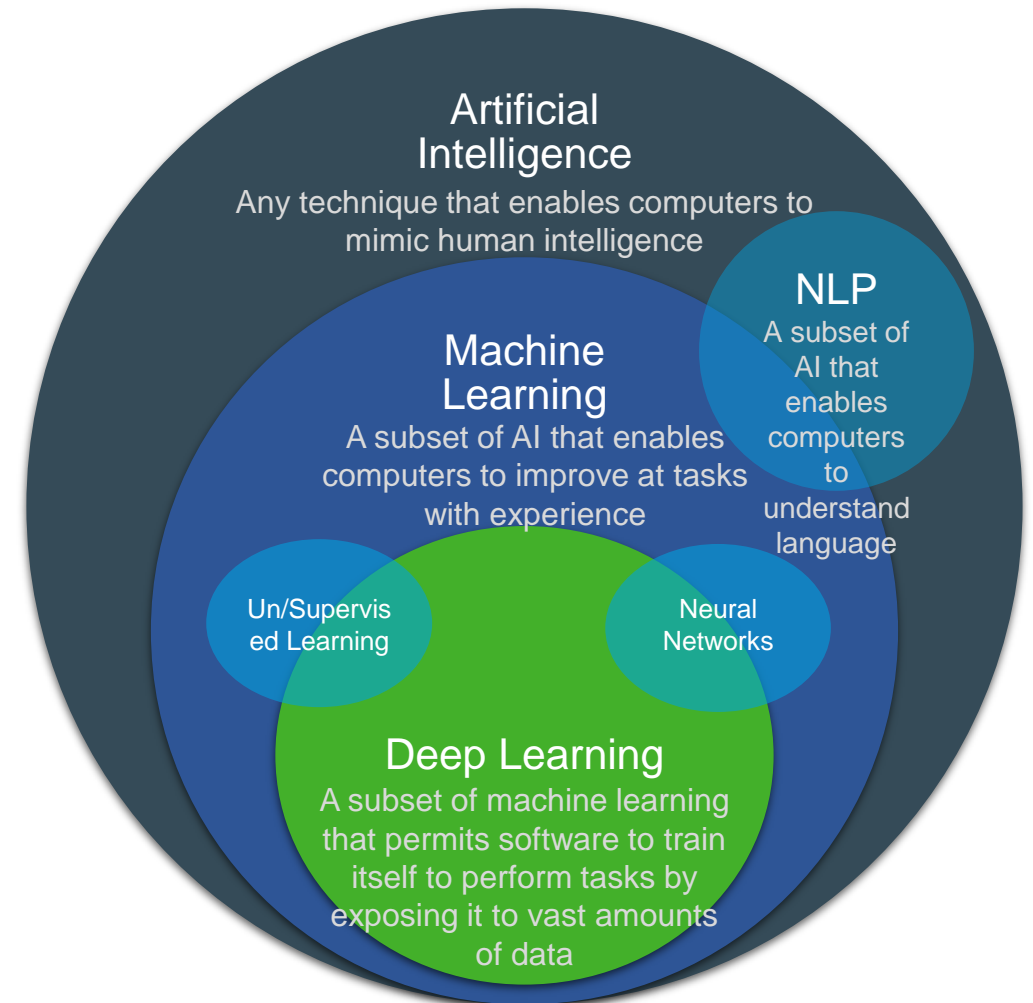
24% under-treated

of diabetics who are undiagnosed and untreated

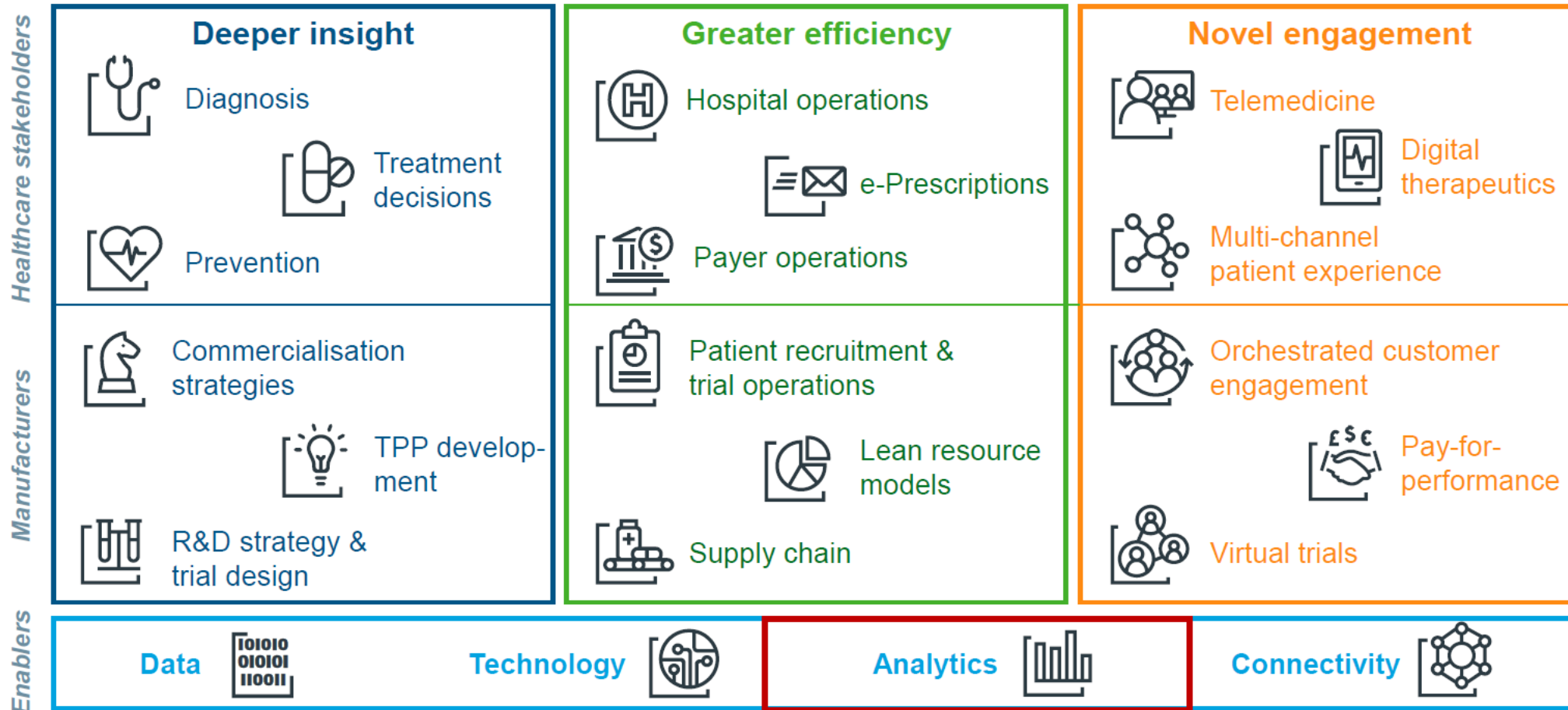
Can help address the

60% non-adherent

patients on chronic therapy who are not refilling their prescription after 6 months

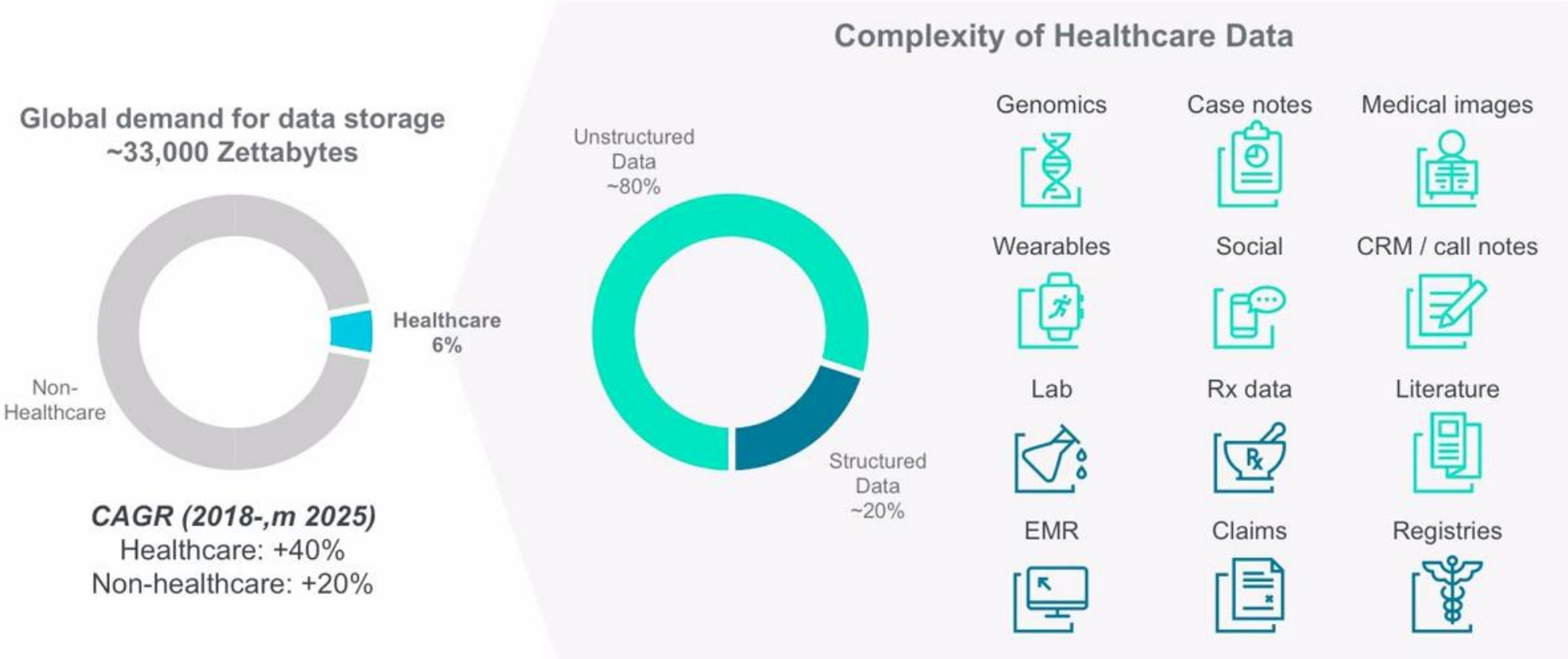


...sul fronte clinico/scientifiche così come su quello dell'efficienza e dell' «engagement», dimensioni sempre più interconnesse



Il potenziale è enorme...Le sfide da affrontare e vincere sono quelle della **qualità** dei dati, dell'**interconnessione** tra sistemi e piattaforme e della **corretta interpretazione** clinico-sanitaria e di costo/efficacia

Unparallel Volume and Complexity, beyond any other industry



Sources: IDC Research and Seagate Technologies whitepaper ("Digitization of the World")
 Copyright © 2019 IQVIA. All rights reserved.

... senza menzionare il tema della **verifica dei dati** e della gestione della **data privacy** che a loro volta hanno peculiarità uniche nel LS

13,160 views | Jan 30, 2018, 07:30am

How AI Is Transforming The Future Of Healthcare

Wired Security

Forbes Technology Council

AI has no place in the NHS if patient privacy isn't assured

MIT Technology Review

Connectivity

In blockchain we trust

Tech & Pharma giants invest in Blockchain technology

Google's DeepMind plans bitcoin-style health record tracking for hospitals

Tech company's health subsidiary planning digital ledger based on blockchain to let hospitals, the NHS and eventually patients track personal data

IBM WATSON, FDA TO EXPLORE BLOCKCHAIN FOR SECURE PATIENT DATA EXCHANGE

DHL and Accenture working on blockchain-based pharma supply chain project

DIGITAL HEALTH BRIEFING: Viant, GSK partner for blockchain in pharmaceuticals

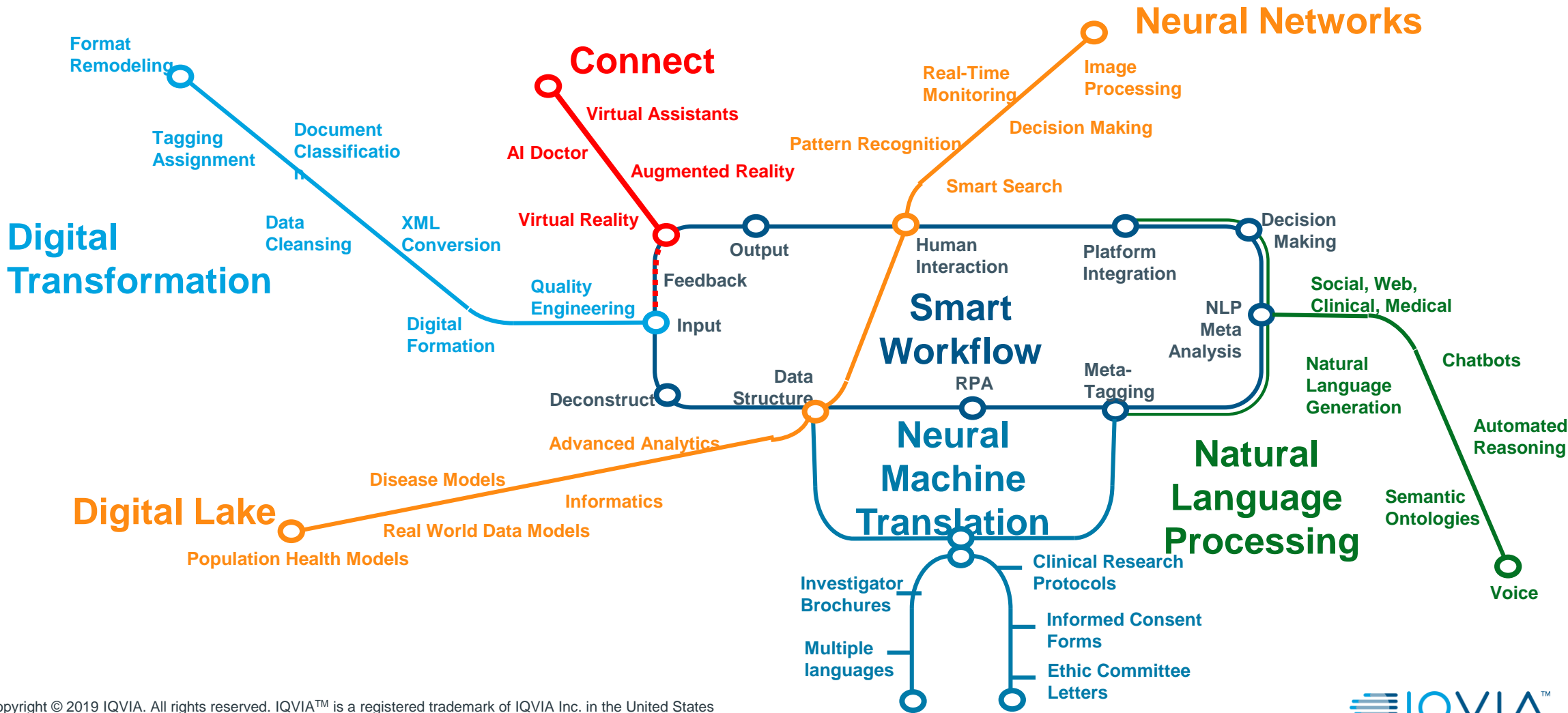
Big Pharma builds blockchain prototype to stop counterfeits

German Ministry of Health is looking for blockchain concepts too

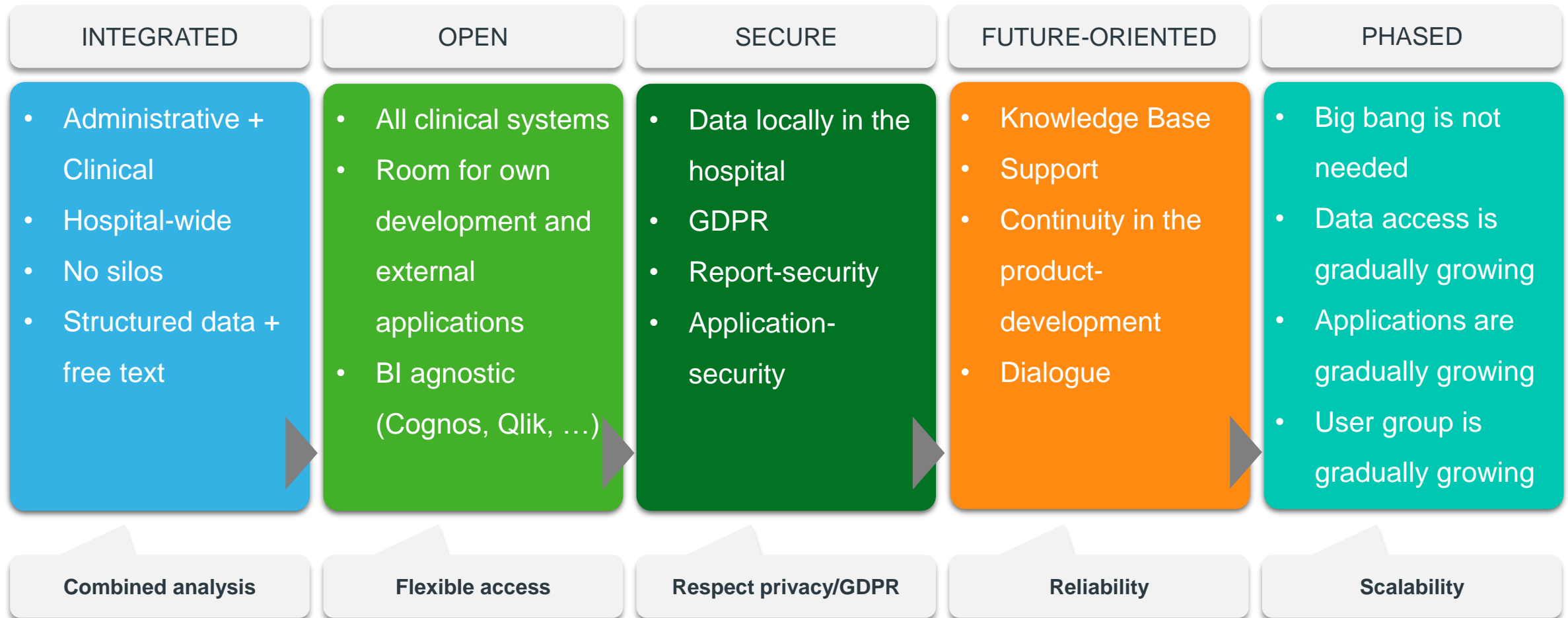

Wir suchen Ihr Konzept für die #Blockchain im deutschen Gesundheitswesen. Nehmen Sie an unserem Ideenwettbewerb teil und gewinnen Sie ein Preisgeld von bis zu 15.000 Euro für Ihre Idee. Infos unter: bundesgesundheitsministerium.de/blockchain


Wie können wir Blockchain-Technologien im deutschen Gesundheitswesen nutzen?
Jetzt bewerben und Preisgeld gewinnen

Il punto fondamentale è la reale capacità di creare valore, a fronte del rischio di favorire semplicemente un'esplosione di dati



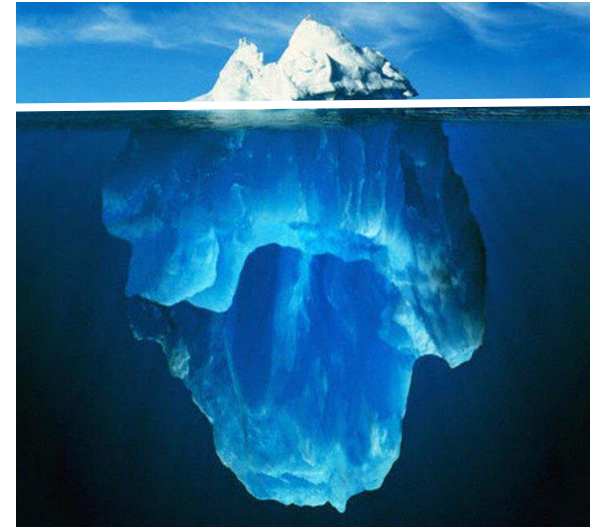
Le best practice IQVIA indicano la strada degli “umbrella frameworks”, capaci di indirizzare scelte clinico/sanitarie, economico/operative e strategiche



L'ambizione è interconnettere fonti diverse sfruttando piattaforme capaci di gestire e sincronizzare ecosistemi di dati diversi



Electronic Medical Record | Clinical systems



Structured data

Unstructured data

Reports
Protocols
Notes
Discharge letters
...

Rapidly evolving context



Technologies
Applications
Potential partners
Government
...

Il modello ospedaliero del futuro: un esempio pratico

CASE STUDY
Hs PLATFORMS

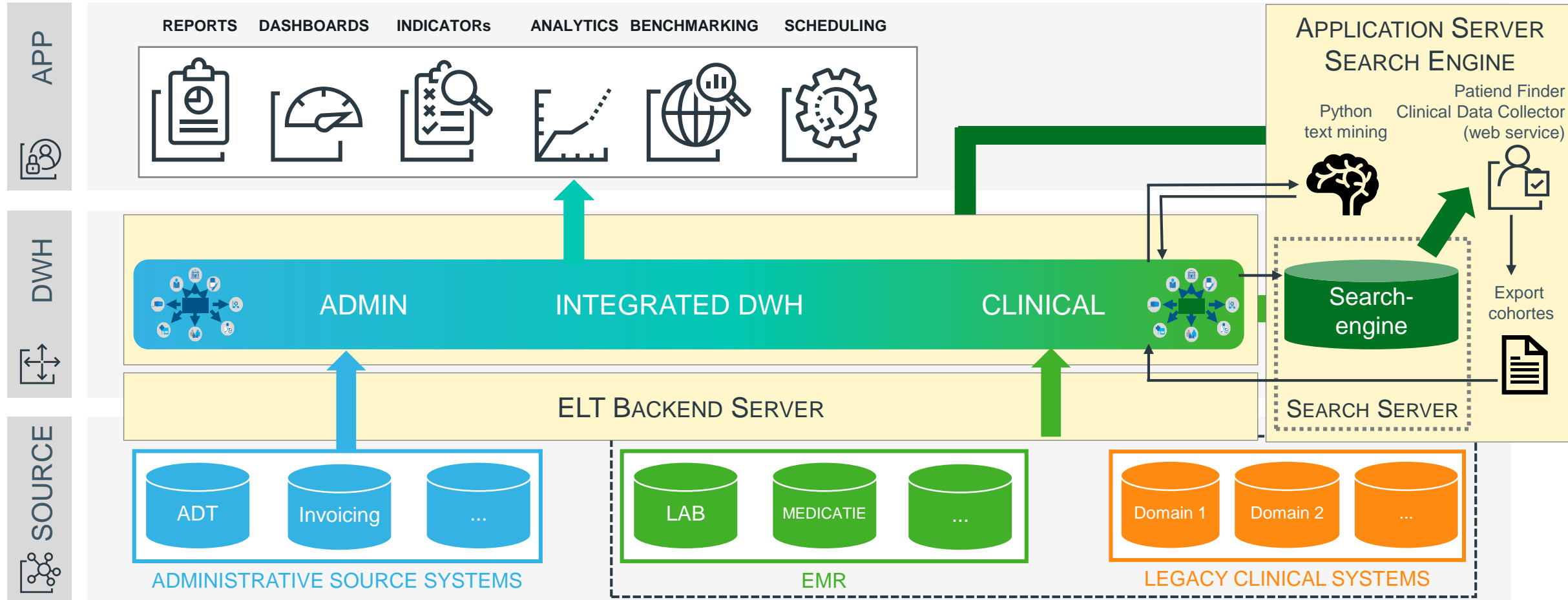
INTEGRATED

OPEN

SECURE

FUTURE-ORIENTED

PHASED



I benefici impattano tutti gli stakeholders del sistema

B E N E F I C I

PATIENT



- Higher quality of care (because of better access to outcome indicators)
- Personalised medicine
- Better treatment decision
- Earlier (rare) disease diagnosis
- Faster clinical trial enrollment
- Better patient experience

PHYSICIAN



- Easier access to his/her own EMR data
- View on outcome and quality indicators (e.g. PROMS - PREMS)
- Faster patient identification for clinical trials
- More efficient set up of patient cohorts
- Support in (rare) disease diagnosis

HOSPITAL



- Faster access to data enabling efficiency gains
- Monitoring of (quality) indicators
- Linked financial and clinical data for financial optimization
- Faster response to clinical trials improving chance to be selected
- Accelerate implementation of the EMR

PAYER



- Improved visibility on eligible patient population for drug treatment supporting evidence based reimbursement decision
- Better view on resource use and cost by disease diagnosis and severity
- Better monitoring of managed entry agreements

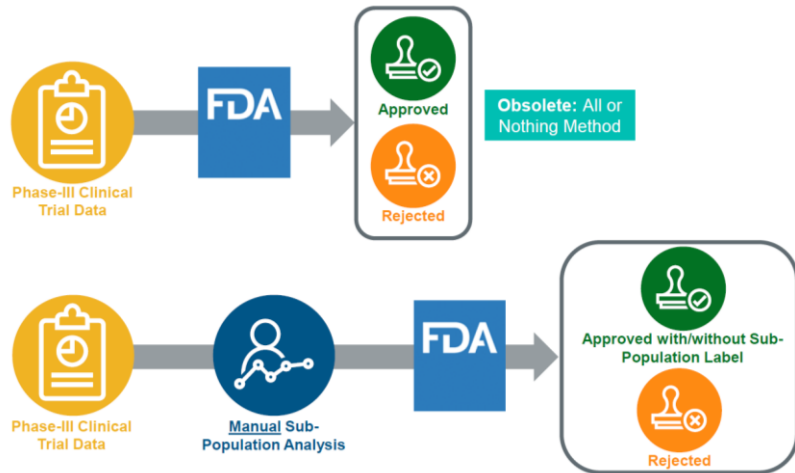
INDUSTRY



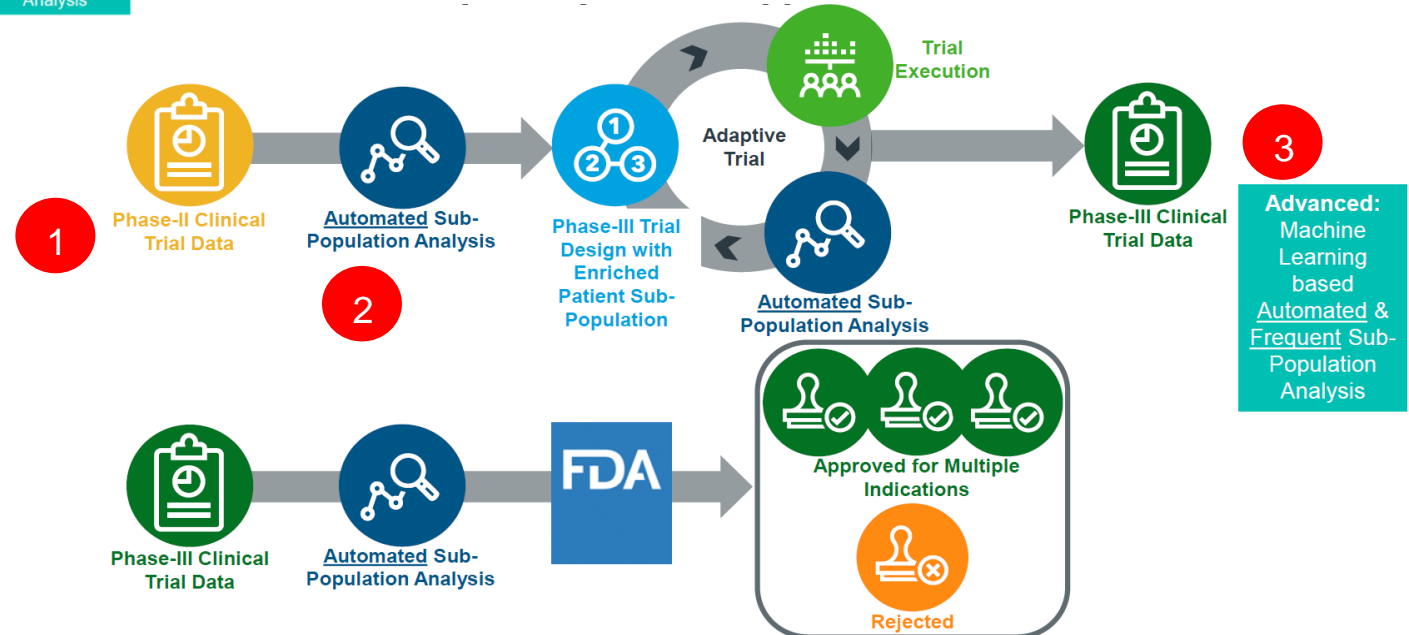
- Stronger evidence in reimbursement dossiers
- Better monitoring of managed entry agreements
- Reduced costs in R&D due to faster patient identification
- More robust patient based brand forecasts

Esempio: applicazioni ML per l'identificazione di sotto-popolazioni per arruolamento in studi clinici

MODELLO TRADIZIONALE



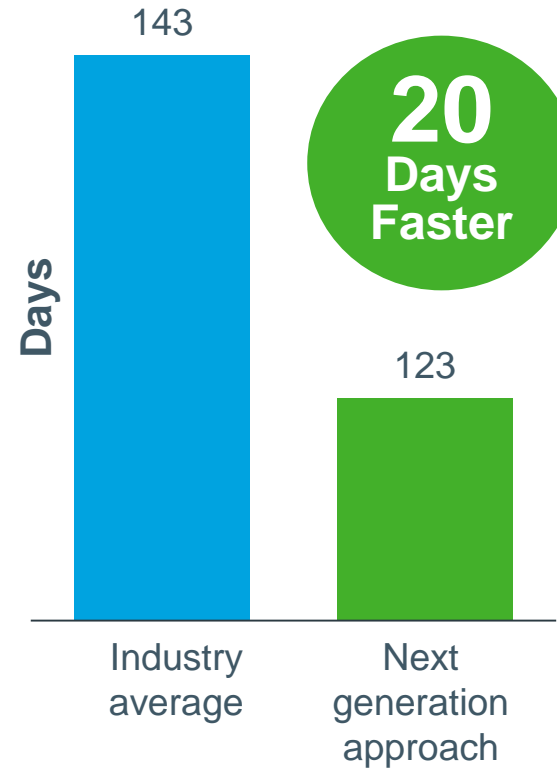
MODELLO «ENABLED» da ML



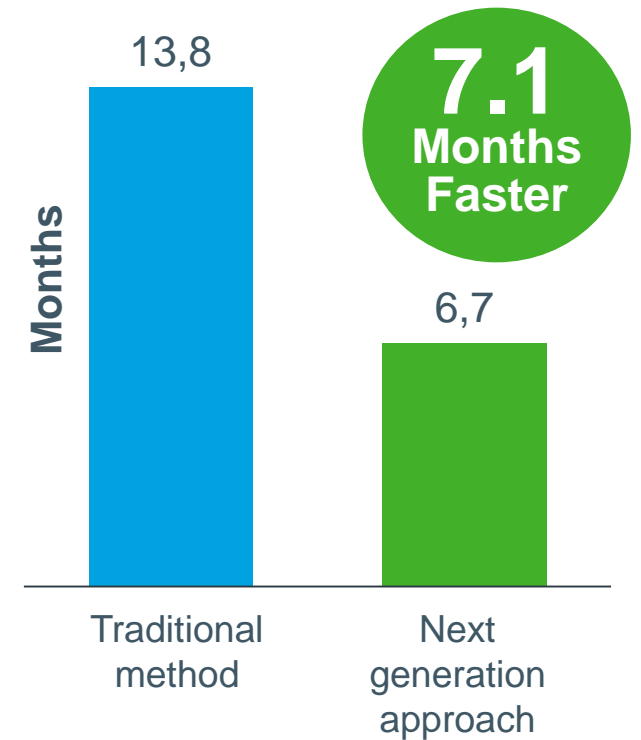
I benefici calcolati in ambito R&D sono importanti



SITE IDENTIFICATION



FIRST PATIENT ENROLLED



ENROLLMENT MONTHS

Modelli predittivi basati su cartelle cliniche ospedaliere per migliorare la diagnosi in malattie rare

Background



- **Under-diagnosis** is a major issue and patients are often **misdiagnosed**
- Patients with this **rare disease** have very high levels of activity pre-diagnosis: **on average, a patient has 25 hospital events in the 3 years prior to diagnosis.**

Challenge

- Above observations suggest medical history data could be used to reveal undiagnosed patients and detect patients earlier in the disease course

Implementation and Impact

IQVIA built a data-driven predictive model to enable better detection of these hard-to-find patients and support earlier diagnosis and access to proper care



Data extract

Used data from partnership with leading clinical centre and integrated with national hospital records to define patients' medical history based on **700 prioritised clinical codes**



Capture complexities in data

Examined the **frequency, timing, and number of unique events** defined by clinical and activities' codes to predict patients earlier in disease course



Identify key predictors

Identified **key primary and secondary diagnoses as well as specialty visits** that differentiated patients with the disease versus those without

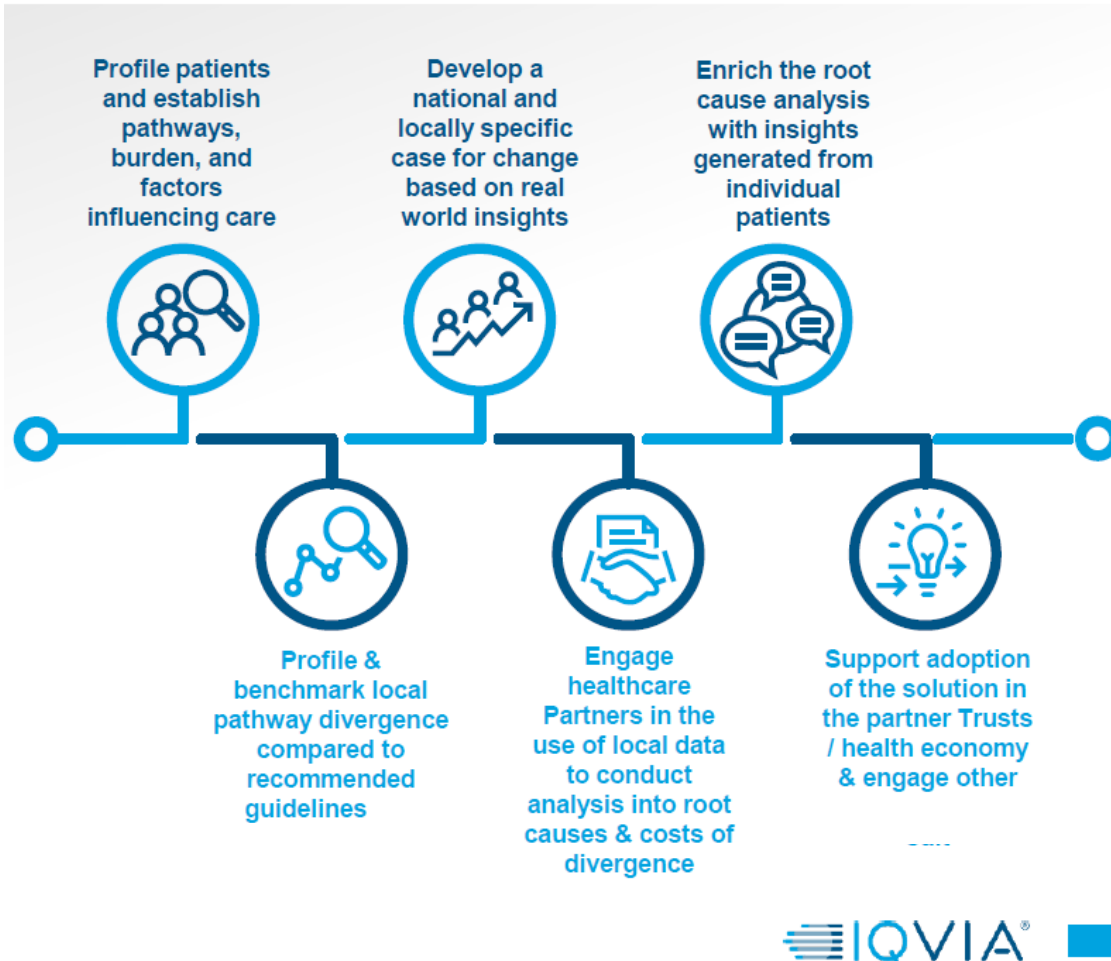


Deploy machine learning model

Performance of model **exceeded KOL expectations** – discussions now focused on developing screening tool to be deployed at specialty care clinical sites

Applicazioni basate su analisi ed ottimizzazione del patient pathway, secondo un modello “Health Value Based”

CASE STUDY
PP Optimization

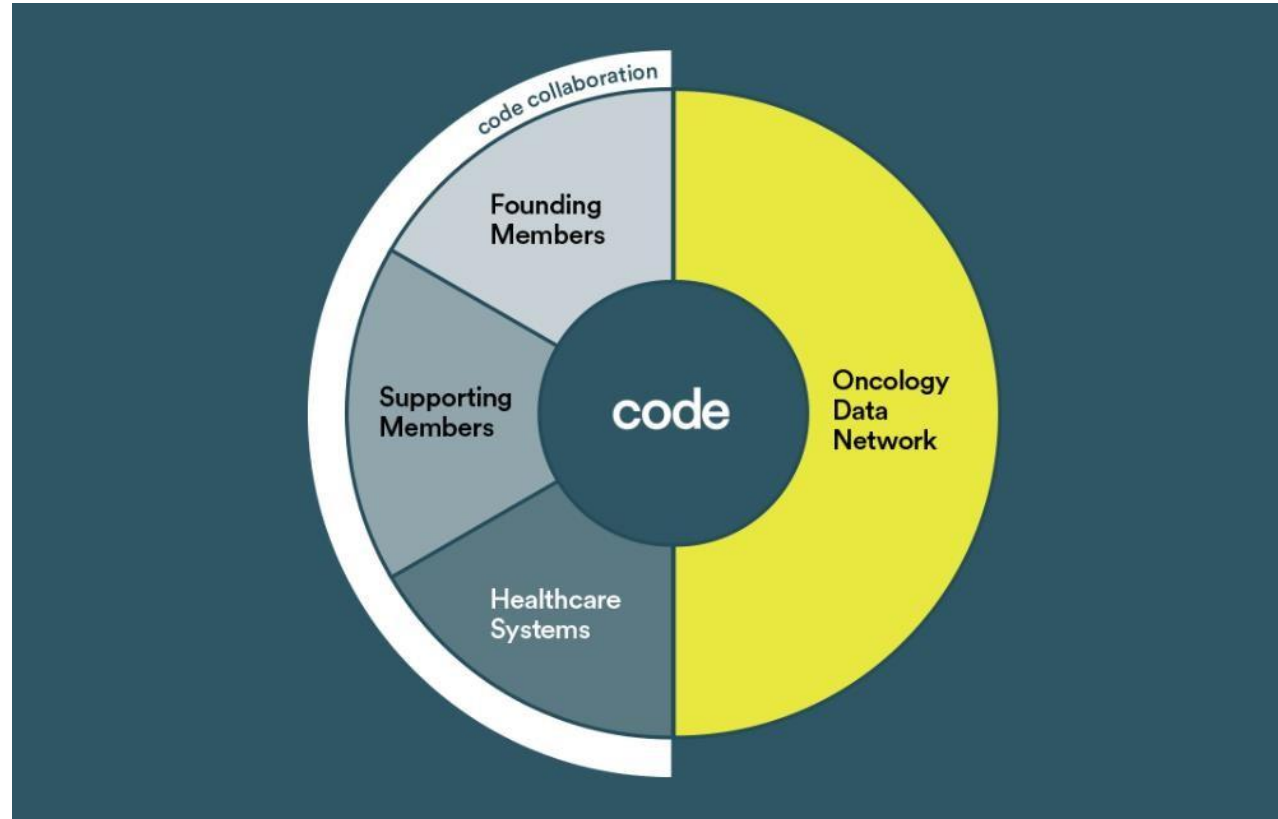


REQUISITI ed OPPORTUNITA'

- **Sistemi Informativi Digitali ed Interoperabili:** ospedale, territorio...ed oltre (Population Health Mngt)
- **Regole chiare e trasparenti** di accesso e trattamento (GDPR compliant) per applicazioni Big Data cross-platforms
- Apertura a sperimentare **setting sanitari «orizzontali» (dalle attività ai pazienti)**, ottimizzando ruoli e competenze
- Puntare sull'**eccellenza del sistema sanitario**, come fonte di attrazione risorse/investimenti Paese
- **Consentire al privato** di essere risorsa del sistema...

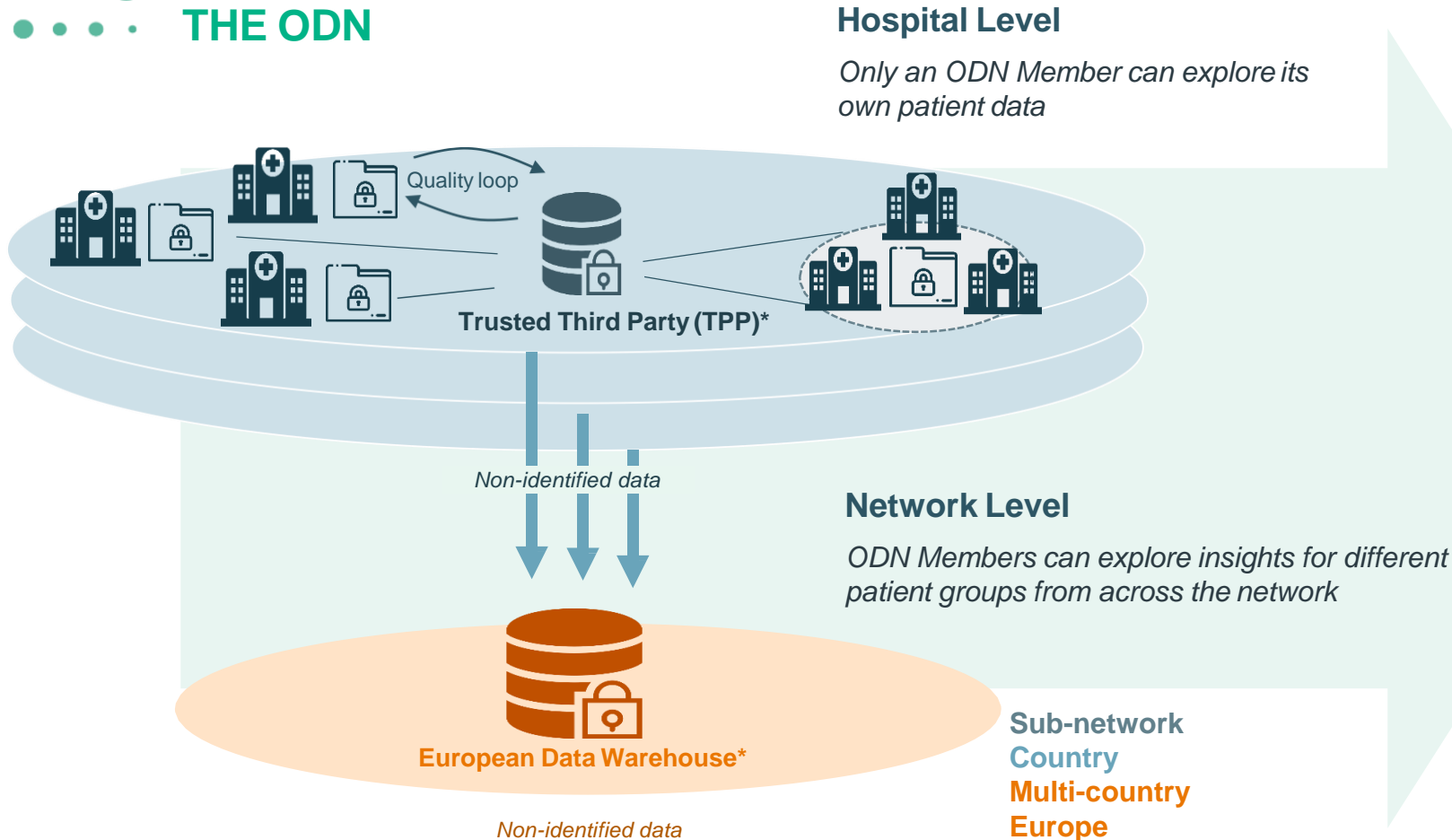
CODE is the European multi-stakeholder, collaborative group, led by IQVIA, that is supporting the creation of the Oncology Data Network (ODN)

CASE STUDY
CODE



We are building a flexible platform which extracts data from existing clinical systems, any European cancer treatment centre and for all cancer types

THE ODN



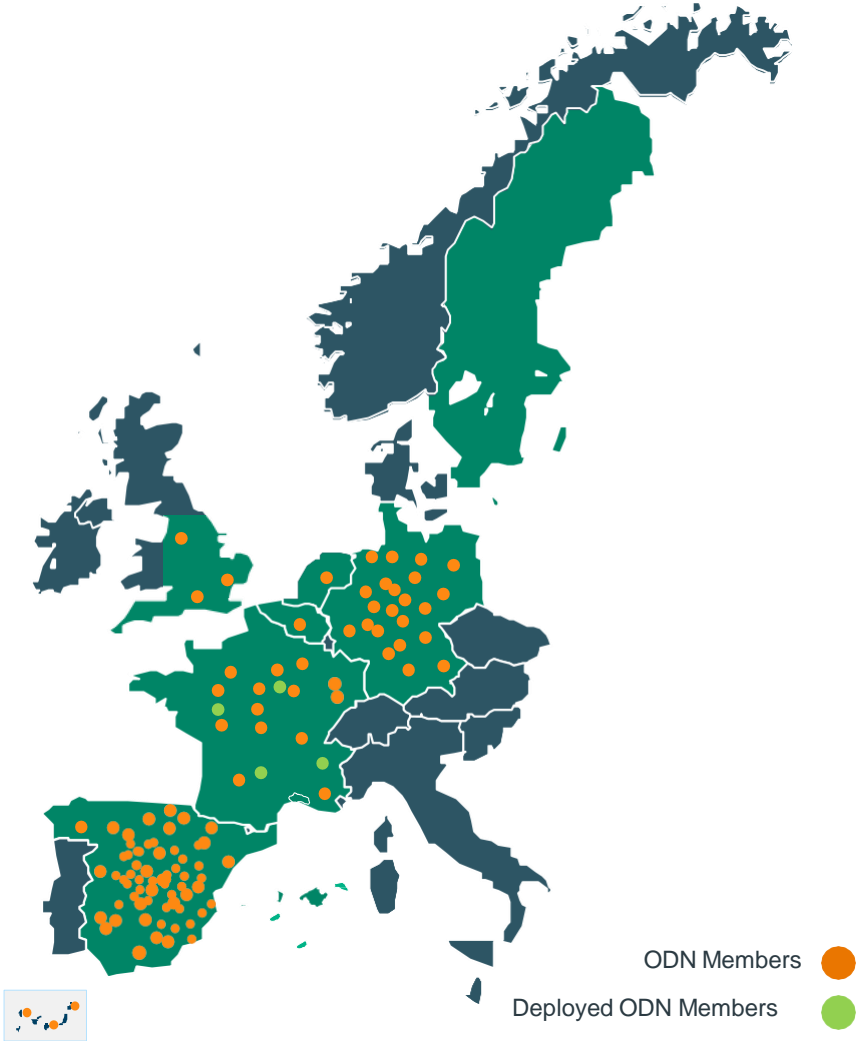
Healthcare Analytics
Analytical outputs only n>=5



A community to connect



The current footprint in Europe is growing rapidly with 110 member hospitals and first insights are being generated



110
ODN Member hospitals*

11 Academic Hospitals
99 Non-academic Hospitals

6+
Countries in scope

38 Public
72 Private

77,000+
Est. Annual Patients on Anti-Cancer Therapy

*As of April 2019



IMS Health & Quintiles are now



Luca Pinto
Principal Real World Insights

luca.pinto@iqvia.com
+39 346 7224409