

Introduction to Composite Indicators for Colorectal Cancer

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The team



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‘ A measure of the clinical management and/ or outcome of care ’

- Outcome, process and evidenced based measures
- Identifiable, accurate and reproducible
- Relevant to current practice
- Assessing performance and monitoring progress
- Hospital feedback

- Identify and model indicators of hospital performance in England
- Model variability of each indicator between NHS trusts in England
- Identify outlying trusts for each indicator
- Pool results
- Develop composite indicator

- National Cancer Data Repository (NCDR)
- All colorectal cancer patients diagnosed in England in 2007 and 2008 (61872)
- Allocated to one of 150 Trusts based on primary management of disease (57806 - 93.4%)
- Demographic, diagnosis and treatment data

Derivation of indicators



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- Collaboration with the Cancer Epidemiology and Services Research Group, University of Sydney
- Habib M, Solomon MJ, Young JM *et al.* Evidence-based and clinical outcomes scores to facilitate audit and feedback for colorectal cancer care. *Dis Col Rectum* 2009; 52:616-623
- Based on clinical knowledge
- Availability of data
- Population based indicators
- Consistency of method for each indicator



Clinical Indicators

1. 1 year survival
2. 3 year survival
3. Proportion of major resections
4. Proportion of any procedure
5. 30 day post-operative mortality
6. Prolonged length of stay
7. Proportion of stoma at 1 year for rectal cancer
8. Proportion of APE for rectal cancer



Other possibilities

- Proportion of Laparoscopic procedures
- Documented cancer stage
- Emergency readmission within 28 days of discharge
- Return to theatre
- Chemotherapy and/or Radiotherapy
- Case ascertainment to NBOCAP
- Evidence-based measures

	Indicator	Denominator	Patient number 2007-2008
1	1 year absolute survival	All patients	57806
2	3 year absolute survival	All patients	57806
3	Proportion of patients having a major resection	All patients	57806
4	Proportion of patients undergoing any procedure	All patients	57806
5	30 day post-operative mortality	Major resection	39293
6	Proportion of patients who had a prolonged length of stay (> 21 days)	Major resection	39293
7	Proportion of patients who had APE for rectal cancer	Major resection + rectal cancer	10238
8	Proportion of patients with a stoma at 1 year following major resection for rectal cancer	Major resection + rectal cancer + alive at 1 year	9361

Statistical methodology



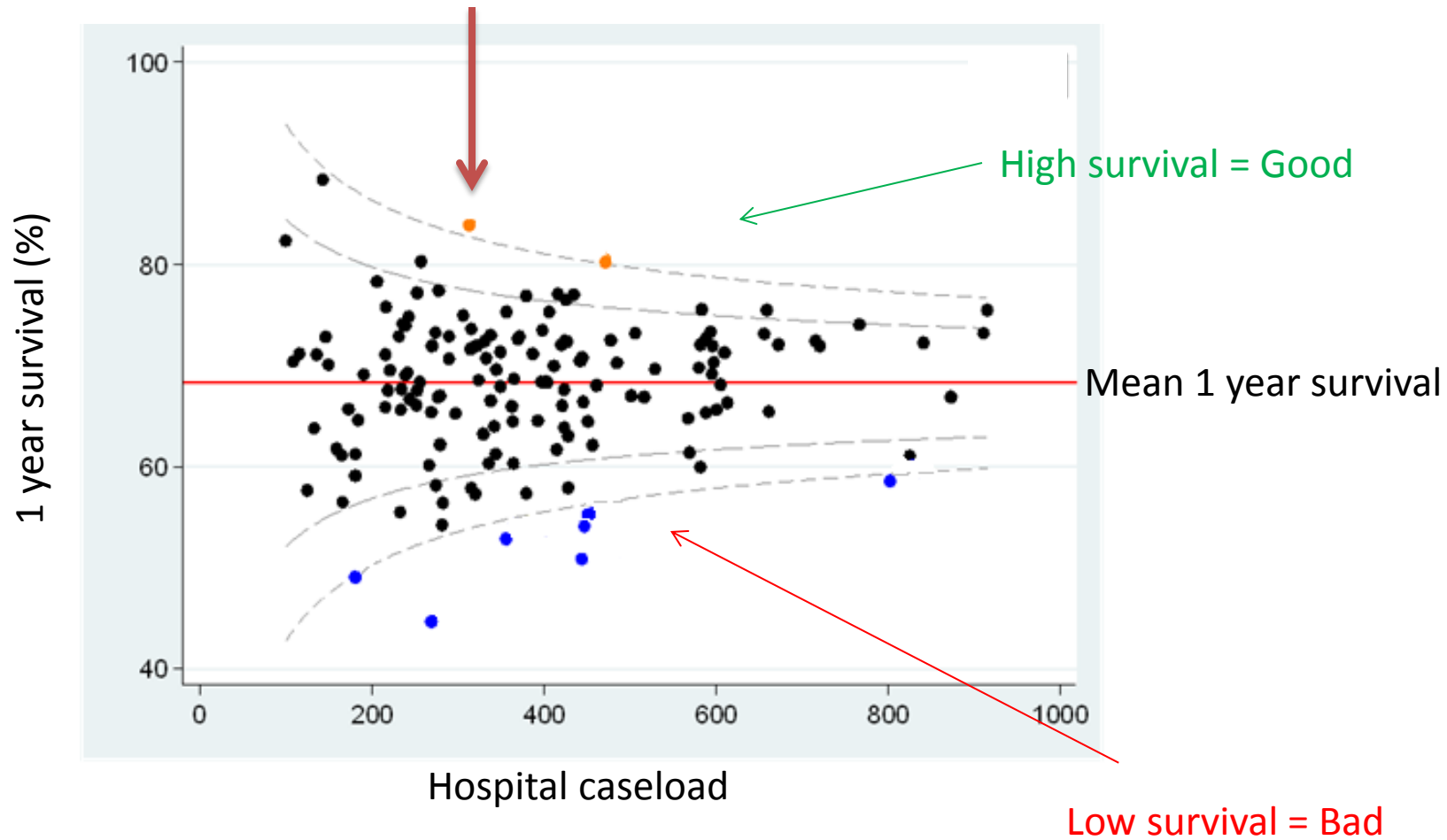
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- Individual models for each indicator
- Outcome → 1 indicator present
0 not present
- Logistic regression (Poisson regression for survival)
- Multilevel structure
- Risk adjusted models
(Age at diagnosis, Sex, Stage, Cancer site, Emergency admission,
Deprivation score, Surgical procedure)
- Funnel plots

1 year absolute survival



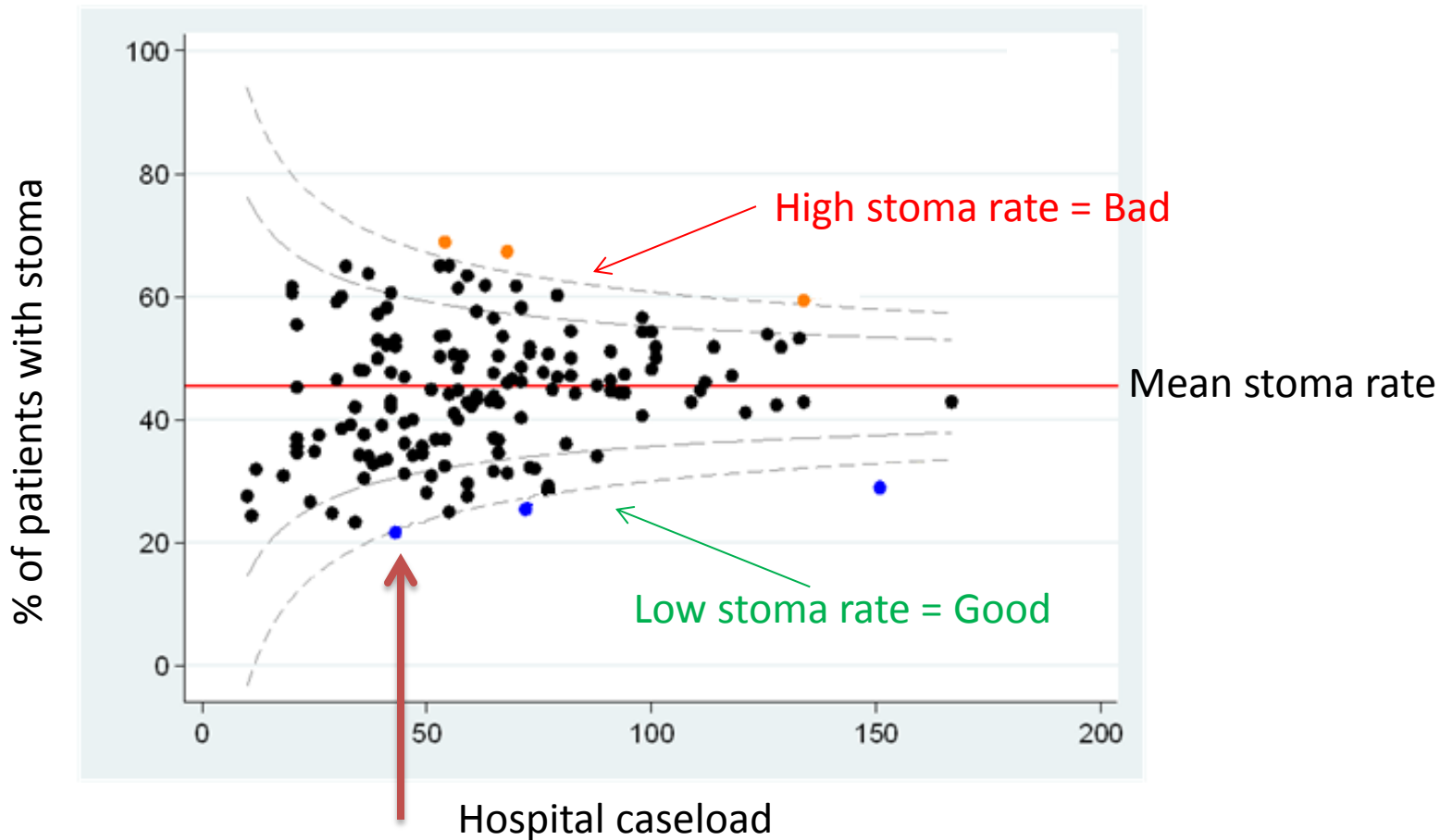
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Stoma at 1 year



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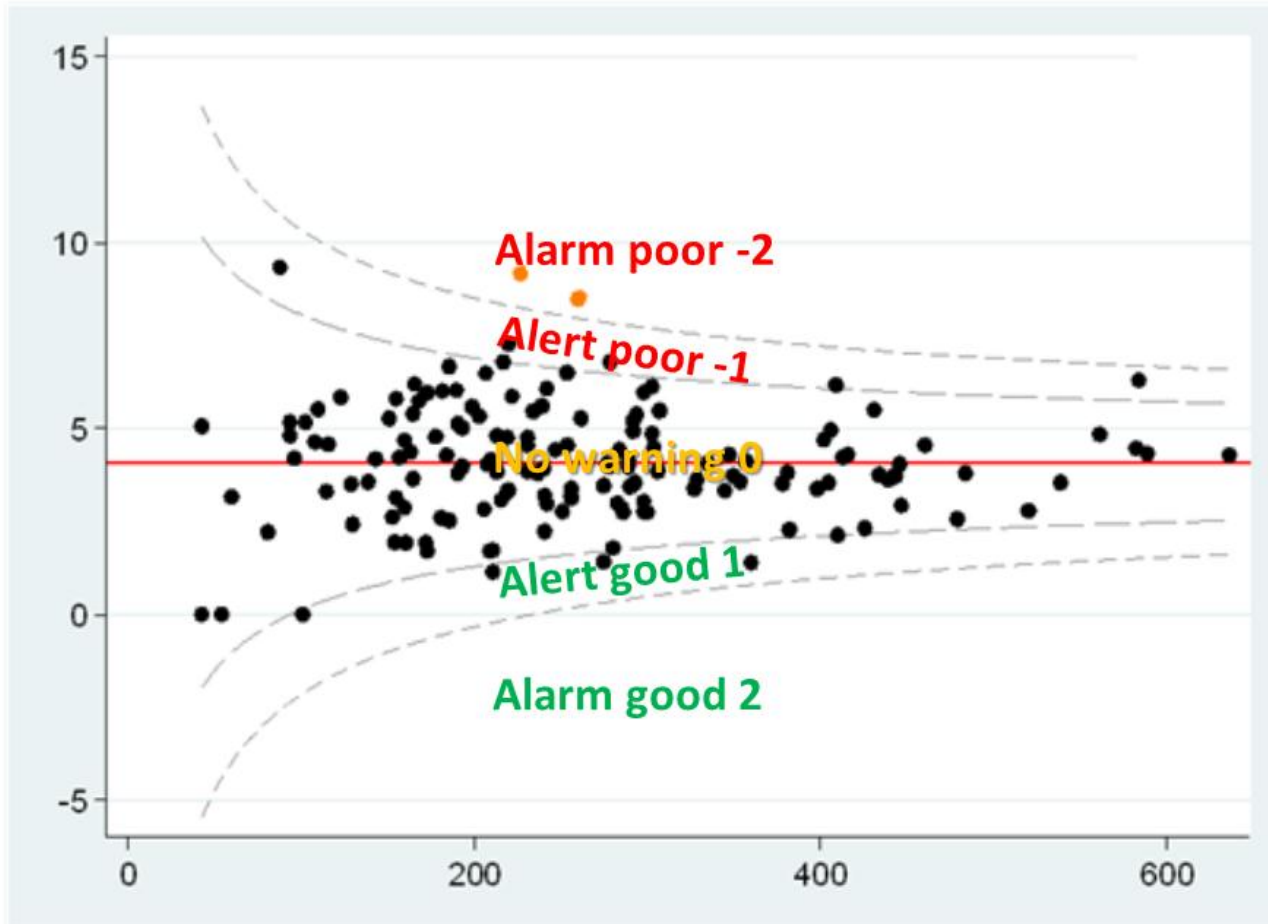


30 day post-operative mortality



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30 day post-operative mortality (%)



Hospital caseload

Composite indicator



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- Sum individual indicator scores
- Neutrality
- Only score poor / good trusts
- Weighting
- Avoid ranking / league table of Trusts

Trust examples



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Trust	30 day post operative mortality	Prolonged length of stay	1 year survival	3 year survival	Stoma at 1 year	APE	Major resection	Any surgery	Sum
A	-1	0	-1	-2	0	-2	0	0	-6
B	0	0	-2	-2	-1	-2	0	0	-7
C	0	0	0	0	0	0	0	0	0
D	0	0	1	1	0	0	-2	-1	-1
E*	0	-1	2	2	2	0	0	0	5
F	0	1	0	1	0	0	2	0	4

Questions



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- Which of these indicators are most important?
- Are there any other nationally available indicators that would be useful?
- Which is the best way to define the composite indicator?
- How to feedback to individual trusts?