National Records of Scotland

Preserving the past | Recording the present | Informing the future

Analysing complaints to drive improvements

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National Records of Scotland

Overview

- What data to collect?
- Meaningful comparisons with small datasets. Has it happened by chance?
- An example – the Scottish Welfare Fund

What Data to Collect

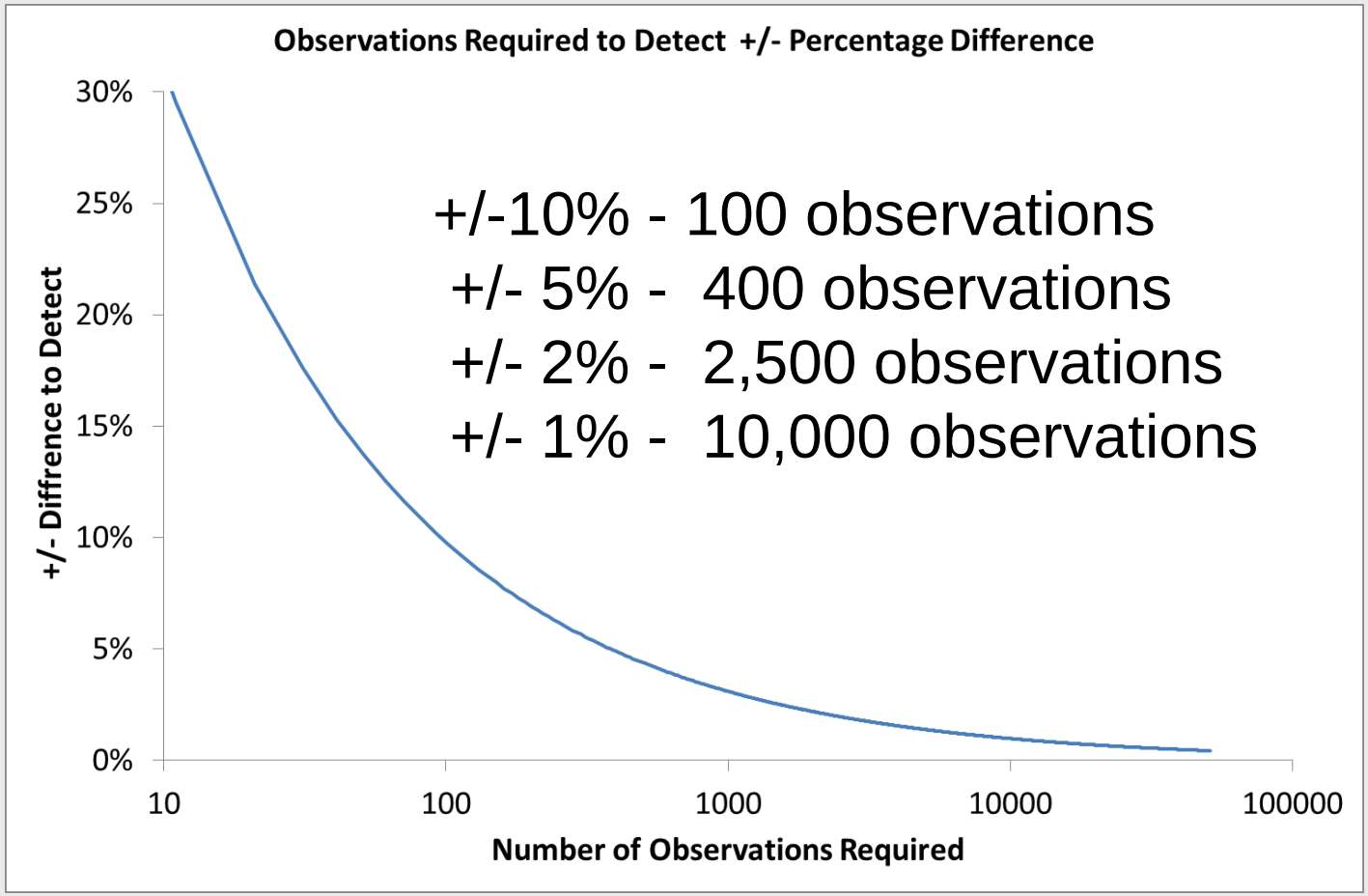
- Timescales – start and end date. Include times too.
- Reasons for review – avoid “other” if possible
- Record outcome separately at each stage.
- Who carried out the review
- Geography – e.g. area office/ Local Authority

More Data – More Certainty

- 1 x Head, 1 x Tail

- 6 x Heads 1 x Tail

When the Numbers are Small - Sampling

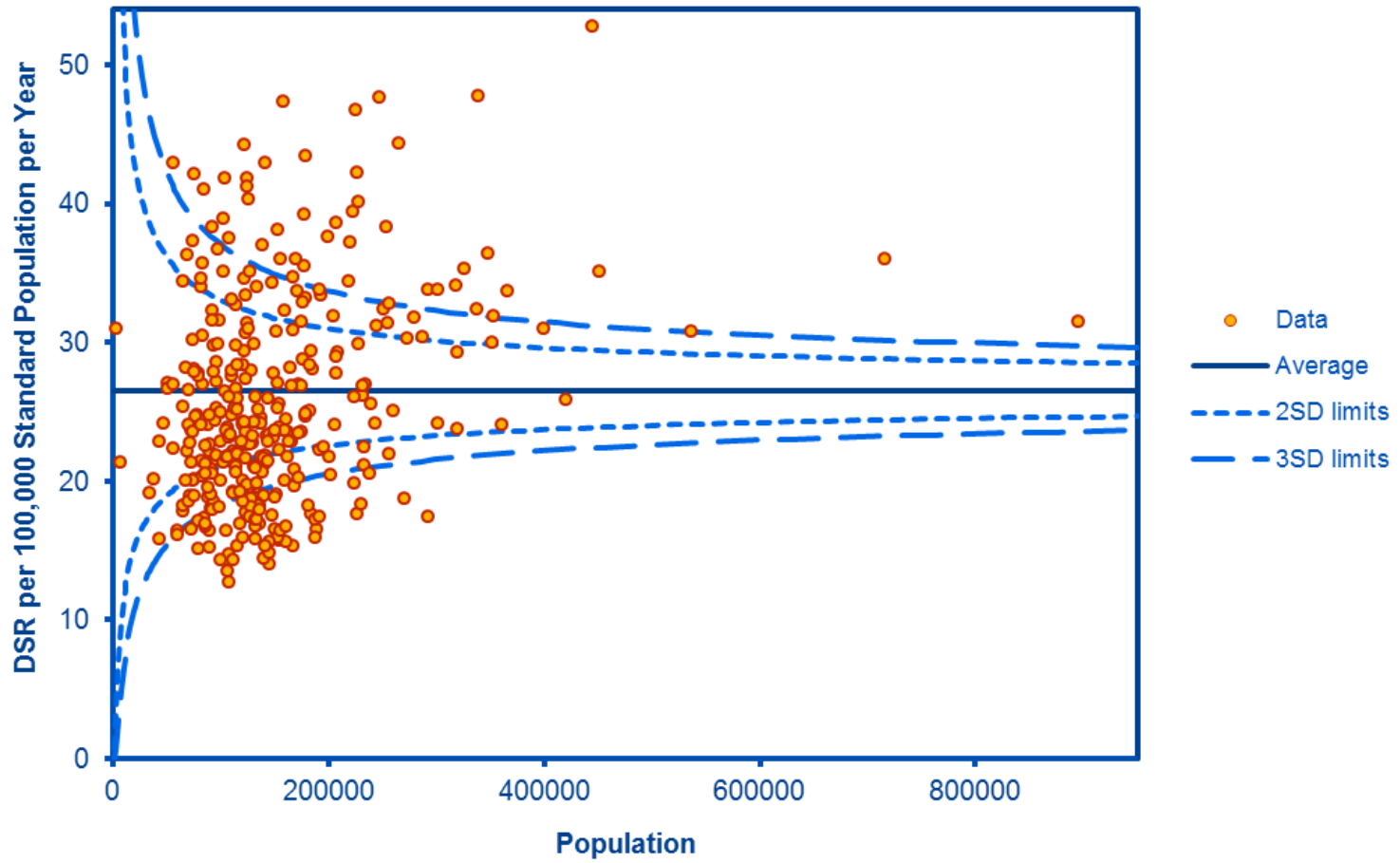


Funnel Plots

- Funnel plots allow many points to be plotted simultaneously, with information about whether each point is significantly above or below the expected, or average value.
- An alternative to simple benchmarking
- Online Example-

  http://www.apho.org.uk/resource/item.aspx?RID=47240

Lung Cancer Mortality in Under 75s, 2004-06



Source: Compendium of Clinical and Health Indicators, December 2007. © Crown Copyright.
Note: Population is adjusted due to Standardisation Calculations

Scottish Welfare Fund

- Commenced in April 2013
- Allocates over £30m a year
- Two parts – Community Care Grants and Crisis Grants

Scottish Welfare Fund

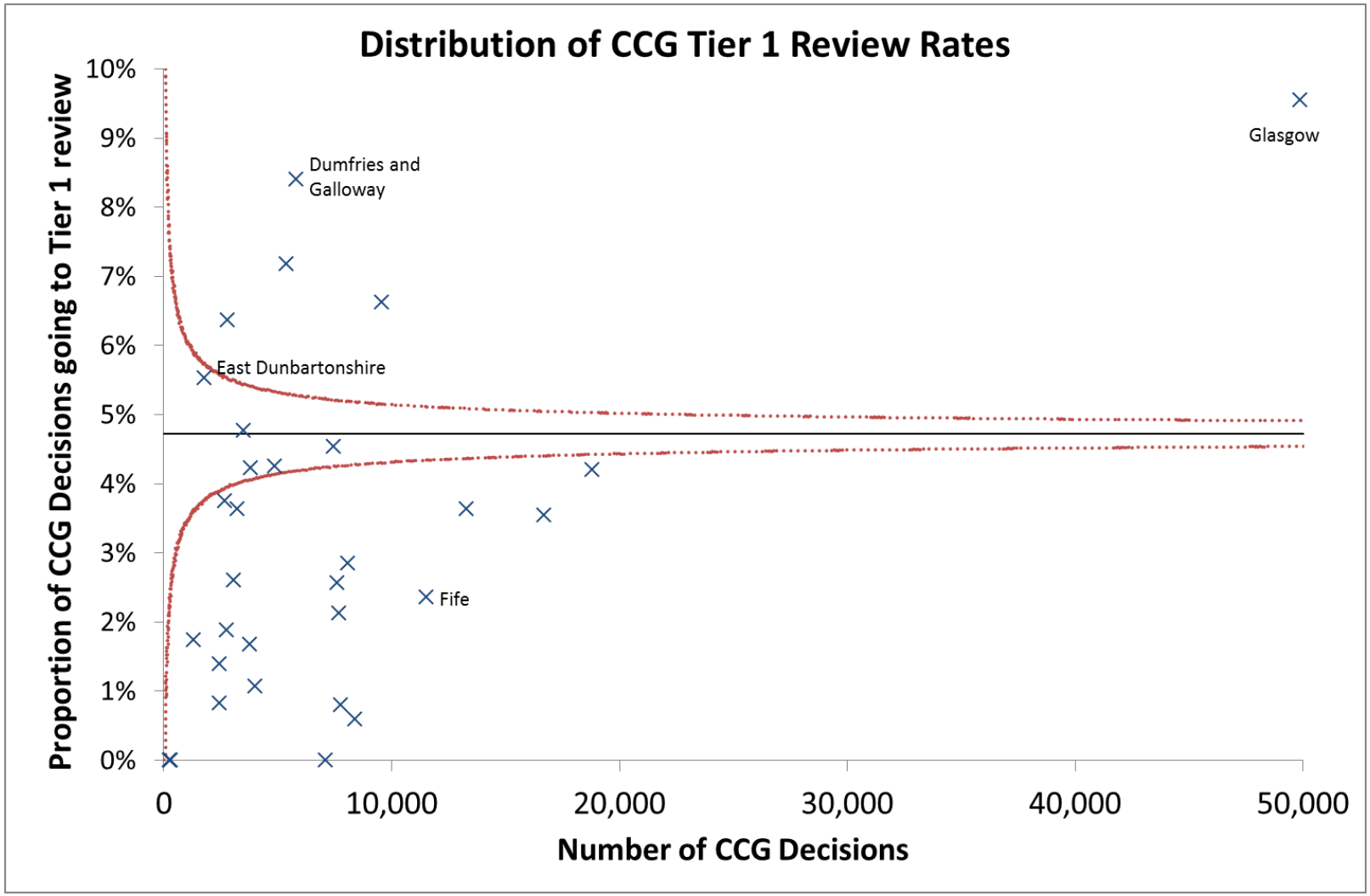
- Tier 1 Reviews by LAs (c. 11k in 42 months ~260 per month)
- Independent Reviews (Tier 2) by SPSO since April 2016. (since the scheme began c. 20 per month)

Scottish Welfare Fund

- Data:

  http://www.gov.scot/Topics/Statistics/Browse/Social-Welfare/swf/

Funnel Plots



Contingency Tables

	Review Requested	No Review Requested
2015	0	25
2016	2	50

- Has the rate of reviews changed?
- 0 out of 25 vs. 2 out of 52
- Is this difference random noise?

Contingency Tables

- Barnard's Test

- http://scistatcalc.blogspot.co.uk/2013/11/barnards-test-calculator.html
- https://goo.gl/NQEJOv

This blog post implements an online Barnard's Test Calculator on a 2 by 2 contingency table. Barnard's test is computationally intensive, and is not as widely used as Fisher's Exact test. However, many statisticians argue (with reasonable justification) that it is a more powerful test especially for the 2 × 2 contingency table scenario.

Please fill in the four text areas with integers greater than or equal to zero, but less than or equal to 100 (for computational reasons).

	Outcome 1:	Outcome 2:	
Category 1:	0	25	25
Category 2:	2	50	52
	2	75	77

Perform Barnard's test

Wald Statistic is 0.993569
Nuisance parameter is 0.600100
P is 0.325337

Rule of Thumb – want P value to be less than 0.05.

Here P is around 0.3 so the difference is statistically significant.

Contingency Tables

	Review Requested	No Review Requested
2015	0	25
2016	2	50

Has the rate of reviews changed?

No. Not statistically significant

(Need 8 review requests out of 52 to be statistically significant)

Dealing with small numbers

- Beware of Disclosure – small numbers can identify people
- Group categories together
  - Time of day -> before/ after lunch
  - Dates - > Months/ Quarters

Summary

- Is this difference real or is it just down to random chance and small numbers?
- Funnel Plots
- Barnard's Exact Test

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