APL Really Can Make Us Healthy(er)

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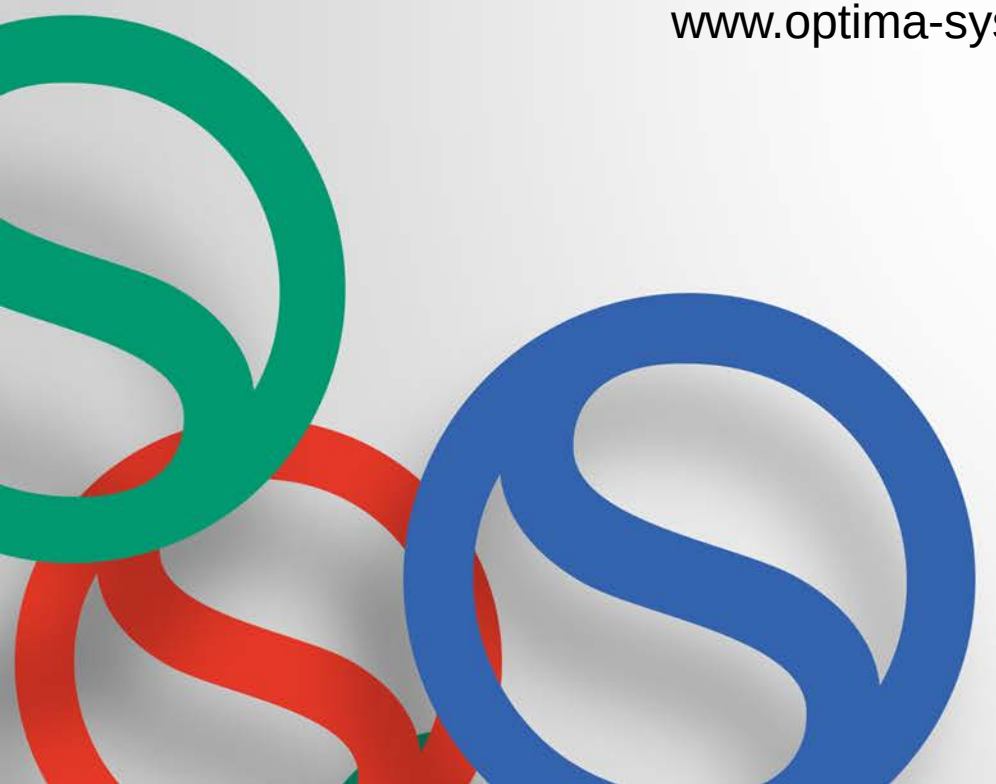


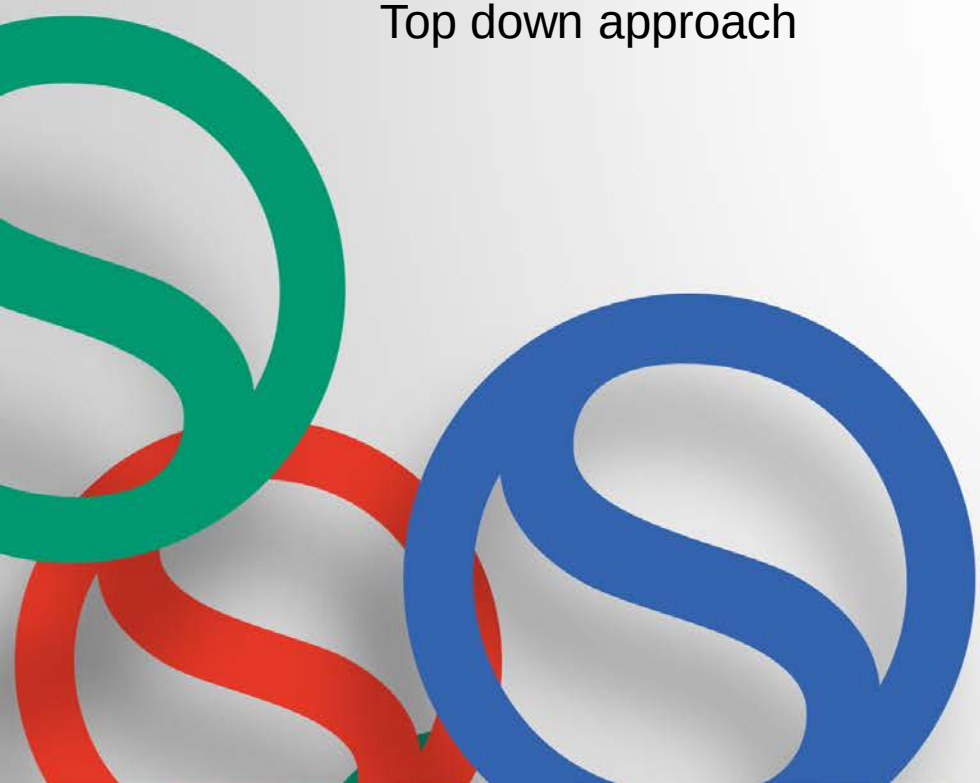
COSMOS Original Concept (1/2)

To be able to view data with no preconceptions

To make the data understandable

To be a little bit different

Top down approach

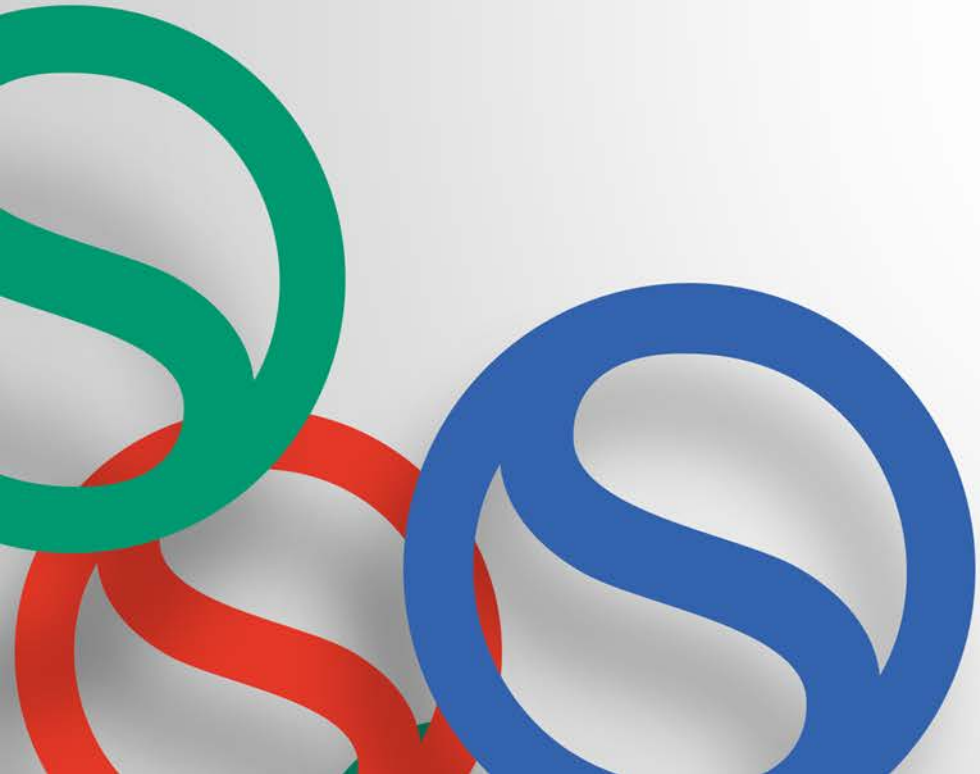


COSMOS Original Concept (2/2)

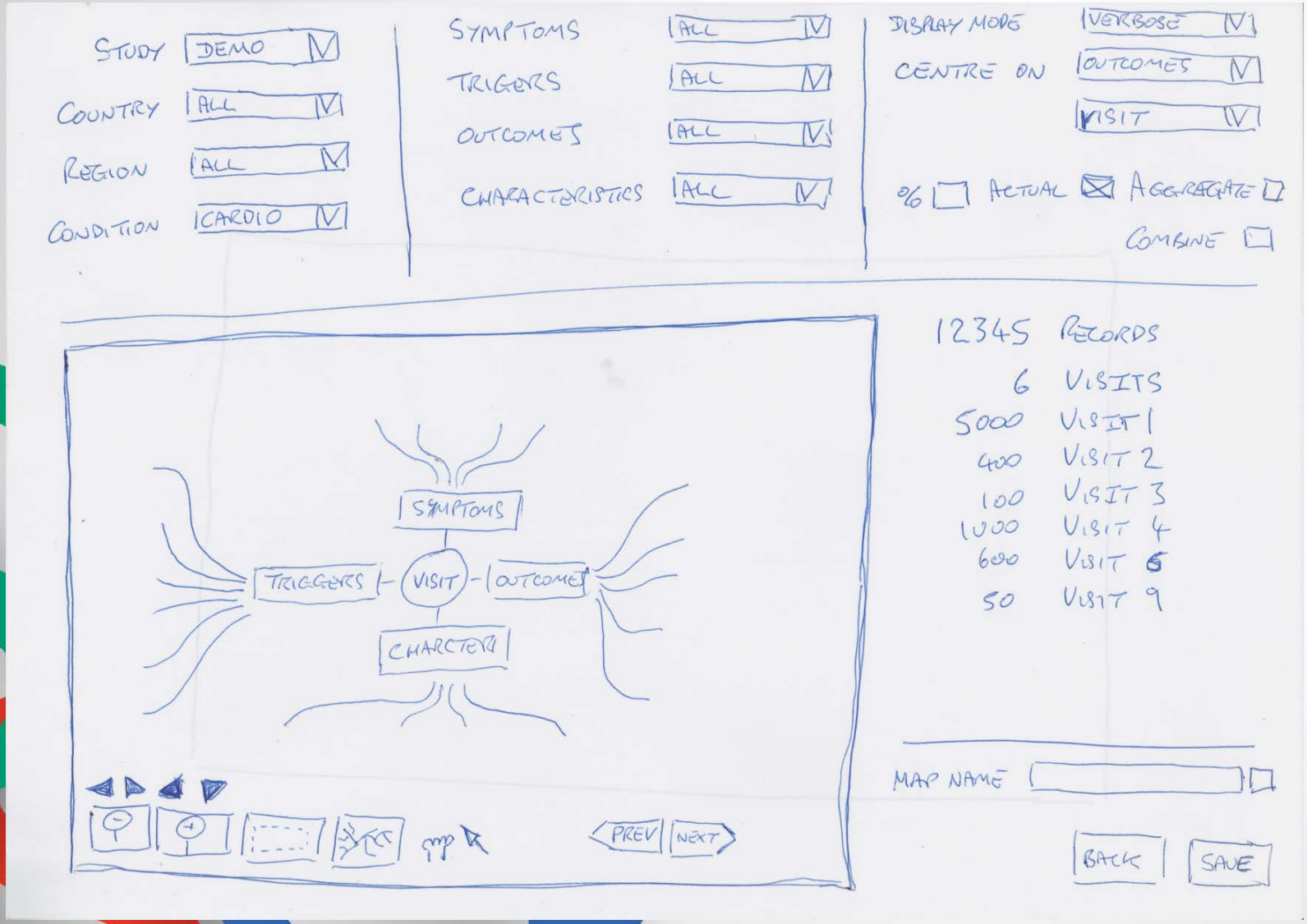
Decided to base our approach on

Neural Networks

Netmap



Original COSMOS Design "Spec" (Circa 2011)

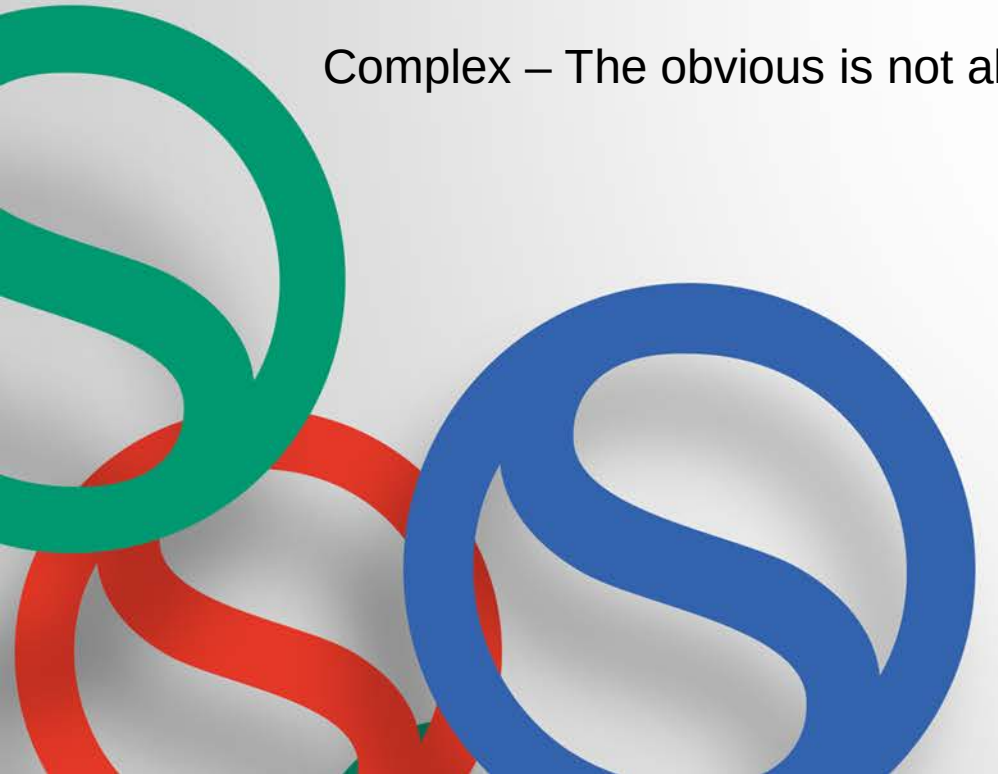


Jumping forward to COSMOS today

Big data **and** small data

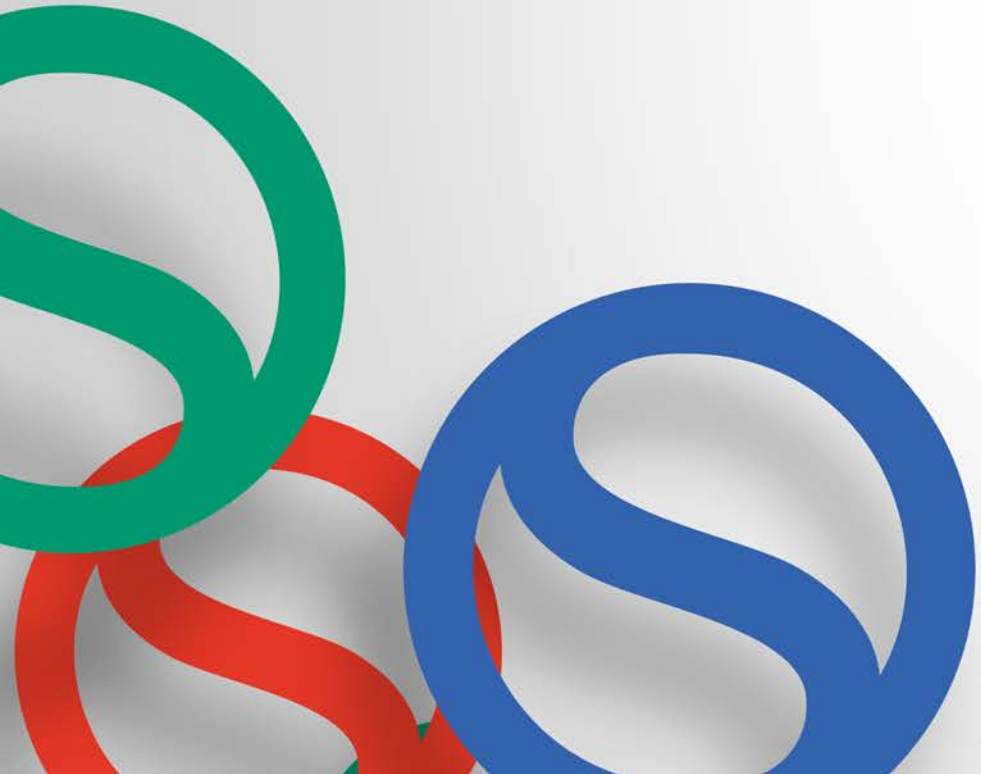
- 8TB datasets
- 250M patient visits, 2-3000 cost items per visit
- 45M unique patients

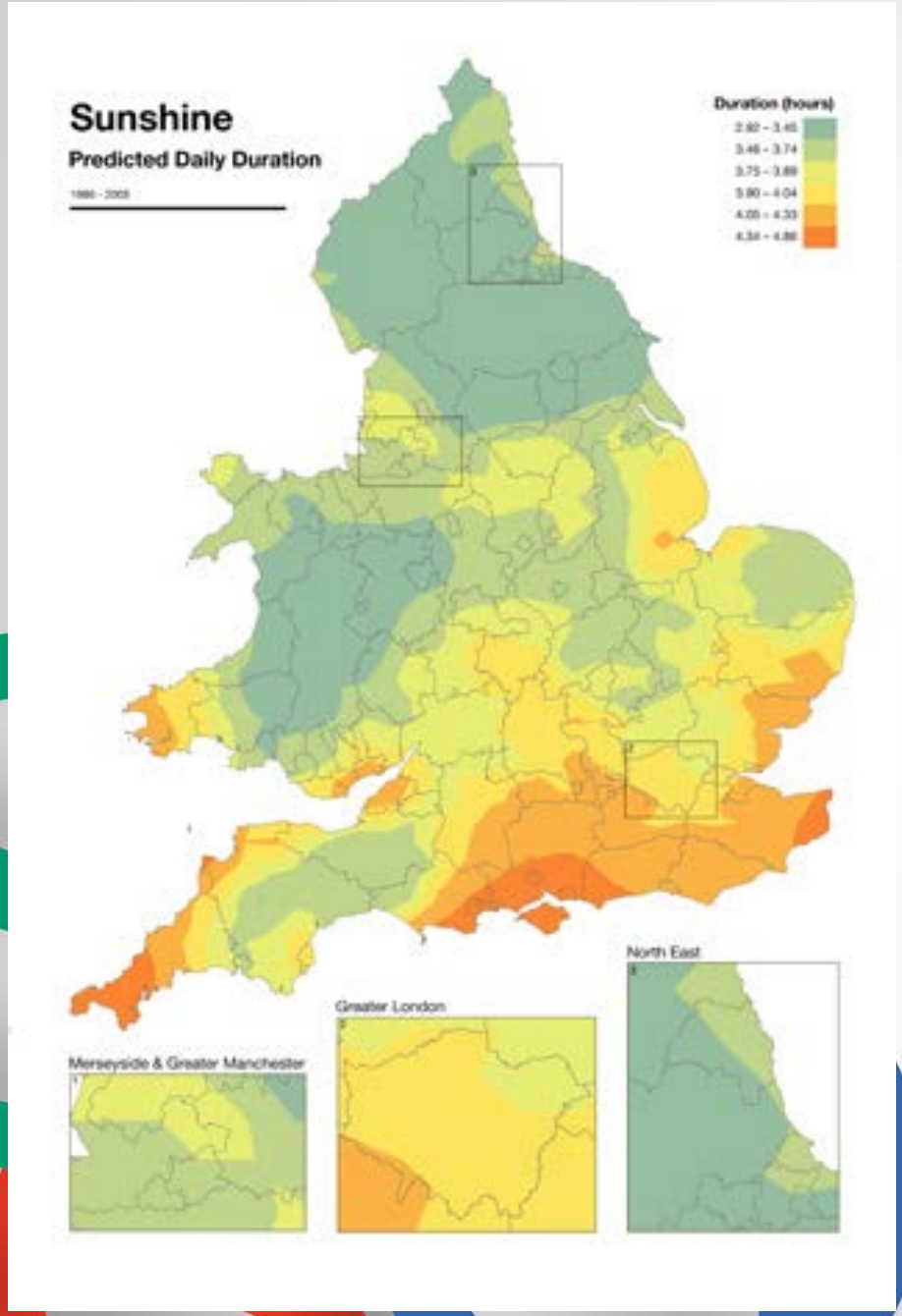
Complex – The obvious is not always so obvious

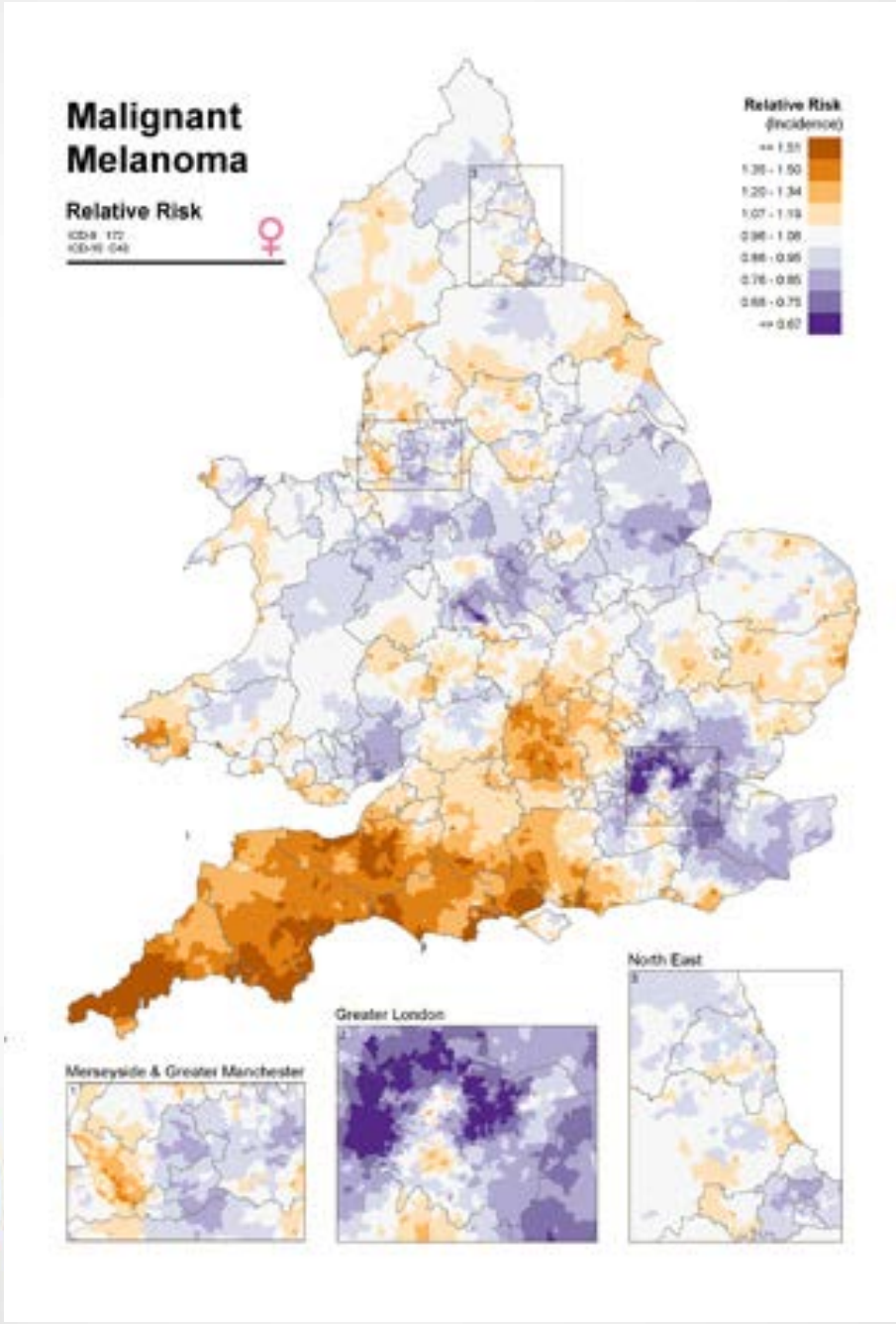


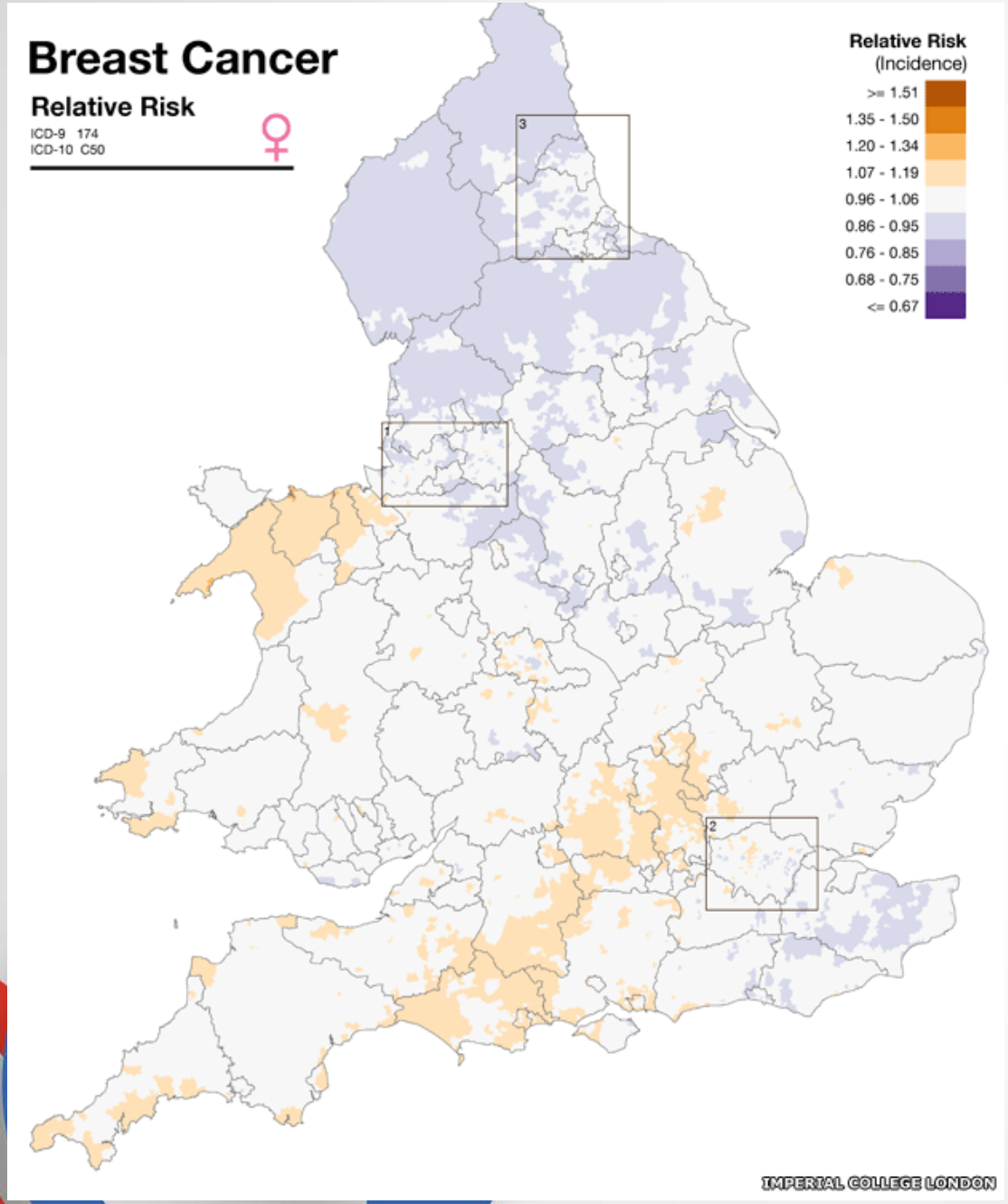
Relying on preconceived ideas is a very risky strategy

Many (but not all) research projects start from premise which may be floored from the outset and wastes time in identifying the “real truth”




Sunshine
Predicted Daily Duration
Duration (hours)
Merseyside & Greater Manchester
Greater London
North East


Malignant Melanoma
Relative Risk
Relative Risk (Incidence)
Merseyside & Greater Manchester
Greater London
North East


Breast Cancer
Relative Risk
ICD-9 174
ICD-10 C50
Relative Risk
(Incidence)
>= 1.51
1.35 - 1.50
1.20 - 1.34
1.07 - 1.19
0.96 - 1.06
0.86 - 0.95
0.76 - 0.85
0.68 - 0.75
<= 0.67
1
2
3
IMPERIAL COLLEGE LONDON

So back to my story

We had expertise in medical data processing

So we targeted;

Data collection agencies
Pharma companies
Clinical research projects

PHASE I

Primarily data visualisation

Typically for companies who;

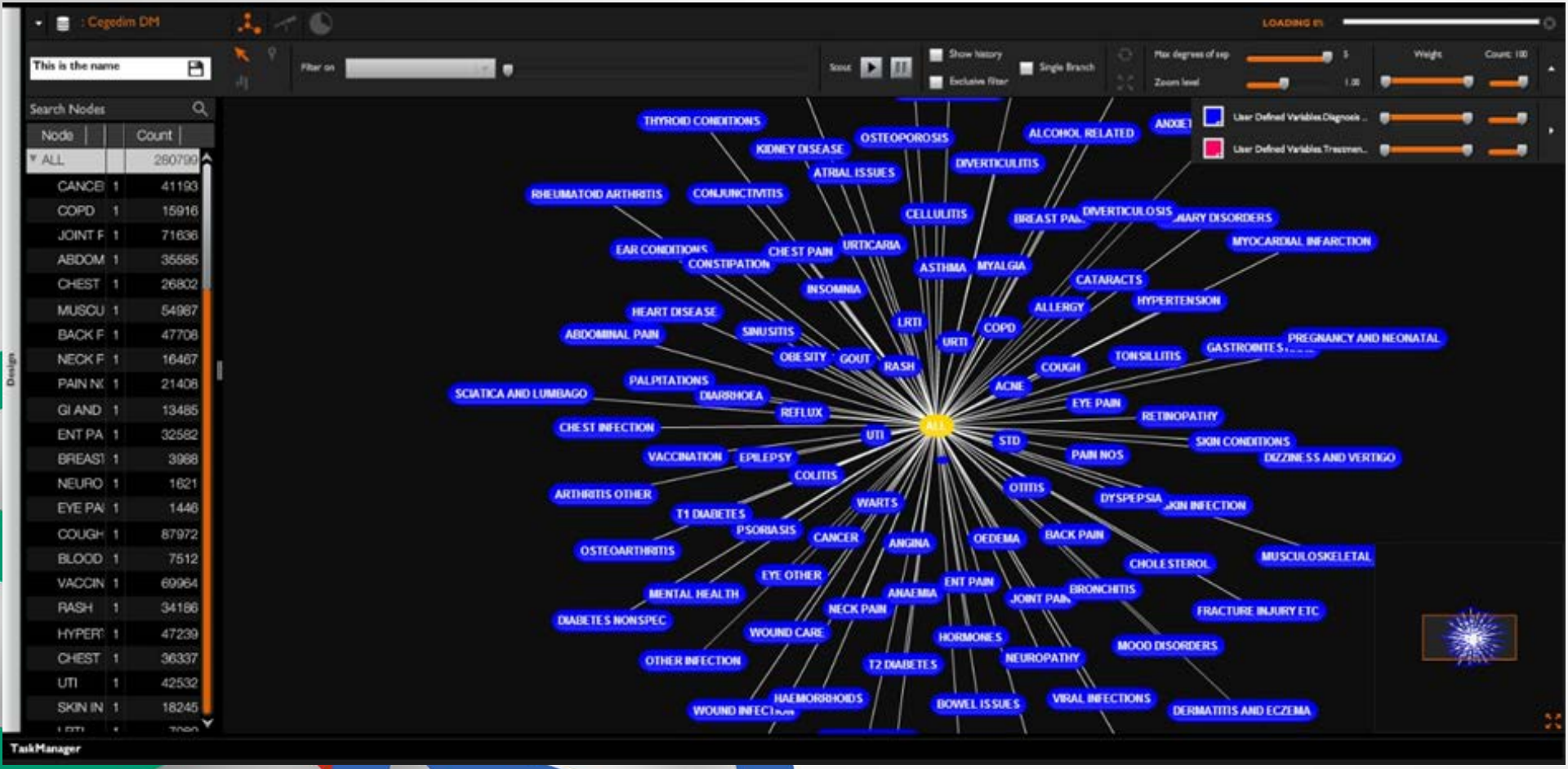
want to sell their data to other third parties

Or understand their own data in-house

Needs to be unique interface

APL – Flash - MiServer

COSMOS Node View screen shot



PHASE II

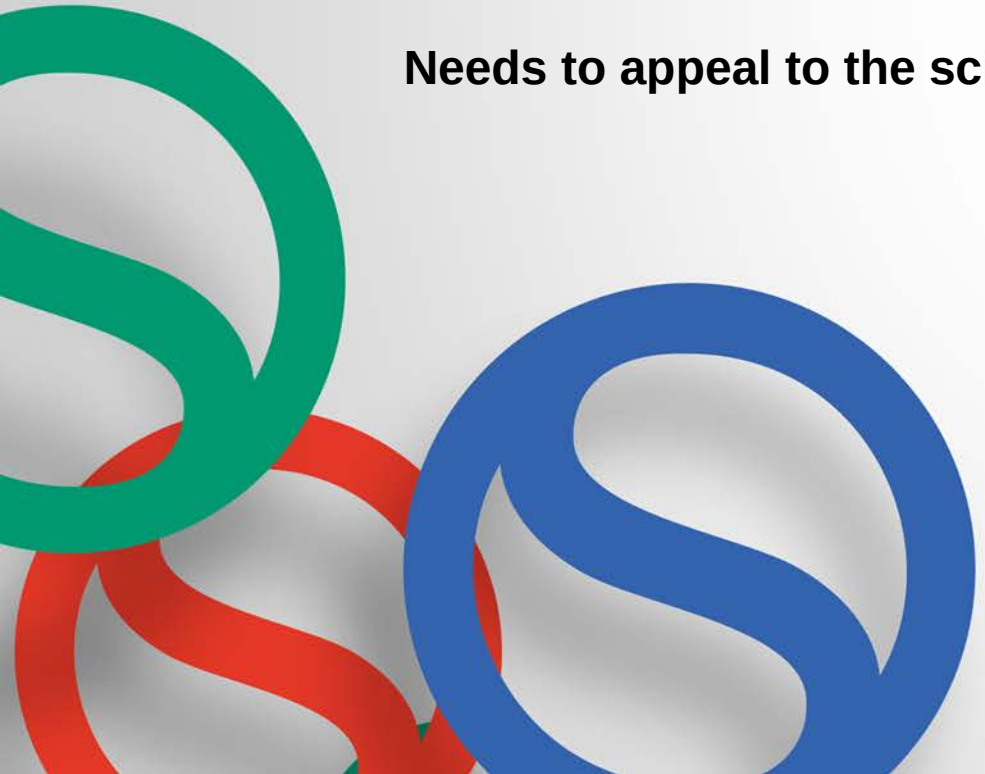
add some analytics

For those who want to;

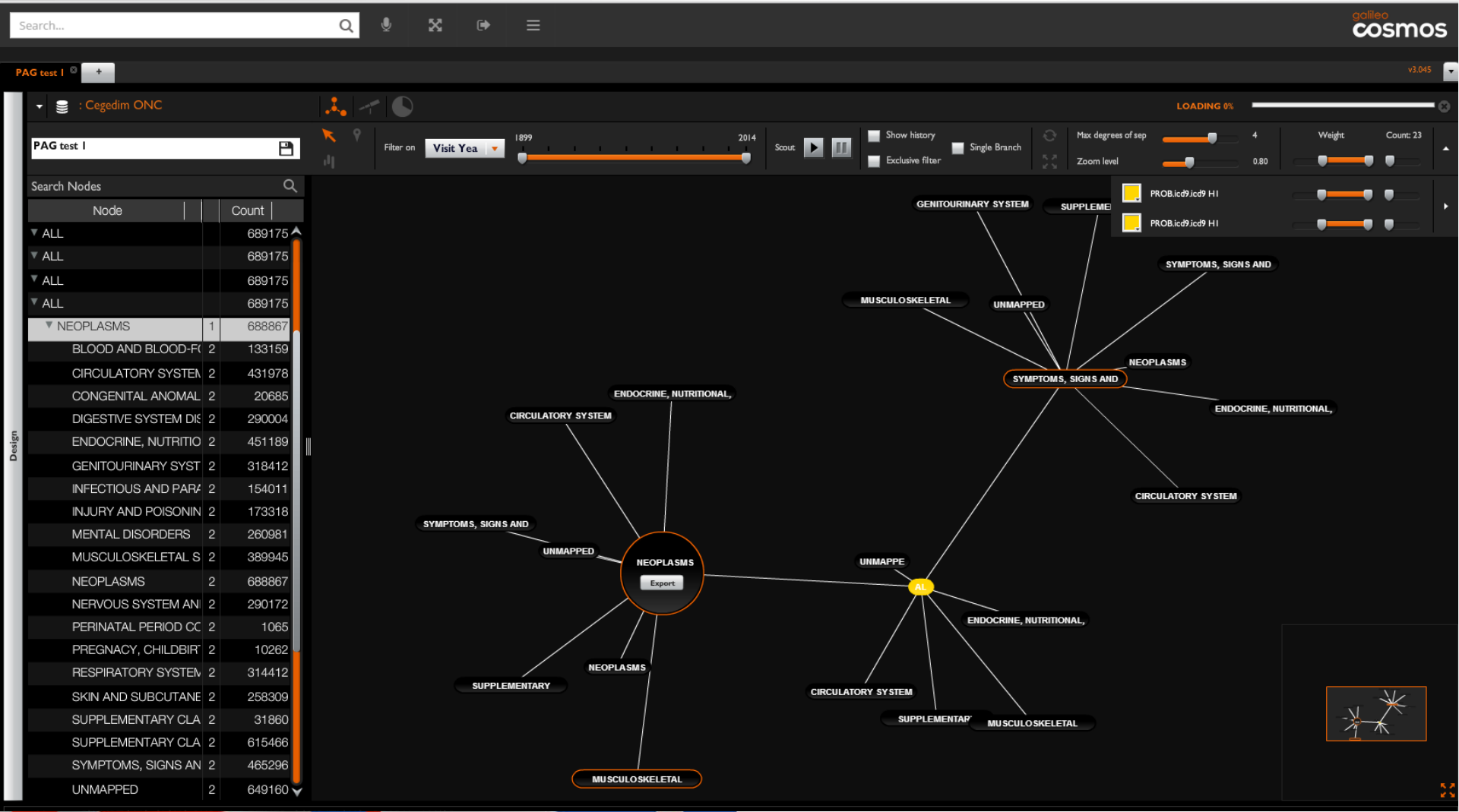
understand their data better

Add more functionality to be sold to their clients

Needs to appeal to the scientist



COSMOS Node View screen shot



PHASE III

Clinical Trials

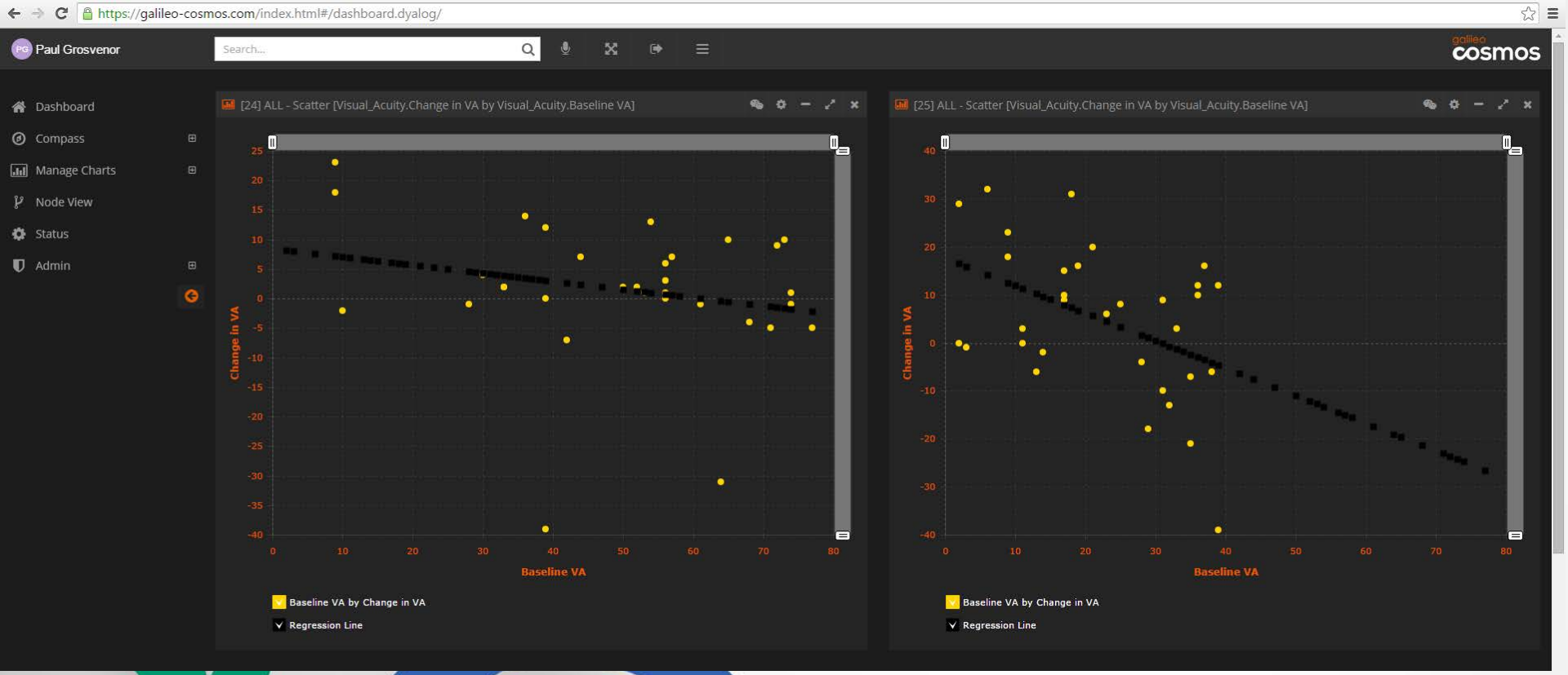
Small, complex datasets including images

Need for a dashboard to monitor

Enhanced security

Flash-APL-MiServer-HTML5

COSMOS Node View screen shot



PHASE IV

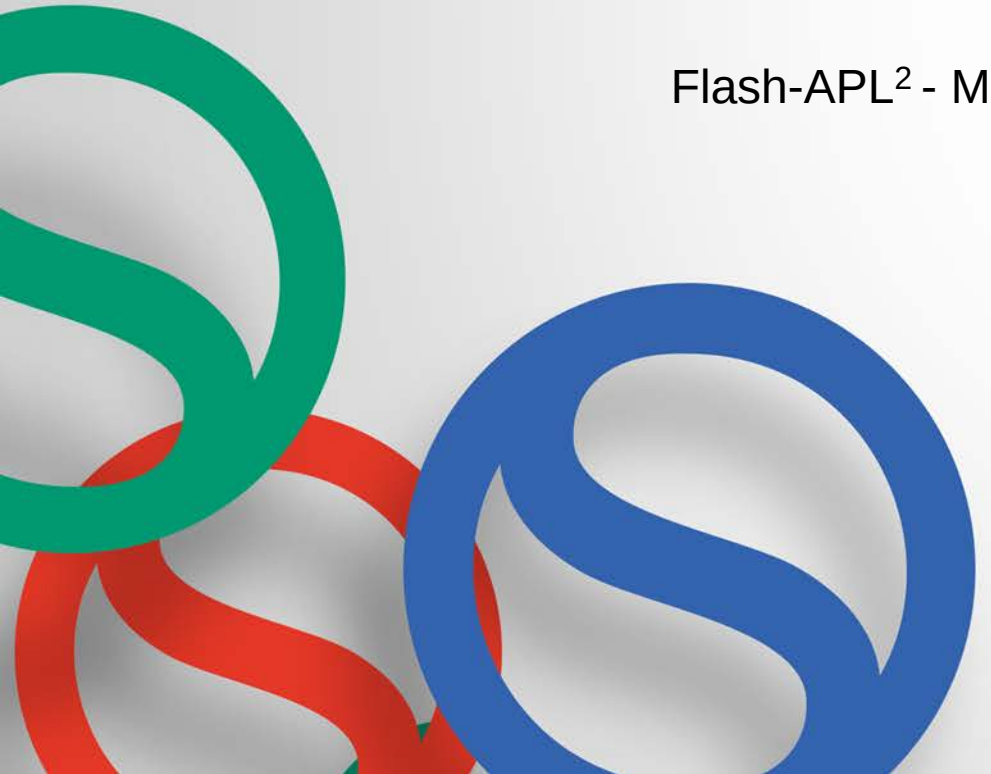
Drug manufacturers

Back to large/complex datasets

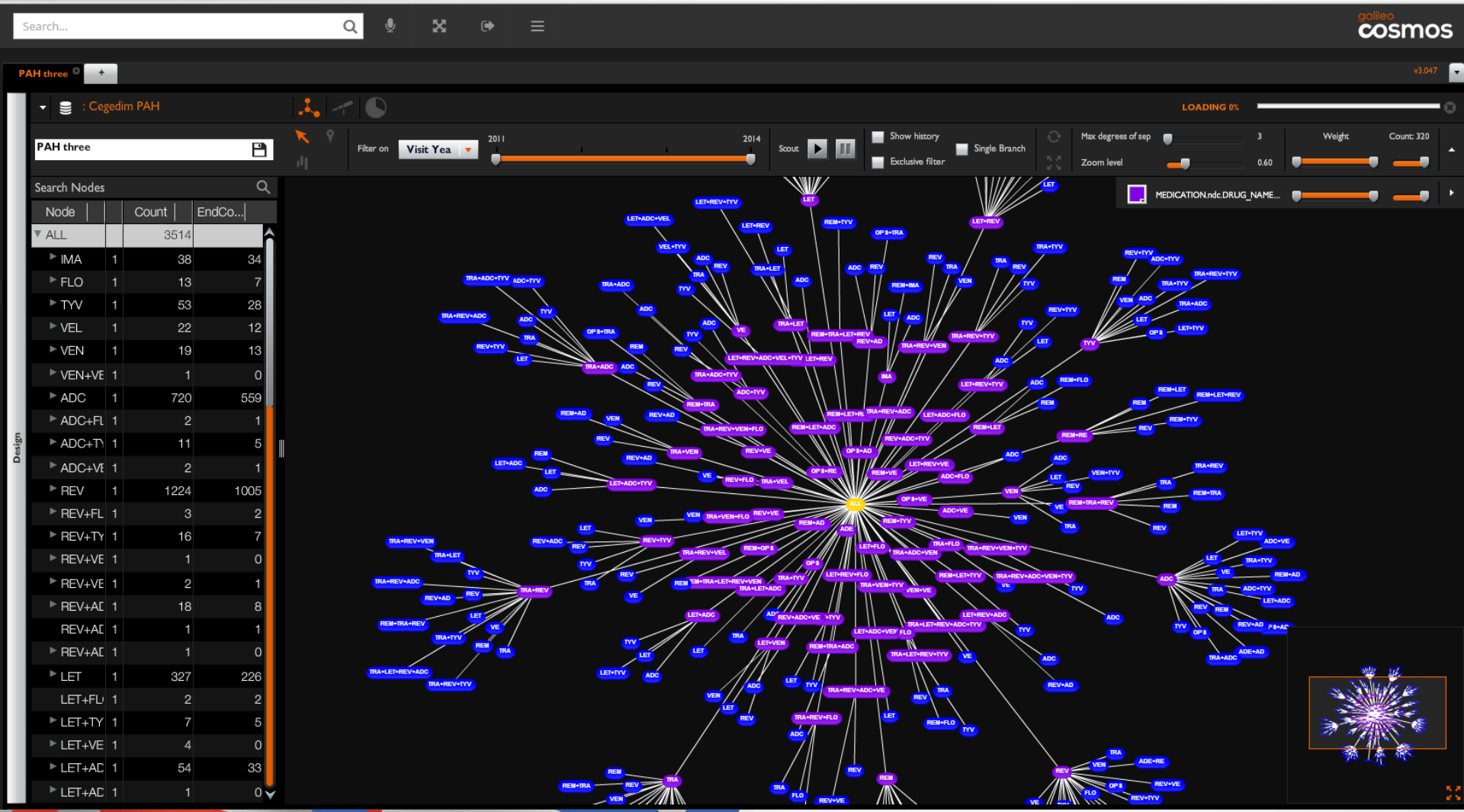
Multiple datasets

Patient flow analysis

Flash-APL^2 - MiServer - HTML5



COSMOS Patient Flow screen shot



PHASE V

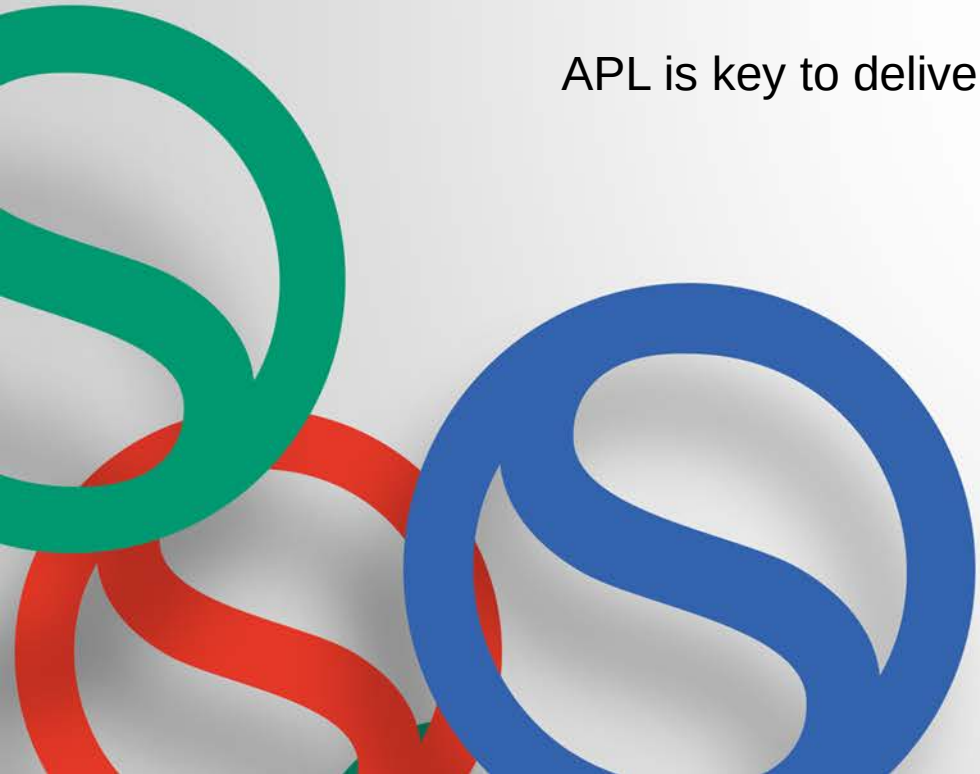
Patient Selection for clinical trials

Now the nub;

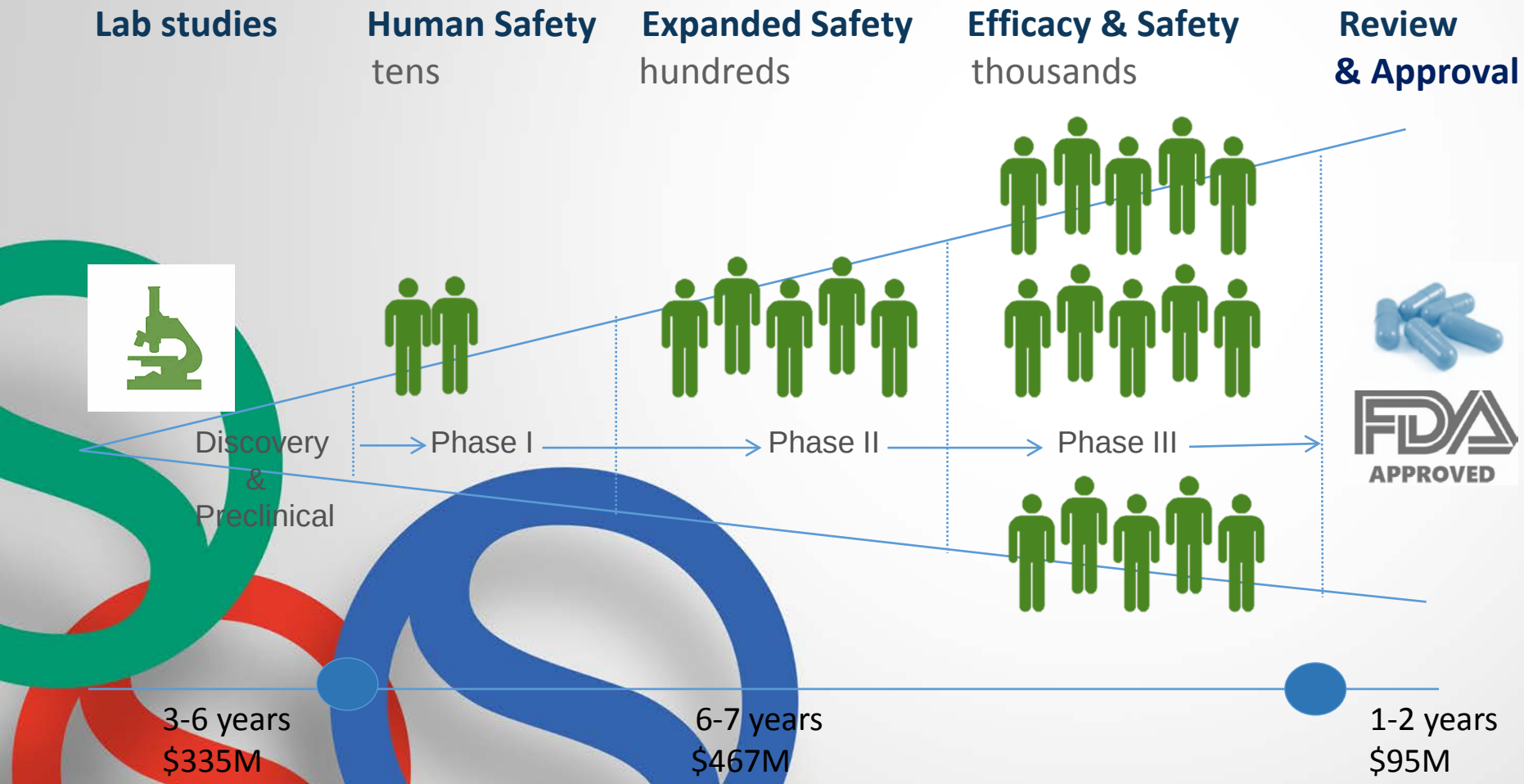
We need MORE data, more datasets, more tests

This is now getting really serious

APL is key to delivering this project



Drug development lifecycle is long & expensive…Patent life is short



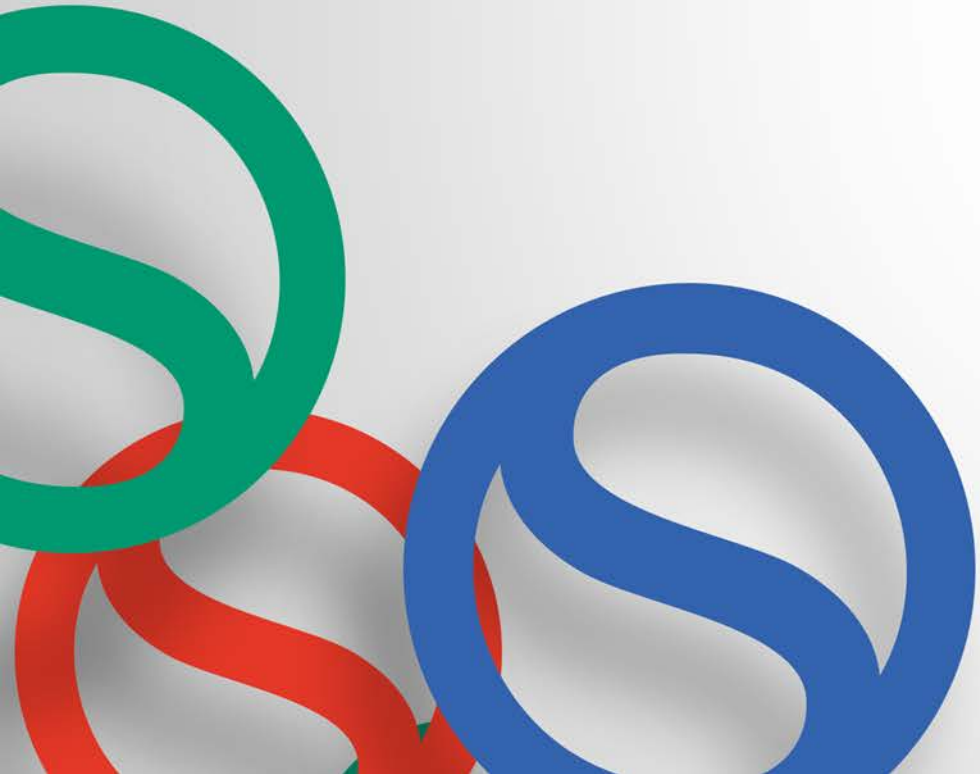
Question

In the US approximately how many drugs are awaiting Clinical Trials ?

A) About 200

B) About 400

C) About 800



Patient Screening

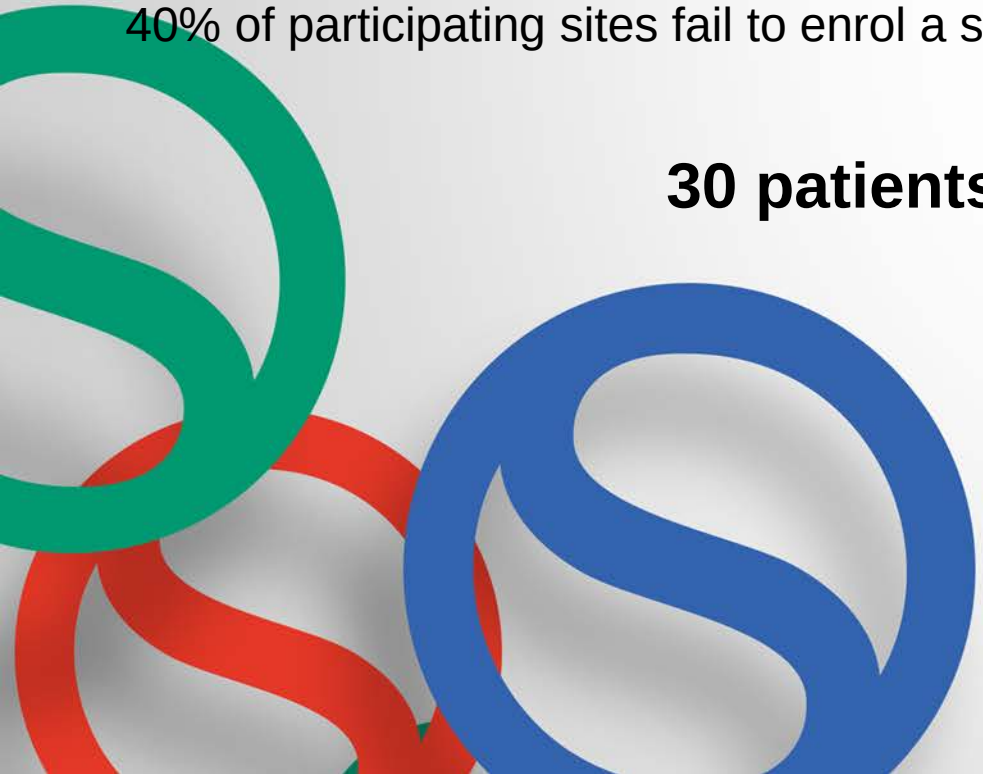
1.6M new **cancer** patients present per year

85% of cancer patients are treated in community hospitals

Only 3% ever get access to clinical trials

Even worse only 1.5% for minority populations

40% of participating sites fail to enrol a single patient costing >$50,000 per site



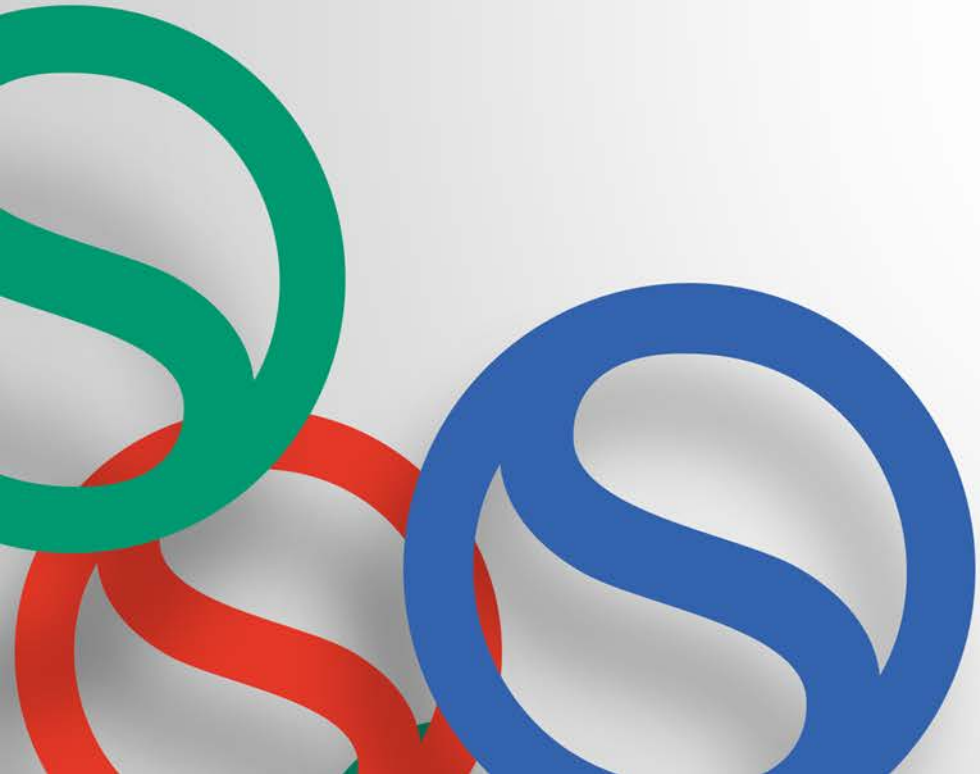
30 patients per drug (15 for minorities)

Patient Screening Script

Very complex

Requires many different data sources

Pages and pages of it



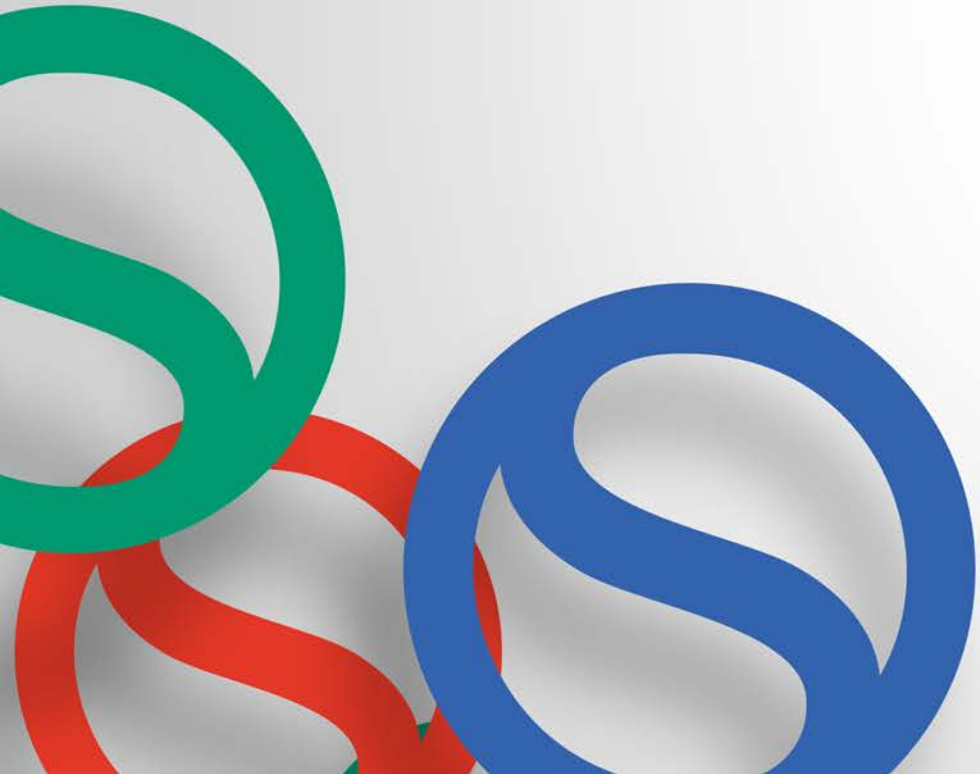
So here we are today

We have the power

We have the flexibility

We have the speed

We have APL

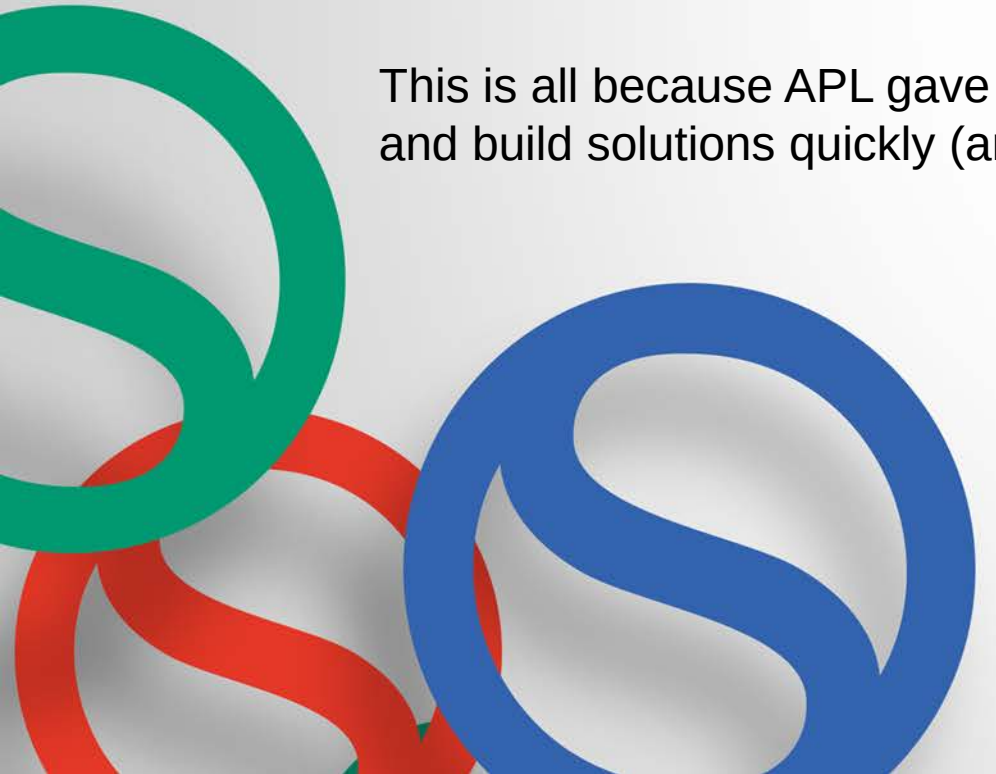


In Conclusion

For the very first time we will be able to view, in real time, patient, demographic, genomic, clinical and cost data in the same place at the same time

We will get more of the right patients available for trials, speed up the development process and get the drugs available for patients faster

This is all because APL gave us the ability to prototype and build solutions quickly (and deliver the results)



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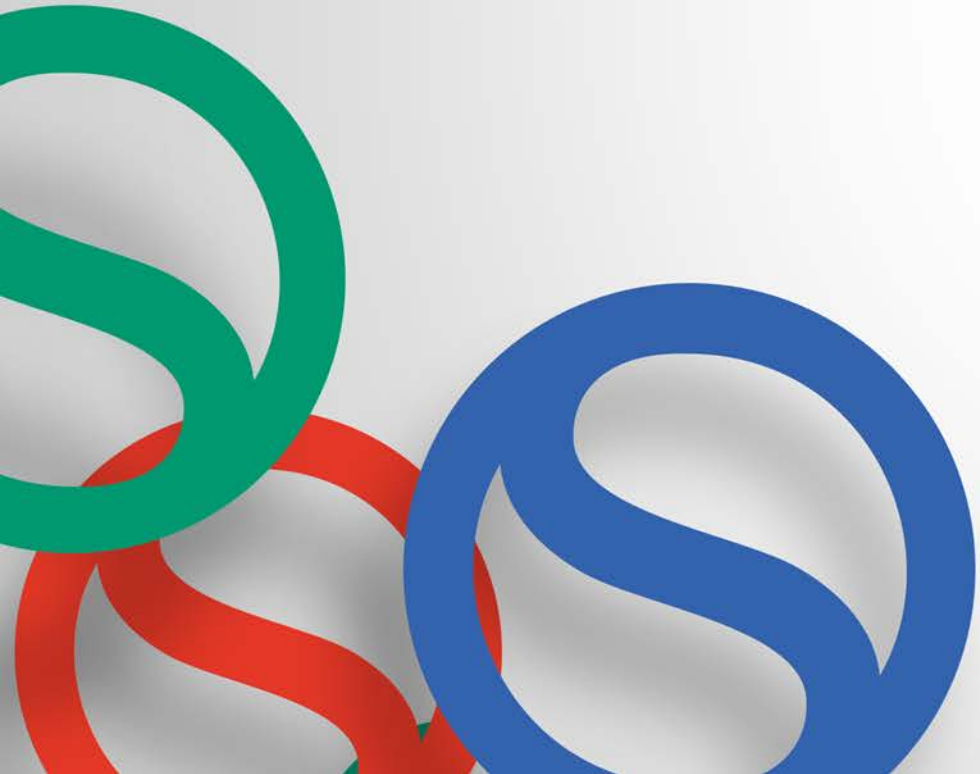
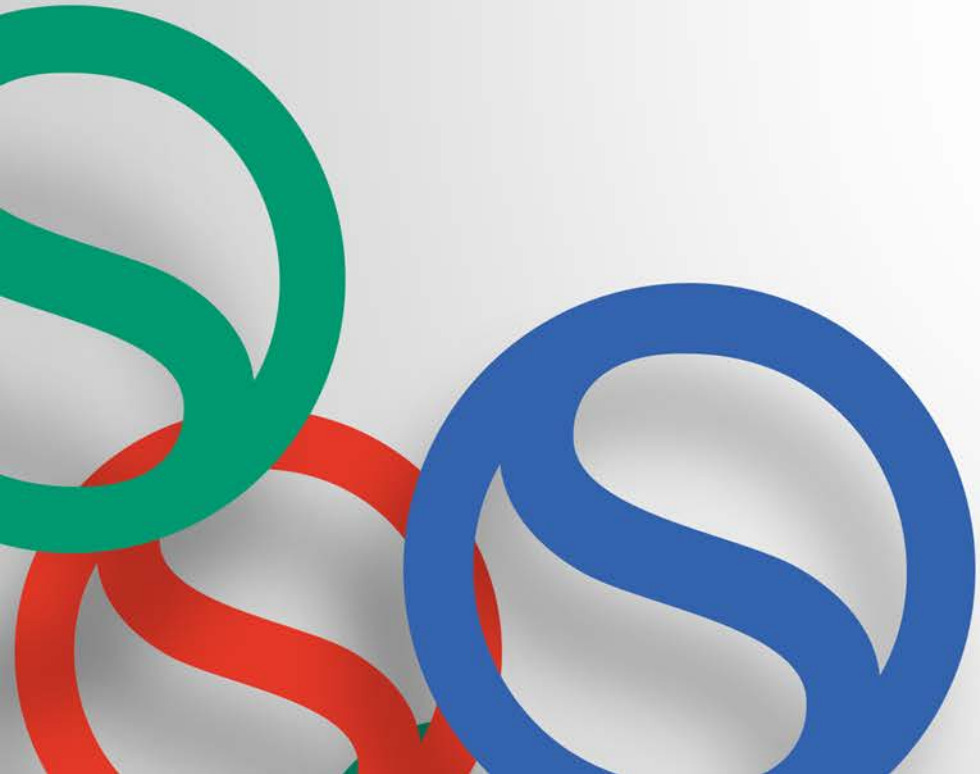
Thank You