

Comparison of PT Scoring for Outliers: FSIS CUSUMs vs. Z Score

Event *	Total Number of CUSUM Outlier and Z Score Outlier	Total Number of CUSUM Outlier with Warning Z Score (not outlier)	Total Number of CUSUM Outlier with Acceptable Z Score (not outlier)	Total Number of Z Score Outlier with Large CUSUM Score (not outlier)
July 2013	3	1		1
January 2014	3	1		4
March 2014	3	2		2
May 2014	5			3
July 2014	8			2
September 2014	3	2		3
November 2014	5	2		1
January 2015	1	1		2
March 2015		2	1	
TOTALS	31	11	1	18

* All events except July 2013 had two sample sets (17 events represented in this table).

This evaluation showed that when CUSUM scoring indicated the presence of an outlier, the z scores either also indicated the outlier or returned a score warning that the result was close to becoming an outlier. Conversely, when the z scores indicated an outlier that CUSUM scoring did not, the result still sustained a relatively large ALP CUSUM score increase. One of the results that was an outlier among the CUSUMs was not an outlier among the z scores and there was no warning that the result was close to becoming an outlier. However, the z score was very close to the warning limit. Warning limits are z scores between -3 and -2, and also between 2 and 3. Results that incur a z score in the warning limit are not considered outliers, but are a signal to the laboratory that it may be experiencing the beginning of a problem and should be prepared to troubleshoot the analytical system.