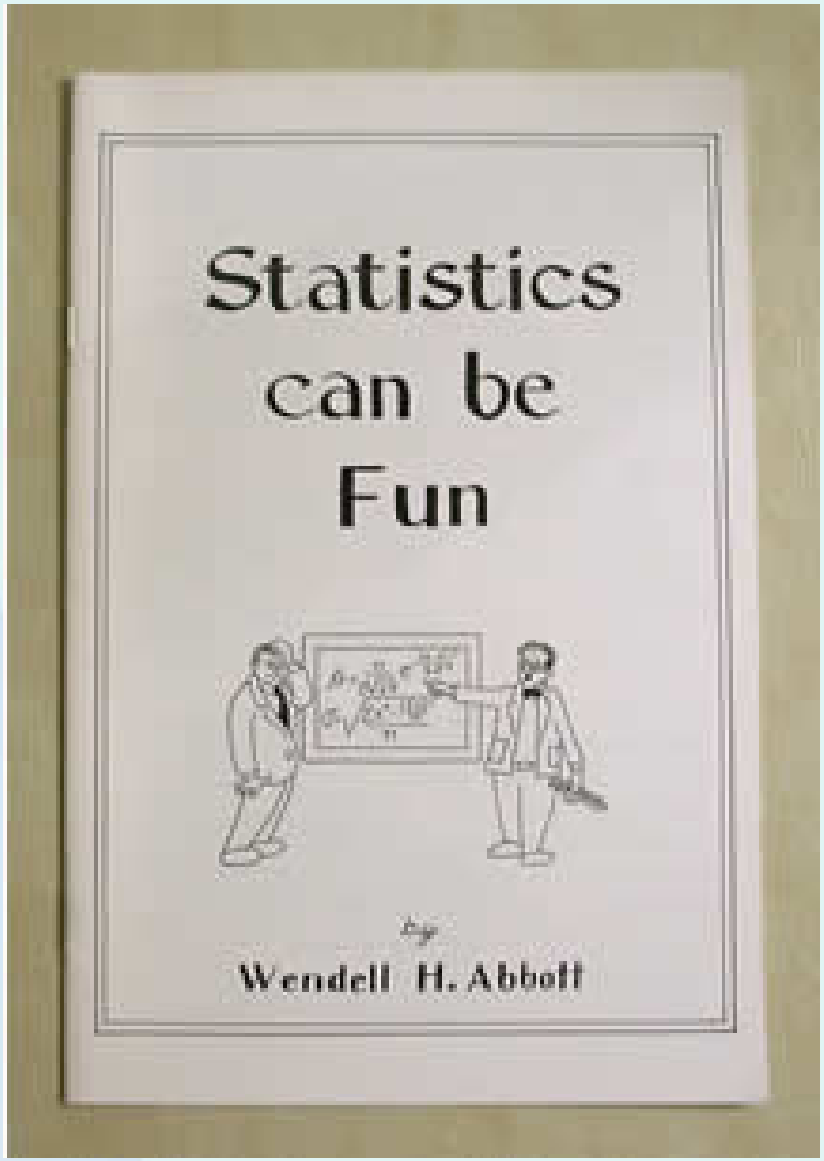
Queensland Government
Queensland Health

Clinical Practice Improvement Centre

Can indicators show the ‘vital signs’ of our service? Can poorly derived indicators drive quality improvement?

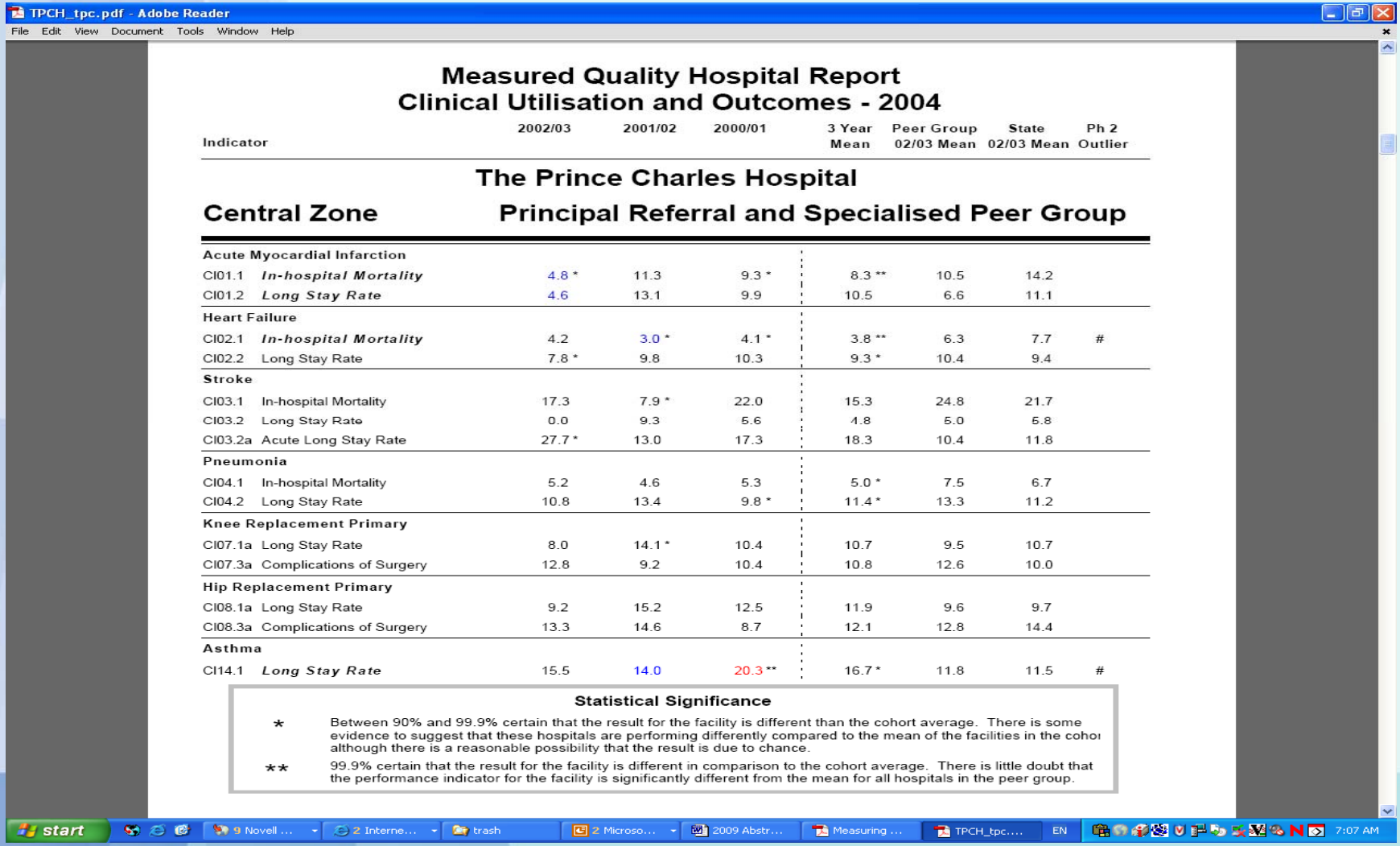
Kirstine Sketcher-Baker

health • care • people


Statistics
can be
Fun
by
Wendell H. Abbott

Prior to VLADs

(Hospital Risk Adjusted Rates per 100 seps.)



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Measured Quality Hospital Report
Clinical Utilisation and Outcomes - 2004

Indicator	2002/03	2001/02	2000/01	3 Year Mean	Peer Group 02/03 Mean	State 02/03 Mean	Ph 2 Outlier
The Prince Charles Hospital							
Central Zone				**Principal Referral and Specialised Peer Group**			
Acute Myocardial Infarction							
CI01.1 *In-hospital Mortality*	4.8 *	11.3	9.3 *	8.3 **	10.5	14.2	
CI01.2 *Long Stay Rate*	4.6	13.1	9.9	10.5	6.6	11.1	
Heart Failure							
CI02.1 *In-hospital Mortality*	4.2	3.0 *	4.1 *	3.8 **	6.3	7.7	#
CI02.2 Long Stay Rate	7.8 *	9.8	10.3	9.3 *	10.4	9.4	
Stroke							
CI03.1 In-hospital Mortality	17.3	7.9 *	22.0	15.3	24.8	21.7	
CI03.2 Long Stay Rate	0.0	9.3	5.6	4.8	5.0	5.8	
CI03.2a Acute Long Stay Rate	27.7 *	13.0	17.3	18.3	10.4	11.8	
Pneumonia							
CI04.1 In-hospital Mortality	5.2	4.6	5.3	5.0 *	7.5	6.7	
CI04.2 Long Stay Rate	10.8	13.4	9.8 *	11.4 *	13.3	11.2	
Knee Replacement Primary							
CI07.1a Long Stay Rate	8.0	14.1 *	10.4	10.7	9.5	10.7	
CI07.3a Complications of Surgery	12.8	9.2	10.4	10.8	12.6	10.0	
Hip Replacement Primary							
CI08.1a Long Stay Rate	9.2	15.2	12.5	11.9	9.6	9.7	
CI08.3a Complications of Surgery	13.3	14.6	8.7	12.1	12.8	14.4	
Asthma							
CI14.1 *Long Stay Rate*	15.5	14.0	20.3 **	16.7 *	11.8	11.5	#

Statistical Significance

* Between 90% and 99.9% certain that the result for the facility is different than the cohort average. There is some evidence to suggest that these hospitals are performing differently compared to the mean of the facilities in the cohor although there is a reasonable possibility that the result is due to chance.

** 99.9% certain that the result for the facility is different in comparison to the cohort average. There is little doubt that the performance indicator for the facility is significantly different from the mean for all hospitals in the peer group.

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Issues of pre-VLAD methodology
(Annual Cross-sectional analysis)

- Limited Governance
  - Data only reported once a year for review
  - Follow-up on identified issues could only be achieved annually
- Timeliness (10 - 22 month lag)
  - Relevancy of the data to current practice
  - Lag-time of 10–22 months in detecting potential issues
  - Lag-time of 2 or 3 years to assess if improvement initiatives implemented as a result of identifying issues from a previous review were effective
- Lack of sensitivity
  - Limited information provided in a single figure
  - Inability to detect and identify time periods where results improved or deteriorated

Variable Life Adjusted Display
(VLAD)

A VLAD is a type of statistical process control chart that visually represents treatment outcomes for selected clinical indicators

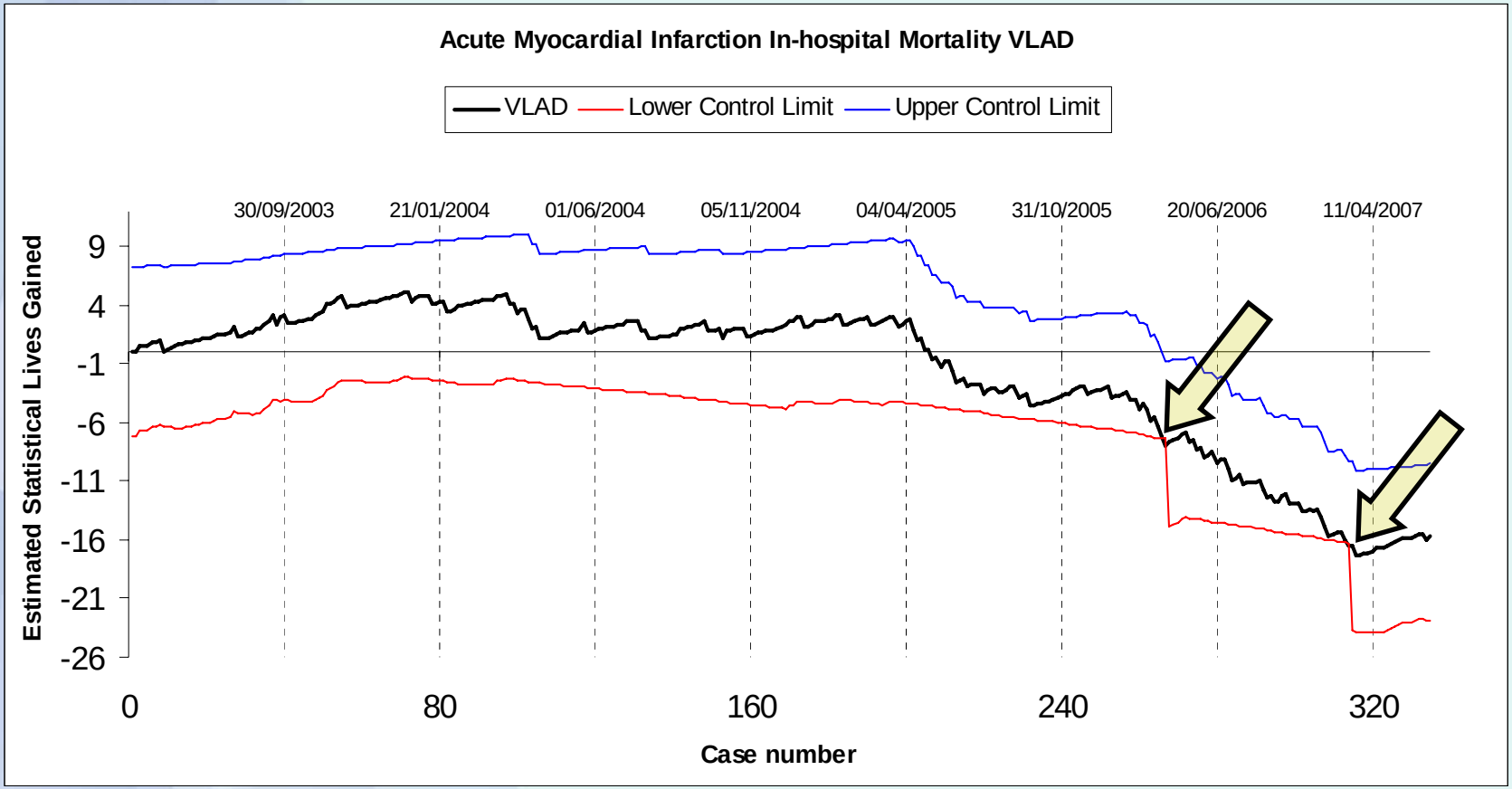
- A monitoring/screening tool of clinical indicators
- Displays trends over time within a hospital
- Compares individual hospitals with the state average

VLAD Characteristics

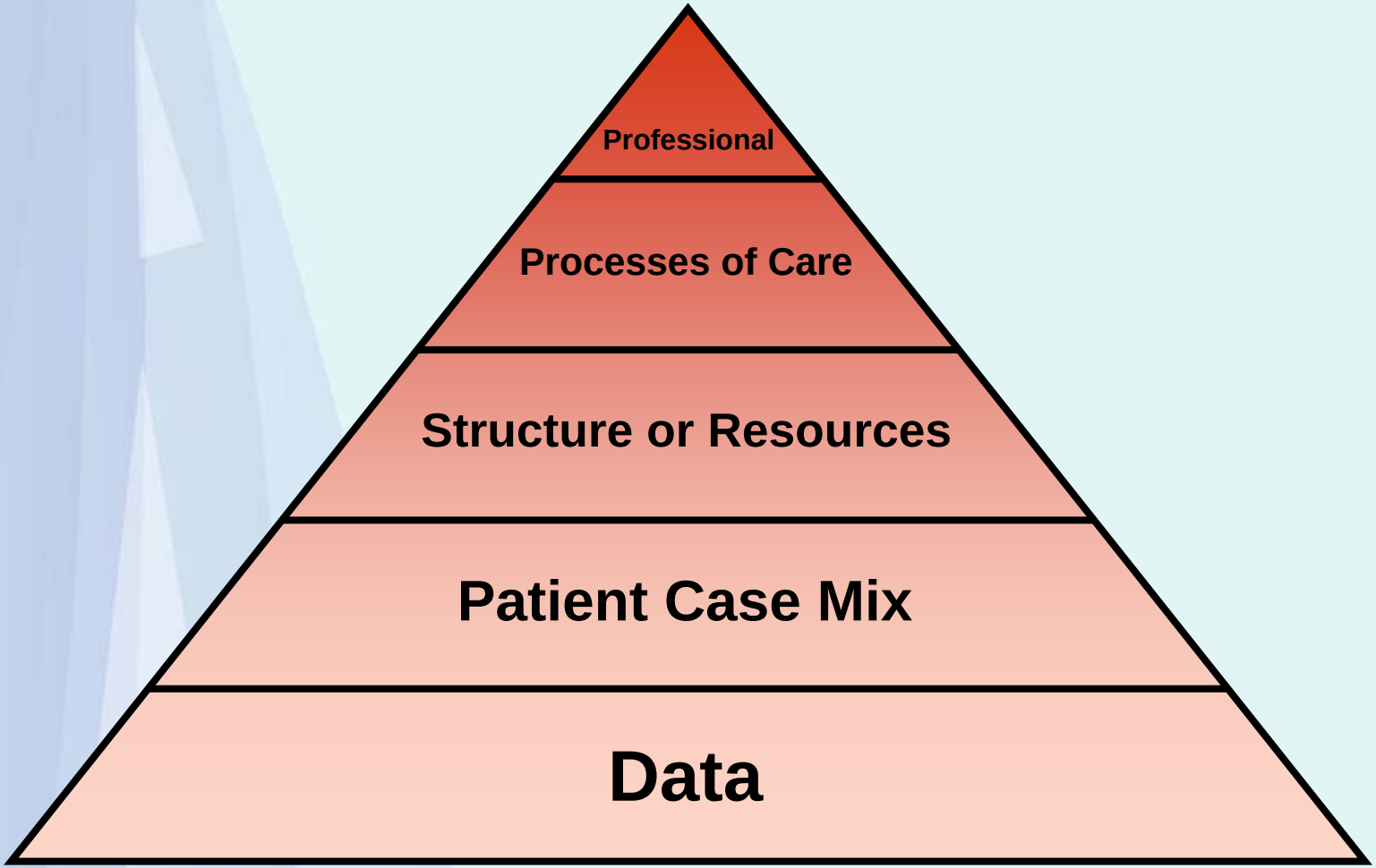
A VLAD investigates:

- ✓ A clinical indicator
- ✓ According to a particular outcome
- ✓ For a particular time period
- ✓ For a particular hospital (public or private)
- ✓ By each patient
- ✓ Against a particular level of variation

In-hospital Mortality VLAD



What is the cause of the variation?



Can indicators show the ‘vital signs’ of our service?

A few ‘vital signs’ detected

Indicator

- Acute Myocardial Infarction Mortality

Findings – (hospital higher rate than state)

- Delays in transferring of patients to other facilities
- Incorrect coding due to poor chart documentation

Findings – (hospital lower rate than state)

- Reduced delays in lysis (previously patients were sent to Coronary Care for lysis however patients now given lysis in Emergency Dept)

A few ‘vital signs’ detected

Indicator

- Pneumonia In-hospital Mortality

Findings – (hospital higher rate than state)

- Junior doctor did not notify consult about a positive blood test (Enterococcus infection) affecting treatment with appropriate antibiotic

Findings – (hospital lower rate than state))

- A high number of low risk patients were admitted which could have been simply treated within the community [antibiotic therapy with recommendations] Clinical Pathway adhered to

Can indicators show the ‘vital signs’ of our service?

Yes, but we have discovered that the “vital signs” are more likely to be shown if the following exists…….

- Expert input in the development of clinical indicators
- Expert review of clinical indicator variances at a hospital level
- Underlying data of clinical indicators readily accessible
- Tools to review variances
- A governance structure
- A process to capture & subsequently review indicator definition feedback

Current VLAD Clinical Indicators

Mortality

- Acute Myocardial Infarction
- Heart Failure
- Stroke
- Pneumonia
- Fractured Neck of Femur

Readmission and Long Stay

- Acute Myocardial Infarction
- Heart Failure
- Knee Replacement
- Hip Replacement
- Depression
- Schizophrenia
- Paediatric Tonsillectomy and Adenoidectomy

Complications of Surgery

- Laparoscopic Cholecystectomy*
- Vaginal Hysterectomy
- Abdominal Hysterectomy
- Fractured Neck of Femur
- Colorectal Carcinoma
- Knee Replacement
- Hip Replacement
- Prostatectomy

Maternity

- Caesarean Section
- Induction of Labour
- Perineal Tears*

Developing Clinical Indicators

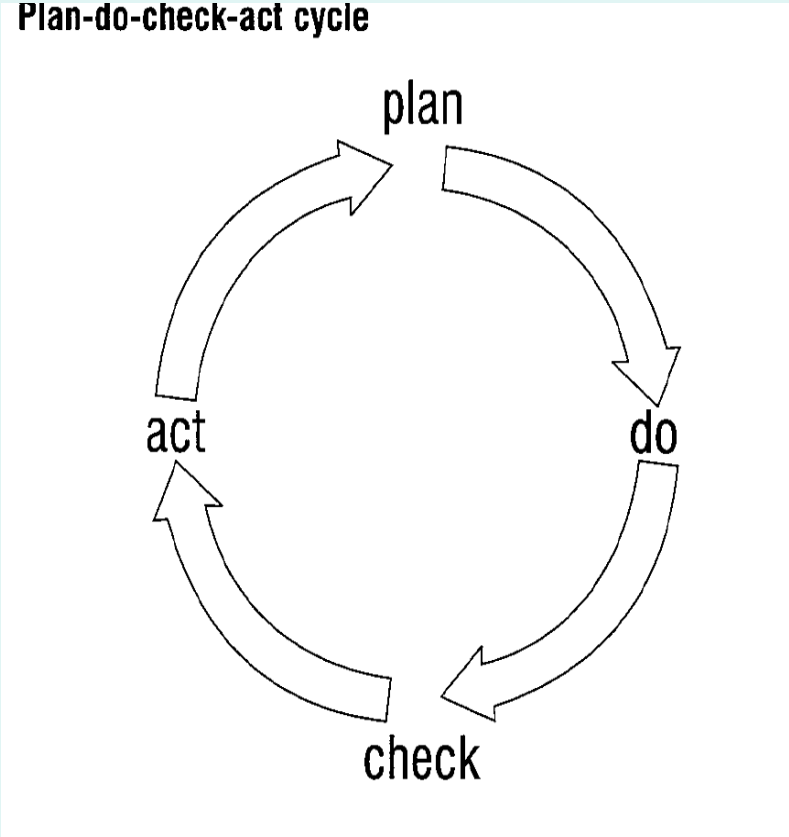
- ✓ 3 main components of a clinical indicator
  - ✓ Denominator – patients of interest
  - ✓ Numerator – those patients experiencing the outcome
  - ✓ Risk Adjustment – used to adjust for illness severity

- ✓ Developed in consultation with clinical expert groups
  - ✓ **Significance:** Clinical significance in terms of burden of disease
  - ✓ **Volume:** Sufficient numbers to provide a reliable measure
  - ✓ **Indicator clarity:** Clearly defined and reliable
  - ✓ **Responsive potential:** Can be systematically improved
  - ✓ **Systematic data:** Derived from systematically collected data

- ✓ Reviewed regularly – feedback incorporated into definition

Define & Refine
Improve or Remove

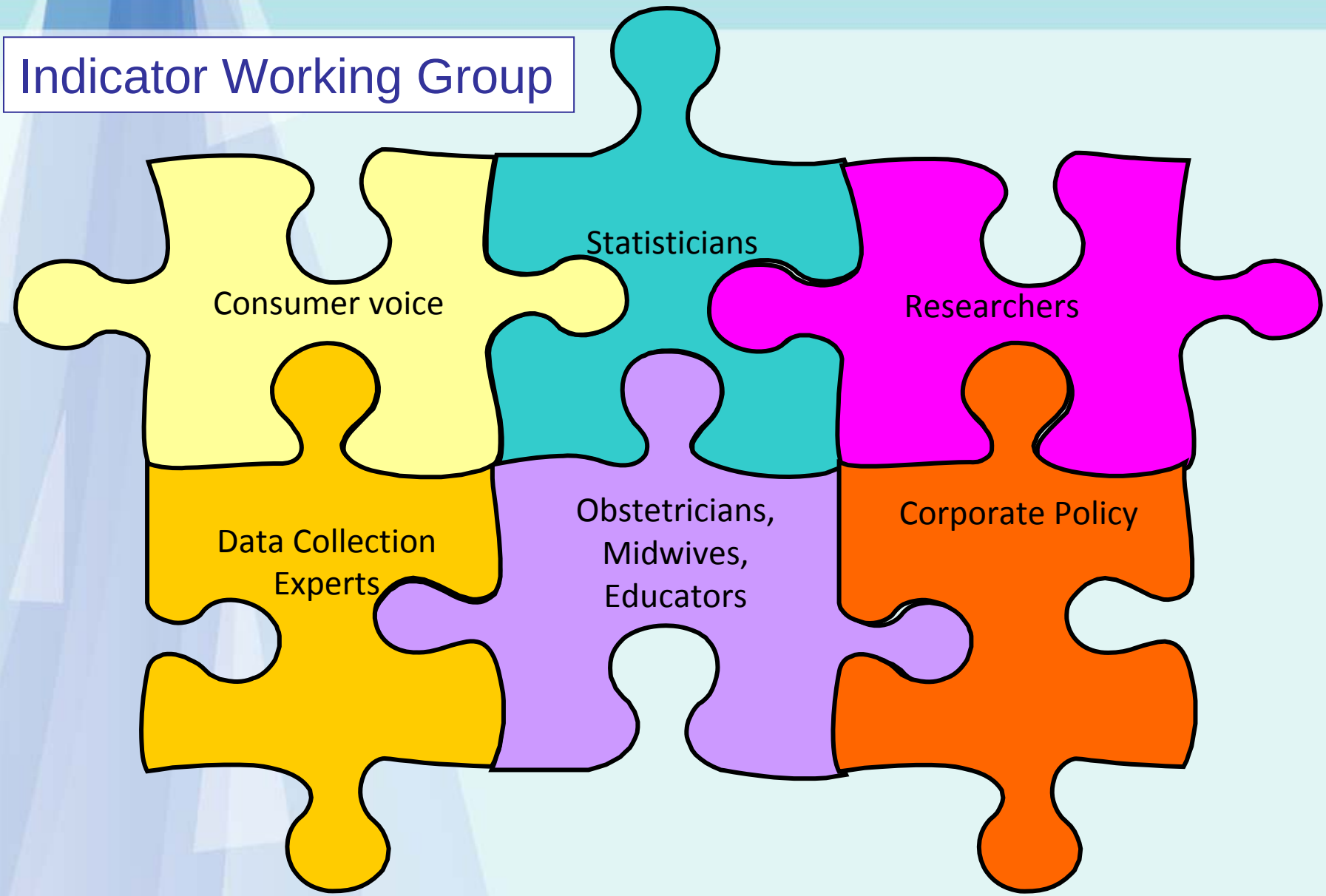
- Developed in consultation with clinical expert groups
- Sex, age and comorbidities used in attempt to risk-adjust for illness severity
- Indicators are reviewed and further refined based on feedback eg. Maternity & Laparoscopic Cholecystectomy Complications of Surgery



Maternity indicator journey

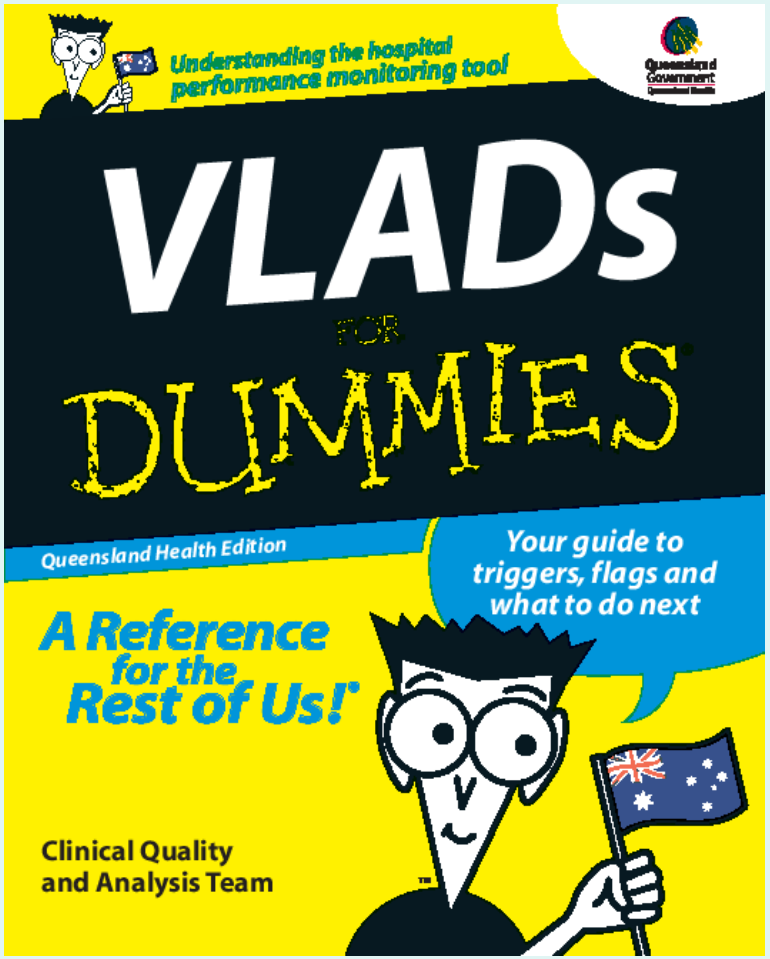
- ✓ Question was raised around the responsive potential of the perineal tears indicator prompting a review of all Maternity Indicators
- ✓ Question taken to the State-wide Maternity Group
- ✓ Maternity Indicator Working group formed to:
  - review current QH VLAD maternity clinical indicators (caesarean sections, inductions and perineal tears)
  - identify other clinical indicators to be monitored using the VLAD

Indicator Working Group



Step 1

- Education of the working group
  - VLAD Statistical Methodology (including constraints etc)
  - Clinical Indicator Construct
    - 3 components
  - Existence of other National and Statewide clinical indicators



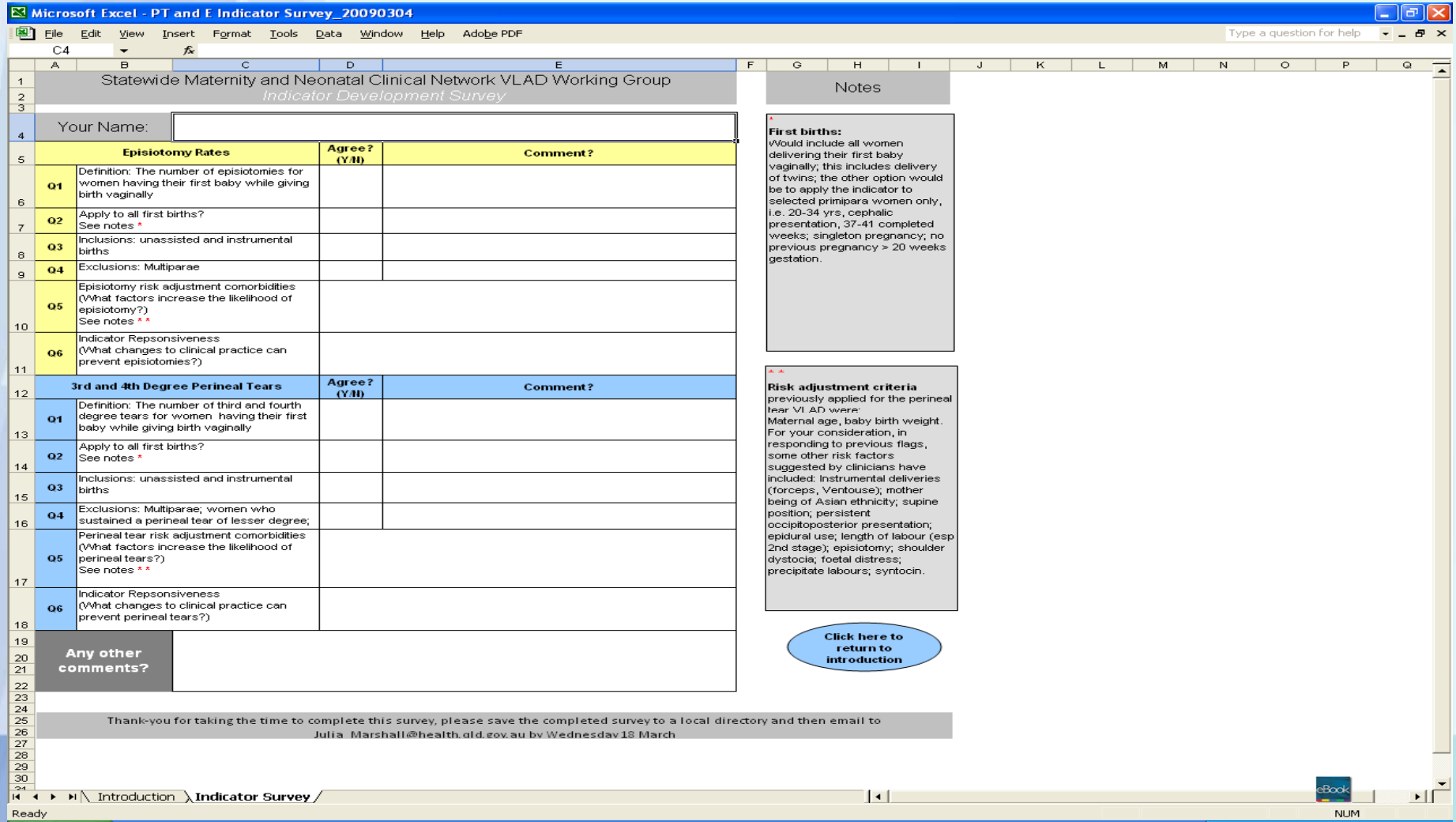
Step 2

- Clinical Indicator Survey developed using key indicator selection criteria and subsequently sent to members

- Questions included
  - **What is being measured, Why is it being measured, Can it be defined?**
  - **Is this important to clinicians? Is this important to consumers?**
  - **Is the outcome responsive to changes in practice?**
  - **What does the research say? What is on the national agenda?**
  - **Are there any limitations with the indicator?**
  - **Is the data available and is it reliable?**
  - **Inclusion and exclusion criteria? Risk adjusting criteria?**
  - **Parallel indicators?**

Step 3

- Members completed and returned survey for compilation of results



Microsoft Excel - PT and E Indicator Survey_20090304

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Statewide Maternity and Neonatal Clinical Network VLAD Working Group

Indicator Development Survey

Your Name:

	Episiotomy Rates	Agree? (Y/N)	Comment?
Q1	Definition: The number of episiotomies for women having their first baby while giving birth vaginally		
Q2	Apply to all first births? See notes *		
Q3	Inclusions: unassisted and instrumental births		
Q4	Exclusions: Multiparae		
Q5	Episiotomy risk adjustment comorbidities (What factors increase the likelihood of episiotomy?) See notes * *		
Q6	Indicator Repsonsiveness (What changes to clinical practice can prevent episiotomies?)		

	3rd and 4th Degree Perineal Tears	Agree? (Y/N)	Comment?
Q1	Definition: The number of third and fourth degree tears for women having their first baby while giving birth vaginally		
Q2	Apply to all first births? See notes *		
Q3	Inclusions: unassisted and instrumental births		
Q4	Exclusions: Multiparae; women who sustained a perineal tear of lesser degree;		
Q5	Perineal tear risk adjustment comorbidities (What factors increase the likelihood of perineal tears?) See notes * *		
Q6	Indicator Repsonsiveness (What changes to clinical practice can prevent perineal tears?)		

Any other comments?

Notes

* **First births:** Would include all women delivering their first baby vaginally; this includes delivery of twins; the other option would be to apply the indicator to selected primipara women only, i.e. 20-34 yrs, cephalic presentation, 37-41 completed weeks; singleton pregnancy; no previous pregnancy > 20 weeks gestation.

* * **Risk adjustment criteria** previously applied for the perineal tear VLAD were: Maternal age, baby birth weight. For your consideration, in responding to previous flags, some other risk factors suggested by clinicians have included: Instrumental deliveries (forceps, Ventouse); mother being of Asian ethnicity; supine position; persistent occipitoposterior presentation; epidural use; length of labour (esp 2nd stage); episiotomy; shoulder dystocia; foetal distress; precipitate labours; syntocin.

Click here to return to introduction

Thank-you for taking the time to complete this survey, please save the completed survey to a local directory and then email to Julia_Marshall@health.qld.gov.au by Wednesday 18 March

Introduction | Indicator Survey

Ready NUM

Step 4

- Results presented and discussed at Indicator Working Group Meeting
- Preliminary indicator definition determined

Step 5

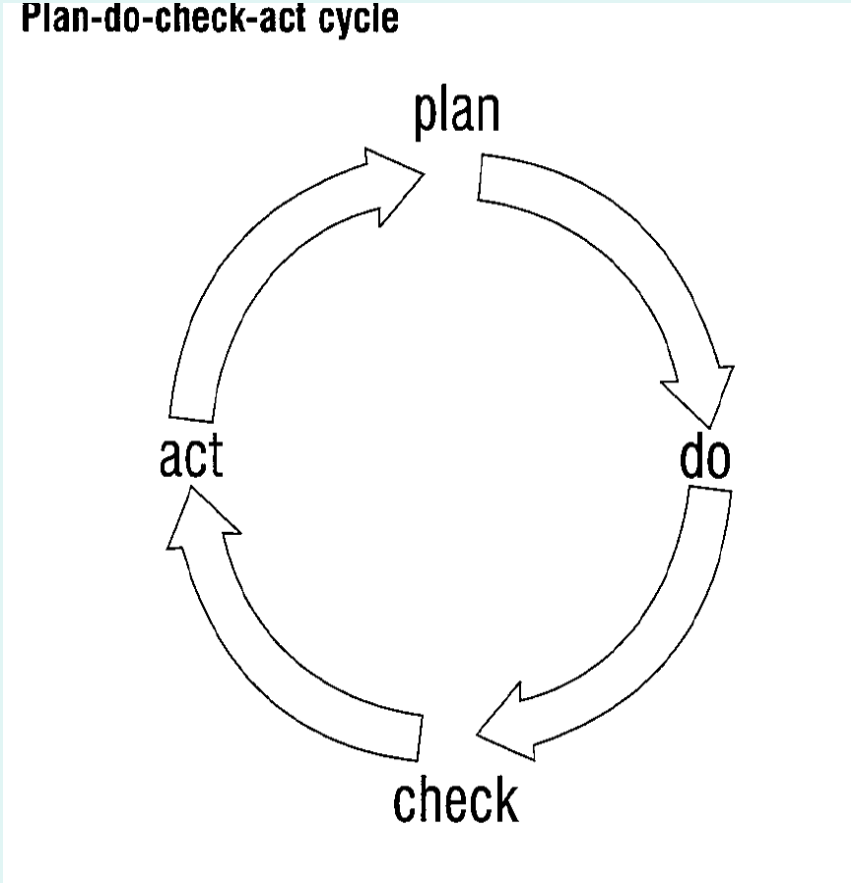
- Preliminary statistical analysis performed

Step 6

- Statistical results presented and discussed at Indicator Working Group Meeting
- Indicator definition finalised

Future Steps

- Indicator Feedback will be gathered via online survey
- Indicator Feedback will be collated 12 months post implementation and presented to the Indicator Working Group for review
- Further refinement of the indicator
- Implementation of the refined indicator



Can poorly derived indicators drive quality improvement?

A poorly derived indicator

Indicator

- Laparoscopic Cholecystectomy Complications of Surgery

Indicator Definition Findings – (hospital higher rate than state)

- Majority of patients had an inadvertent puncture/laceration of the gall bladder – not considered to be a complication of surgery
- A few complications were from a previous procedure

A poorly derived indicator – yet quality improvement achieved

Indicator

- Laparoscopic Cholecystectomy Complications of Surgery

Process of Care Findings – (hospital higher rate than state)

- Clinical Director identified a locum's management of cases flagged as concerning - Locum surgeons since this event are now only given less complex cases to manage with supervision by a senior surgeon
- A Laparoscopic clip applicator which had been re-used a number of times failed to secure the cystic duct in a laparoscopic cholecystectomy

Can poorly derived indicators drive quality improvement?

Yes, but time may be wasted in detecting similar issues over and over therefore reducing credibility of the tool

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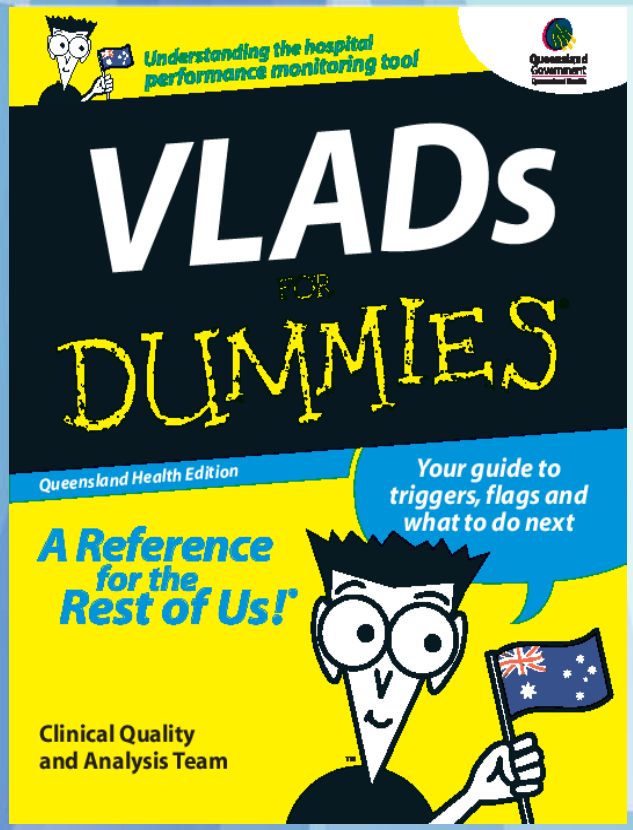

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