

## Data is the new oil – So what?

**How routine healthcare data can help deliver better patient outcomes and better patient experiences.**

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“Data is the  
new Oil”

– Clive Humby

## So What?.....



### Case Study

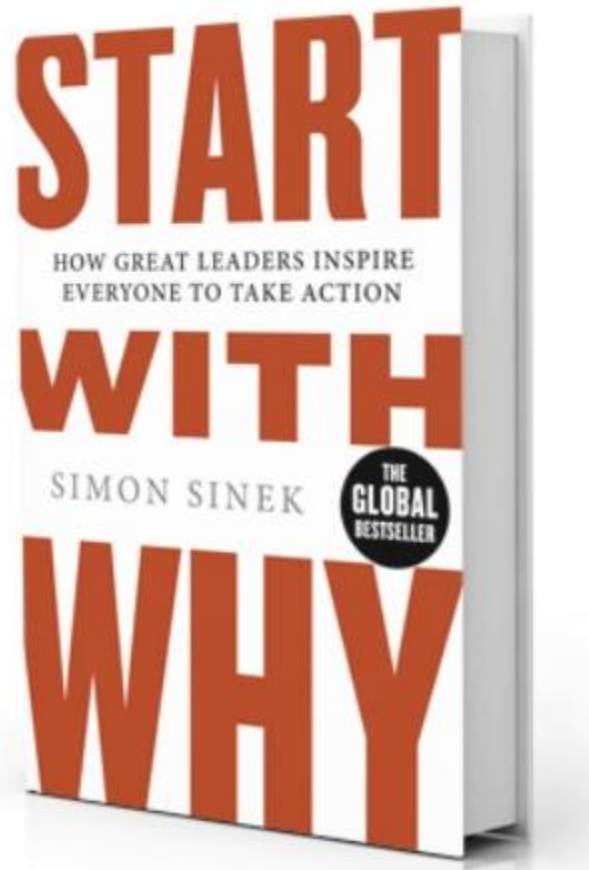
## Proactive Care at Brighton and Hove

The collaborative approach to this project, involving [Here](#), Sollis, Age UK and Community Works, has provided clinicians, pharmacists and data analysts with the insights to dig deeper into patients' health and also the outcomes that are important to those patients.

This case study demonstrates what is achievable when dedicated professionals put aside tribal allegiances and join as a team to deliver to a common purpose.

More importantly, it is the story of one particular patient – James.

Above all this is a human story.



## Imagine a world where

.....high quality patient care is assured, and people's lives are enriched, all because of the existence of actionable data.

To get this right we need friends.....



## Population Health Management (PHM)

- Population Health Management (PHM) is a system using **data and analytics** to evaluate and improve the health of population groups as a whole
- PHM is a process and it is **data driven** endeavour
- It is a **TEAM** endeavour

## Key Healthcare Themes

- The Quadruple Aim
  - Better Health Outcomes
  - Improved Patient Experience
  - Lower Cost of Care
  - Improved Staff Experience
- Prevention
- Unexplained Variation
- Health Inequalities / Health Inequity
- Care Gaps
- Case finding





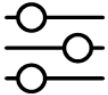





## **Analytical Tools / Methodologies**

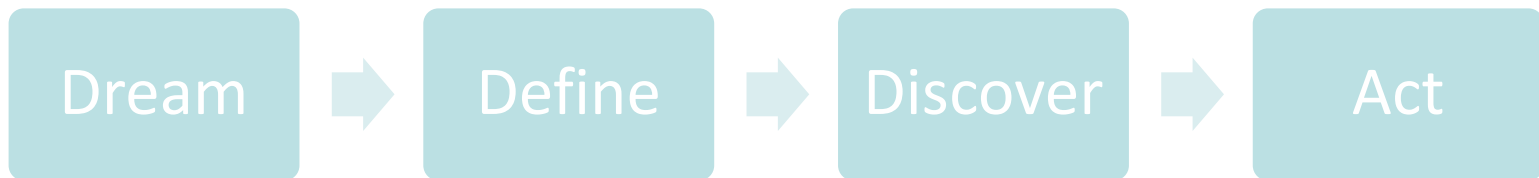
- Population Needs
- Risk Stratification
- Predictive Modelling
- Population Segmentation
- Case-mix Adjustment / Benchmarking
- Actuarial Analysis
- Impactability Modelling
- Evaluation & Feedback / Outcome Measurement

**Now for the clever stuff.....**

## Helping you to identify, understand and manage your target population

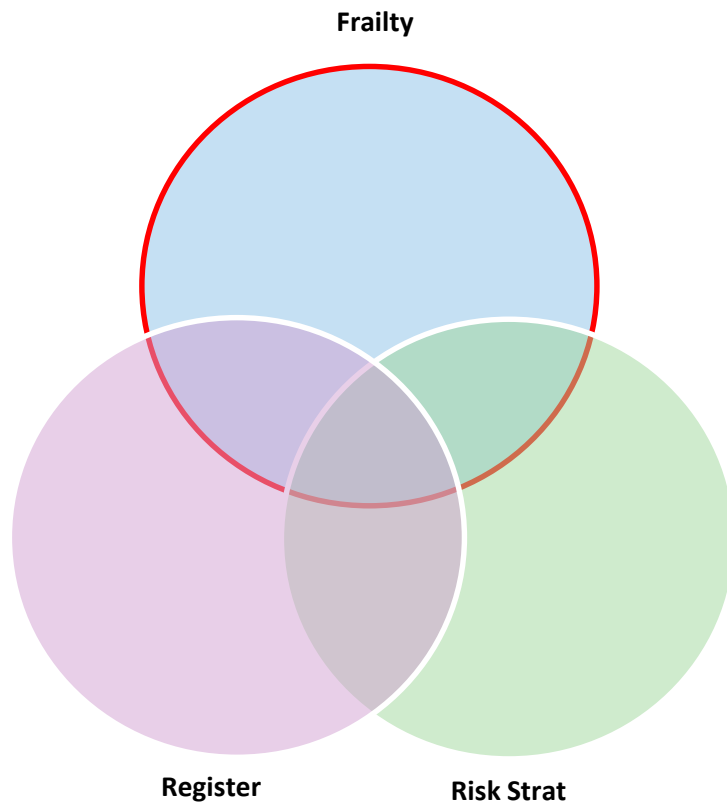
Who	Setting out your population aims	Understanding your population's composition	Understanding your population's composition	Understanding your population's composition
				
	Whole population	Subpopulation	High risk population	Individual
How				
	Outcomes Measurement	Segmentation	Risk stratification	Impactability modelling
	Identify unwarranted variation and opportunities for improvement	Systematically identify homogenous groups and provide detailed insights	Equitably identify individuals with the greatest relative risk of certain outcomes	Highlight individuals who also may be amenable to preventative care
Why	<i>We have an unusually high incidence of falls in our elderly population and wide inequalities across the population</i>	<i>Our 'older people with long term conditions and complex needs' have the highest incidence of falls and are the most expensive service users</i>	<i>We have an unusually high incidence of falls in our elderly population and wide inequalities across the population</i>	<i>We have an unusually high incidence of falls in our elderly population and wide inequalities across the population</i>

## Enabling service improvement through a hypothesis driven data science service



- Sprint-based approach to help develop key lines of enquiry
  - *As a PCN clinical director what are the most influenceable outcomes I am an outlier for?*
- Testing and iteration of hypotheses through curation of our evidence base, application of data science and clinical/operational engagement
- Use insights to help design programs and services with cross functional teams
- 'Projects to product' to help 'land and expand' pilot programs through a data driven and equitable approach

## Building ontologies - using analytical 'lenses' to identify the right cohort

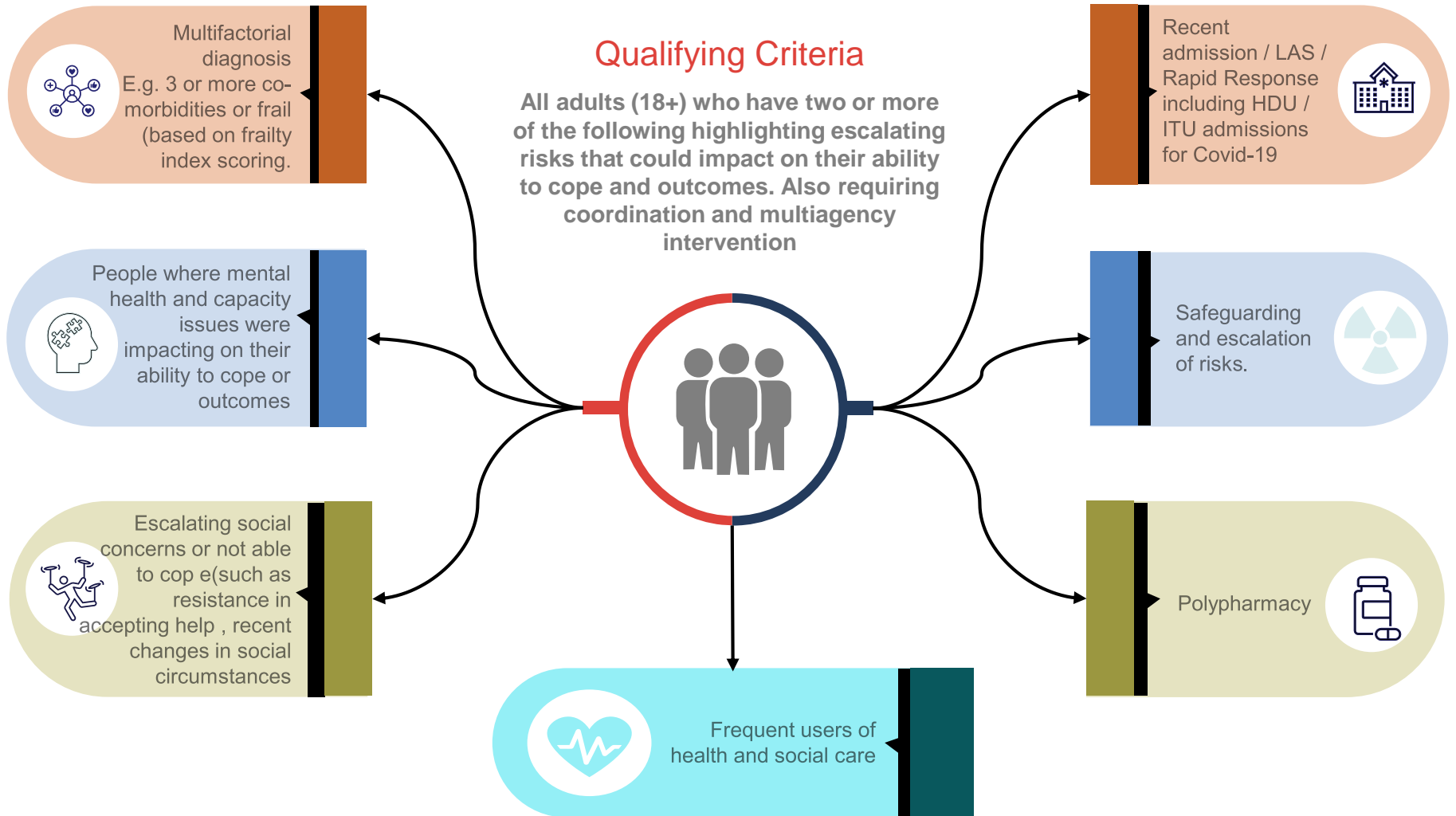


### Defining Frailty and Eligibility Criteria

Sollis have an extensive suite of segmentation and stratification tools. Combined they offer more power and configurability:

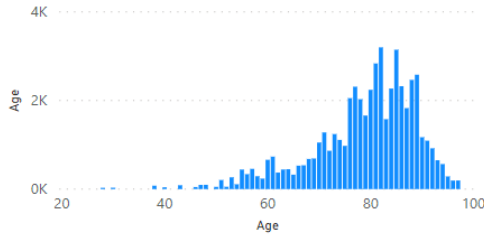
- Moderate or severe eFI banding **and**
- Housebound, isolated or is a carer **and**
- Persistently high cost **and**
- High risk of emergency admission **and**
- At least 1 emergency admission in last 12 months **and**
- They have more than 10 active ingredients in their meds OR they have a high risk drug.

# Defining 'Complex'

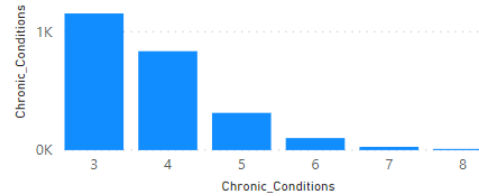


# Defining Complexity and Targeting the Right Outcomes

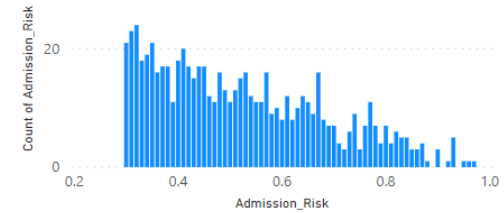
1. How old?



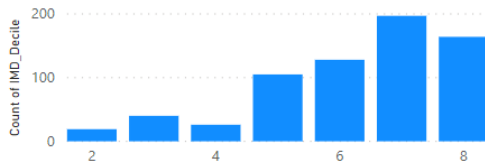
2. Chronicity



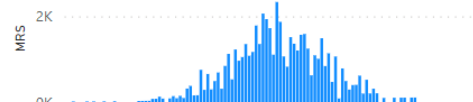
3. Risk of emergency admission



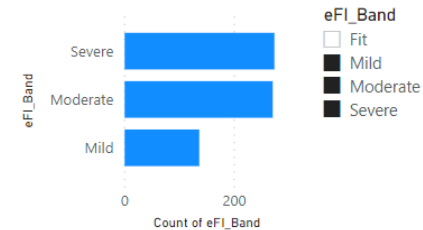
4. Relative Deprivation



5. Risk of Mortality <12 Months



6. Frailty Classification



Selected Cohort

**679**

Patients

Outcome

**363**

Admitted

Positive Predictive Value

**53.46%**

PPV

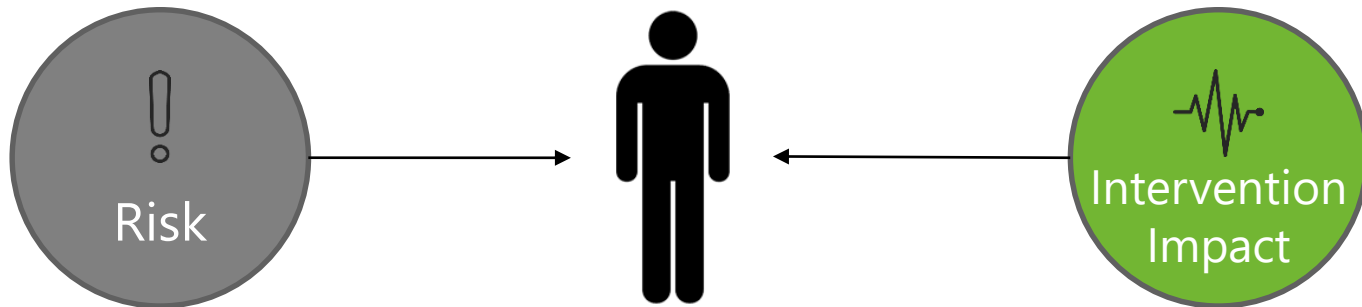
Additional Outcomes

Average Length of Stay	5.94
Average Cost of Emergency Admissions	£4,428

From a worklist of 227 patients only one that wasn't suitable

## Evaluation and Impactability

- Through application of statistical techniques we can help identify when there has been a step change in outcome measurement.
- We perform more complex evaluation using quasi experimental techniques to better understand whether an intervention or clinical program has caused improved outcomes.

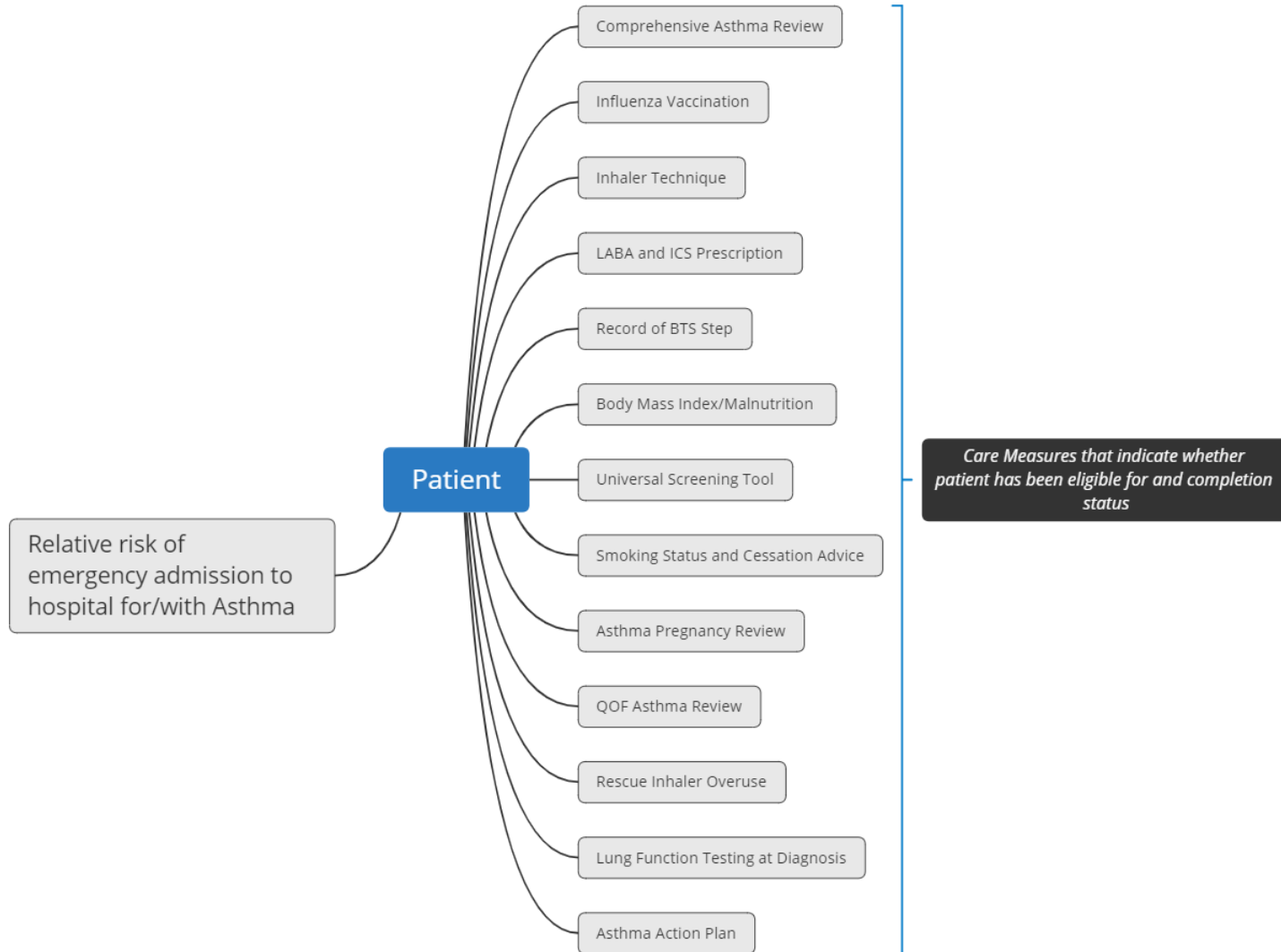


We already have a good understanding who in the population is at greatest risk of negative events.

We are addressing that by using our extensive data science capability to answer "what is likely to benefit this individual".



## Real World Challenges



## The Exam Question

- This is potentially the right target dataset to explore the development of an impactability model. This by definition is a model that tries to unite predictive risk modelling, causal inference and Bayesian mathematics to answer the question:
- ***“Who is our population is at risk of a specific negative event that are also amenable to care interventions, and what impact does this create across the whole population?”***
- Three patients have similar relative risk of having an emergency admission to hospital for/with Asthma in the next six months. Our impactability model suggests that Patient A is like to respond well to an Asthma Action Plan. Patient B is less likely to respond well to the Asthma Action Plan but rather would likely respond well to providing education on their Asthma Inhaler Technique and a flu vaccine. Patient C is unlikely to be impacted by any of these care measures and other options should be investigated.

Patient	Asthma Action Plan	Inhaler Technique + Flu Jab	Guidance
A (RR 80%)	35%	75%	Action Plan
B (RR 80%)	75%	35%	Education + Jab
C (RR 80%)	79%	79%	Explore other options

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