

Fitting the tiny bit(s)...

Presented by Per Bækgaard, PhD

Associate Professor (Digital Media Engineering), Cognitive Systems, DTU Compute

pjba@dtu.dk | [@per_baekgaard](https://twitter.com/per_baekgaard) | (+45) 4050 2574

Prepared in cooperation with

Jakob Eg Larsen, PhD

Associate Professor, Cognitive Systems, DTU Compute

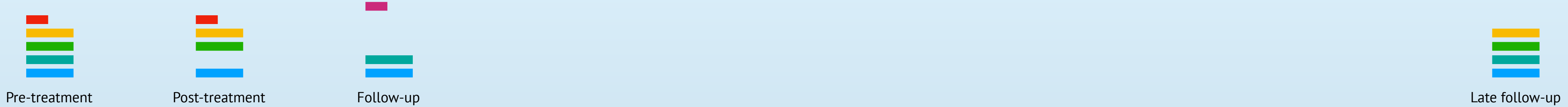
not just **more** but **new** kinds of data

leading to

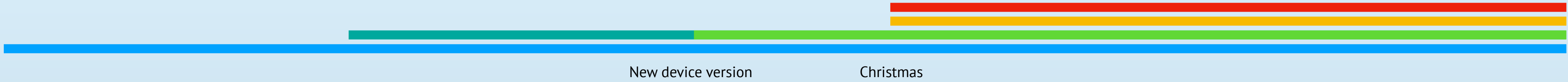
non salient data become meaningful,
new options for anomaly detection,
finding new correlations,
and more insights based on higher densities

Patterns of Data Collection – Different Data Densities from Different Domains

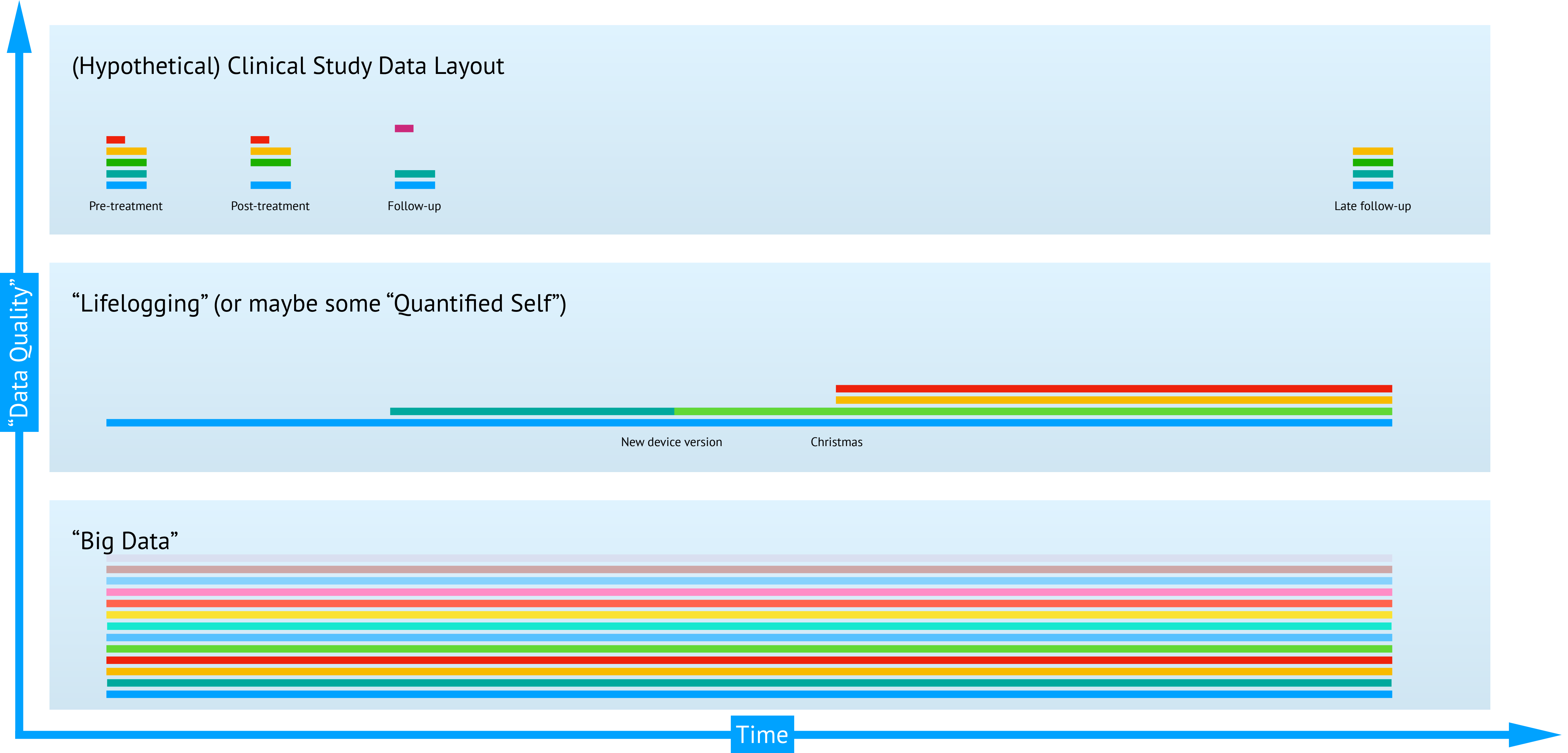
(Hypothetical) Clinical Study Data Layout



“Lifelogging” (or maybe some “Quantified Self”)



“Big Data”



Patterns of Data Collection – Different Data Densities

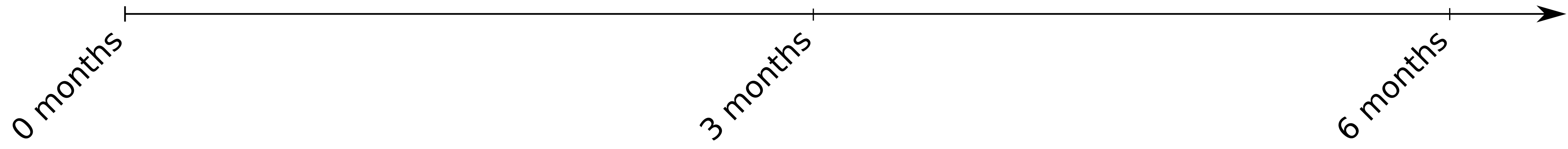
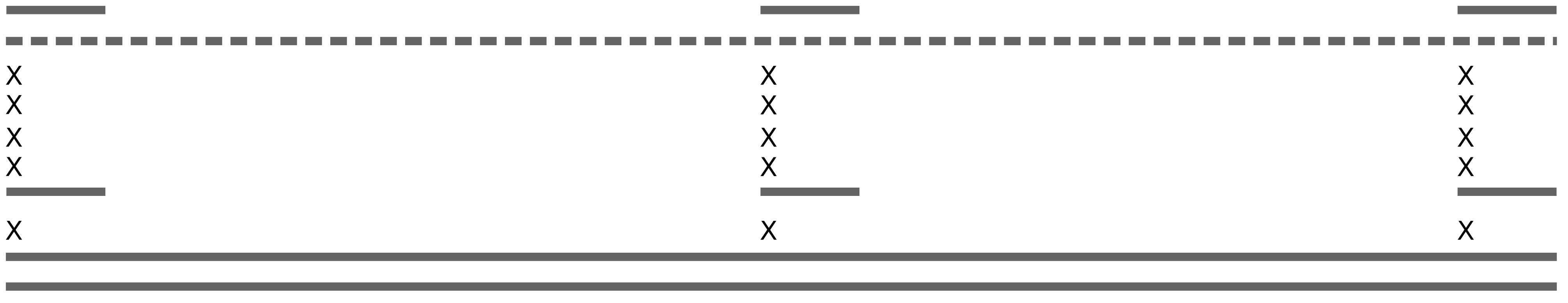
Smartphone

- Accelerometer
- Location
- Steps
- Activity Recognition



Clinical

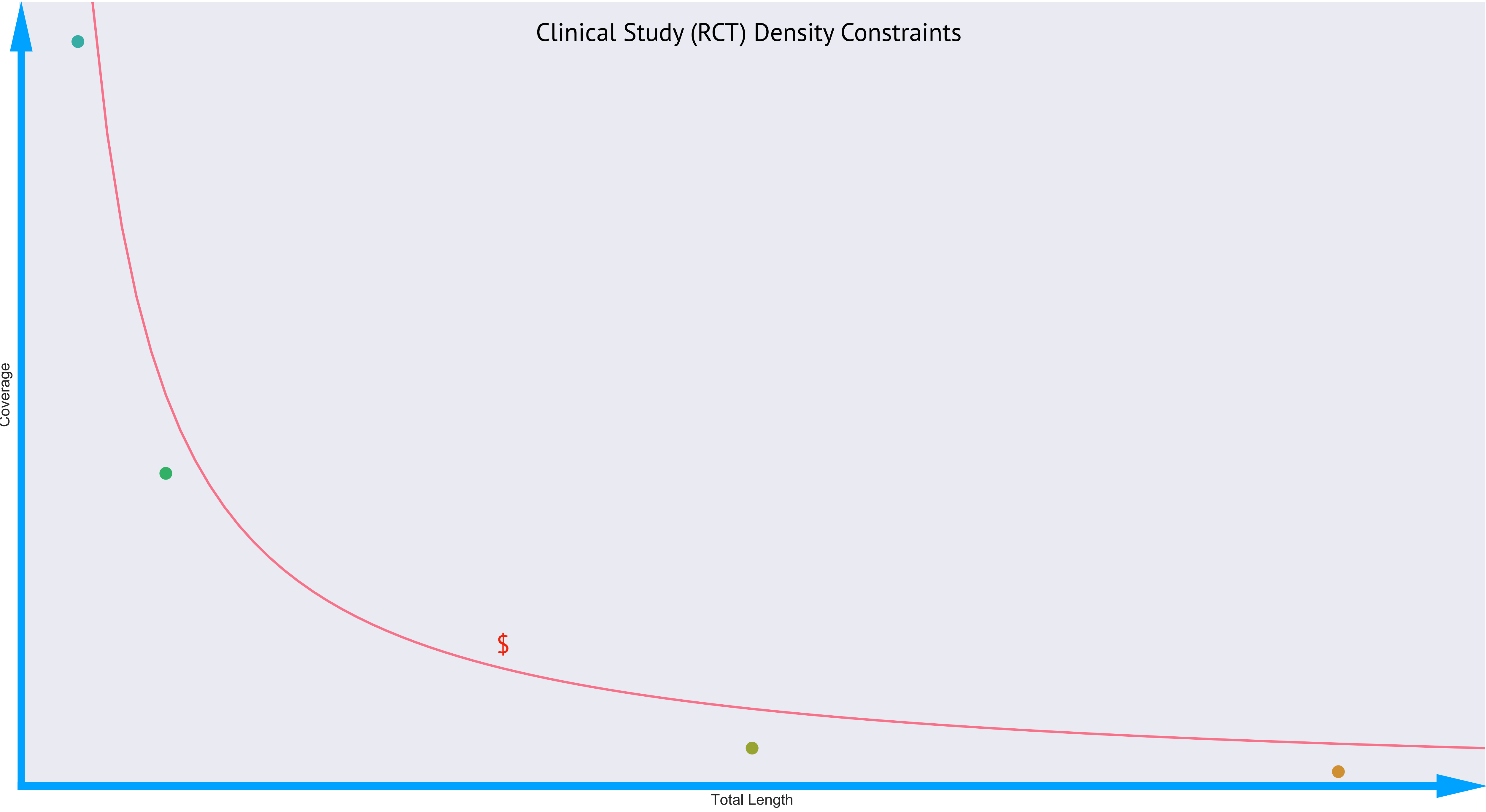
- Accelerometer
- Heart Rate
- Insulin sensitivity
- Physical tests
- Biopsy
- Blood analysis
- Labelled water
- MRI
- Weight
- Sleep diary



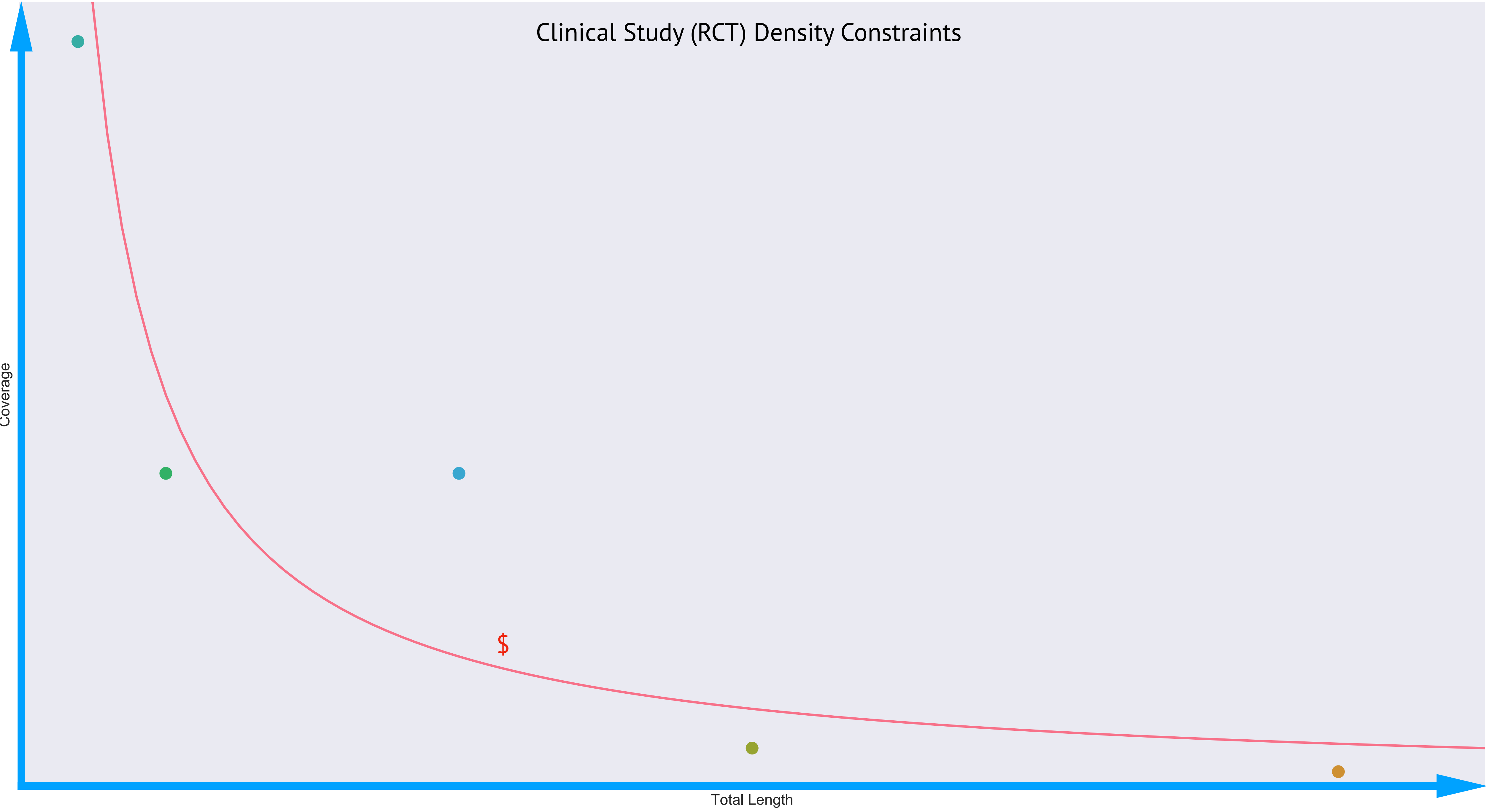
Clinical Study (RCT) Density Constraints



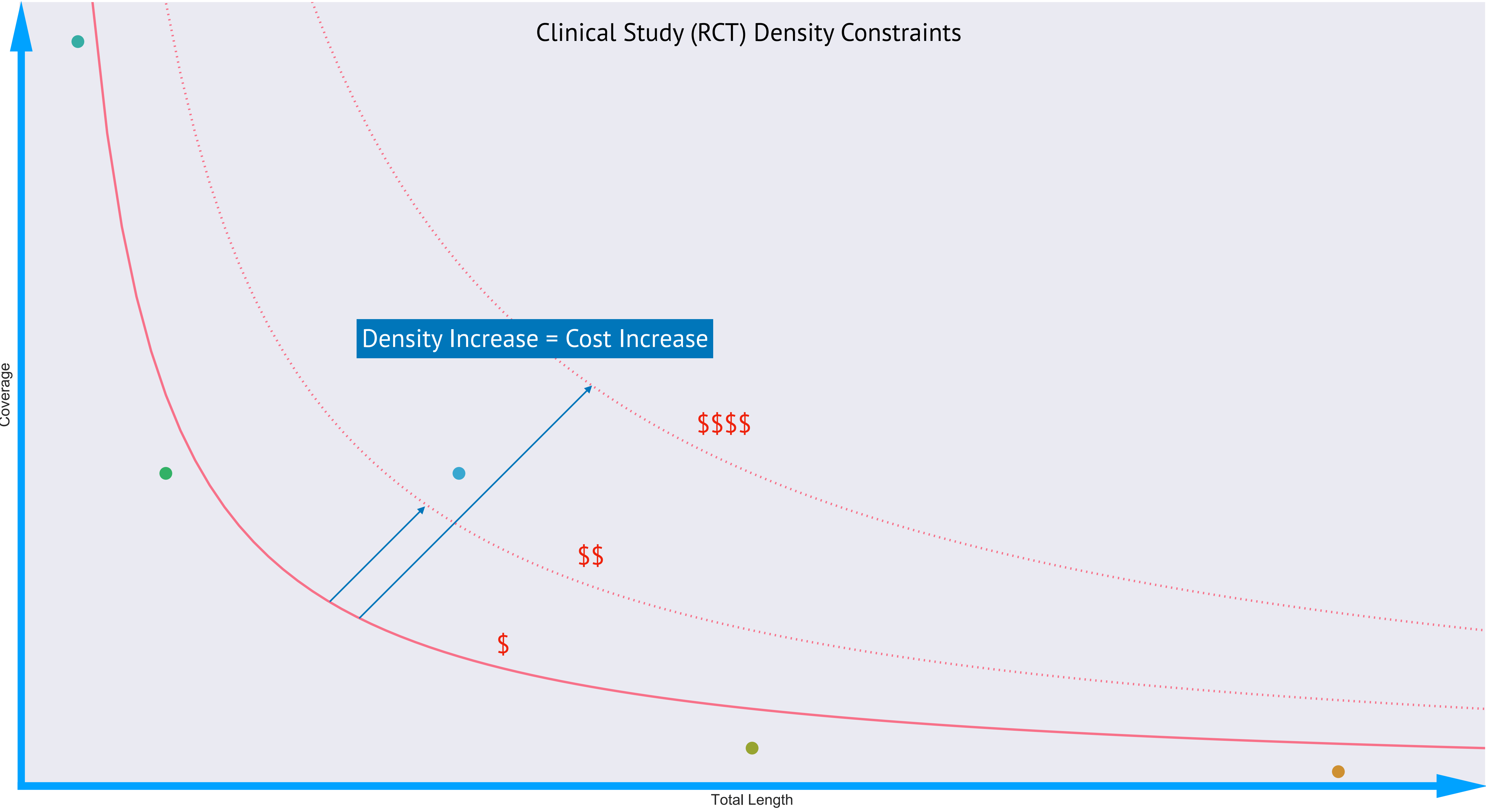
Clinical Study (RCT) Density Constraints

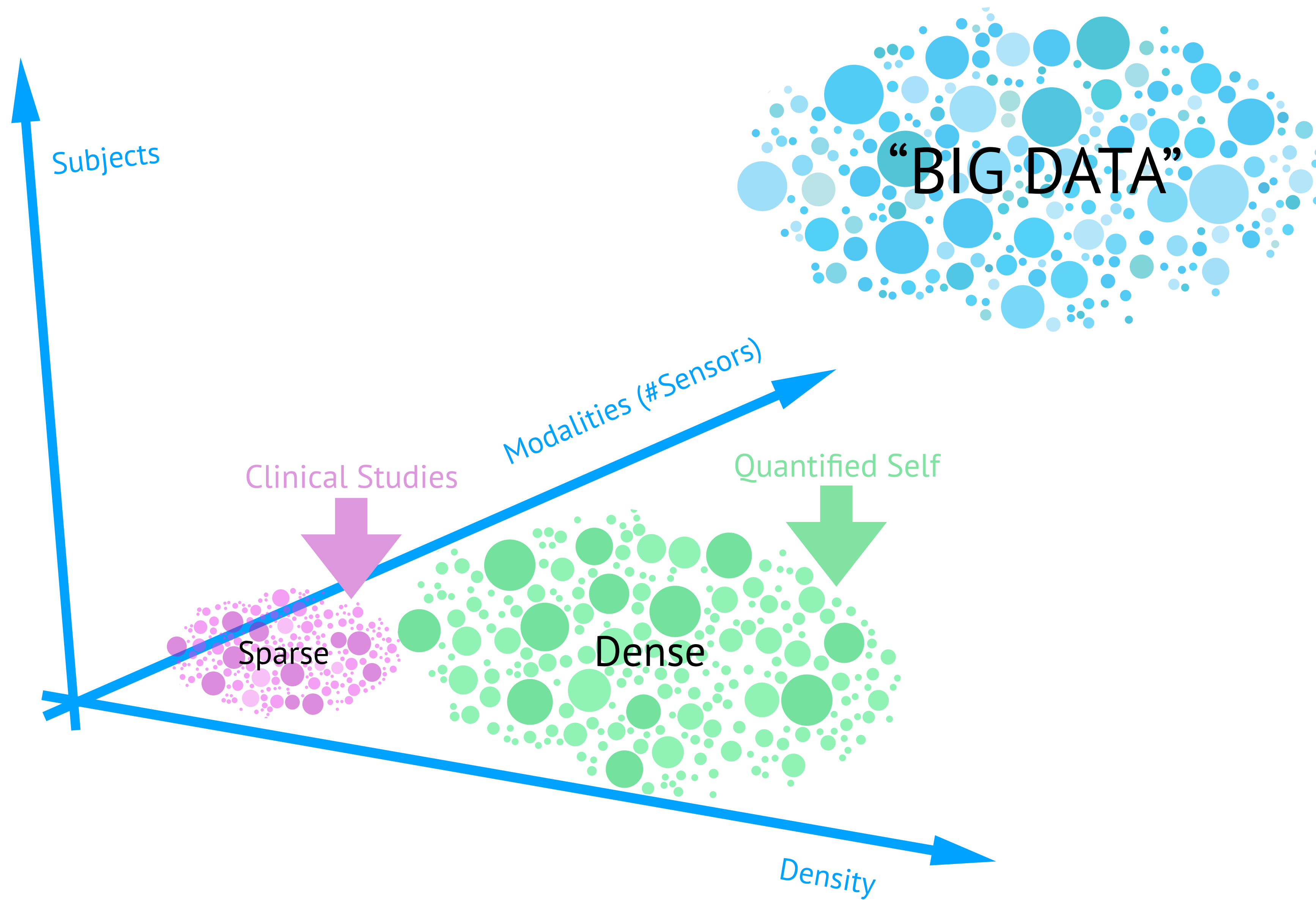


Clinical Study (RCT) Density Constraints



Clinical Study (RCT) Density Constraints





so what happens when
diverse areas meet

ALMEN PRAKSIS | NYHEDER



Self-tracking kan revolutionere forskning og behandling

En dansk forskergruppe har sat sig for at ændre den måde, sundhedsvæsenet ser på og bruger patienters egne data om f.eks. symptomer og bivirkninger. Dataene kan nemlig danne grundlag for langt bedre behandling af de patienter, som er allersværest at hjælpe.

Linn Emilie Fedders | 23/09/2016

Del: [Facebook](#) [Twitter](#) [LinkedIn 49](#) [E-mail](#)

»I ved ikke, hvor mange gange det har kløet i min næse,

VS



DIGITAL SUNDHED

Læger er splittede over potentialet i sundhedsdata

Helle Baagø - 6 November 2017

Wearables indsamler informationer, som kan bruges til at personalisere behandling og forebygge sygdomme. Men langt fra alle læger bifalder, at forbrugerne tracker sig selv. Her er 4 budskaber fra en debat om fremtidens sundhedsvæsen, arrangeret af Det Ethiske Råd.

Mens forbrugerne i stigende grad bruger fitnesstrackers, smarte ure og andre wearables til at få indsigt i deres egen sundhed, er det langt fra alle læger, der synes, at det er en god ide.

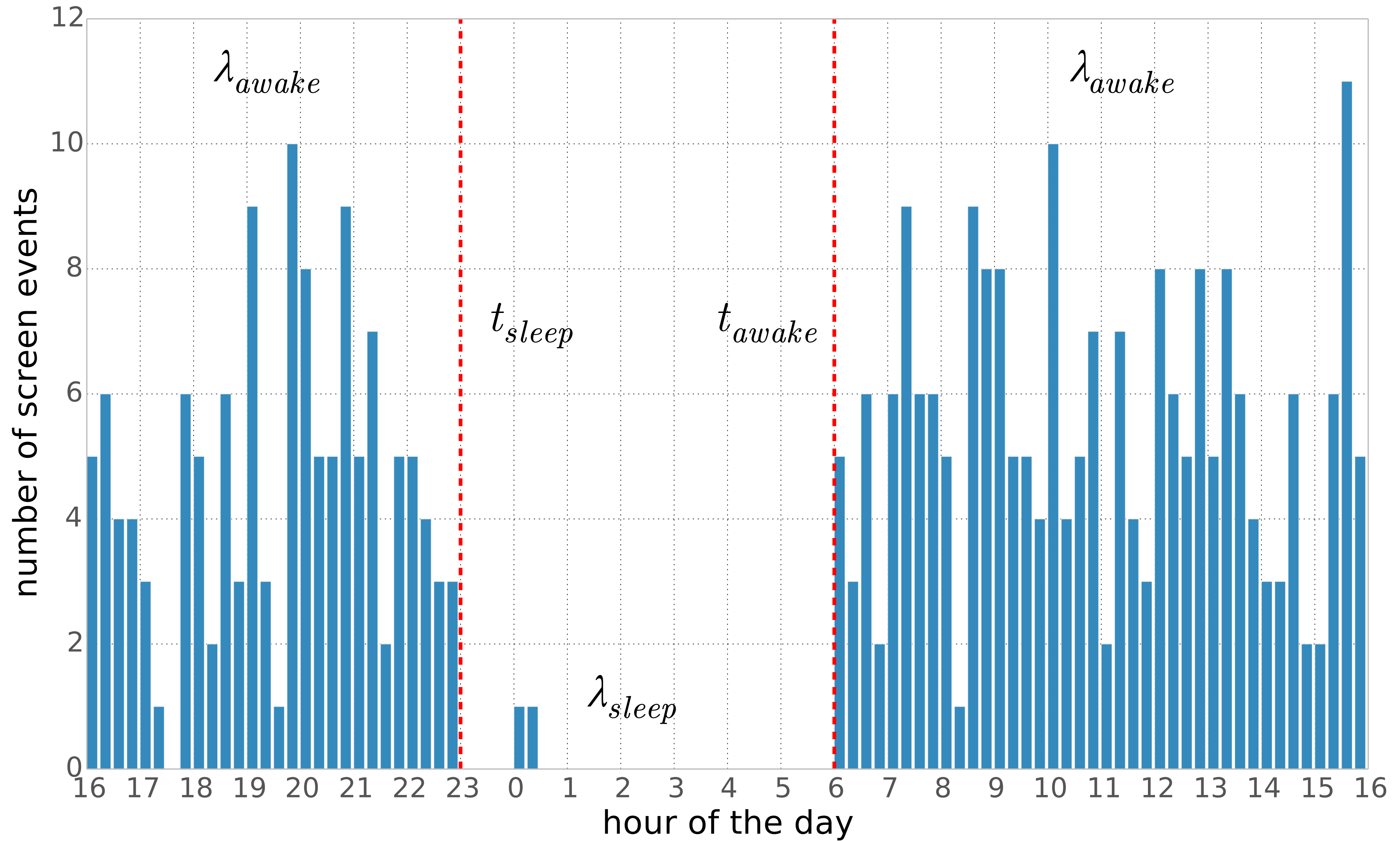
Meds læger ser et stort potentiale i den nye teknologi, men andre er bange for, at patienterne skal blive

big data clinical data quantified self
dense data sparse data thick data

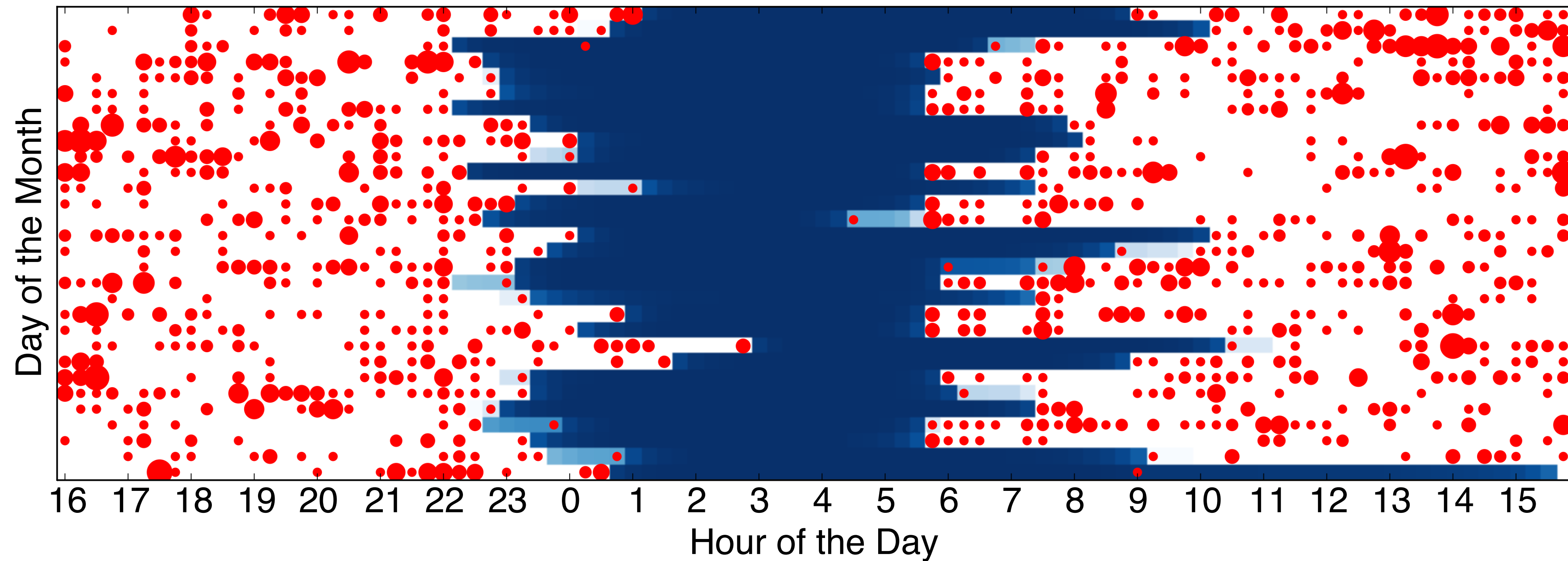
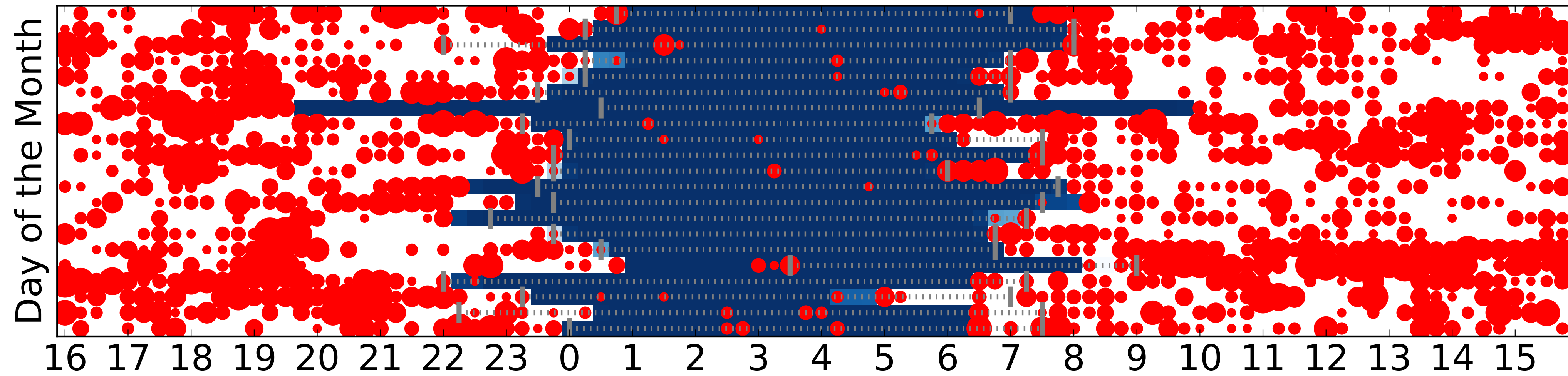
but what is the **right data**

"One Bit Only"

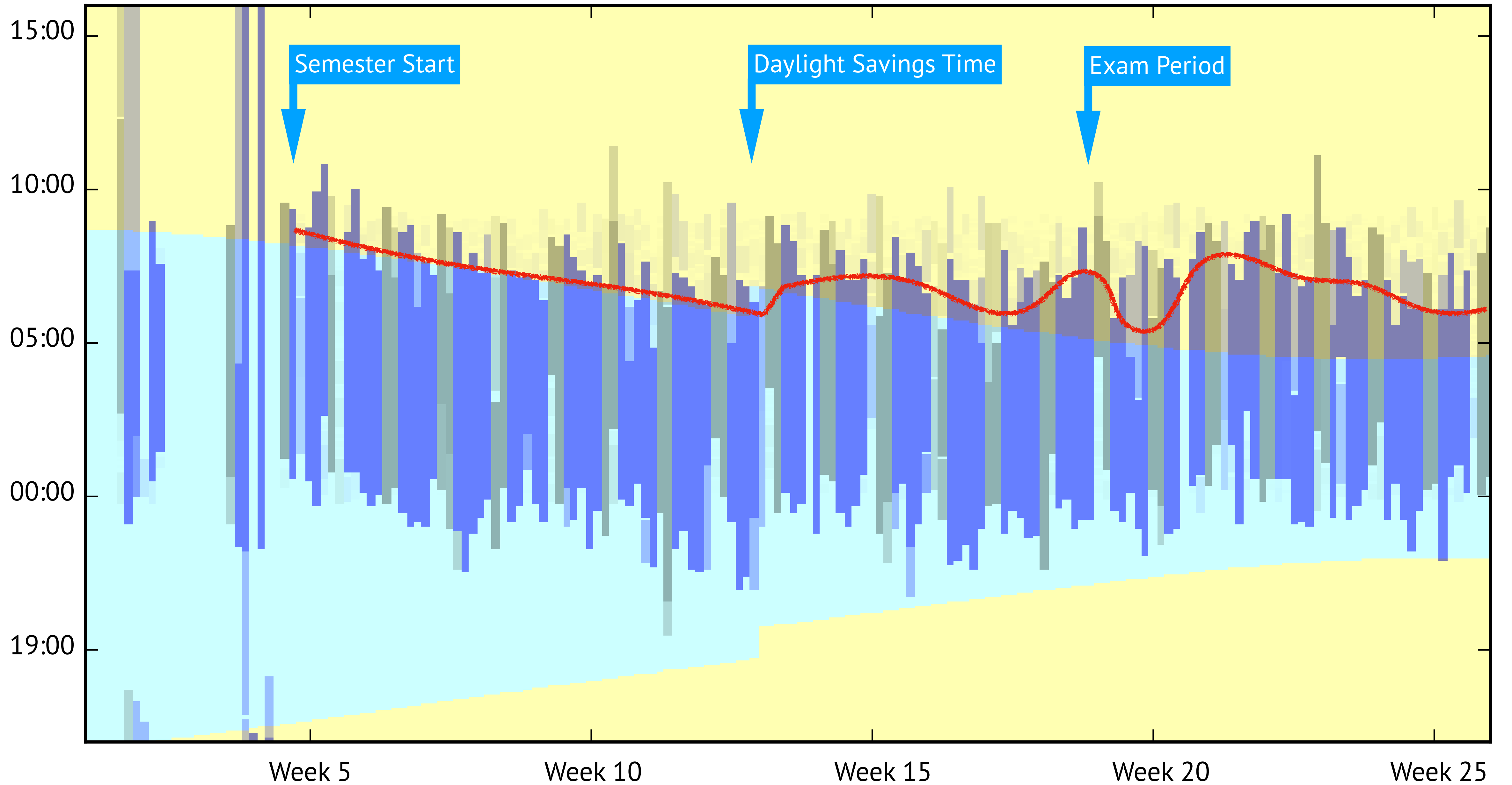
Typical phone usage for one subject during one day



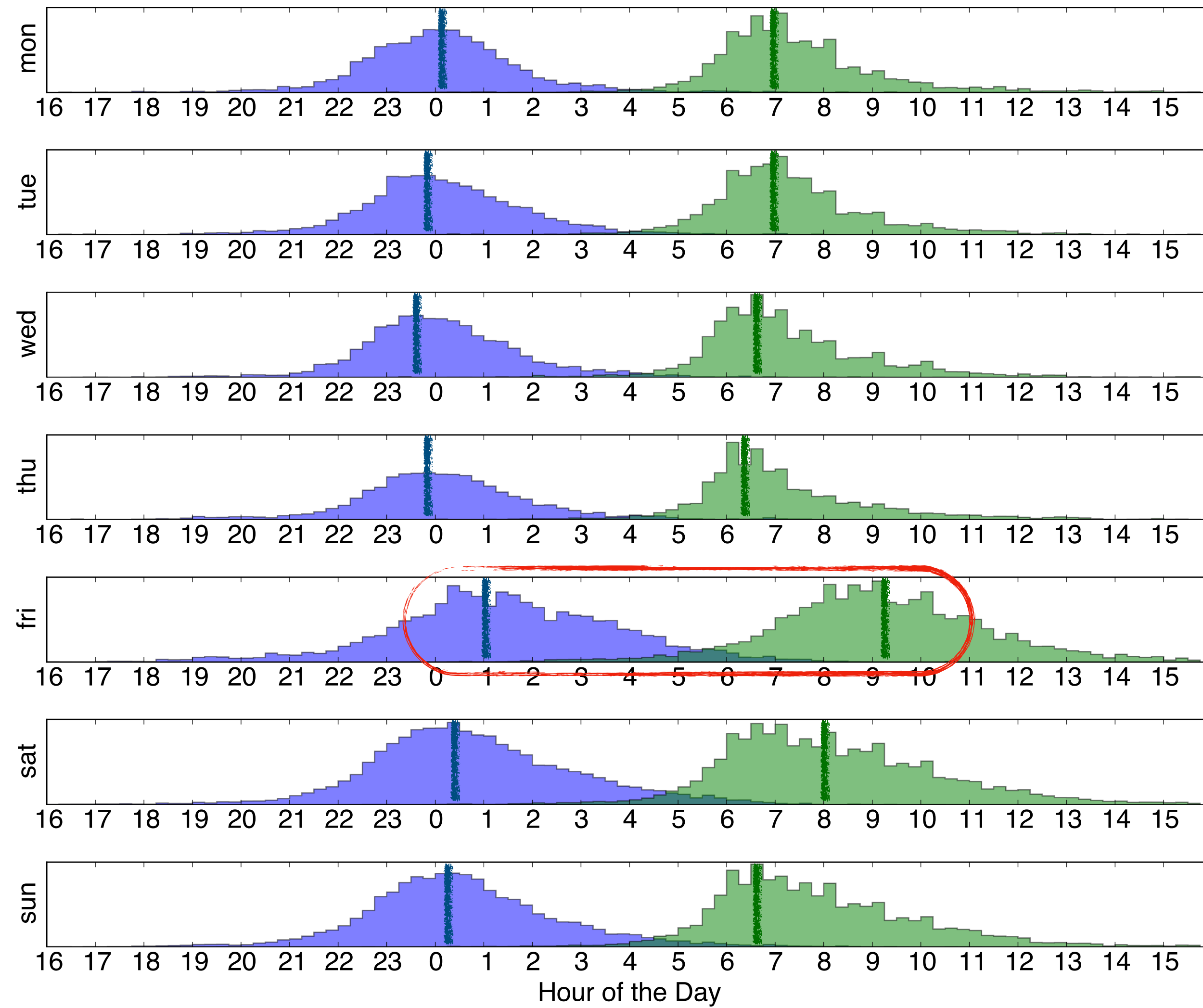
Phone Usage and Derived Sleep Patterns for two subjects (21 and 30 days respectively)



Sleep Pattern for one subject during 1st half 2014



Derived Sleep- and Wake Times across a larger population of students during semester



we learn **new patterns**

but what about

understanding the **individual baselines**

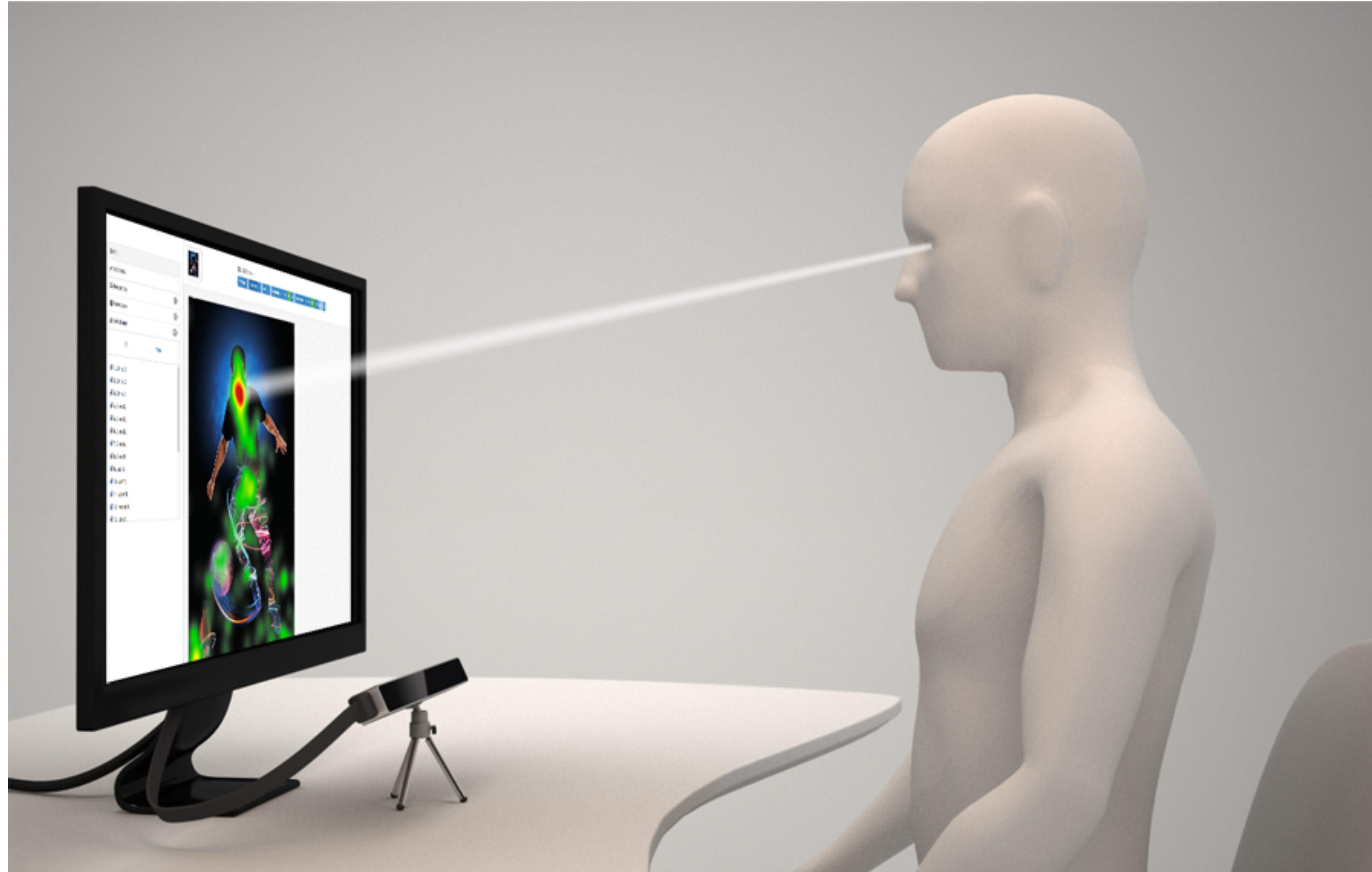
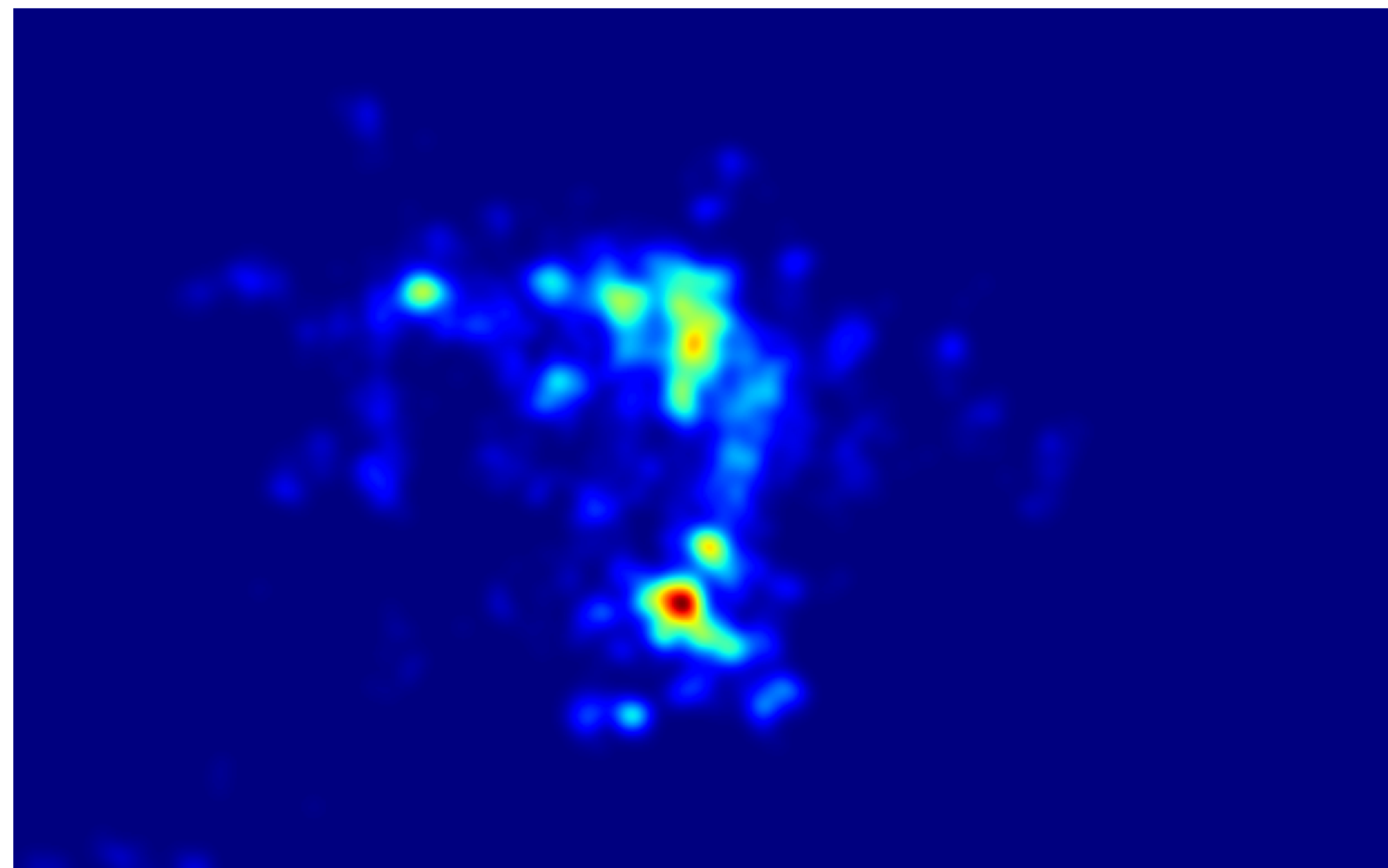


Figure from former website of "The Eye Tribe" (now part of Facebook)

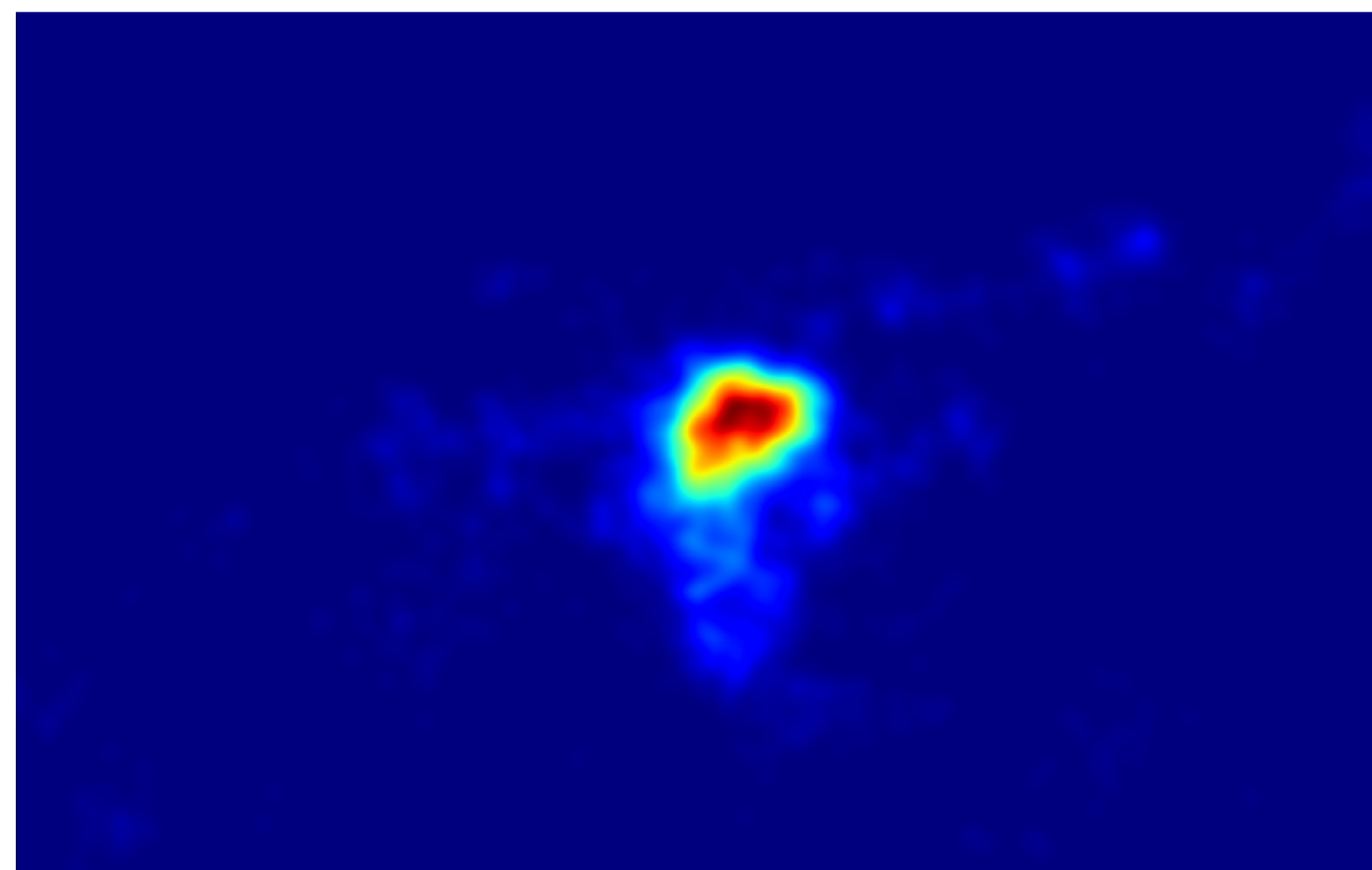
Two different heat maps

But what is the story here?

A



B



how do we...

incorporate new data sources

utilise weaker signals

establish personal baselines

eventually getting at the **right data**