

Hospital Admission Thresholds

← *and the Left Shift* ←

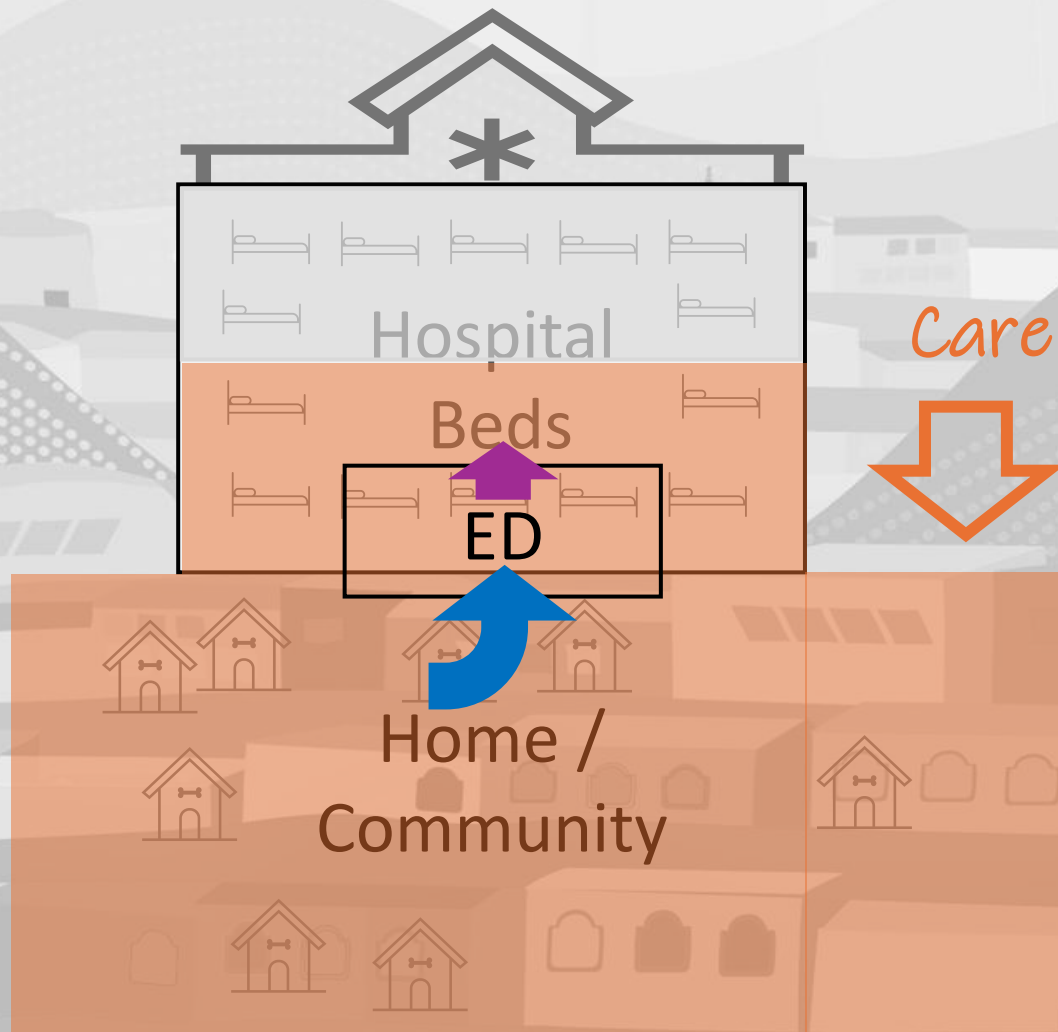
Andrew Jones and Steven Wyatt

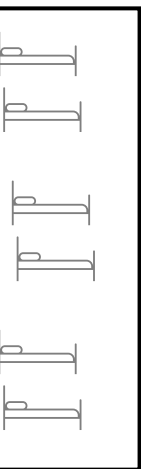
20th August 2026



Care delivery



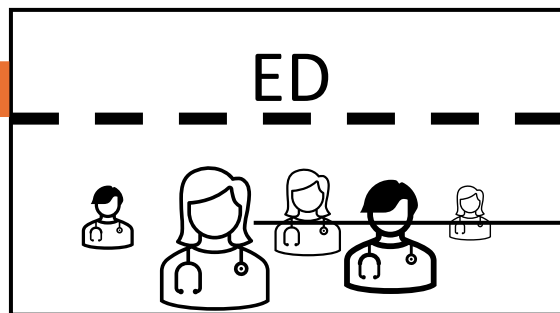




Admitted

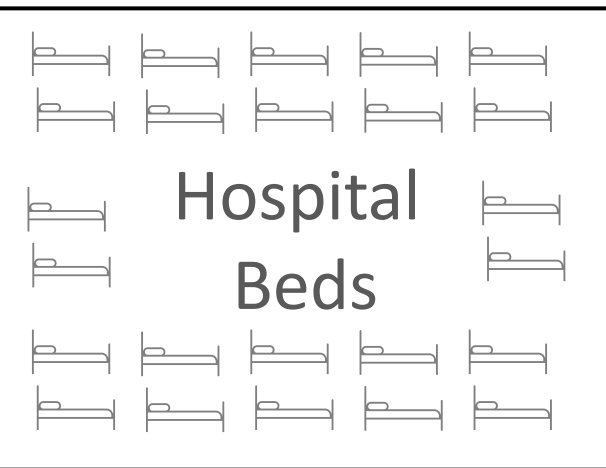


Sent home



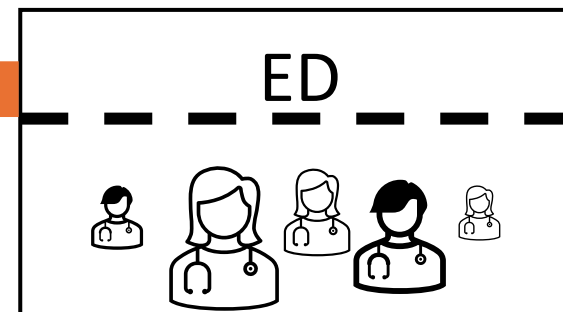
illness
threshold

Admission criteria:
Condition
+ ...
+ many beds free?



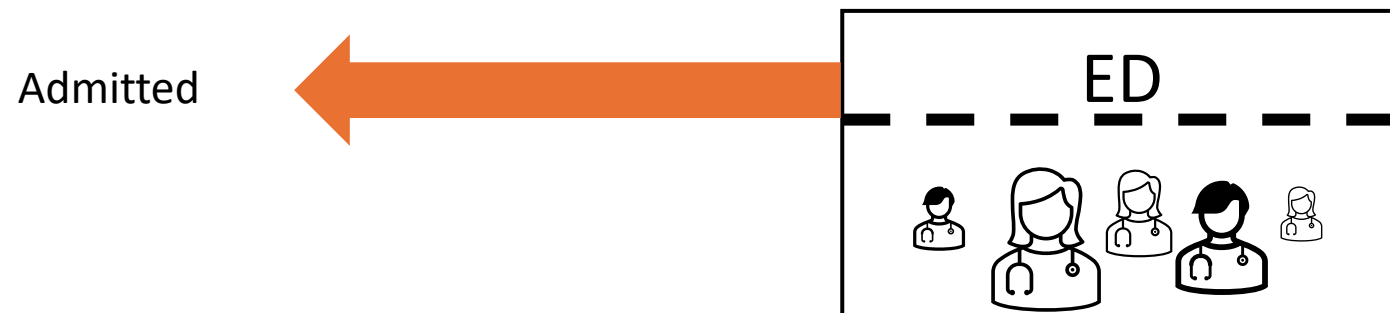
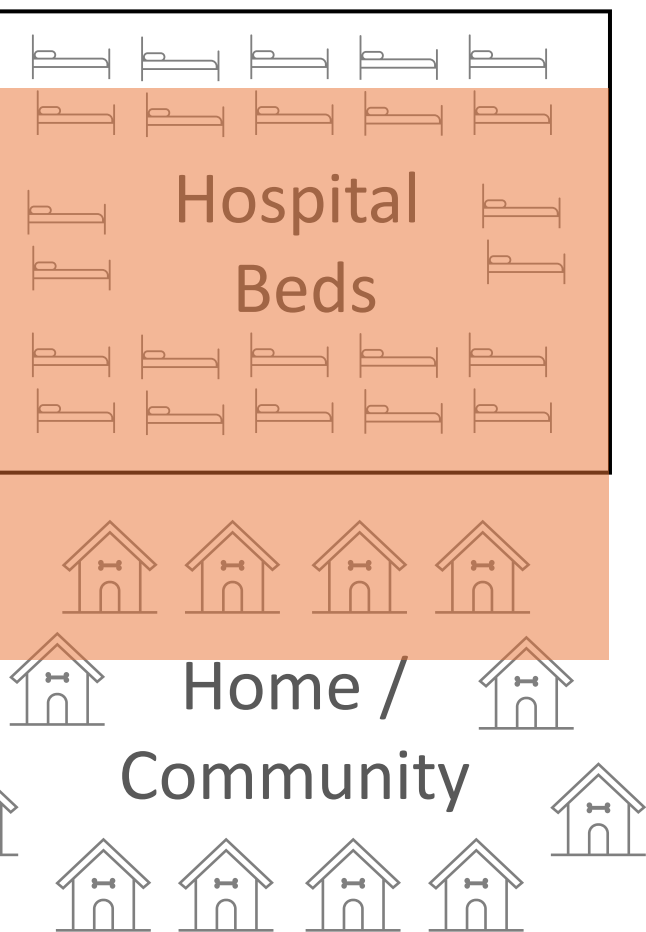
Admitted

Sent home



illness
threshold

Admission criteria:
Condition + ...
+ many beds free?

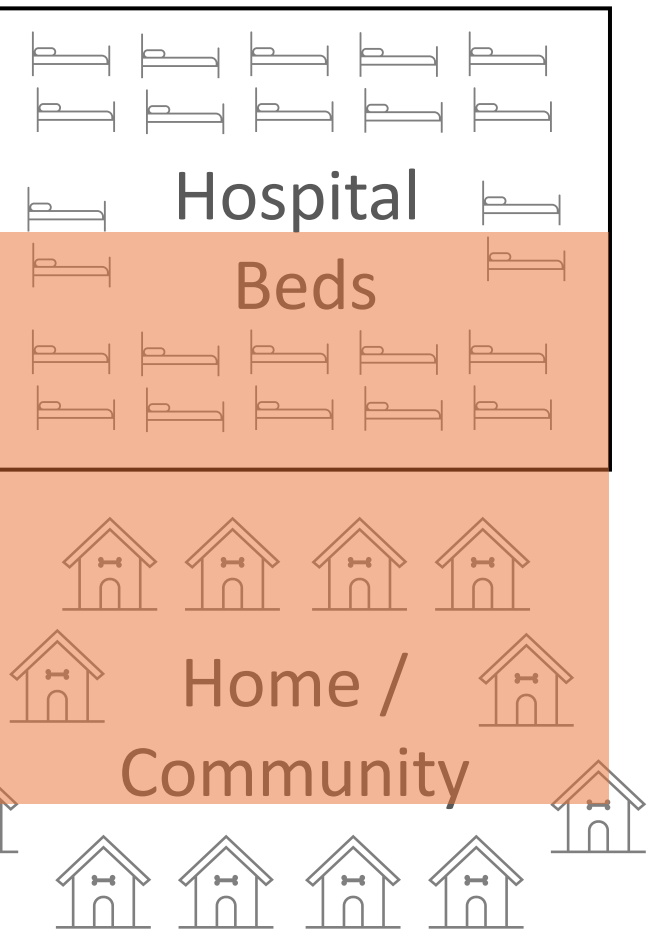


Admitted

Sent home

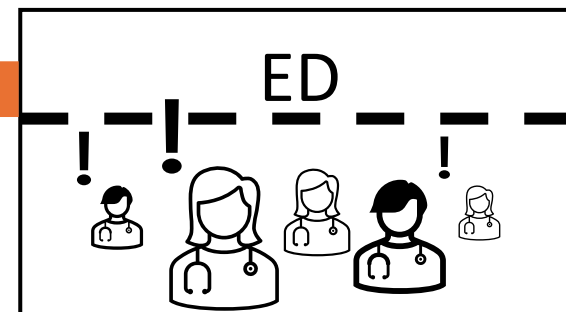
illness
threshold

Admission criteria:
Condition + ...
+ many beds free?



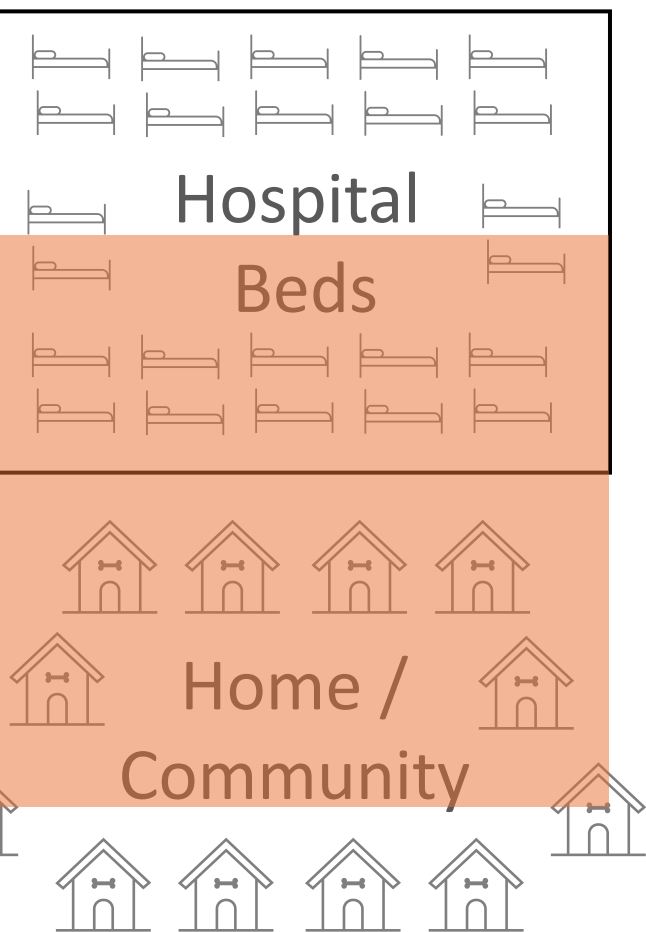
Admitted

Sent home



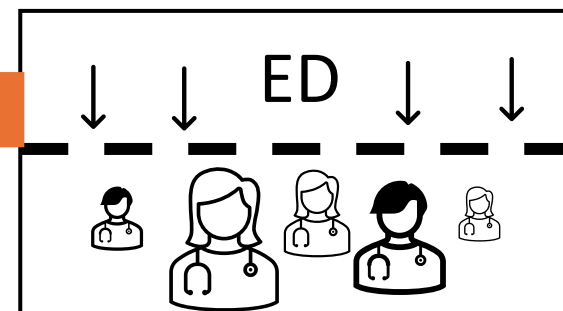
illness
threshold

Admission criteria:
Condition + ...
+ many beds free? !



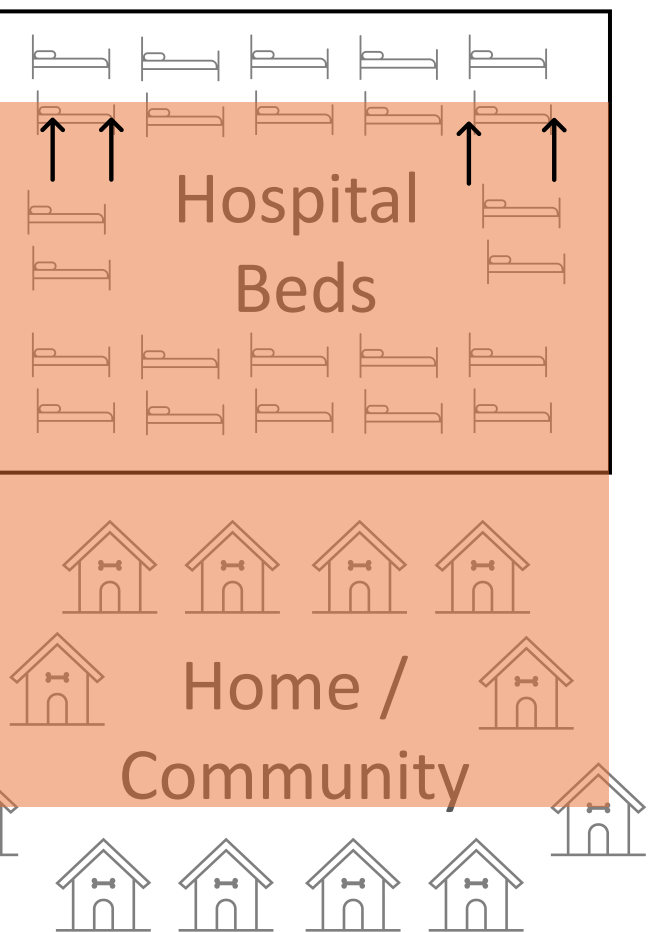
Admitted

Sent home

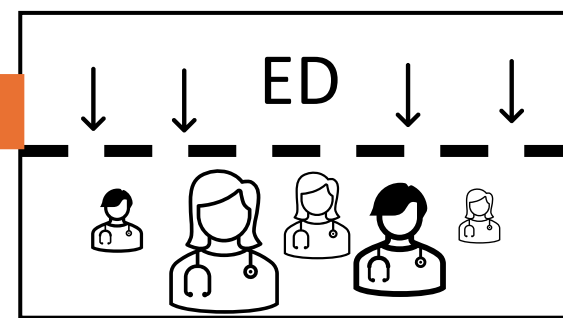


illness
threshold

Admission criteria:
Condition + ...
+ many beds free? !



Admitted



illness
threshold

Admission criteria:
Condition + ...
+ many beds free? !



Sent home



Part One:
Trends in
National Admission Thresholds

id	admitted
A	0
B	0
C	0
D	1
E	0
F	0
G	0
H	0
I	0
J	1

Probability (admission) = 0.2

$$\text{Odds} = \frac{P}{1-P} = \frac{0.2}{0.8} = 0.25$$

id	admitted	diagnosis
A	0	Sprained ankle
B	0	Sprained ankle
C	0	Sprained ankle
D	1	Sepsis
E	0	RTI
F	0	RTI
G	0	RTI
H	0	Asthma
I	0	Asthma
J	1	Asthma

Reference

$$\text{Odds Ratio (asthma)} = \frac{\text{Odds Asthma}}{\text{Odds RTI}} = 1.3$$

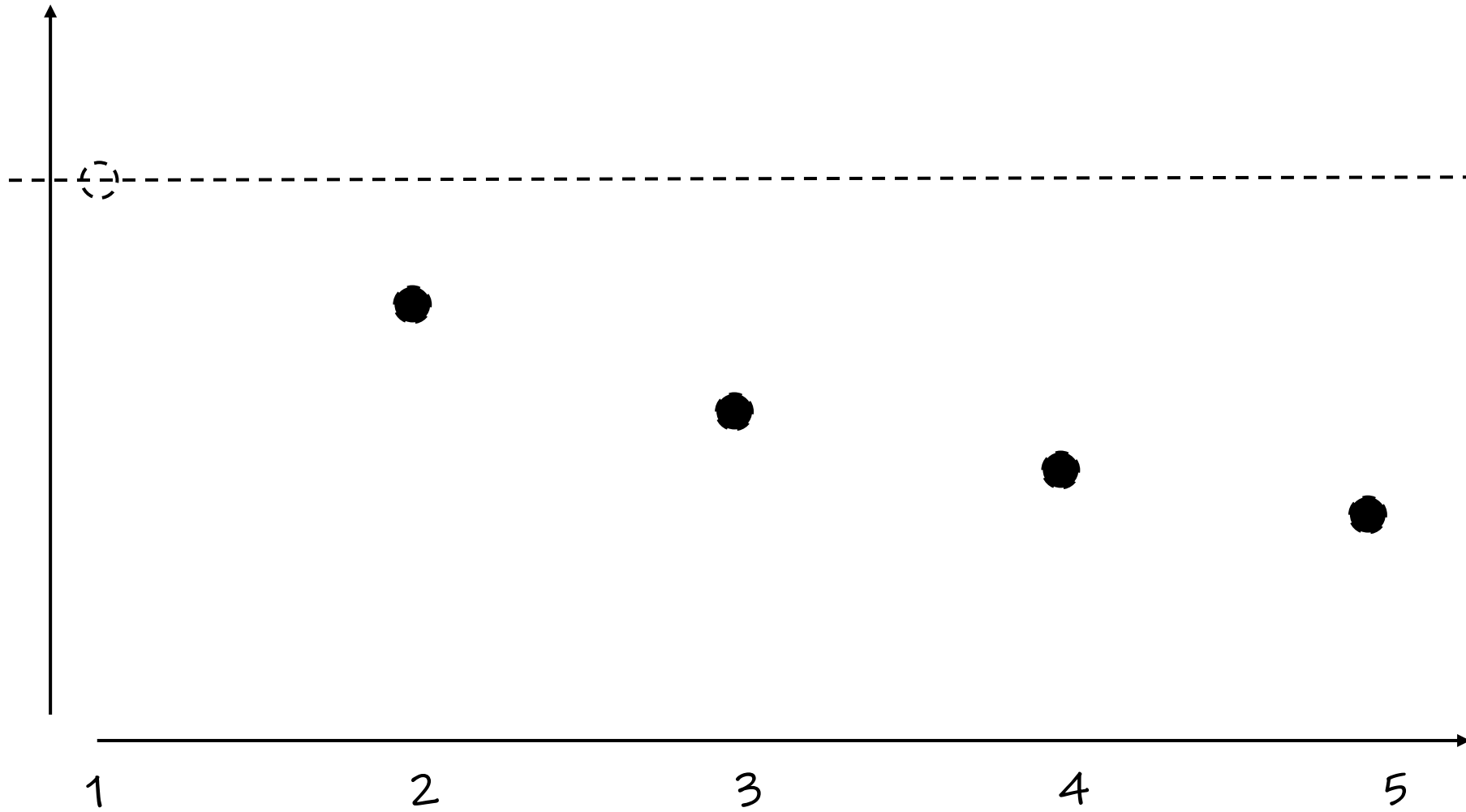
id	admitted	diagnosis	year
A	0	Sprained ankle	1
B	0	Sprained ankle	1
C	0	Sprained ankle	2
D	1	Sepsis	2
E	0	RTI	3
F	0	RTI	3
G	0	RTI	4
H	0	Asthma	4
I	0	Asthma	5
J	1	Asthma	5

Reference

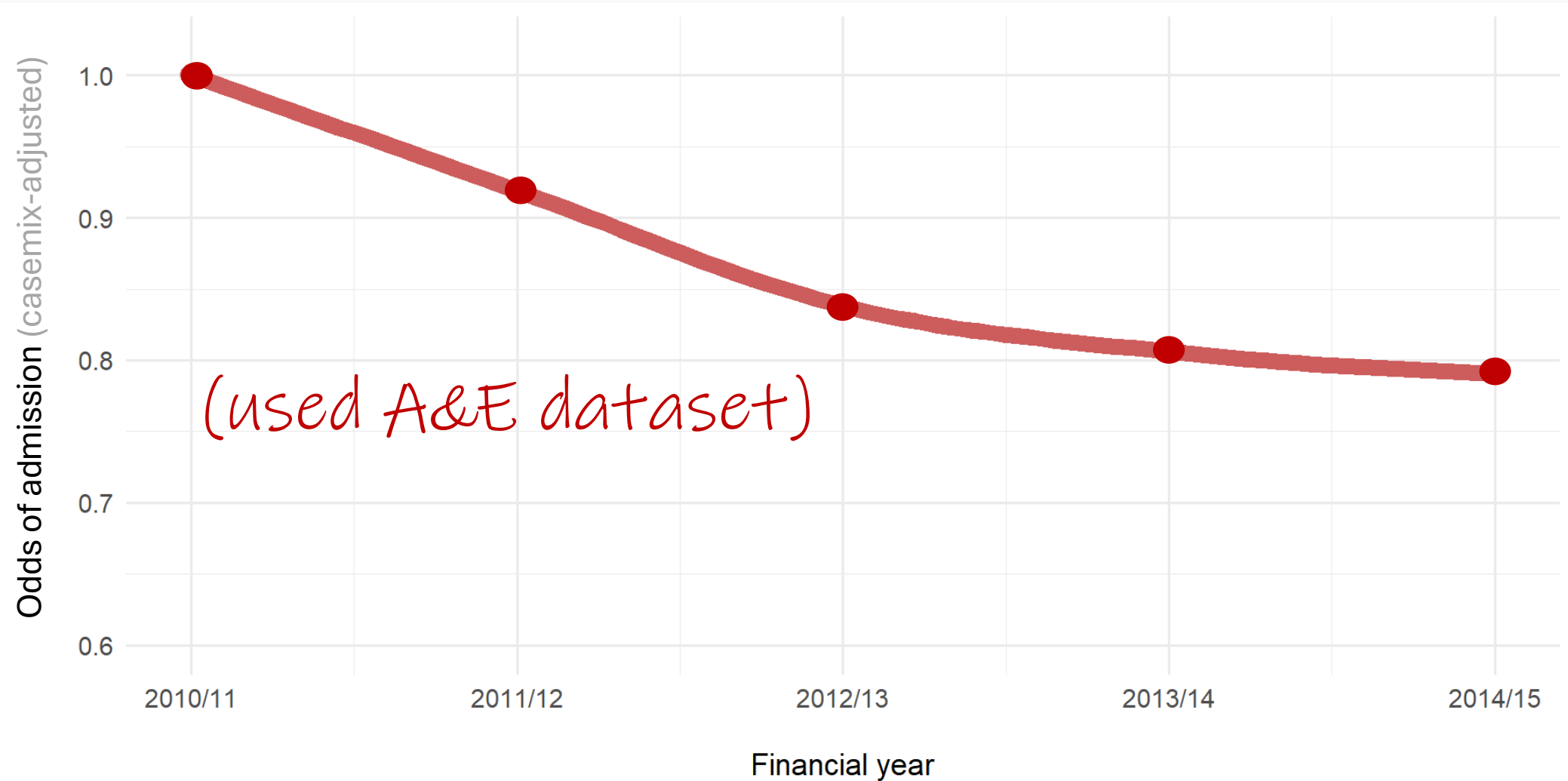
$$O.R. (yr\ 4) = \frac{Odds\ yr\ 4}{Odds\ yr1} = 0.9$$

(i.e. 10% lower than 1)

Odds of
admission
(relative to year 1)



Year value

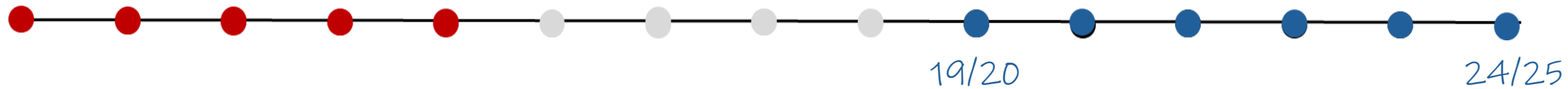


A&E dataset



A&E dataset

ECDS



id	Site Name
1	St Mary's Hospital - Emergency Department
2	Scarborough General Hospital
3	Airedale General Hospital
4	The Queen Elizabeth Hospital
5	Treliske Hospital
6	Derriford Hospital
7	Great Western Hospital A&E
8	Salisbury District Hospital
9	Leeds General Infirmary
10	Queen Elizabeth Hospital
11	University Hospital of North Tees
12	Lincoln County Hospital
13	Pilgrim Hospital
14	Leicester Royal Infirmary
15	St Richards Hospital
16	Worthing Hospital

case-mix adjustment

other

Outcome

Admitted
(y/n)

~

interest

Year- quarter

Age

Sex

Diagnosis

Ambulance
(y/n)

Socio-
economic
background

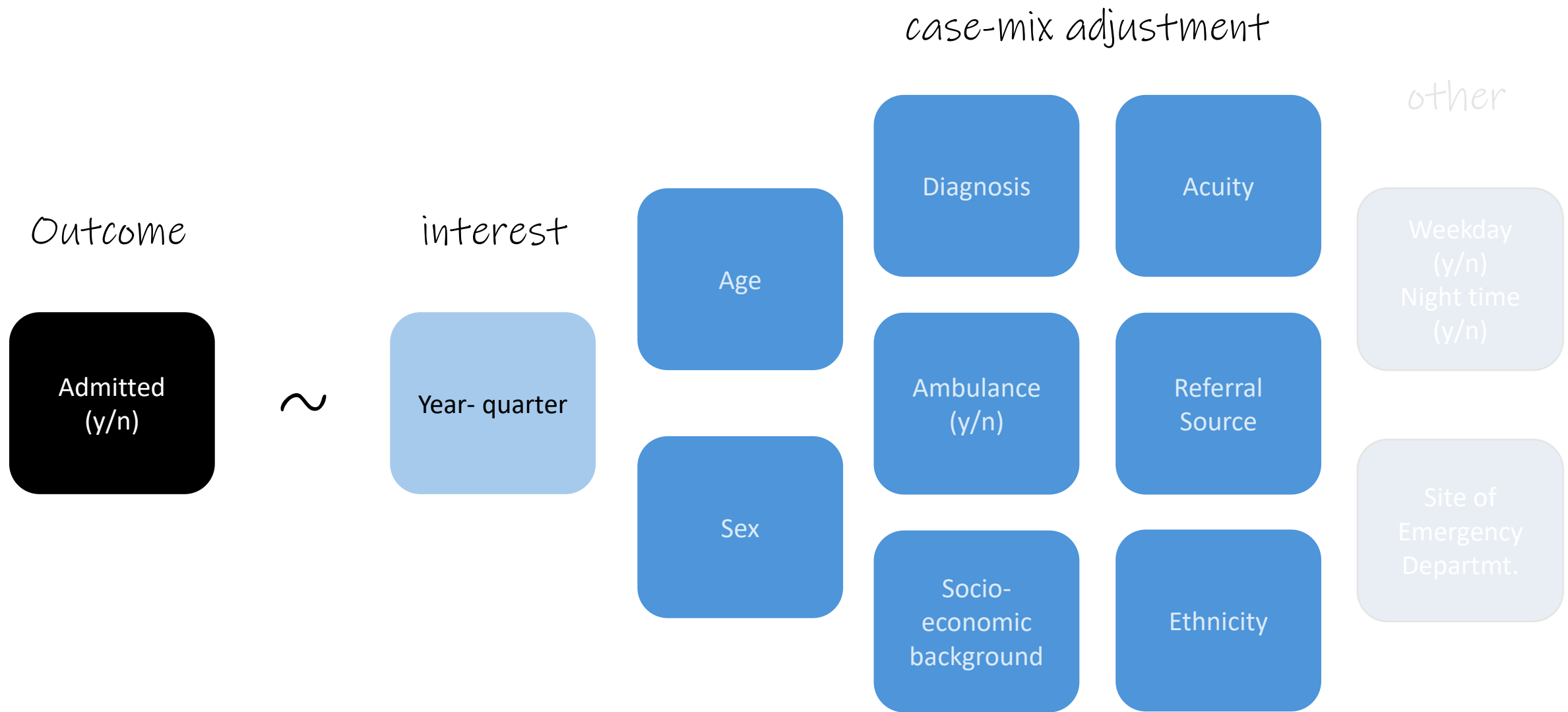
Acuity

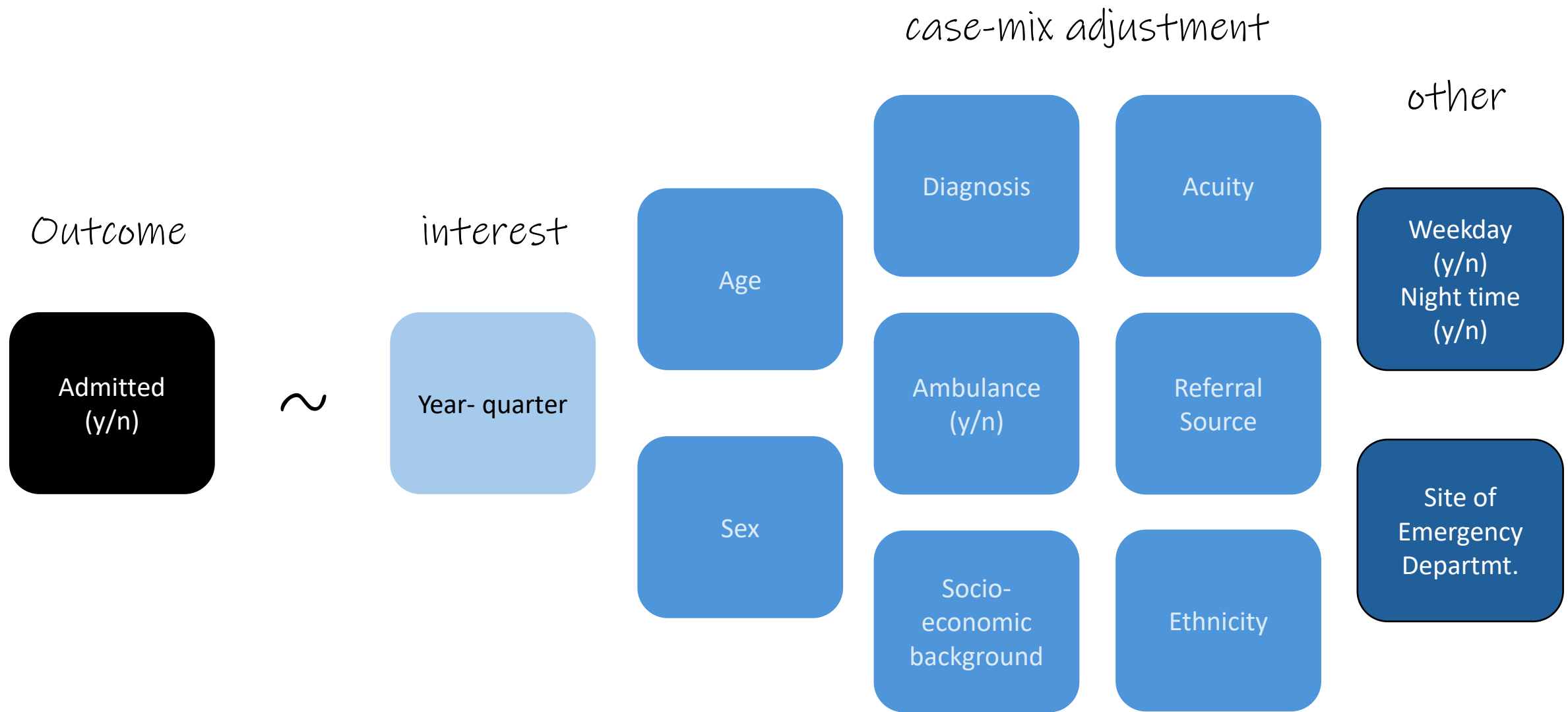
Referral
Source

Ethnicity

Weekday
(y/n)
Night time
(y/n)

Site of
Emergency
Departmt.





Casemix-adjusted odds of admission (log scale)

Reference category: 2019 Q1

1.2
1.1
1.0
0.9

Apr 2019

Apr 2020

Apr 2021

Apr 2022

Apr 2023

Apr 2024

Apr 2025

Date (quarter commencing)



Casemix-adjusted odds of admission (log scale)
Reference category: 2019 Q1

1.2
1.1
1.0
0.9

Apr 2019

Apr 2020

Apr 2021

Apr 2022

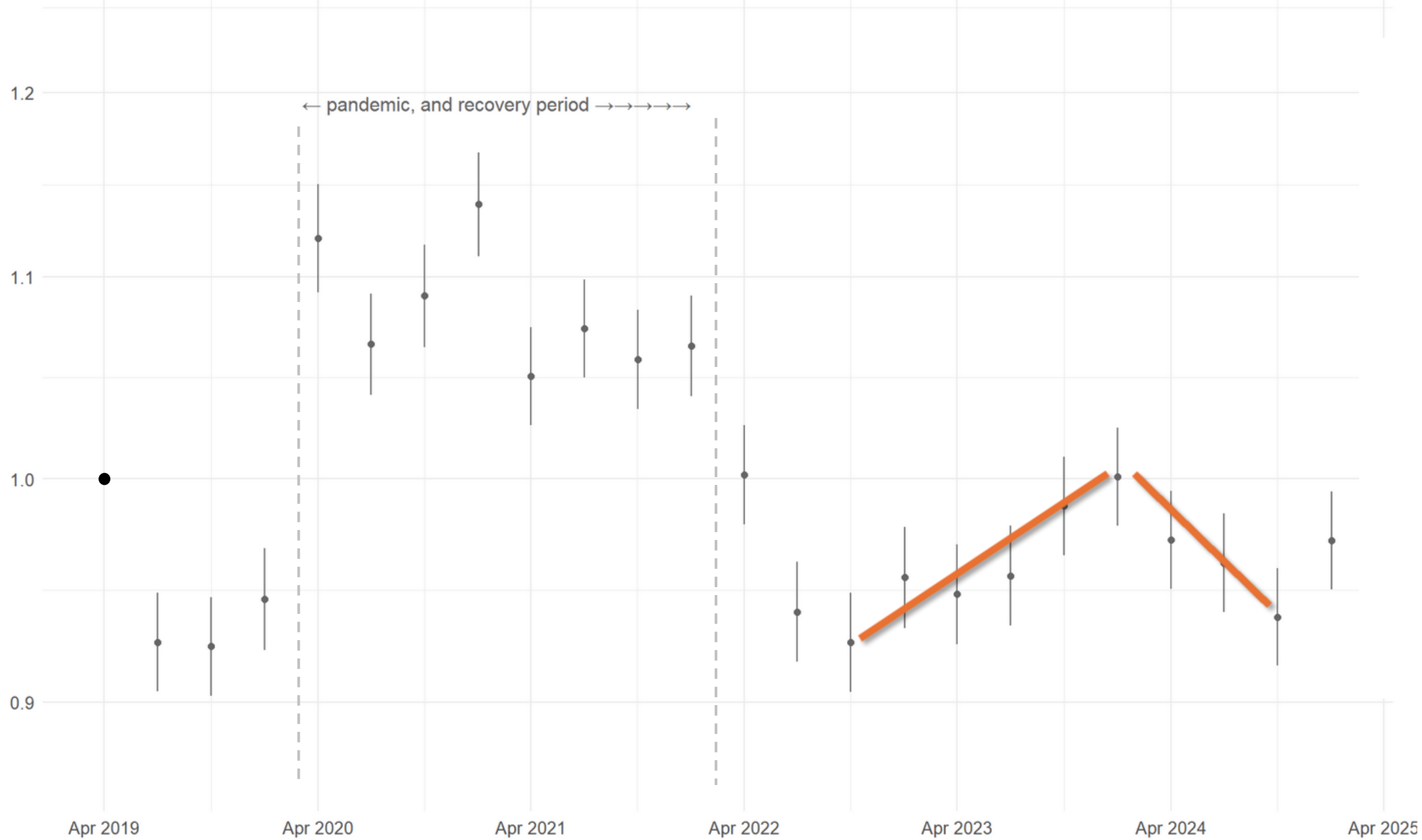
Apr 2023

Apr 2024

Apr 2025

Date (quarter commencing)

← pandemic, and recovery period →→→→→



1. Provider Selection

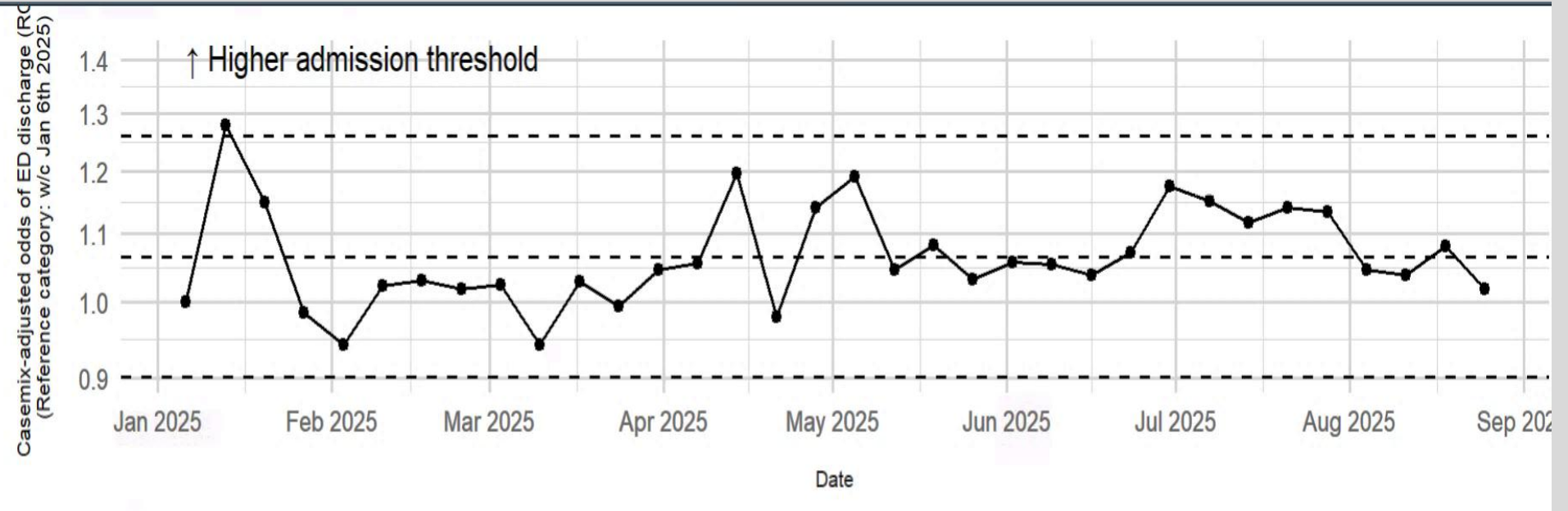
Dropdown

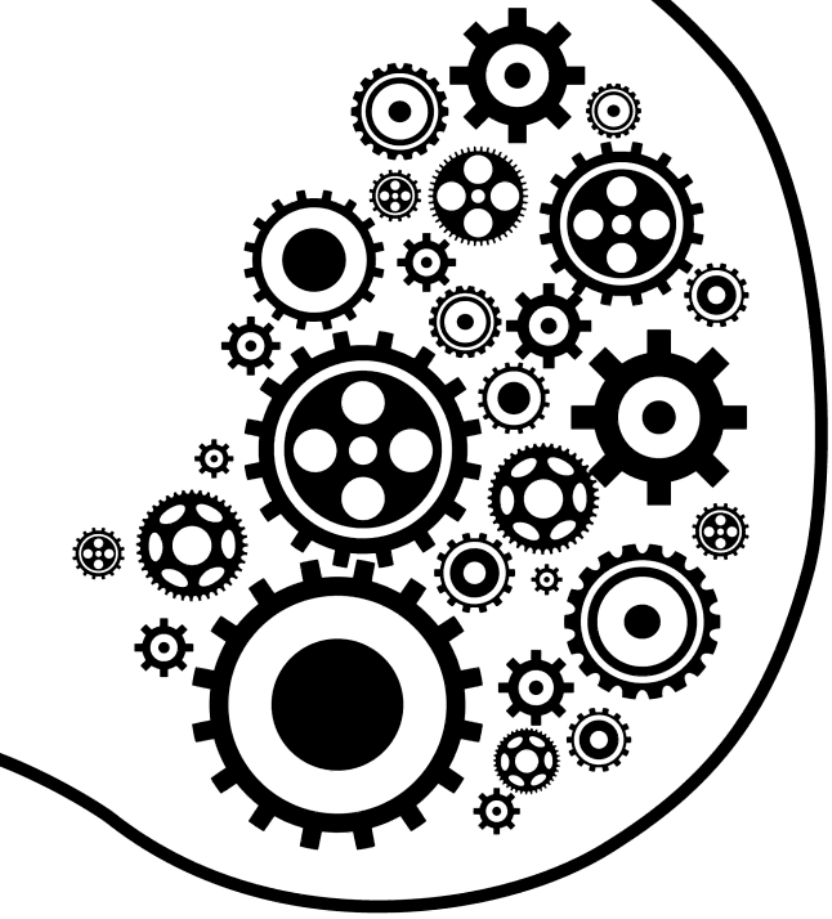


Walsall Manor Hospital

Leicester Royal Infirmary

Royal Surrey Counry Hospital





ED-level models:

- Faster returns ECDS
- From April 2025
- Weekly results

Recording of variables used for case mix:

Site A

Site B

Site C

case-mix adjustment

Outcome

Admitted
(y/n)

~

interest

week

Age

Sex

Diagnosis
(or complaint)

Ambulance
(y/n)

Socio-
economic
background

Acuity

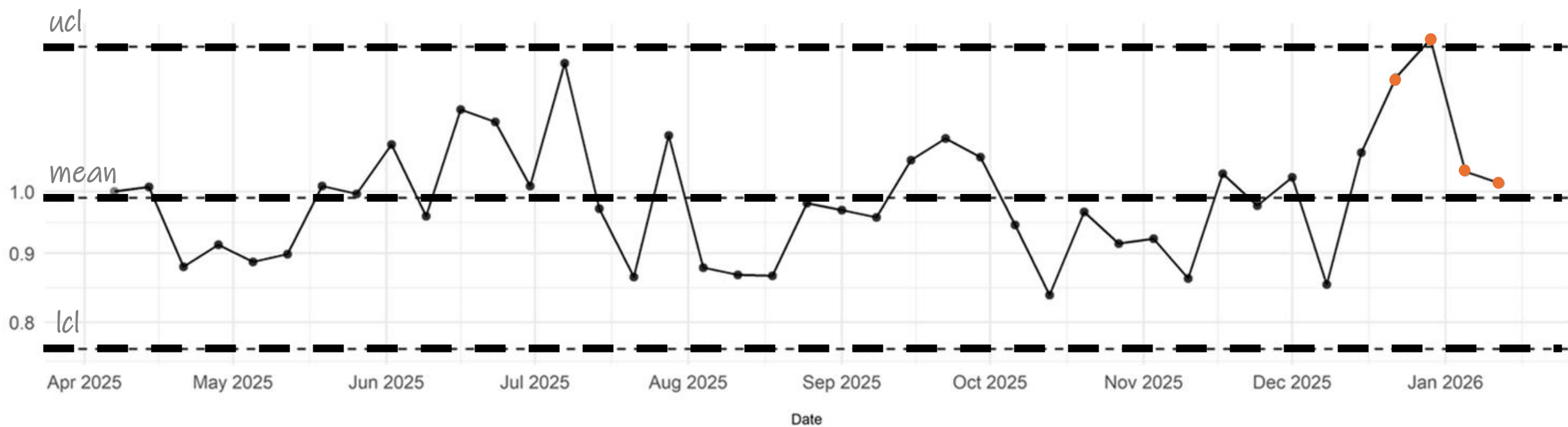
Referral
Source

Ethnicity

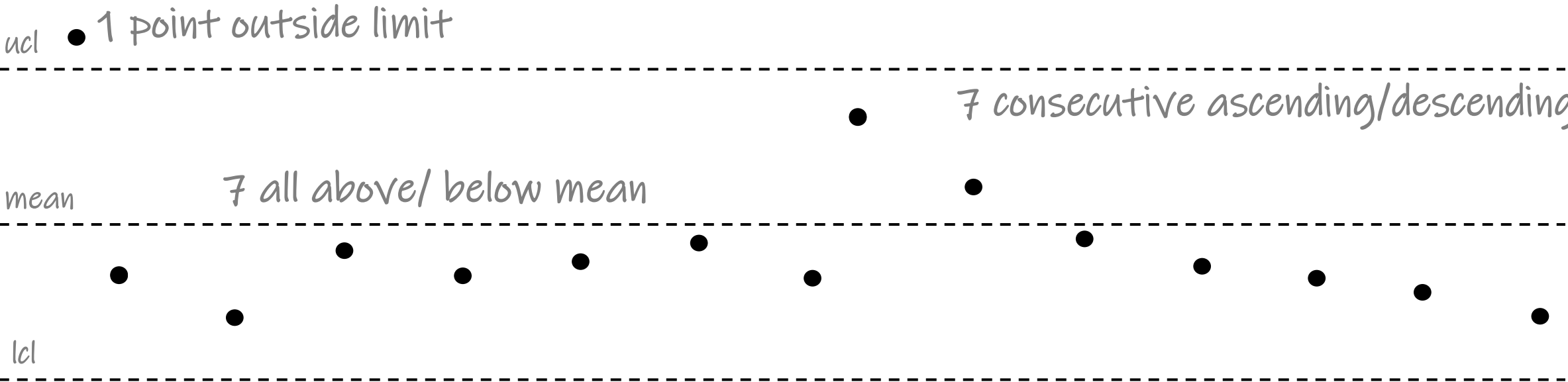
other

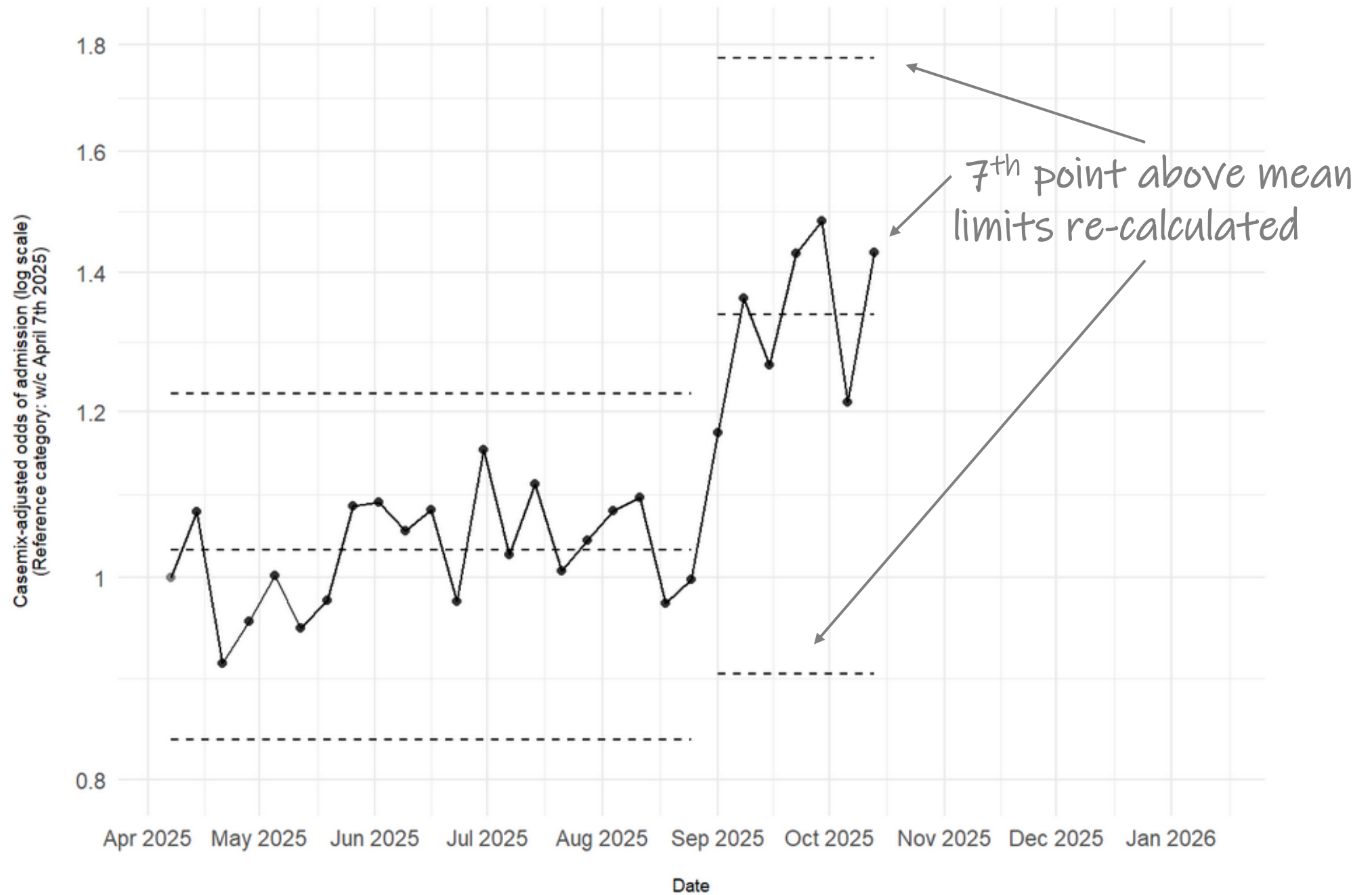
Weekday
(y/n)
Night time
(y/n)

Casemix-adjusted odds of admission (log scale)
(Reference category: w/c April 7th 2025)



(Selected) other rules indicating process change





Final thoughts:

↓ Falling thresholds not automatically bad

Effect of SDEC etc.

Data Quality = Big Return

Left Shift Evaluations ?