IPACS: Improving Patient flow between Acute, Community and Social care

HDR UK Better Care SW Partnership

Dr Richard Wood
Head of Modelling and Analytics
NHS BNSSG CCG

South West Better Care Partnership

Started: June 2020
To finish: May 2023

SW Better Care Programme
(J Sterne)

1. P-NEWS

2. AMR

3. IPACS

4. Hospital efficiency

5. Improving linked dataset

Shaping better health

Problem: Delayed Transfers Of Care (DTOCs)

Acute hospital stay

Delayed transfer of care (DTOC)

Social Care

Community Service (time-limited)
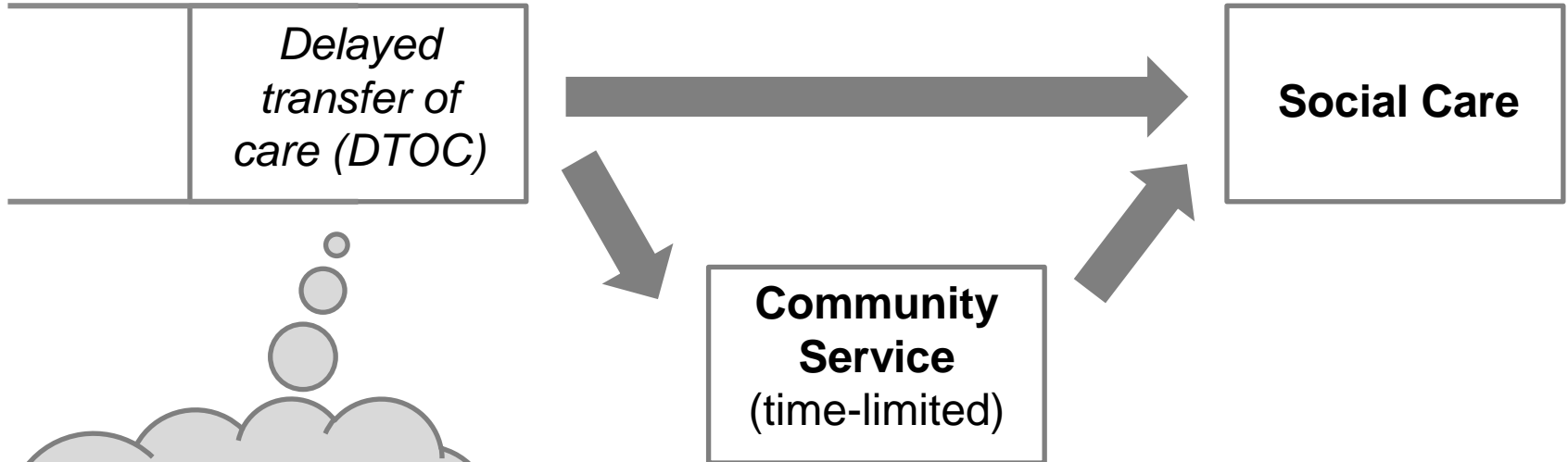
500,000 acute bed days lost annually just due to Social Care capacity. Costing £820m.

Additionally:
– DTOCs propagate upstream, causing surgery cancellations, A+E crowding, and ambulance handover delays
– DTOCs affect patient outcomes, reducing physical and mental independence

Current state of the art

| Practice	Research
Very primitive methods in use. Based on 'averages' and not appreciating variability in arrivals, length of stay, and discharge delays. Such approaches are well-known to considerably under-estimate capacity requirements.	There has been limited research interest in this problem. Perhaps due to a lack of research-ready linked data across the health and care divide. Less than a handful of potentially relevant articles could be found.

⇒ *significant opportunity for applied research*

Shaping better health

# Approach: Stochastic simulation of patient flow

- Using queuing theory methods we will develop a dynamical model.

- Scenario analyses will be used to **optimise pathway configuration** and resources, **improving operational performance** and **patient outcomes**.

E.g. current modelling for reconfigured centralised stroke pathway
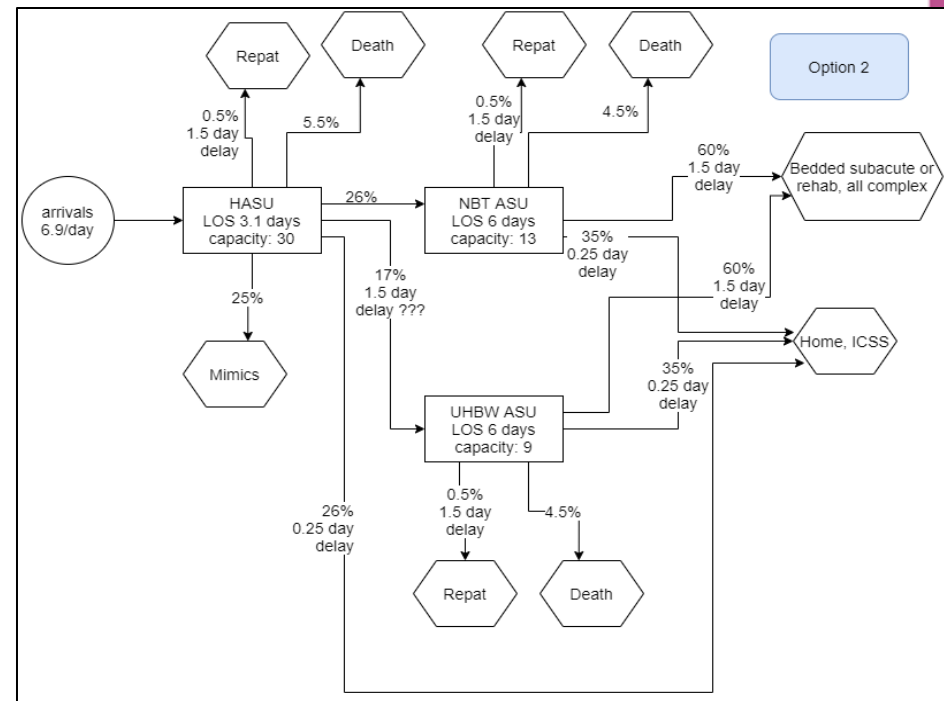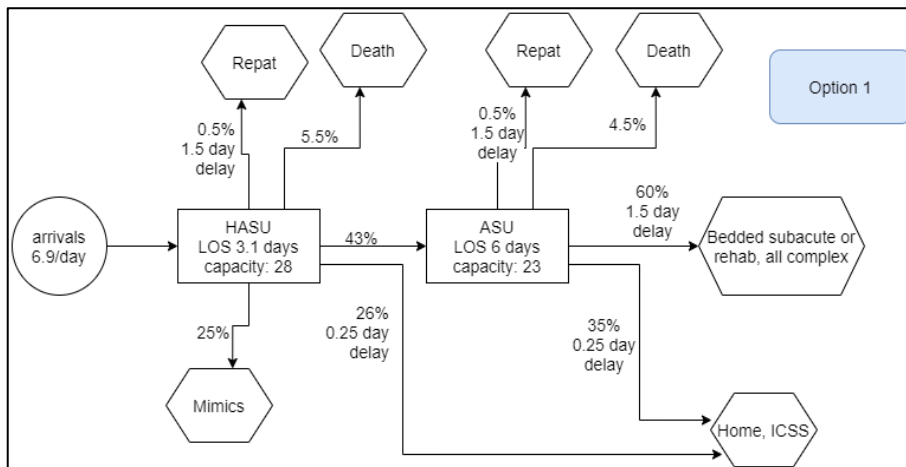
Envisaged insights

- We will understand the 'high level' **optimal budget allocations** between health and social care.

- This will test the hypothesis that a net saving can be made by investing more in **less expensive, downstream services**.
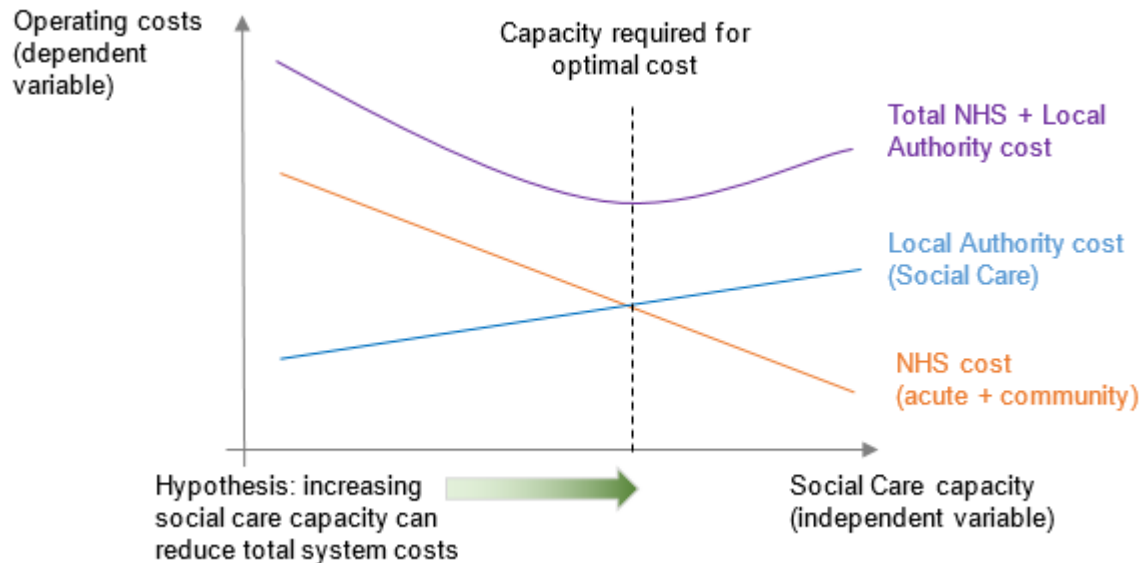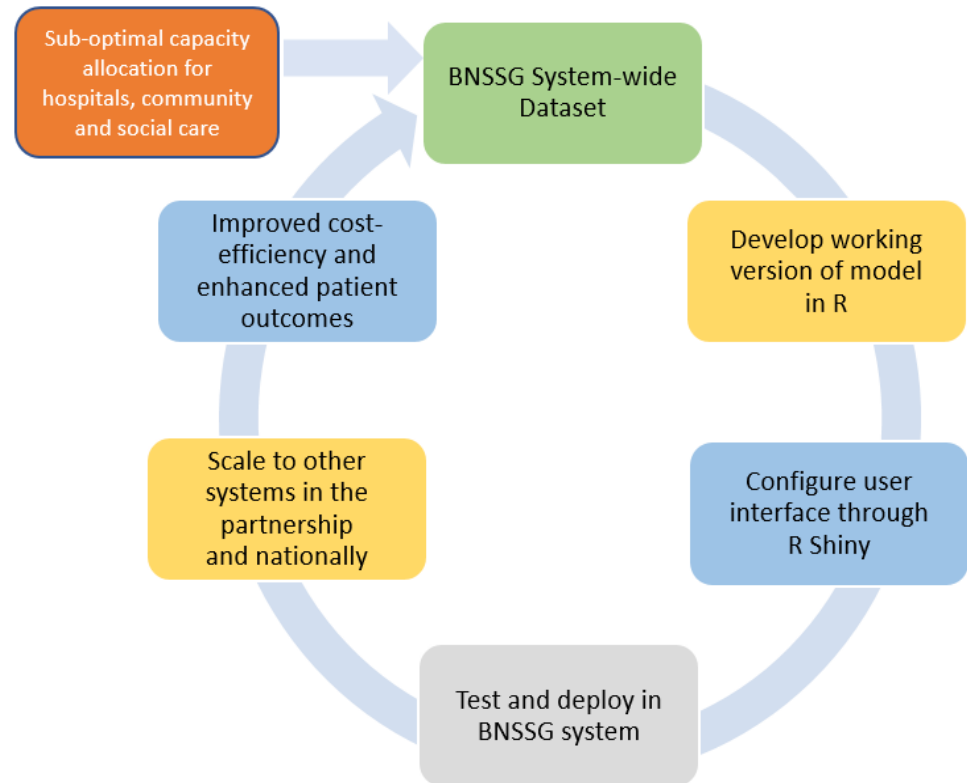
Progress to date

- Surveyed the literature, identified others working in this space.

- Set up relationships with key people across the whole pathway.

- Reviewed various sources of data existing across the system.

- Working with analysts to sequentially improve current 'modelling' solution for operational and strategic capacity assessment.
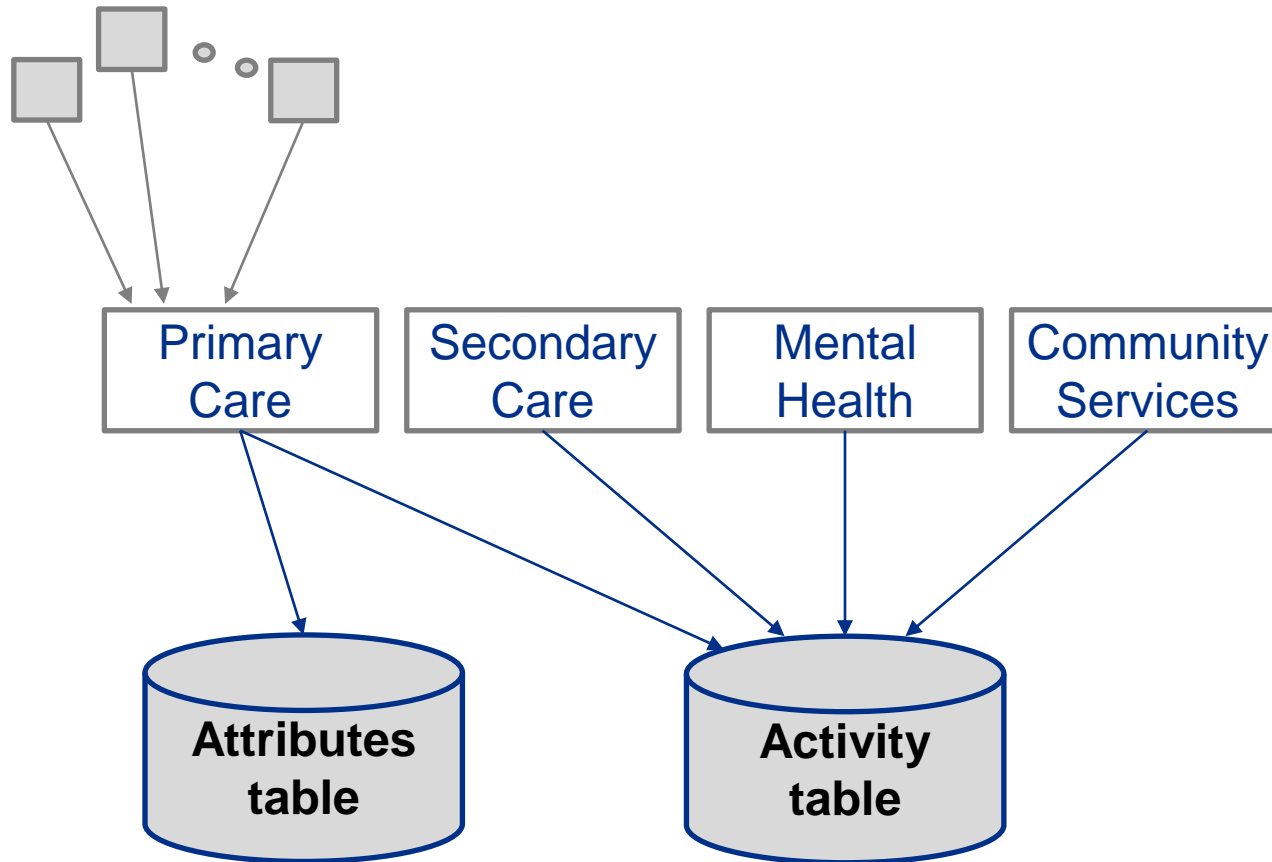
Shaping better health

Envisaged Better Care Loop

- We have regional partners on our bid who will work with us in **upscaling** the model and learnings across the South West.

- This is useful in ensuring sufficient **genericity** ahead of a wider release.

- Resulting interventions will be shared among healthcare systems, providing a new foundation to evolve the linked data, model, and impact.

Sub-optimal capacity allocation for hospitals, community and social care

BNSSG System-wide Dataset

Develop working version of model in R

Configure user interface through R Shiny

Test and deploy in BNSSG system

Scale to other systems in the partnership and nationally

Improved cost-efficiency and enhanced patient outcomes

Shaping better health

BNSSG System Wide Dataset @ June 2020

x 1 million individuals

Shaping better health

BNSSG SWD data structure

Attributes table

Patient ID	Age	LTCs	…
XX1	18	0	
XX2	75	3	
XX3	34	1	
XX4	65	2	
…			

Each row is a patient

Each column contains an attribute for that patient

Activity table

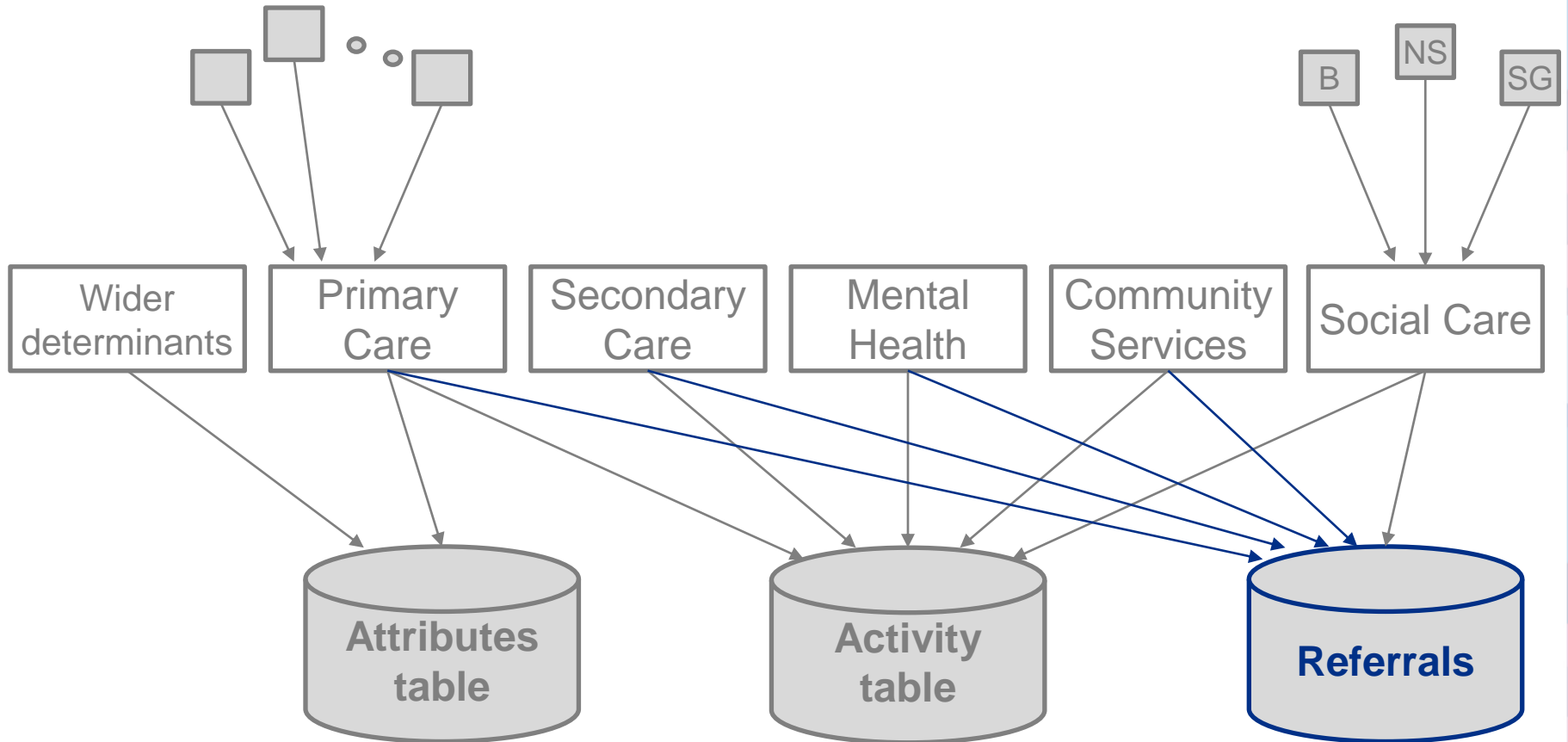| Patient ID	Setting	Date	…
XX1	GP appt.	04/05/19	
XX1	OP cons.	21/10/19	
XX2	A+E attend	05/07/20	
XX3	MH appt.	13/05/20	
…			

Each row is a discrete activity

Each column contains details for that activity

SWD progress in recent months
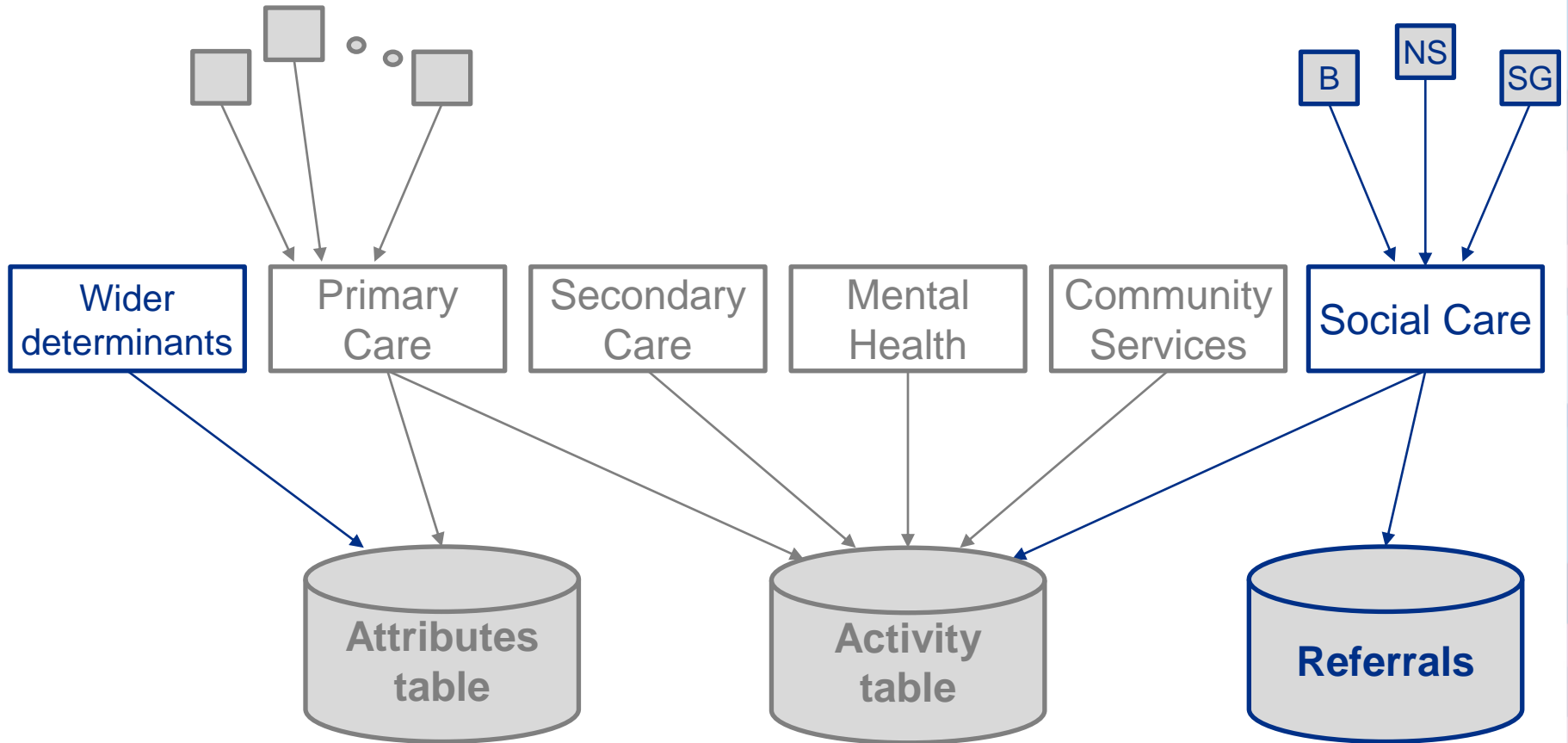
Future plans: Enhance referrals table

Shaping better health
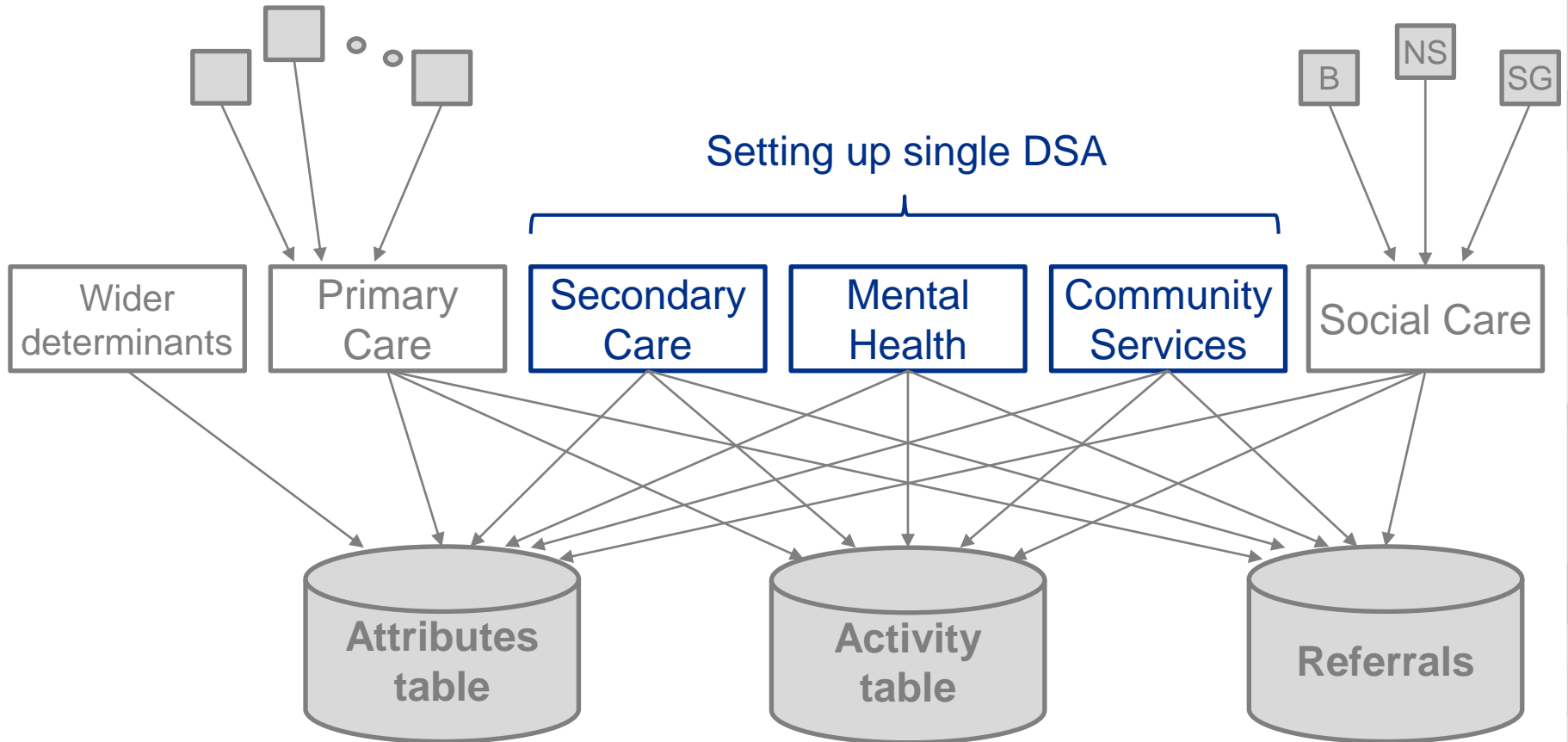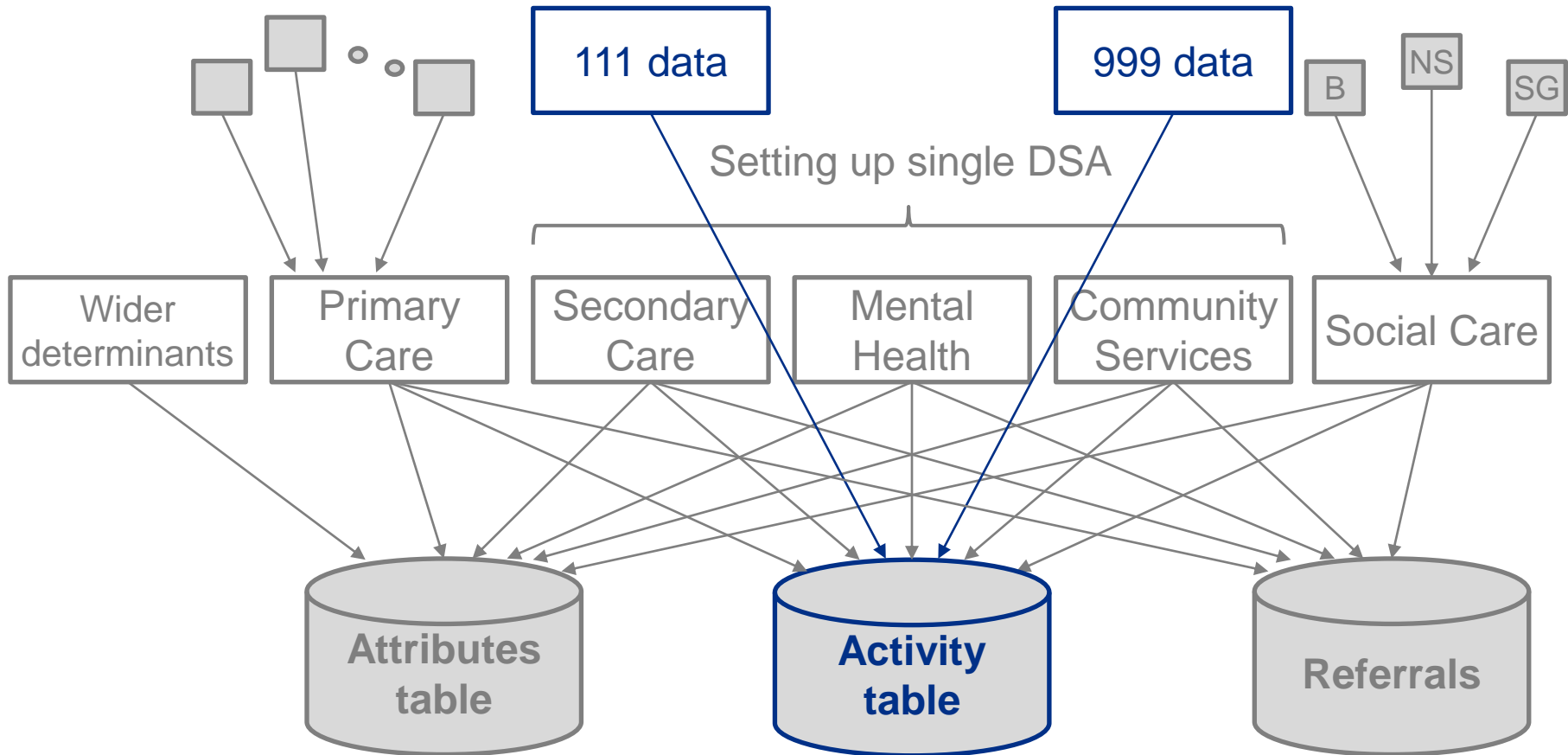
Additional patient info into Attributes table
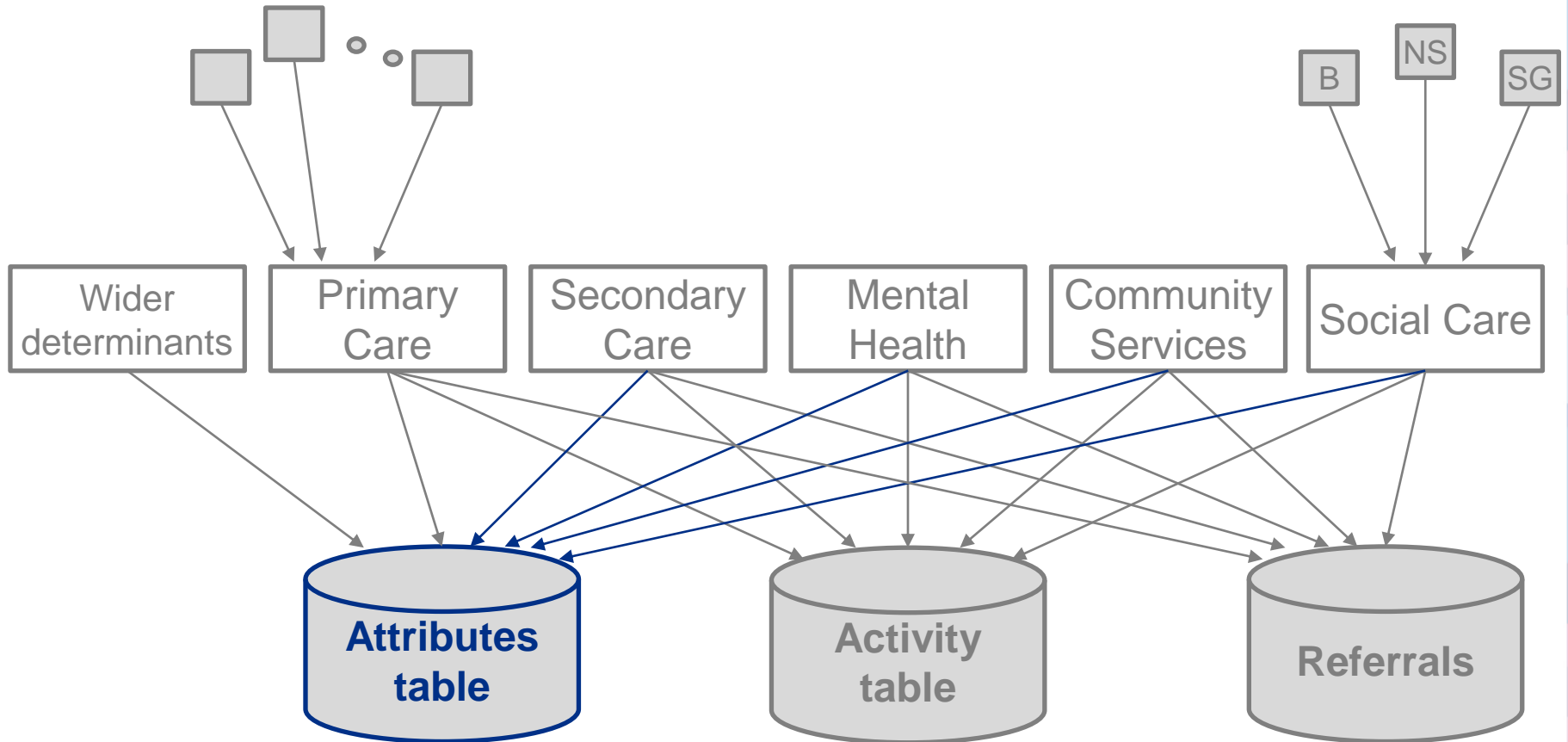
Replace NHS-D flows with local flows

Expand coverage of Activity table

111 data

999 data

NS

B

SG

Setting up single DSA

| Wider determinants | Primary Care | Secondary Care | Mental Health | Community Services | Social Care |

Attributes table

Activity table

Referrals

Bring in additional dimensions

Shaping better health
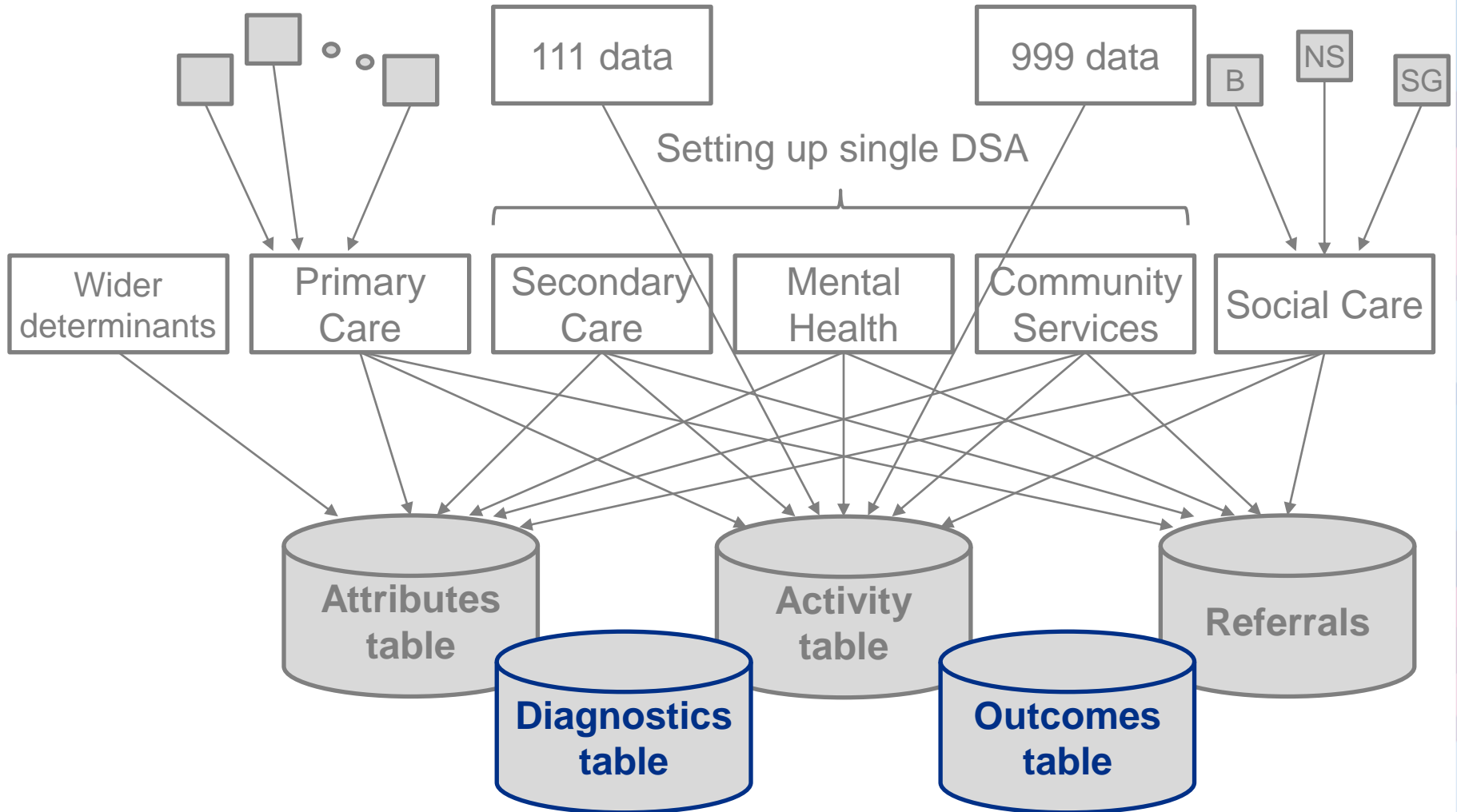
richard.wood16@nhs.net

IPACS Project Team:
- Dr Paul Forte (BNSSG CCG)
- Dr Alison Harper (University of Exeter)
- Prof Martin Pitt (University of Exeter)
- Prof Christos Vasilakis (University of Bath)

Shaping better health