

National Prostate Cancer Audit

Explaining funnel plots

Commissioned by **HQIP** on behalf of **NHS England** and **Welsh Government**

Based at the **Clinical Effectiveness Unit**,
Royal College of Surgeons / London School of Hygiene & Tropical Medicine

Clinical leadership provided by **BAUS** and **BUG**

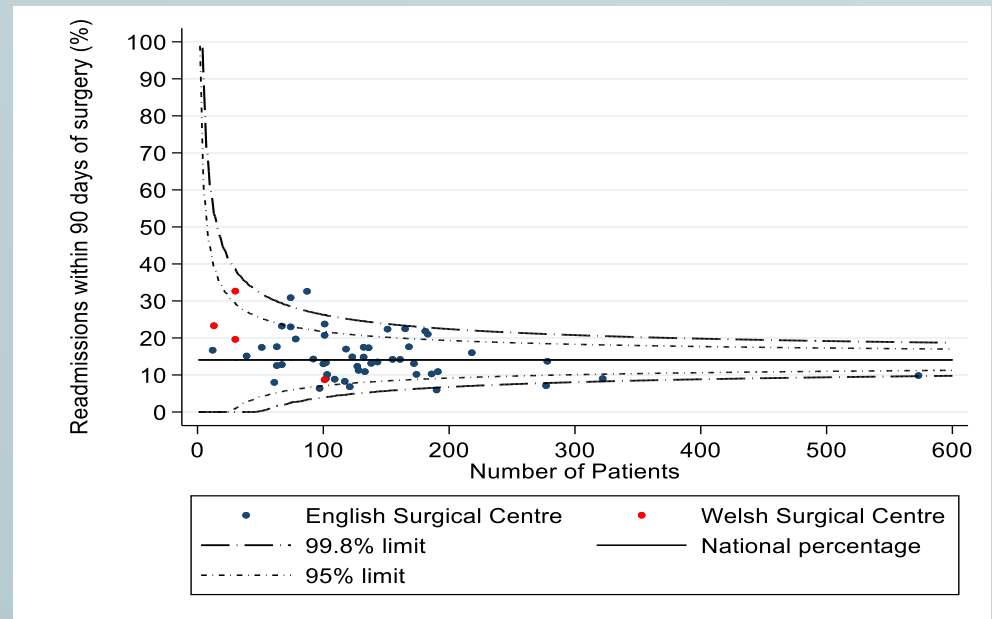
Data partners: **National Cancer Registry and Analysis Service**, PHE; **Wales Cancer Network**, PHW



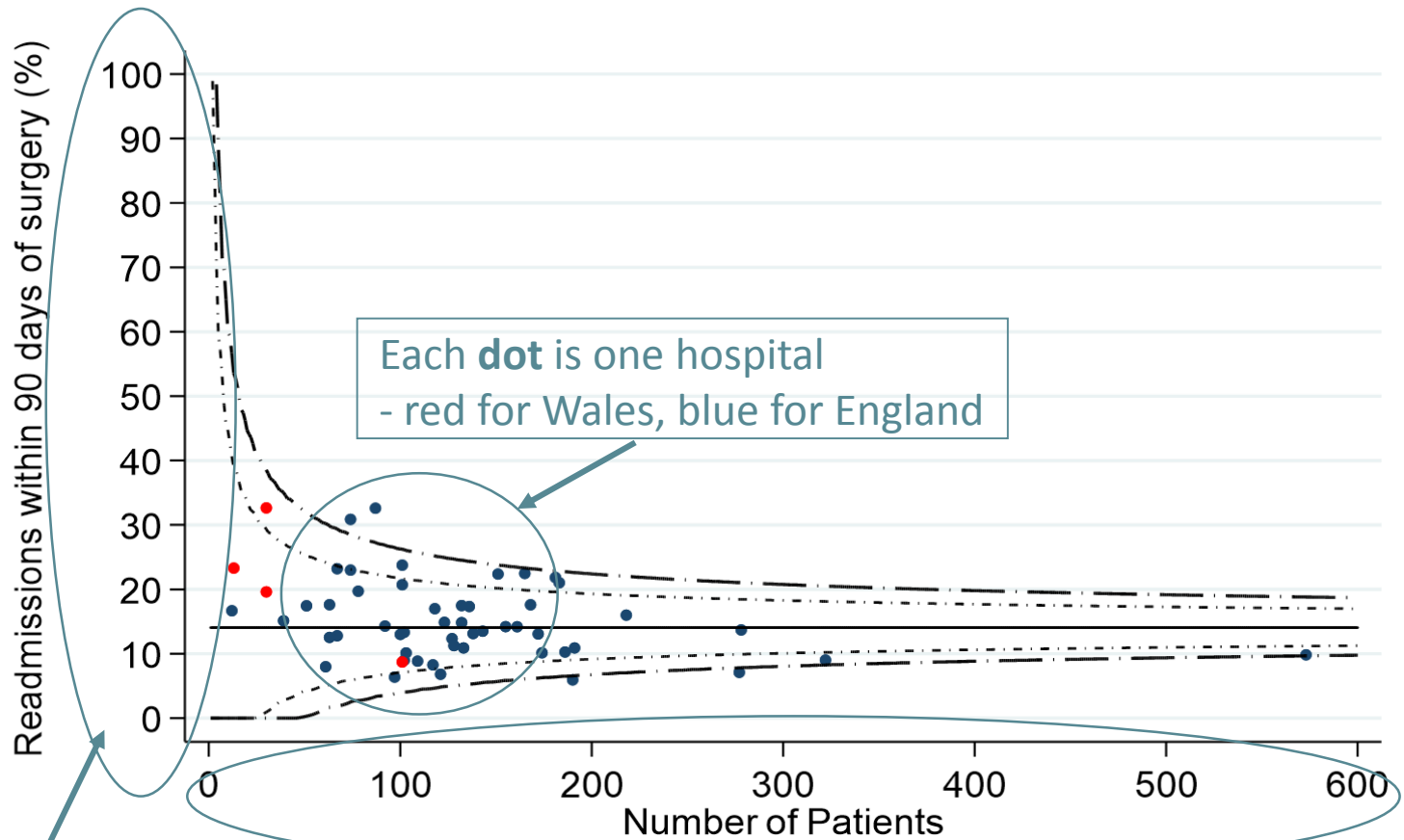
What are funnel plots?

- Funnel plots are a type of graph
- In the National Prostate Cancer Audit, we use them to show the variation of results across the hospitals of England and Wales
- We report them for each of the performance indicators
- They look like this:

In these slides we will use an example to show you each part of the graph and explain why they are funnel-shaped, and how to understand the information in them.



Parts of a funnel plot (1)



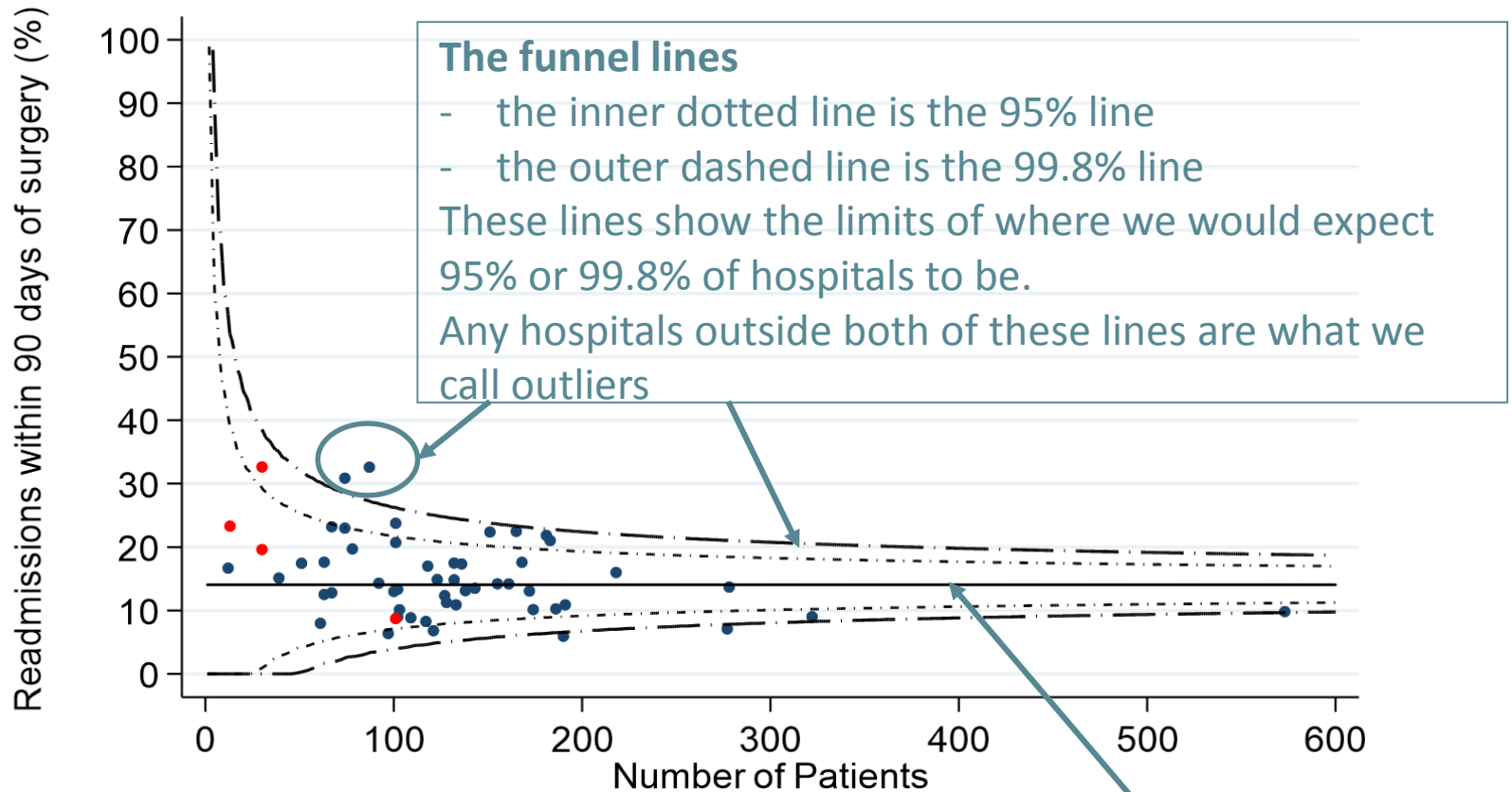
Vertical (y) axis

- shows percentage of patients with the outcome of interest

Horizontal (x) axis

- shows number of patients treated (with surgery in this case) in each hospital

Parts of a funnel plot (2)



Why are the lines funnel-shaped?

- They get wider when there are fewer patients treated in a hospital
 - They get narrower when there are more patients
- This is because we expect there to be more variability in results when there are fewer patients per hospital

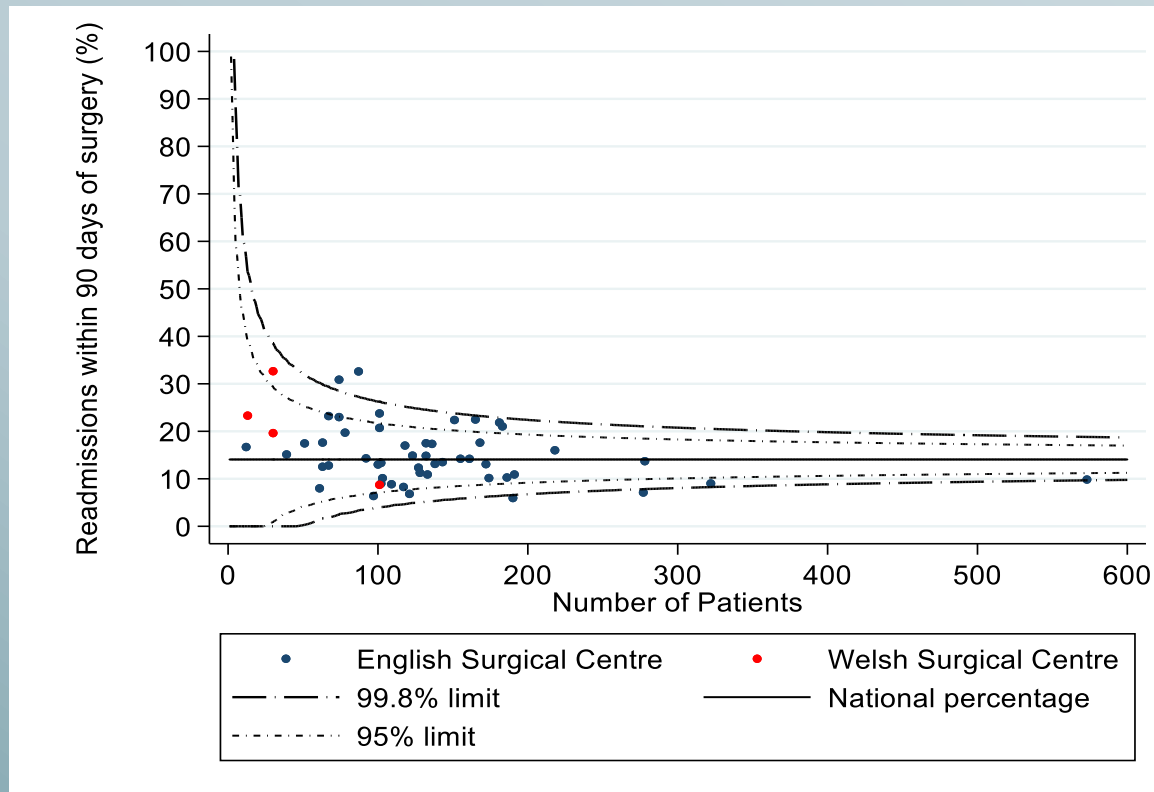
The average line

- shows the average percentage of the outcome across all hospitals (14% in this case)

What does this funnel plot show (1)?

Example: The percentage of men readmitted within 90 days of their surgery

- Most hospitals operated on under 200 patients, one operated on almost 600; Welsh hospitals operated on less than 100 patients during this period
- The average percentage of men readmitted within 90 days of surgery was 14%
- The vast majority of hospitals are within the expected limits for readmission



What does this funnel plot show (2)?

Example: The percentage of men readmitted within 90 days of their surgery

- In this case a **higher percentage is a worse outcome** (more patients readmitted) so:
 - two hospitals are **negative (or ‘alarm’) outliers**, sitting above the top limit line (worse than expected)
 - two are **positive outliers**, sitting below the bottom limit line (better than expected)
 - several sit between the two upper limit lines and so would be termed **‘alert’ outliers**

Providers found to be outliers (**outside the expected range of values**) are given the opportunity to view their data and **comment or explain the findings**:

- These are reported in our annual reports
- Results for each provider can be found on [our website](#)

