

AB023. LA08. Using CUSUM for monitoring a new program

Nuria M. Novoa

Department of Surgery, Service of Thoracic Surgery, Salamanca University Hospital, Salamanca, Spain

Correspondence to: Nuria M. Novoa. Department of Surgery, Service of Thoracic Surgery, Salamanca University Hospital, Salamanca, Spain. Email: nuria.novoa@usal.es.

Abstract: Today's needs of increasing quality assurance on any new surgical program can be fulfilled because the proper tools are already developed. Many forms of quality-control monitoring have been suggested, but they are often impractical, difficult to implement or not sensitive to our needs. Cumulative sum (CUSUM) is a simple method to provide visual feedback before significant quality issues arise. CUSUM is defined as a statistical tool that graphically presents the sequential monitoring of cumulative performance of any binary variable we are assessing. It makes special emphasis in failures penalizing them against the correct performance. This makes this statistical method especially sensitive to negative changes. It has very positive characteristics like it is easy and intuitive to read and can be

created from an unknown sample size and will grow with every new case included. There are four data that need to be agreed and adjusted before creating the chart: the binary variable that will be monitored with a clear definition of acceptable and unacceptable outcomes, the unit of monitoring, the type I and II errors for the defined variable and finally, the individual risk of acceptable or unacceptable outcomes. With these data, two different types of charts can be drawn: the standard non-risk adjusted and risk-adjusted CUSUM chart. Each one presents the recorded performing status for each case along a temporal series. In the chart, the lines characterizing the natural or underperforming variations of the monitored procedure will also appear signaling whether the performance is adequate or not. If the performance is considered inadequate: analysis, discussion and implementation of agreed measures should be taken. Although, the CUSUM analysis has also some problems, that will be discussed, the conclusion is this is a good tool for monitoring a new program.

Keywords: CUSUM chart; statistical process control; quality control; risk-adjusted CUSUM; quality improvement methodologies

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