

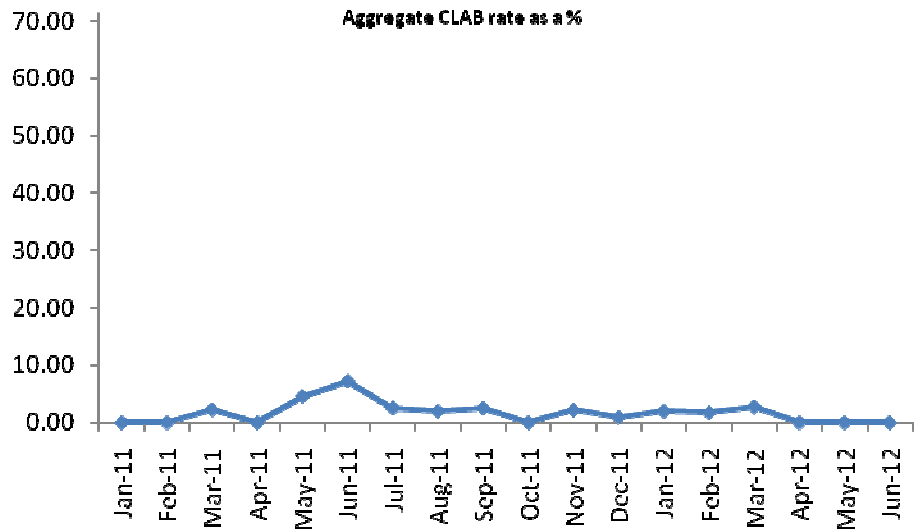
# Measurement and Improvement

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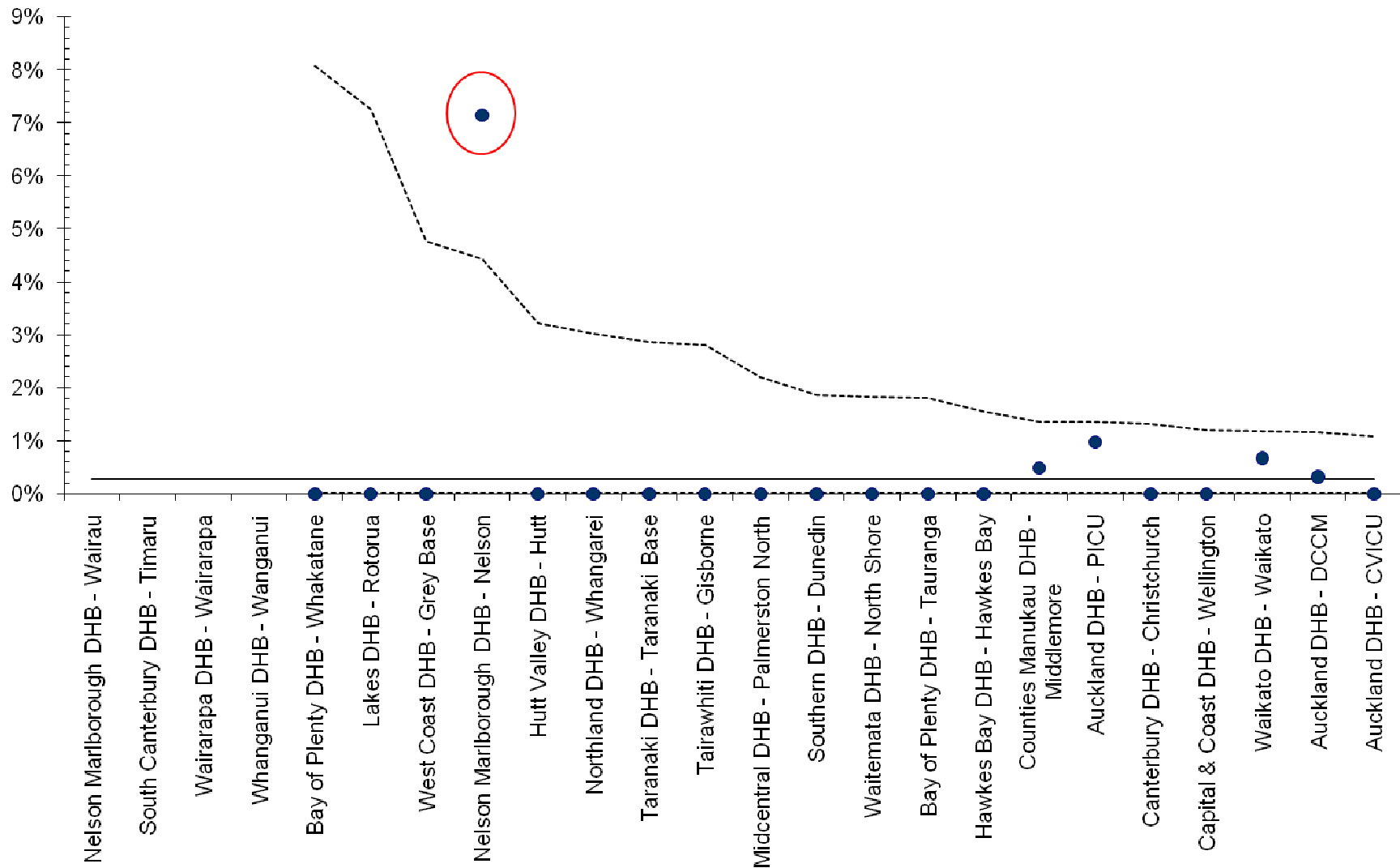
# Reviewing our data

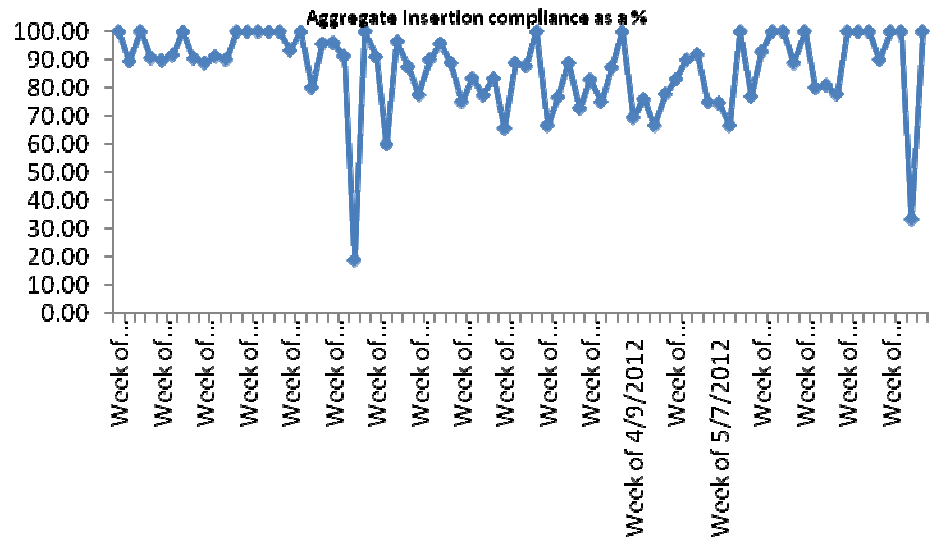


<b>Auckland DHB - CVICU</b>	<b>Auckland DHB - DCCM</b>	<b>Auckland DHB - PICU</b>	<b>Bay of Plenty DHB - Tauranga</b>	<b>Bay of Plenty DHB - Whakatane</b>
<b>Canterbury DHB - Christchurch</b>	<b>Capital &amp; Coast DHB - Wellington</b>	<b>Counties Manukau DHB - Middelmore</b>	<b>Hawkes Bay DHB - Hawkes Bay</b>	<b>Hutt Valley DHB - Hutt</b>
<b>Lakes DHB - Rotorua</b>	<b>Midcentral DHB - Palmerston North</b>	<b>Nelson Marlborough DHB - Nelson</b>	<b>Nelson Marlborough DHB - Wairau</b>	<b>Northland DHB - Whangarei</b>
<b>South Canterbury DHB - Timaru</b>	<b>Southern DHB - Dunedin</b>	<b>Tairāwhiti DHB - Gisborne</b>	<b>Taranaki DHB - Taranaki Base</b>	<b>Waikato DHB - Waikato</b>
<b>Wairarapa DHB - Wairarapa</b>	<b>Waitemata DHB - North Shore</b>	<b>West Coast DHB - Grey Base</b>	<b>Whanganui DHB - Wanganui</b>	

New Zealand CLAB rate - March 2012 - P Chart

Percent





<b>Auckland DHB - CVICU</b> 	<b>Auckland DHB - DCCM</b> 	<b>Auckland DHB - PICU</b> 	<b>Bay of Plenty DHB - Tauranga</b> 	<b>Bay of Plenty DHB - Whakatane</b> 
<b>Capital &amp; Coast DHB - Wellington</b> 	<b>Counties Manukau DHB - Middlemore</b> 	<b>Hawkes Bay DHB - Hawkes Bay</b> 	<b>Hutt Valley DHB - Hutt</b> 	<b>Lakes DHB - Rotorua</b> 
<b>Midcentral DHB - Palmerston North</b> 	<b>Nelson Marlborough DHB - Nelson</b> 	<b>Northland DHB - Whangarei</b> 	<b>South Canterbury DHB - Timaru</b> 	<b>Southern DHB - Dunedin</b> 
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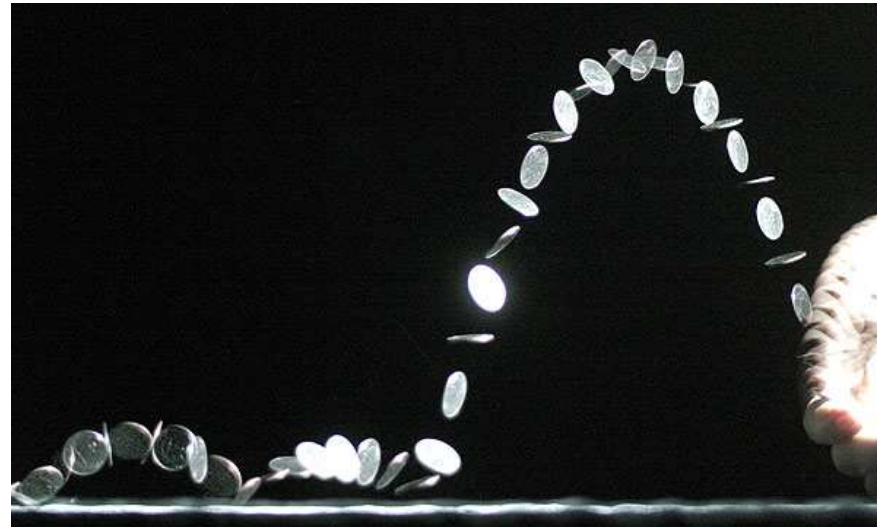
# Another way to understand rare events

- T chart – aka Time Between Events Chart
- G chart – aka Cases Between Events Chart

# Why Statistical Process Control methods?

# Leveraging Probability

- What is the probability of a coin landing heads or tails?
- .5
- $.5 \times .5 = .25$
- $.5 \times .5 \times .5 = .125$
- $.5 \times .5 \times .5 \times .5 = .0625$
- $.5 \times .5 \times .5 \times .5 \times .5 = .03125$
- $.5 \times .5 \times .5 \times .5 \times .5 \times .5 = .015625$





**Figure 4-10: Balancing the Mistakes Made in Attempts to Improve**

<b>ACTION</b>	<b>ACTUAL SITUATION</b>	
	<b>When NO Special Cause is occurring in System</b>	<b>When a Special Cause is occurring in System</b>
<b>Take action on individual outcome (treat special)</b>	<b>-\$ (Mistake 1)</b>	<b>+\$</b>
<b>Treat outcome as part of system; work on changing the system (treat common)</b>	<b>+\$</b>	<b>-\$ (Mistake 2)</b>

## Some authors overemphasize the statistical basis for Shewhart charts

*“It is wrong (misuse of the meaning of a control chart) to suppose that there is some ascertainable probability that either of these false signals [fail to identify or cause investigation where there is not one] will occur. We can only say that the risk to incur either false signal is very small.” (p. 176)*

*It is a mistake to suppose that the control chart furnishes a test of significance – that a point beyond a control limit is “significant.” This supposition is a barricade to understanding (p. 177)*

Deming, W. E., *The New Economics, Second Edition*, page 176-7, MIT Center for Advanced Studies, 1994.

Improvement Science Consulting