

# HL7 FHIR

## Quo Vadis?

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CEO, Health Level 7

AMDIS PCC  
Ojai  
19 June 2019



Starting point:  
The average  
college graduate  
can retain 3 facts  
in 45 minutes.\*



\* I'll try to stick to the high points,  
and yes, you can have all of the slides

*HL7 FHIR  
is a Community*



“We can’t solve problems with the  
same kind of thinking when we  
created them.”

Albert Einstein



My coach said that I  
kick like a girl.

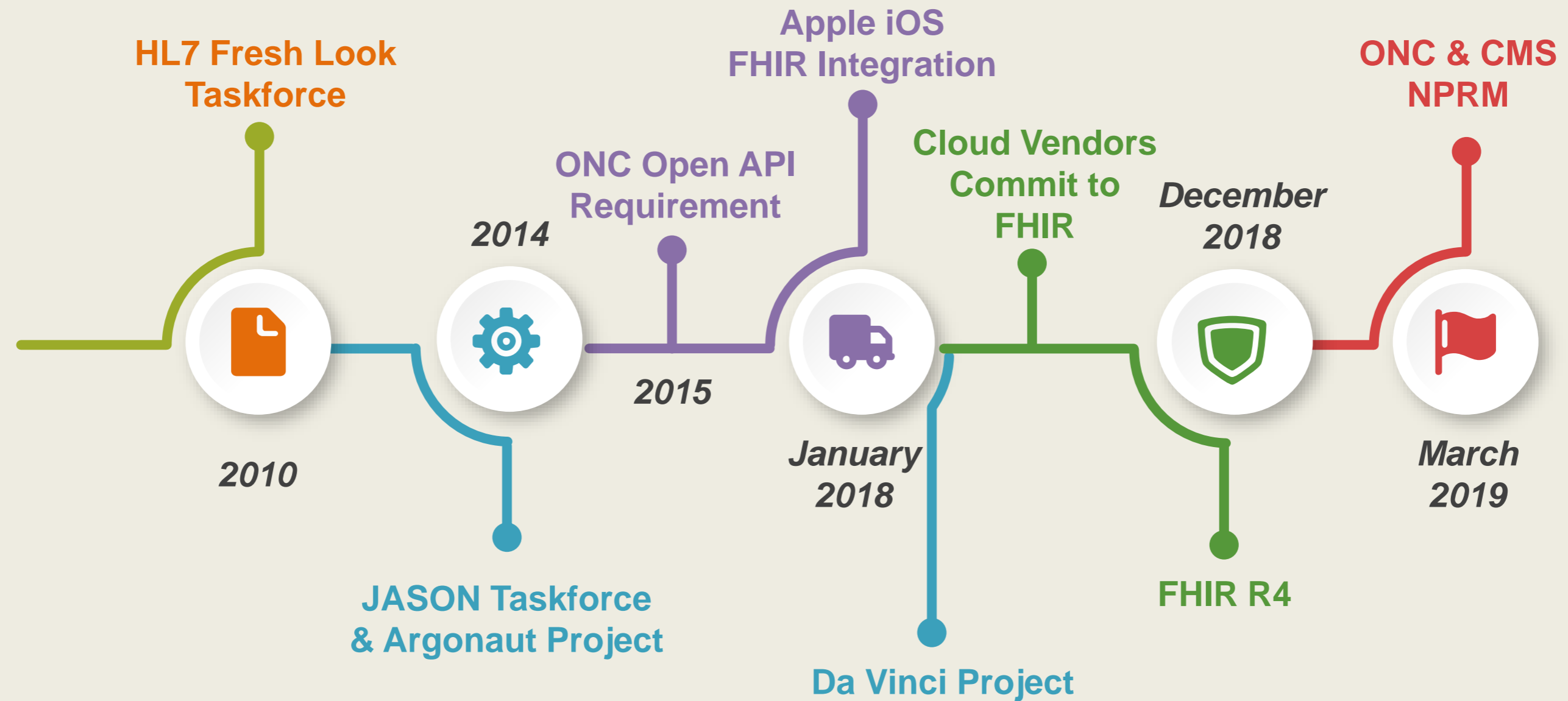
I told him that if he  
tried harder, he  
could too.

Mia Hamm

HL7 FHIR took more  
than a good idea

It took a community.

# HL7 FHIR Timeline

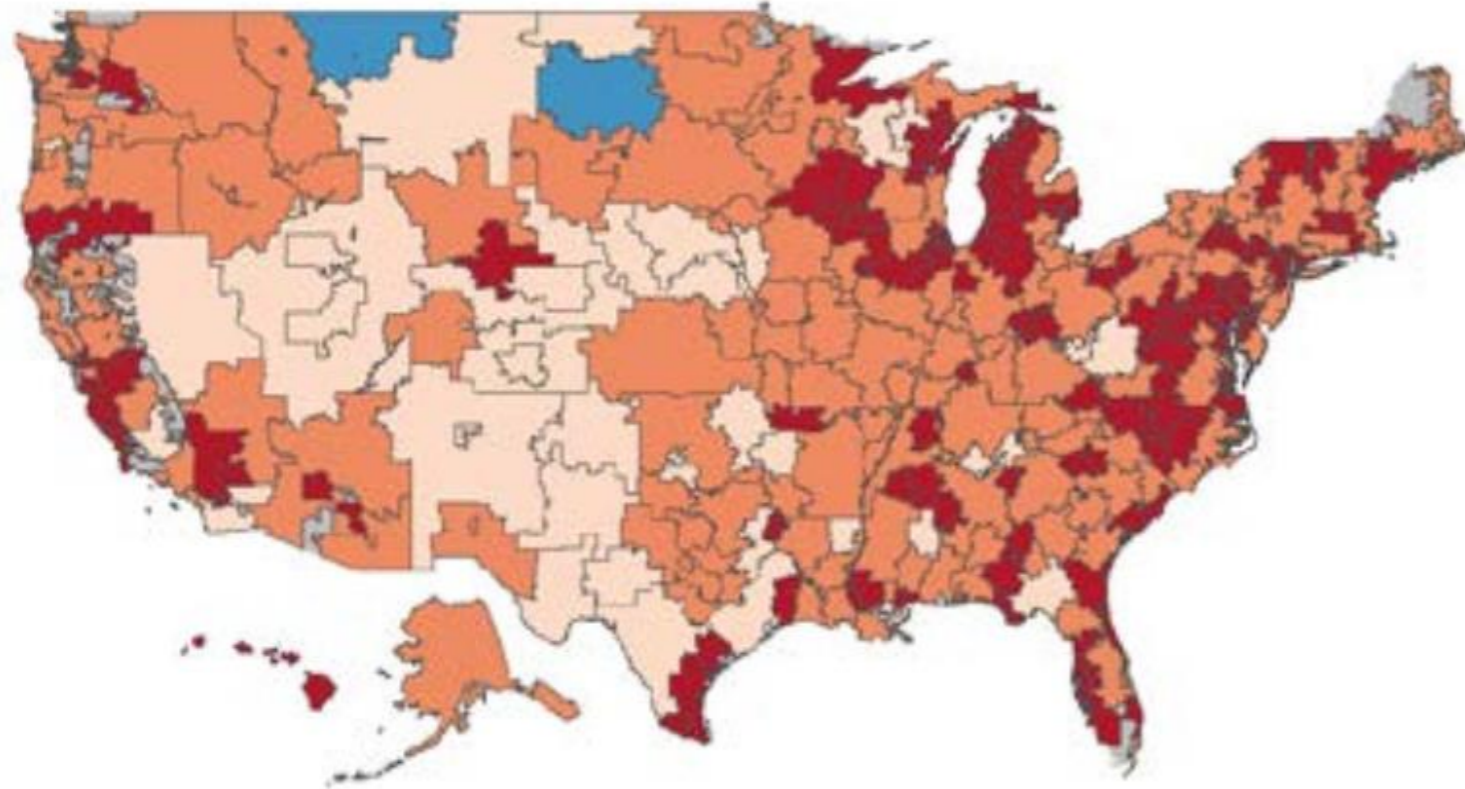


# HL7 FHIR Heat Map

**Percent of hospitals with a 2015 Edition certified-API enabled with FHIR**

*By Hospital Referral Region*

% w/ FHIR    <50%    51-75%    76-99%    100%

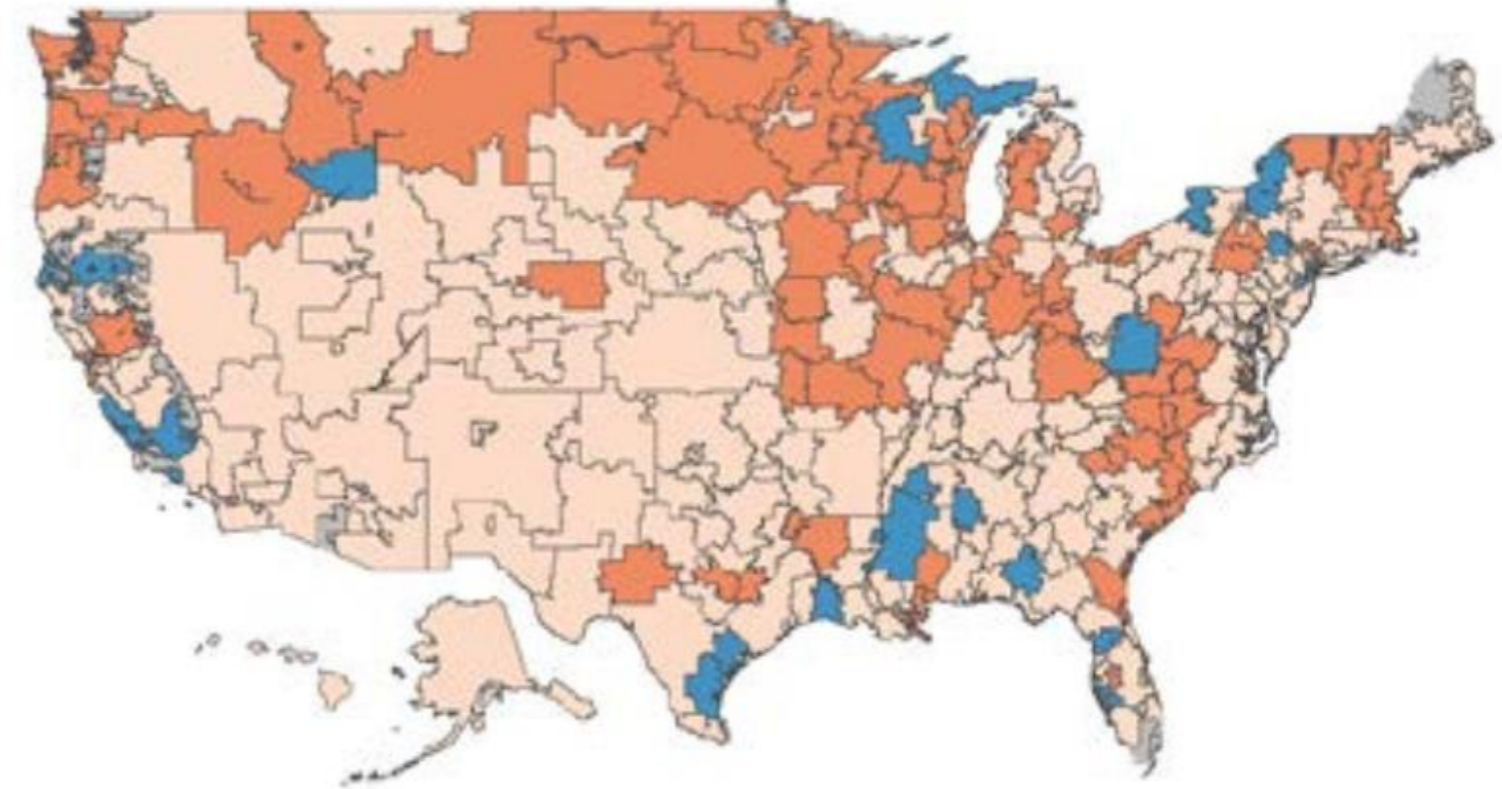


Source: CHPL, Medicare EHR Incentive Program  
Notes: (1) gray areas = HRR with no hospital; (2) The most recent attestations to the Medicare EHR Incentive Program were used to determine EHR installations for all hospitals. These attestations may not reflect the most currently installed technology for all hospitals. In some cases, %'s may be underestimated for HRRs.

**Percent of clinicians with a 2015 Edition certified-API enabled with FHIR**

*By Hospital Referral Region*

% w/ FHIR    <50%    51-75%    76-99%



Source: CHPL, Medicare EHR Incentive Program  
Notes: (1) gray areas = HRR with no clinicians; (2) The most recent attestations to the Medicare EHR Incentive Program were used to determine EHR installations for all clinicians. These attestations may not reflect the most currently installed technology for all clinicians. In some cases, %'s may be underestimated for HRRs.

A little compromise:  
FHIR for non-Engineers  
in 3 minutes





FHIR is both the technology  
and the agreement on the  
meaning of the data.



# REST: The Essence of FHIR

REpresentational State

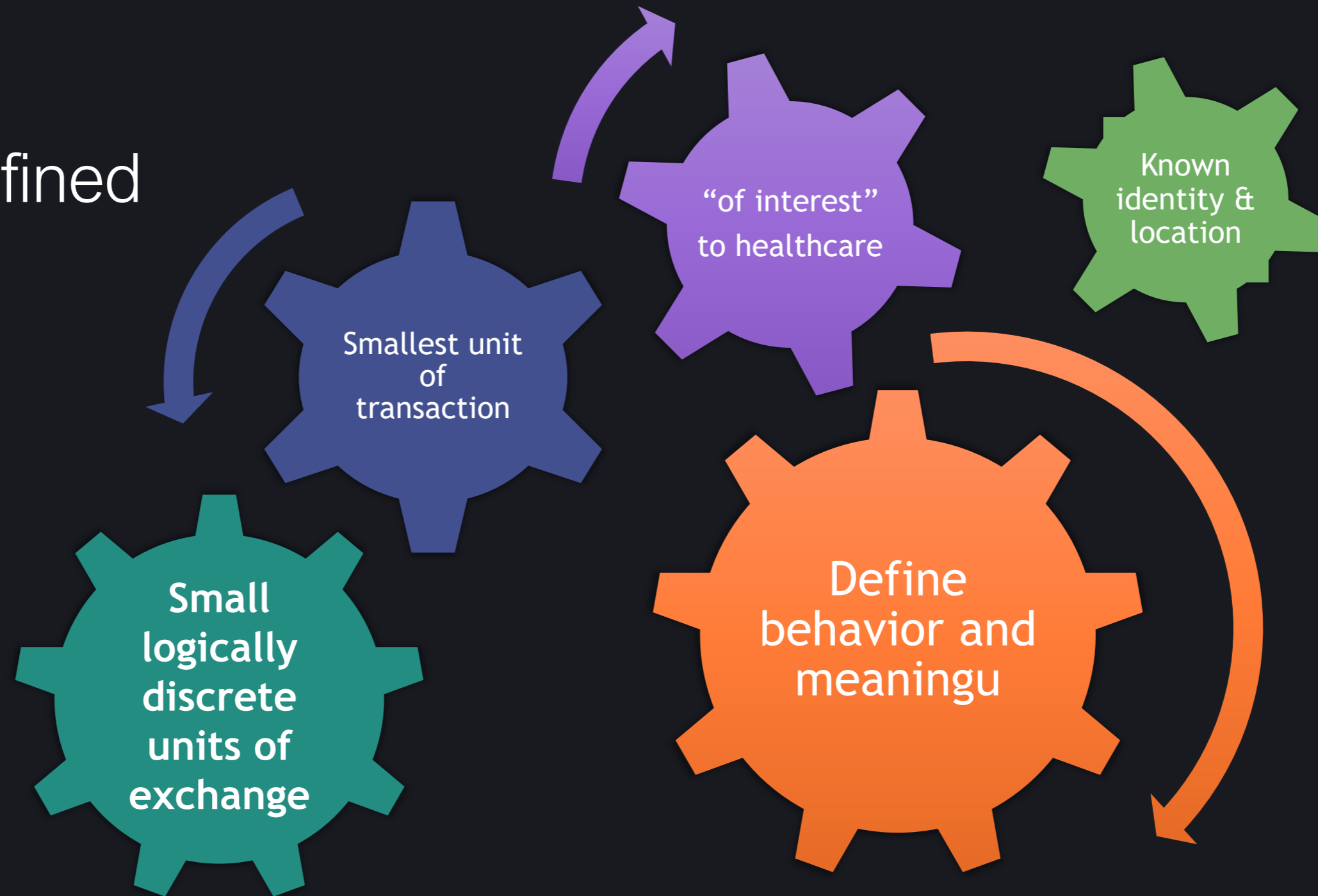
Google, Twitter, FaceBook

Your favorite travel website



# FHIR Resources

Resources defined



# The Challenge of Defining Terms



A black horse with white stripes or...  
a white horse with black stripes?

# The Challenge of Defining Diseases

*Asthma defined:*  
Review of 113 articles,  
of which 106 articles relied upon  
definitions the validity of which were  
not justified.

*Defining asthma and assessing asthma outcomes using electronic health record data: a systematic scoping review*  
Mohammad A. Al Sallakh, Eleftheria Vasileiou, Sarah E. Rodgers, Ronan A. Lyons, Aziz Sheikh, Gwyneth A. Davies  
European Respiratory Journal 2017 49: 1700204



# FHIR Profiles

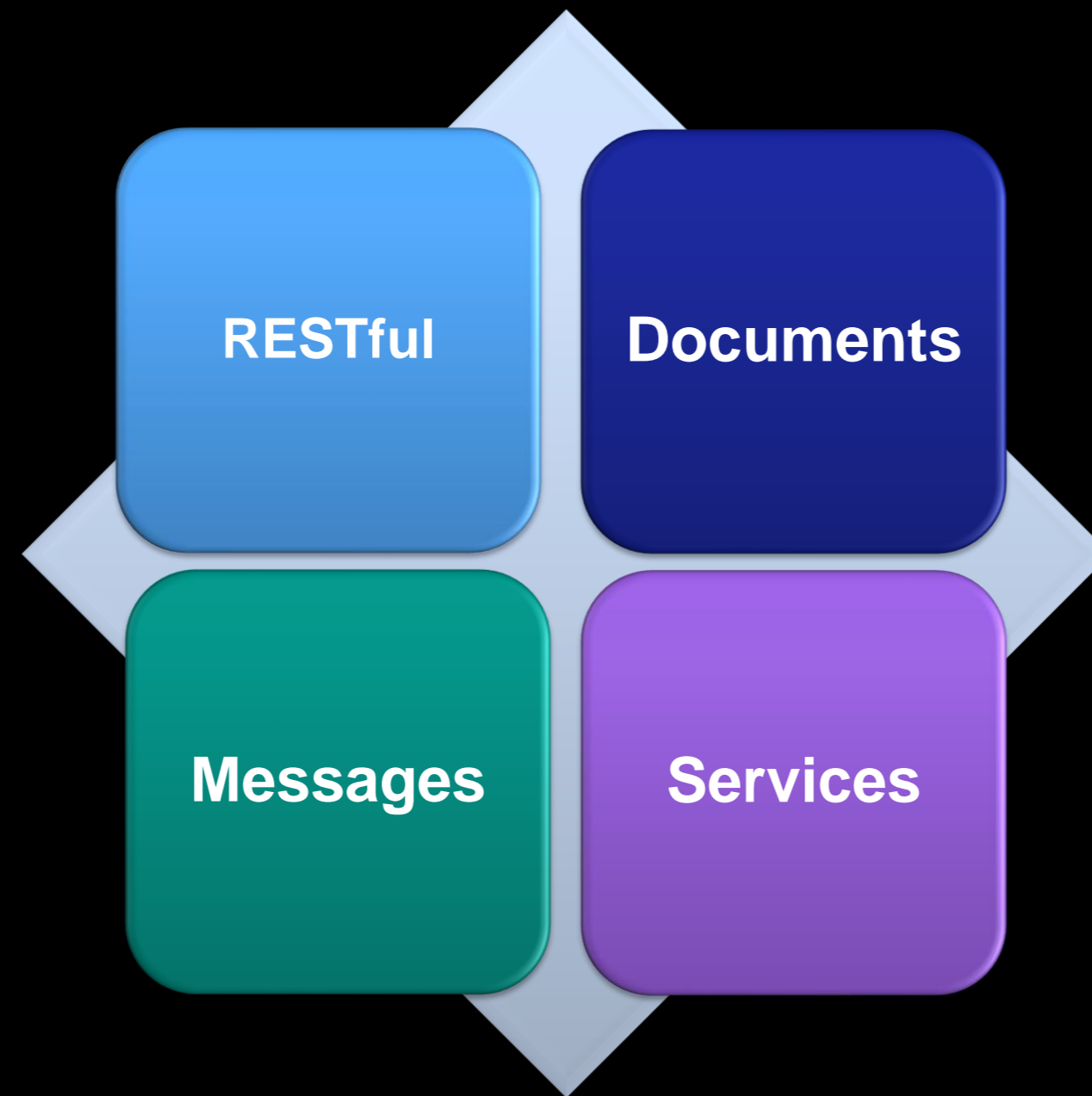
## Profiles are basis of implementation

- Built for specific use cases from simple to complex
- Encompass the entire clinical scenario

## Profiles include constraints for a use case

- Multiple Resources & Extensions: FHIR building blocks
- Vocabulary/terminology/code binding

# FHIR API Supports 4 Interoperability Paradigms



# FHIR Extensions & the 80/20 Rule

FHIR Resources have data elements if  
80% of existing systems include them

Extensions are the other 20%

- Meet specific use cases
- The encoding looks no different
- Comply with ISO guidelines



# FHIR Implementation Guides\*

- Scope of usage
- Implementation requirements
- Relevant FHIR artifacts (profiles)
- Usage
- Conformance validation

*\*Computable!*



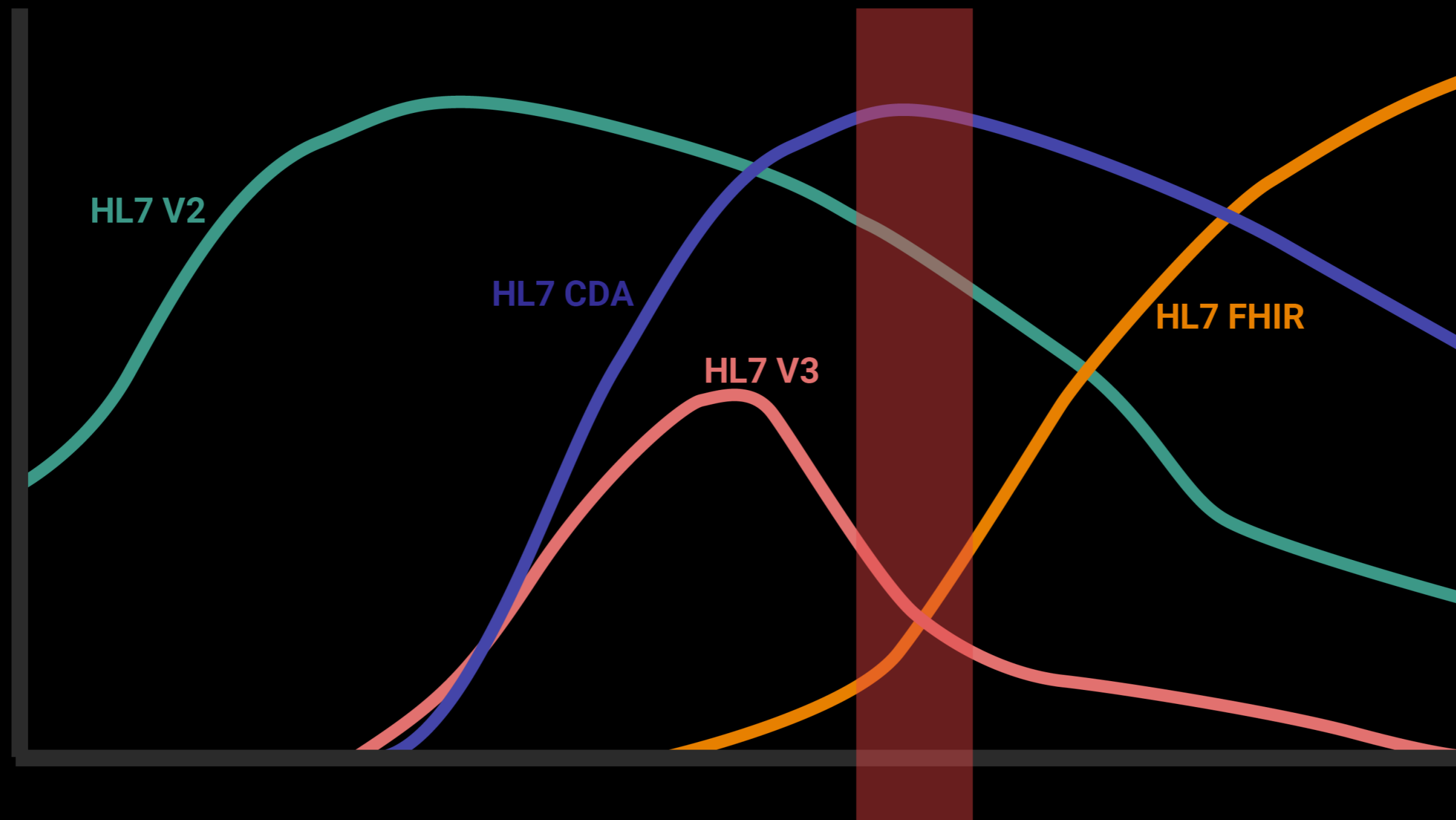
# The Challenge of Data Quality

$$\int_{i=0}^{\infty} \textit{garbage} = \textit{garbage}$$

Source: Doug Fridsma, MD



# Lifecycle of HL7 Standards



*HL7 FHIR is more than  
technology.*

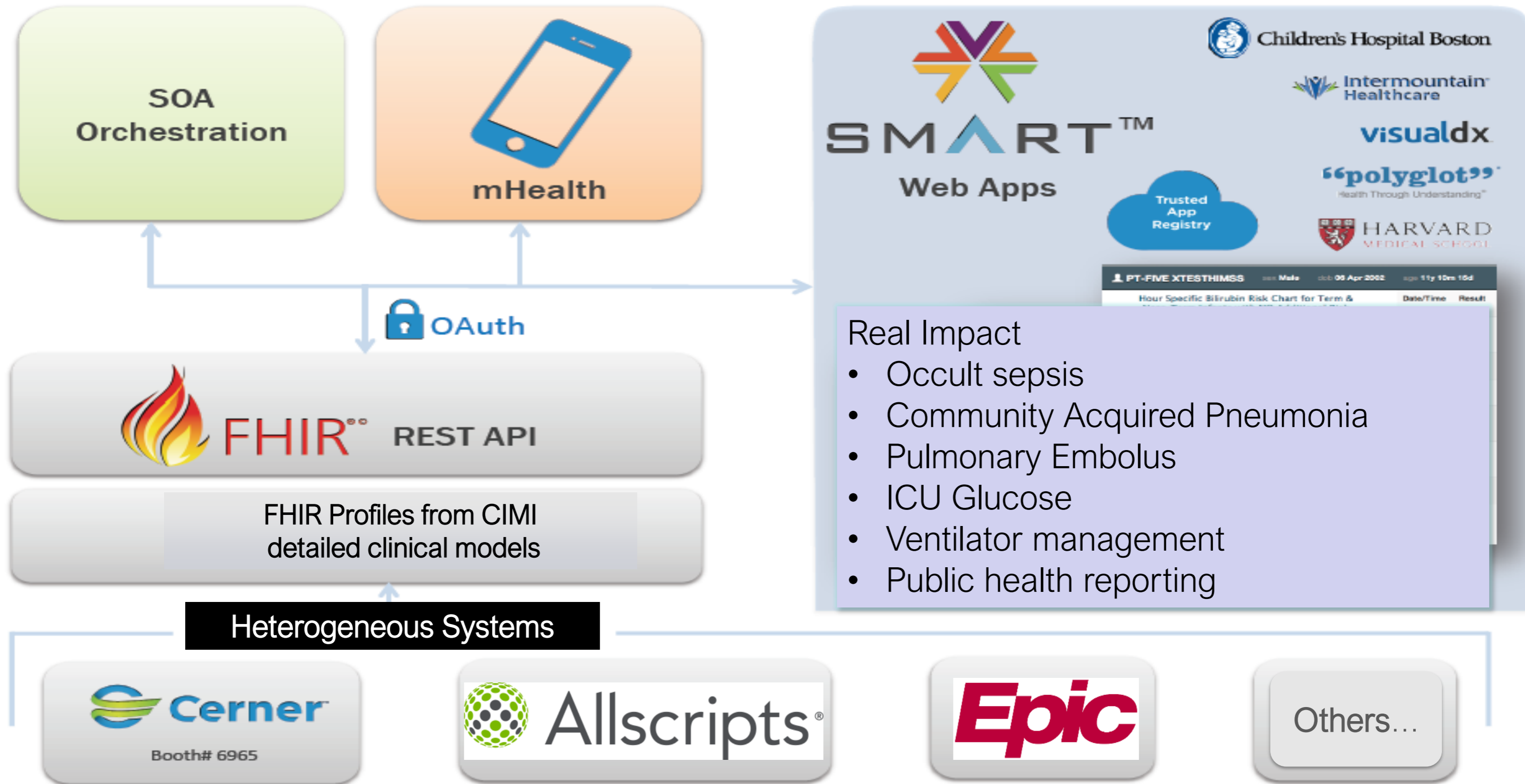
*HL7 FHIR is about  
Community.*



The HL7 FHIR Community  
has grown through a series of  
strategic collaborations.



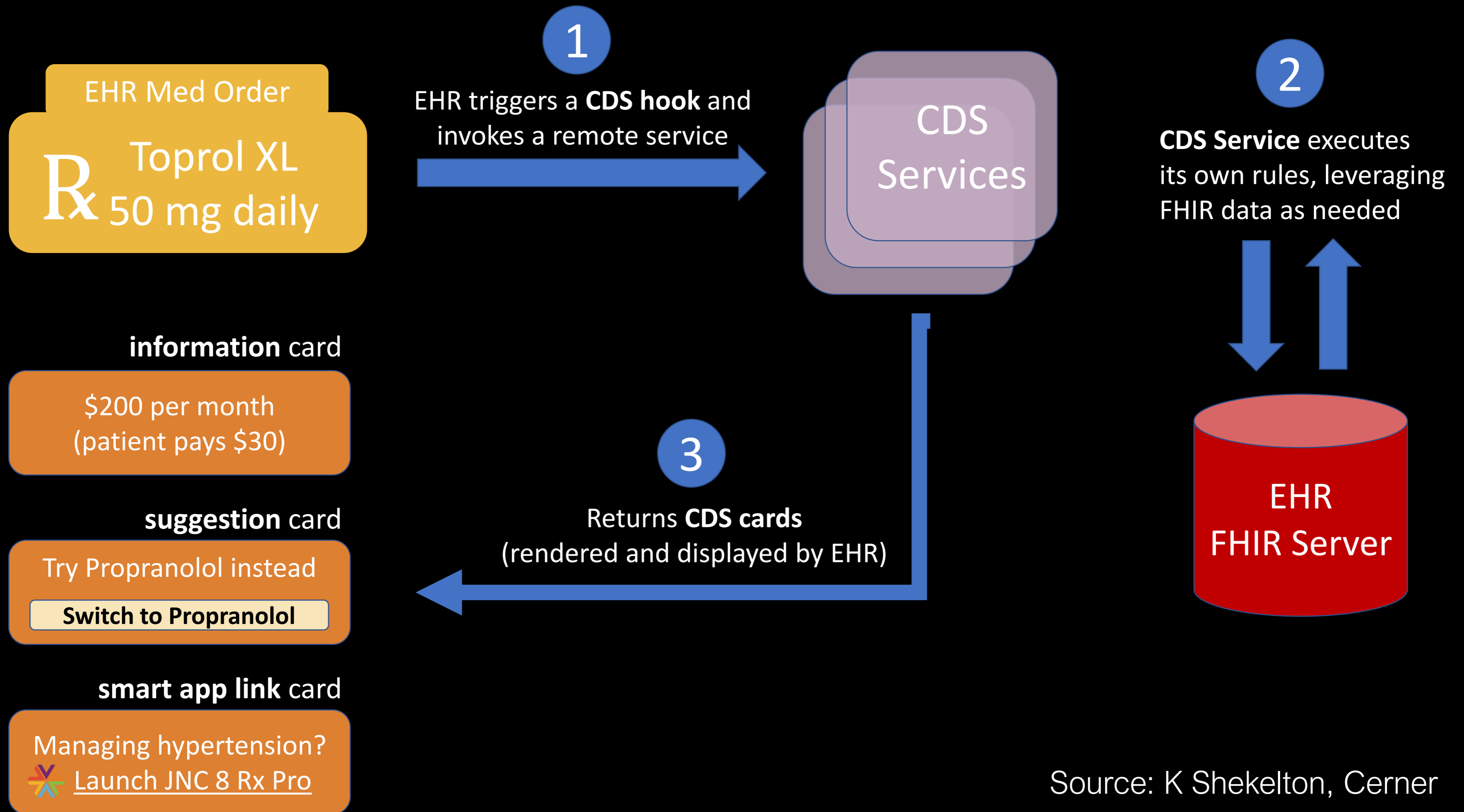
# SMART on FHIR® – Open Platform Architecture



# CDS Hooks

A vendor-agnostic remote Clinical  
Decision Support platform that helps to  
solve the problem of workflow integration



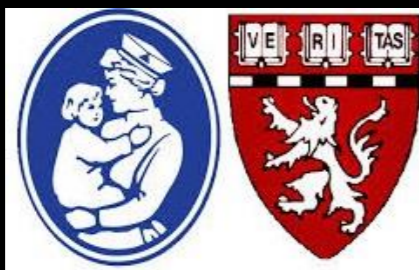


Source: K Shekelton, Cerner

# Bulk Data on FHIR

The technology & policy for exchanging records from an unlimited number of patients or study subjects

supporting data analytics for population health, value-based care, clinical trial design and pharmaco-vigilance.



It's all about asking the right question

I asked the Librarian if she had a book  
about Pavlov's dog & Schrödinger's cat.

She said that it rang a bell, but  
she wasn't sure if it were there or not.



The FHIR Community  
is a network of implementers  
around the world.



# Argonaut Project



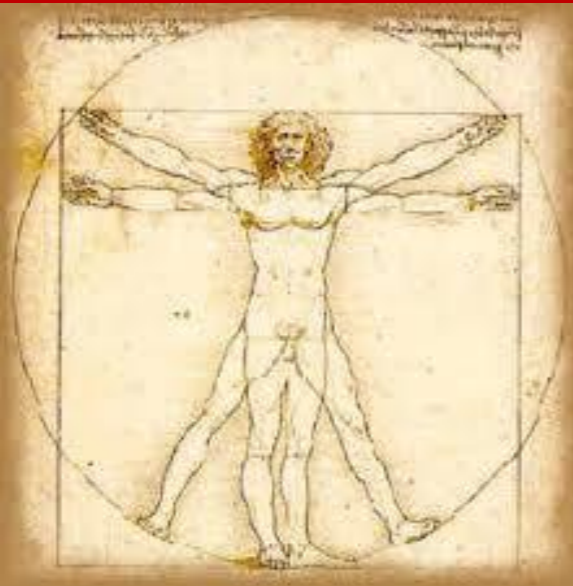
A private-sector initiative established in 2014 to accelerate FHIR implementation.

Now utilized around the world for international data exchange



# Da Vinci Project

Advancing “Value-Based Care”  
by leveraging FHIR for  
the capture of granular clinical data  
from patient records  
to improve quality, to reduce costs,  
and to enhance care management.



<http://www.hl7.org/about/davinci/index.cfm?ref=common>



# Da Vinci Use Cases

## Quality Improvement

Data Exchange for  
Quality Measures  
Framework:

Gaps in Care &  
Information

## Coverage / Burden Reduction

Coverage Requirements  
Discovery

Documentation  
Templates and  
Coverage Rules

Prior-Authorization  
Support

Clinical Data  
Exchange

Payer Data  
Exchange

Payer Data Exchange:  
Formulary

Payer Data Exchange:  
Provider Network

Payer Coverage  
Decision Exchange

Patient Cost  
Transparency

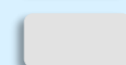
Risk Based Contract  
Member Identification

Chronic Illness  
Documentation for  
Risk Adjustment

## Process Improvement



Balloted



Planned for September Ballot



In Discovery, Planned for January Ballot



Use cases in discovery (some may be balloted in January 2020)

## Use Case Status

## Member Access

Payer Data  
Exchange

Clinical Data  
Exchange

Alerts/Notifications:  
Transitions in Care, ER  
admit/discharge

Health Record  
Exchange: Patient Data  
Exchange

Performing Laboratory  
Reporting

## Clinical Data Exchange

# CARIN Alliance


Enabling consumers and their  
caregivers to easily obtain, utilize,  
and share  
their digital health information  
when, where, and how  
they want to achieve their goals.







There is a solution to  
seamless implementation of  
emerging FHIR initiatives



# HL7 FHIR Accelerator Program



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About HL7

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Resources

Events

Training and Education

Certification

## HL7® FHIR® Accelerator Program




The HL7 FHIR Accelerator Program is designed to assist implementers across the health care spectrum in the creation of FHIR Implementation Guides or other informative documents

### Vision

HL7 FHIR has gained rapid acceptance on a global scale. Since its inception, FHIR standards development has focused on implementation and adoption. As an increasing array of use cases emerge, implementers across the health care spectrum are eager to accelerate the readiness of FHIR. HL7 has served as a global convener for standards development and will extend that capability to advance implementation in the interest of accelerating FHIR adoption while also maintaining the robustness of the FHIR adoption.

### Strategy

HL7 will work with implementers to facilitate FHIR acceleration and adoption activities. The service will allow implementation communities to select a range of support solutions based on their own needs and resources, ranging from self-service templates and tools, to contracted project management, SME, and infrastructure services.



# *The Busy FHIR Accelerator Onramp*



- Gravity Project (SDHC)
- Codex Project (Oncology)
- Consortium for Agile Genomics
- Death on FHIR (CDC Morbidity & Mortality Reporting)
- Clinical Modeling (AMA)
- Translational Science (CTSA)
- Digital Quality Measures



“If I had asked my customers what they wanted, they would have asked for a faster horse.”

Henry Ford

# *HL7 FHIR Clinical Safety*

FHIR defines data elements, resources, formats, methods and APIs for exchanging healthcare data between different participants in the healthcare process.

Clinical Safety is a key concern with regard to the specification and its many and various implementations.



# *Implementer's Safety Checklist*

## The Rationale

Because of the nature of healthcare, and healthcare processes, and cultural concerns, there are a number of features in FHIR that implementers are obliged to consider in order to implement safe systems.



# *Implementer's Safety Checklist*

- Conformance with FHIR specifications
- Date & Time-zone related requirements
- Search-related capabilities for client & server
- Deletion-related policies [*Safety critical*]
- Privacy issues [Consent and disclosure]
- Security demands
  - Communications
  - Authentication / Authorization
  - Access control
  - Integrity



There is a growing FHIR Community  
in the US Government Sector



*Carequality & CommonWell Health*  
have partnered on a common FHIR platform  
to foster interoperability



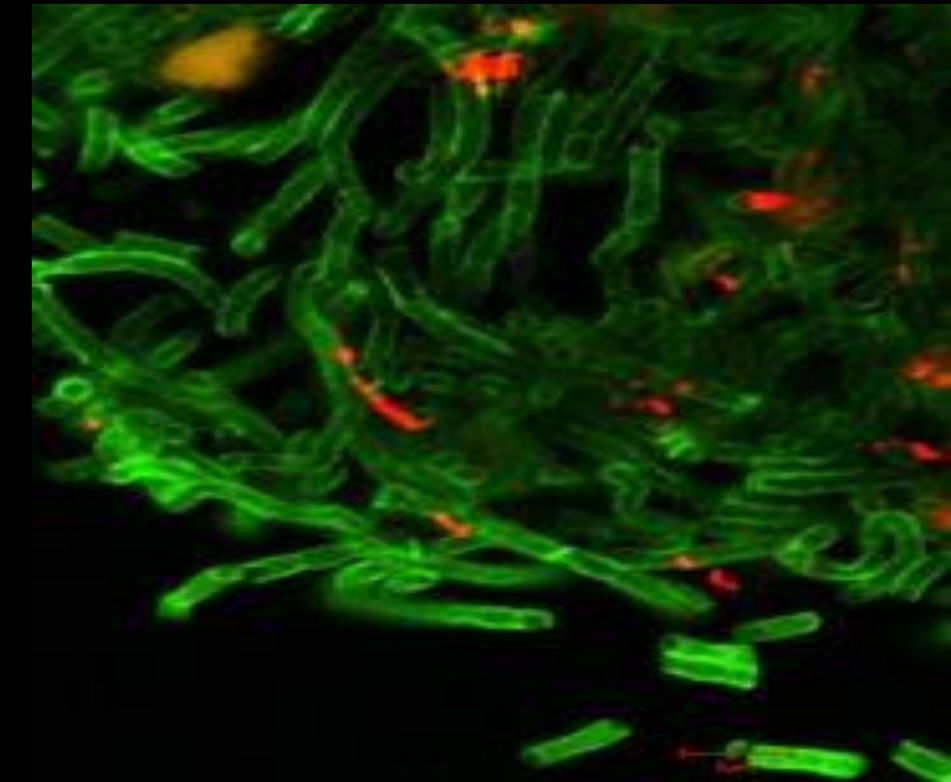


# VA Lighthouse Gateway Project

FHIR API gateway platform  
supporting mobile and web Apps  
for both providers and patients

# CDC is leveraging FHIR for Morbidity & Mortality reporting\*

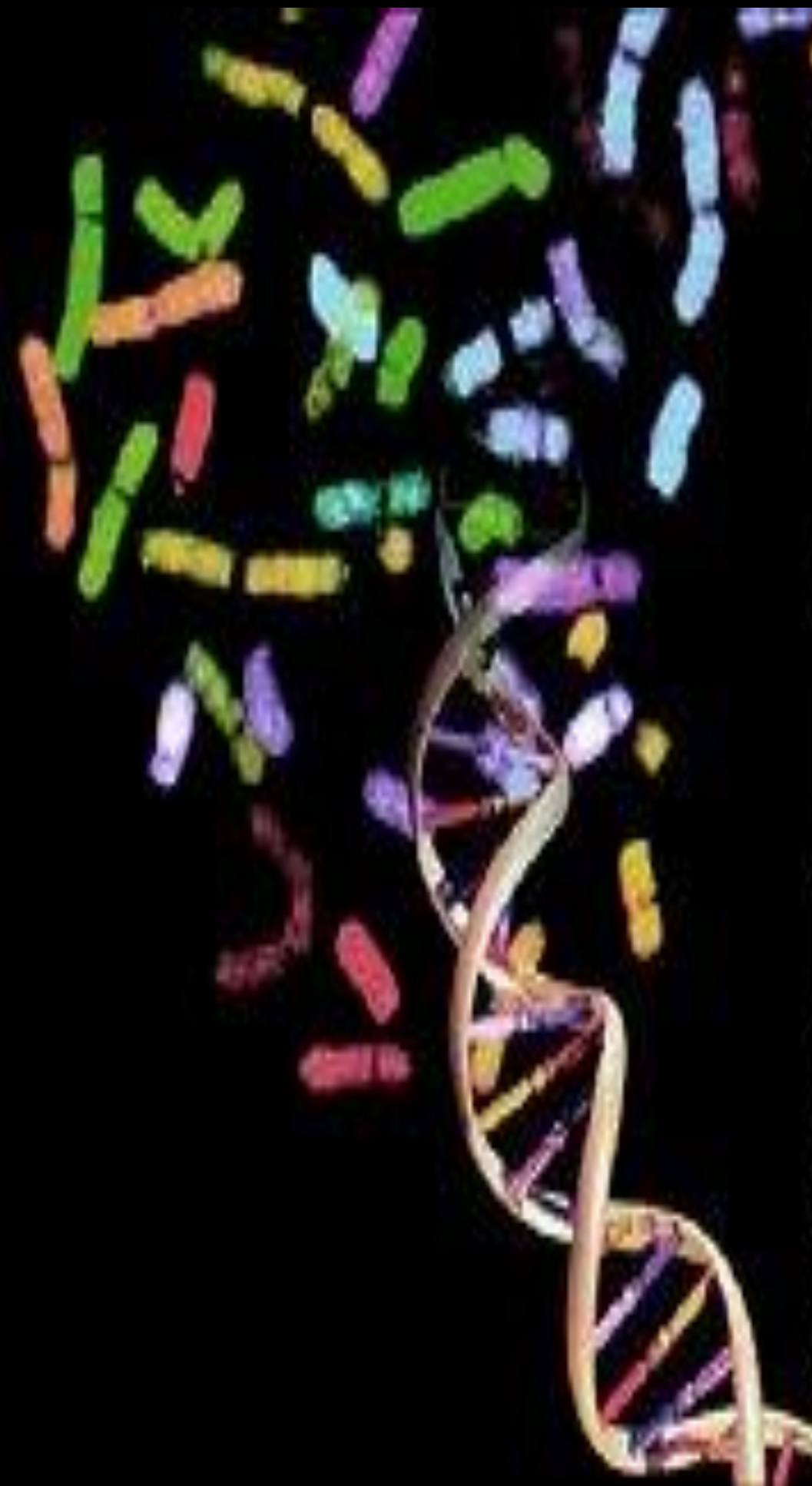
\*Death on FHIR pilot (6 states)



The FDA is collecting data from  
the EHRs to capture  
*Real-World Data*  
for drug safety and  
effectiveness\*.

\*CDER Oncology





*Sync4Science*

*Sync4Genes*

*& DIGITizE*

FHIR enabled Genomic Data for  
Precision Medicine,  
Translational Science,  
& Clinical Decision Support



# Translational Science: CTSA

The CTSA community is leveraging FHIR to create a learning health system between pre-clinical science and patient care.



The HL7 FHIR Community of  
*Standards Developers*  
has brought new opportunities  
for collaboration



# IHE & DICOM<sup>TM</sup>

## *Imaging & Image reporting*



# World Wide Web Consortium®

*Semantic Health: RDF on FHIR*

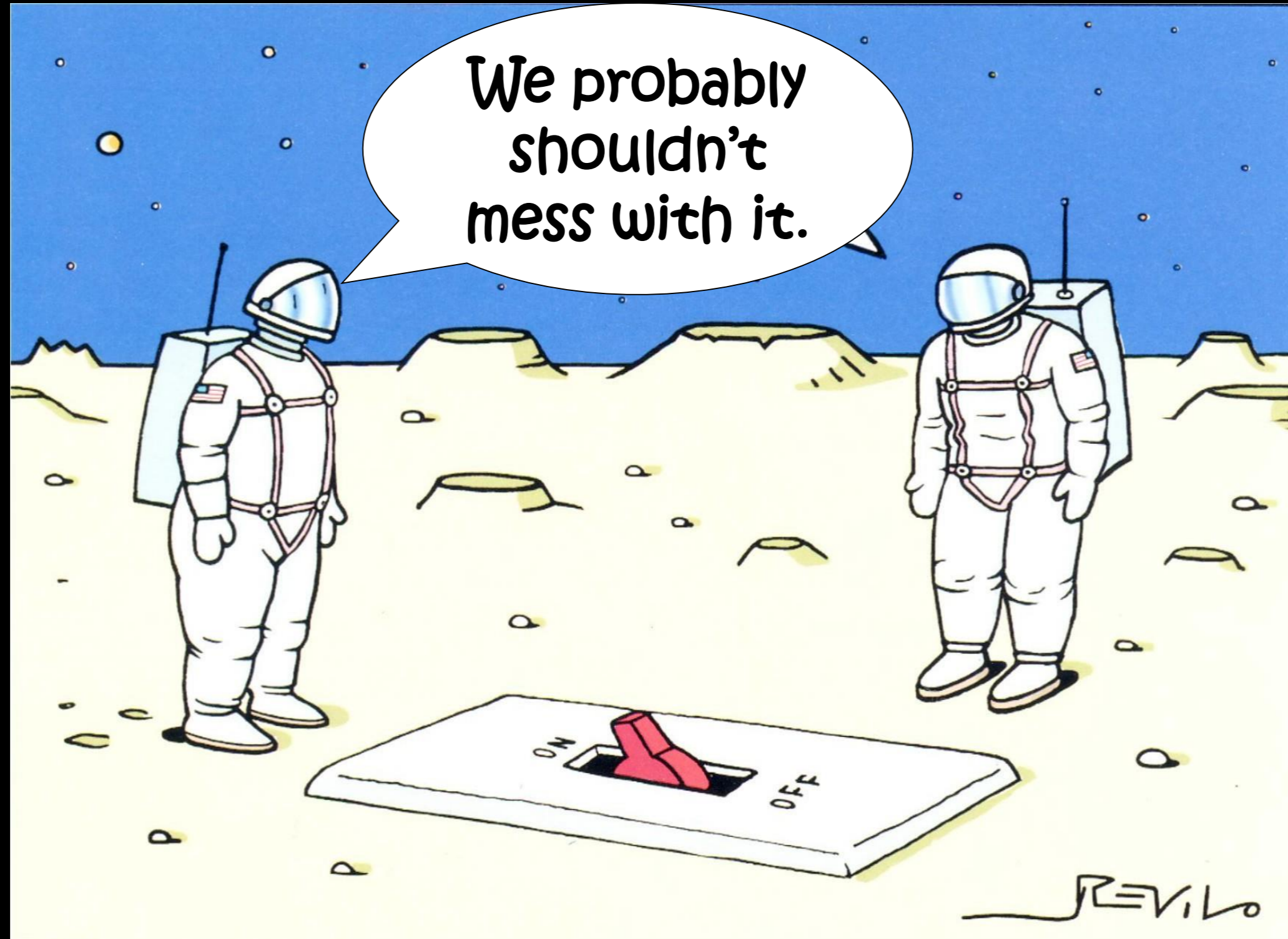


# Regenstrief & SNOMED<sup>®</sup>

*Coordinating Clinical Terminologies*



Change Management is about  
taking well-informed chances



There is a fast growing  
FHIR Community  
in the Non-Government Sector

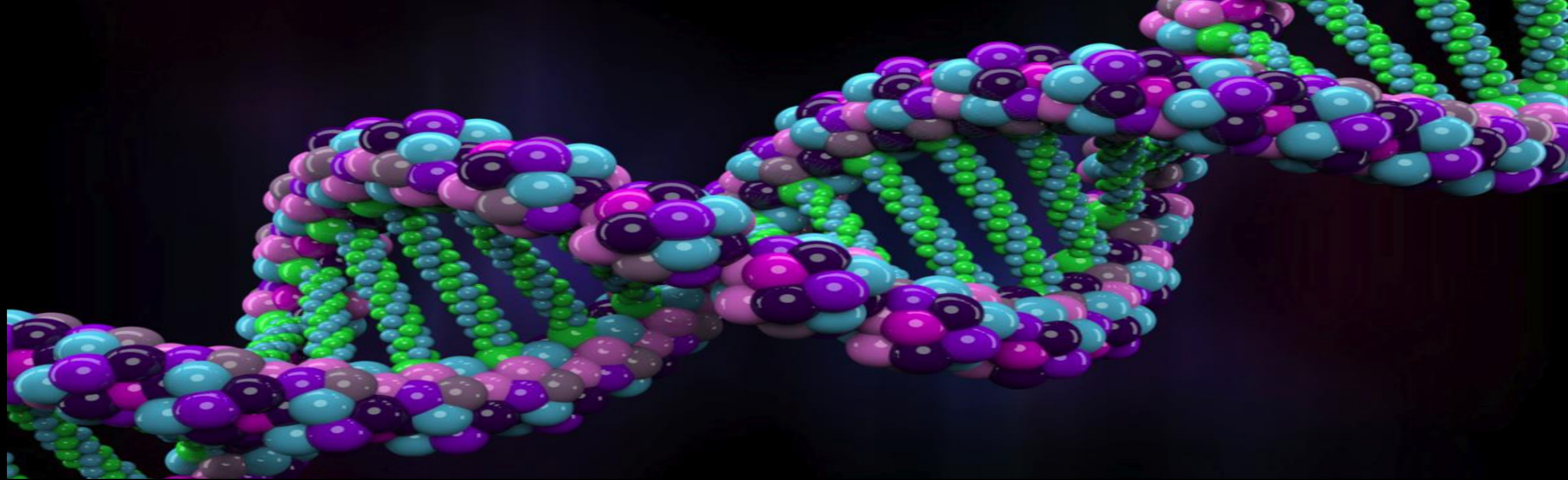


# Apple iOS 11.3 supports patient aggregation of clinical information



based upon the Argonaut Project  
Implementation Guide





# *Consortium for Agile Genomics*

partnership with  
Global Alliance for Genomics & Health



**Global Alliance**  
for Genomics & Health  
Collaborate. Innovate. Accelerate.



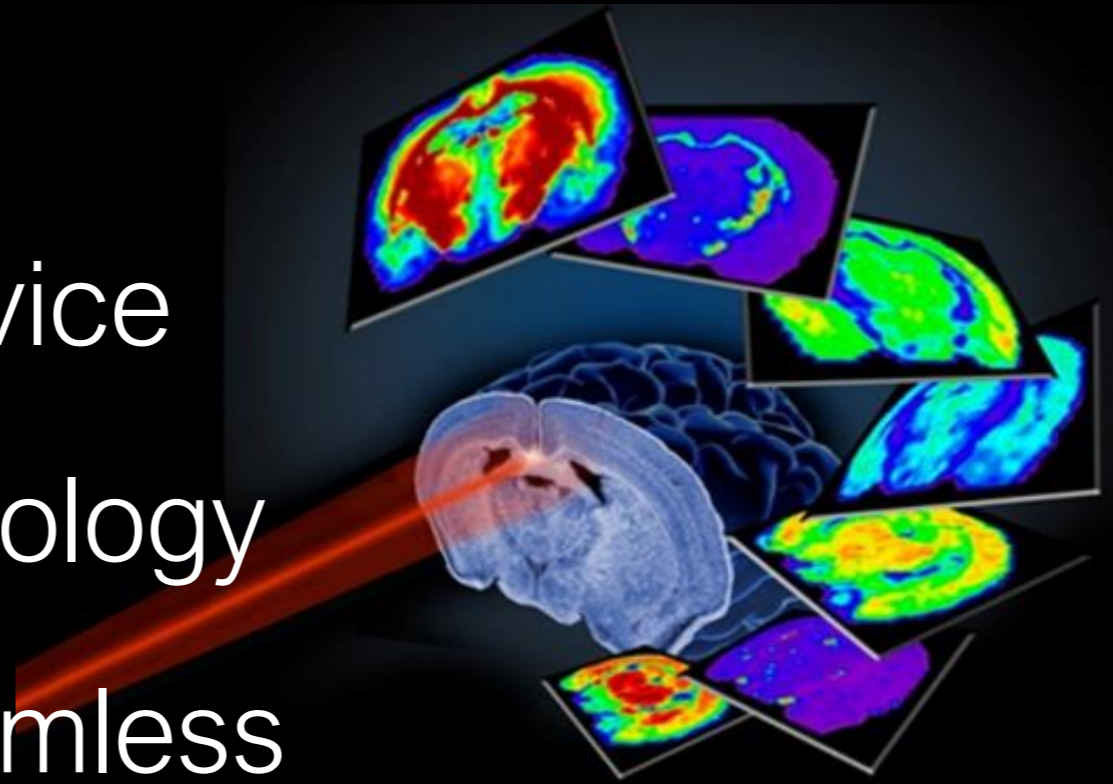
**HL7® FHIR®**

International BioPharma  
is leveraging HL7 FHIR  
for real-world evidence for  
clinical trials,  
post-marketing bio-surveillance,  
and genomics integration.

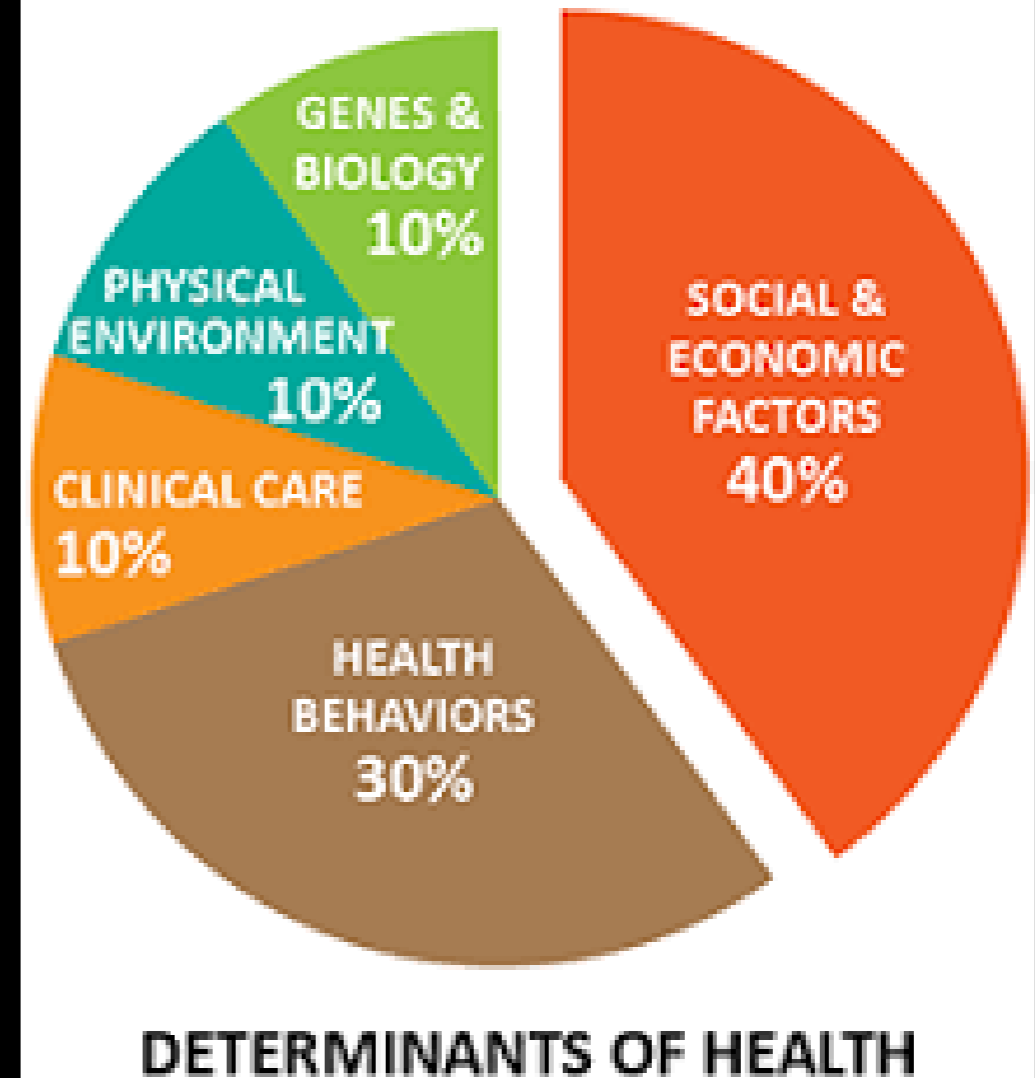


# *Devices on FHIR*

A collaboration of device  
manufacturers & technology  
vendors ensuring a seamless  
exchange of data between  
clinical devices and  
health information systems



The social  
determinants of health  
must be seamlessly  
integrated  
into patient care  
decisions



# Tech Giants Announce Collaboration on FHIR API for Healthcare Cloud Interoperability



August 13, 2018, Washington

FHIR  
is  
Free



# Inside the Beltway

The opinions expressed are entirely my own, and in no way should you blame anyone from HL7.

# A final word on FHIR

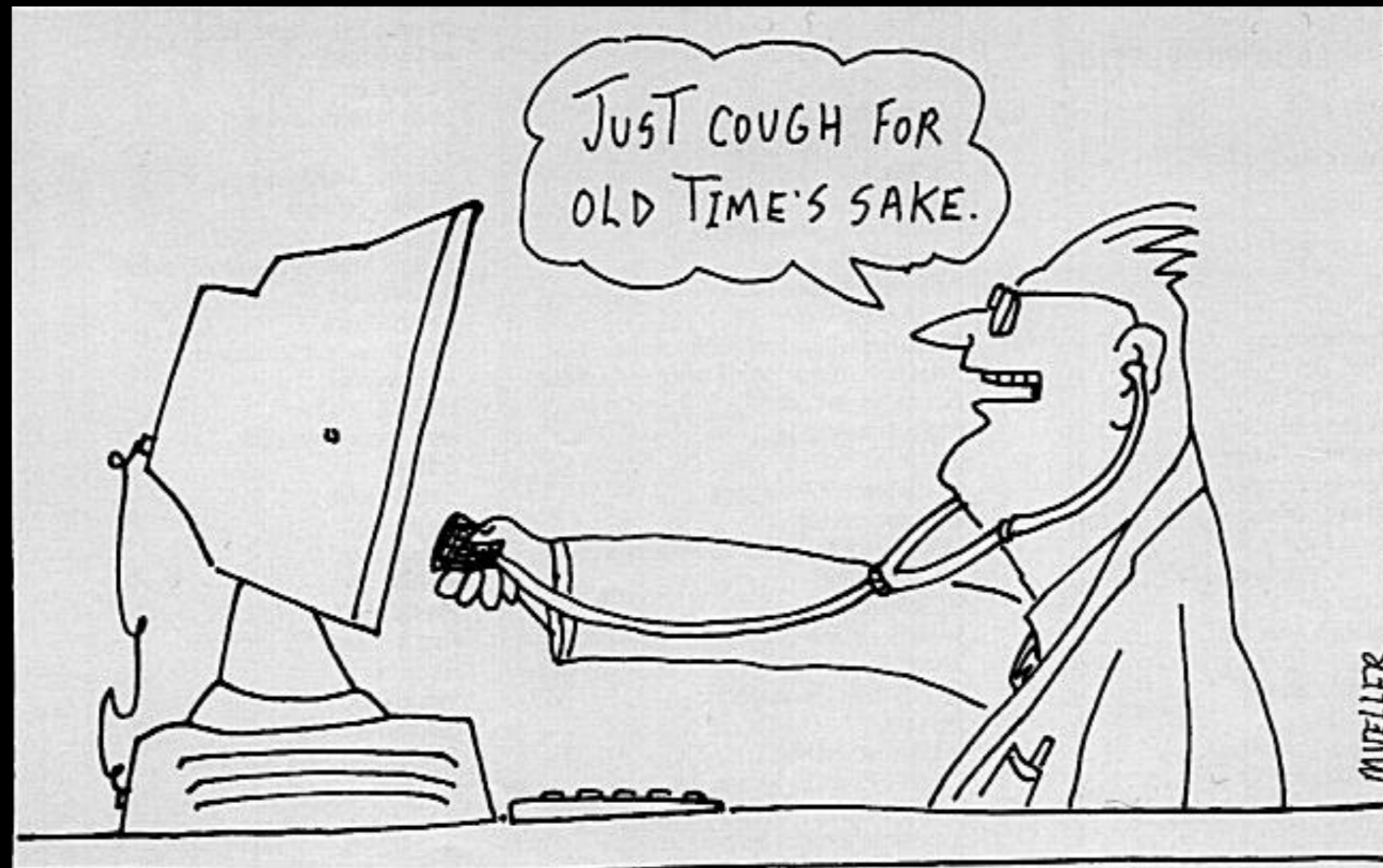
A delusion held by many is a culture.

A delusion held by a few is a cult.

A delusion held by two is love.

A delusion held by one is psychosis.

# Thanks



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