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# Data – Does it help or hinder?

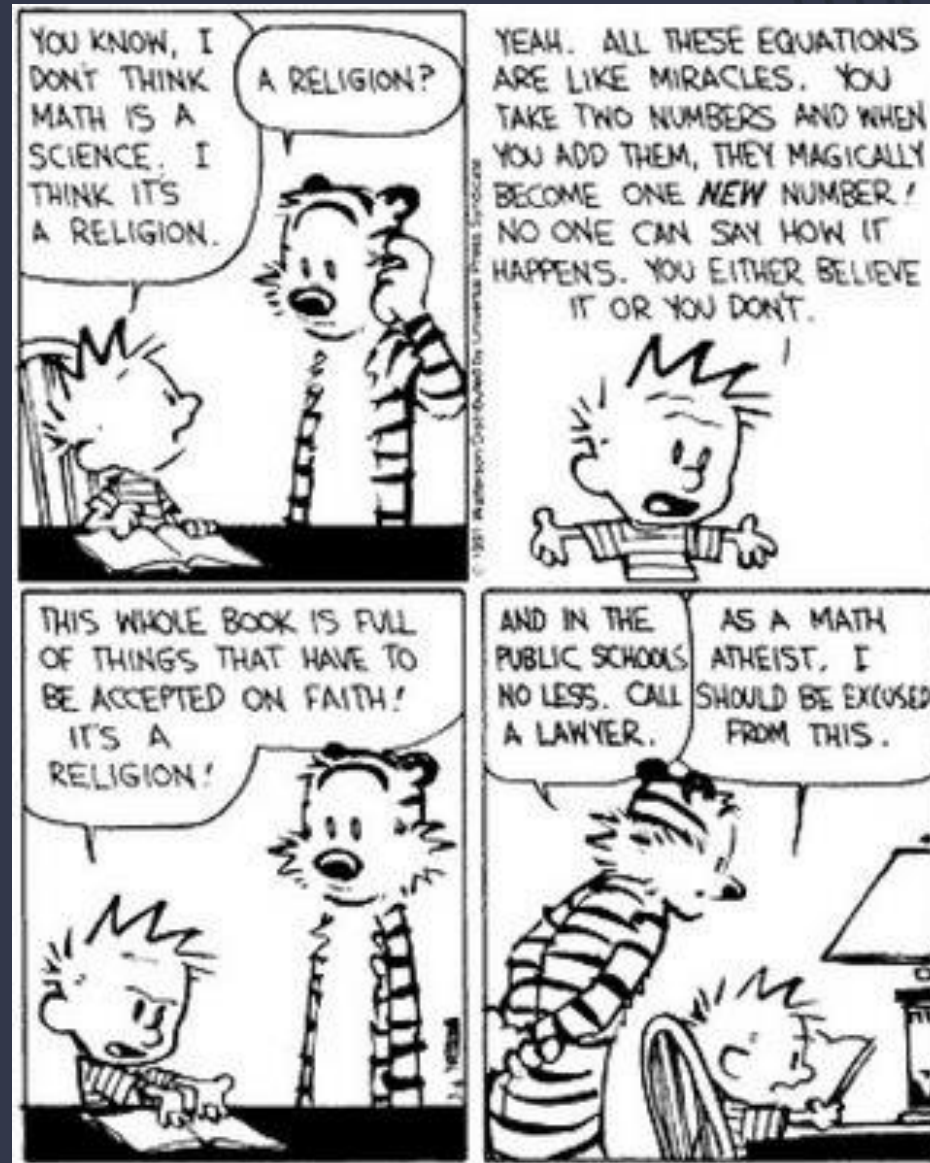
Dr John Robson  
RNZCGP Quality Symposium  
July 2017

# Summary

- **Data** is important to improvement processes
- Defining the **aim** and what you want to **measure** is key before you start your **Plan – Do – Study – Act** cycle
- Understand **variation**



**NEW ZEALAND  
IMMIGRATION**



MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT  
HĪKINA WHAKATUTUKI

[New Zealand Government](#)



“Without data  
you’re just  
another person  
with an opinion.”

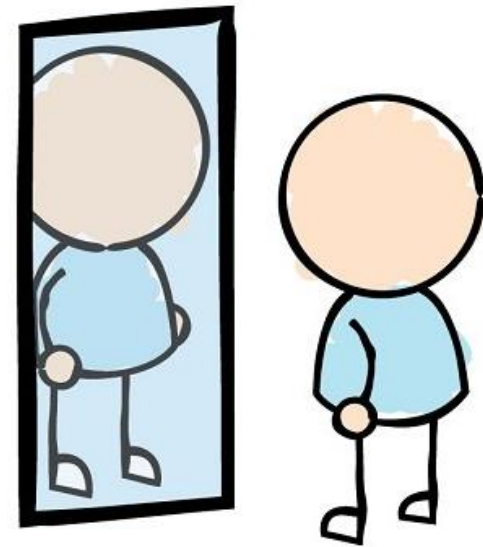
- W. Edwards Deming,  
Data Scientist

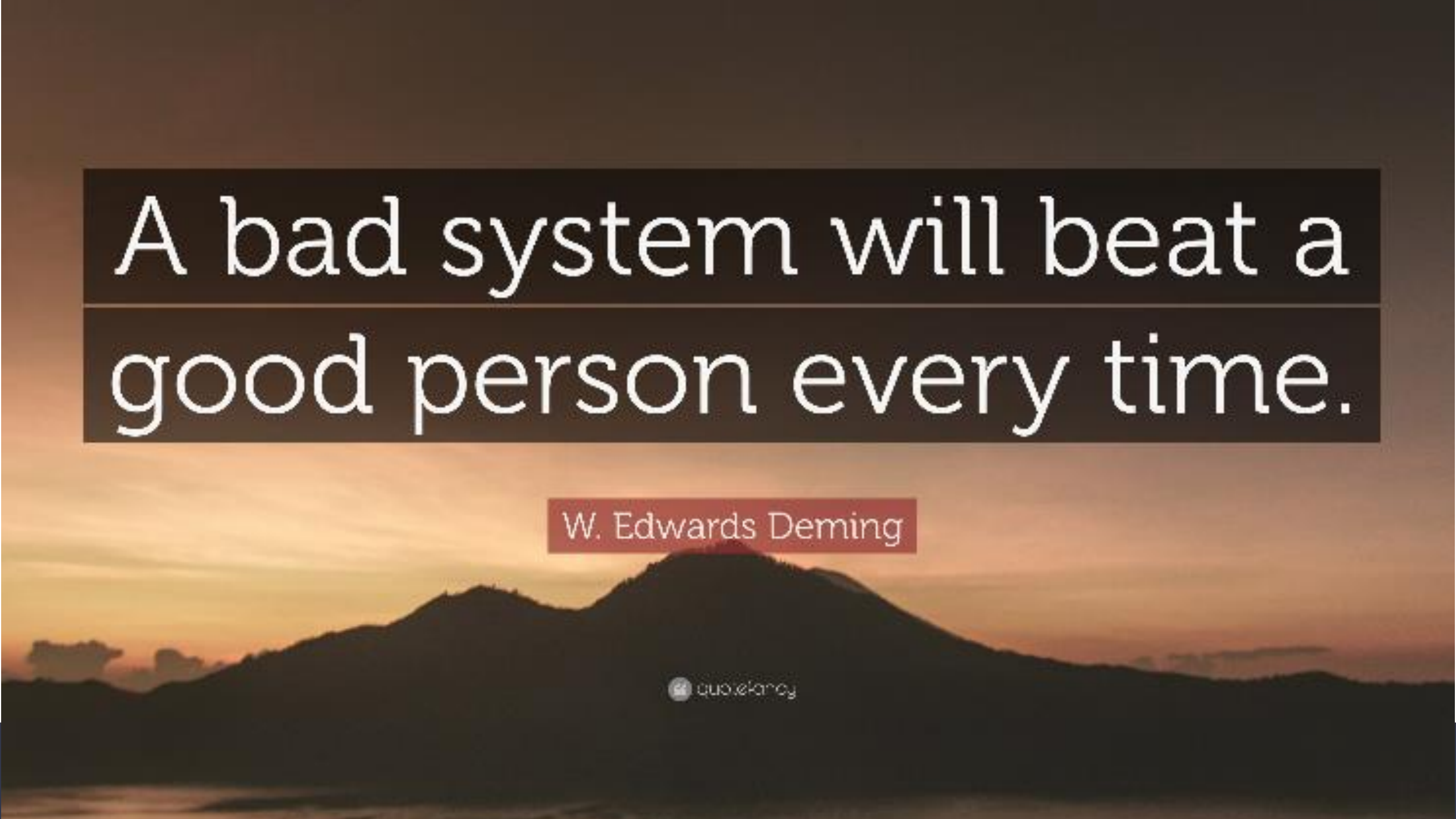




# Reflections

- How did this make you feel?





A bad system will beat a  
good person every time.

W. Edwards Deming





# Why Deming?

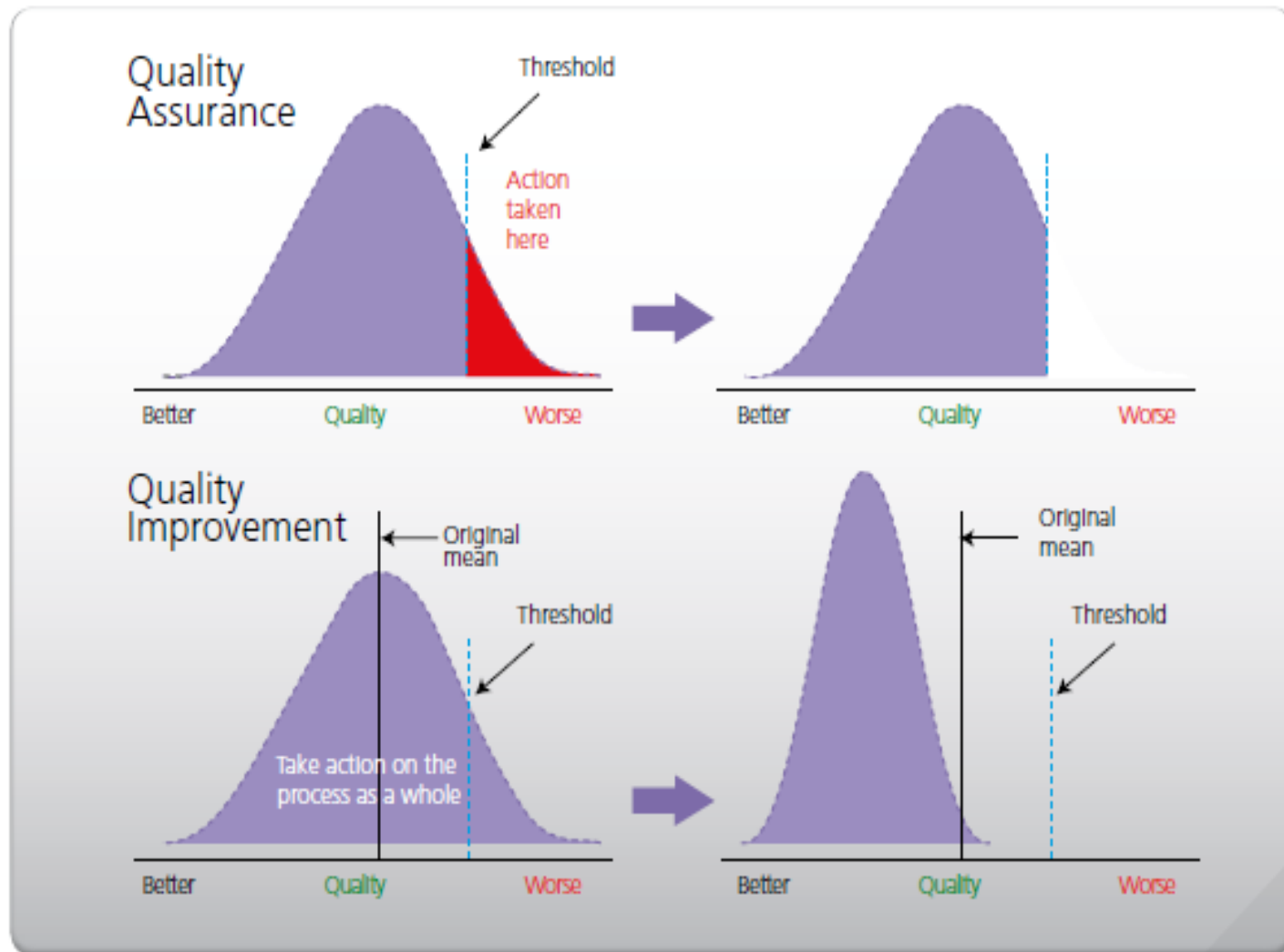
*[QI] aims to improve patient experience and outcomes by taking a systematic approach that uses specific techniques to improve quality. These approaches are often known as ‘organisational’ and ‘industrial’ methods, as their origins are in the manufacturing industries. The approaches help organisations to analyse performance and make systematic changes in order to improve quality.*

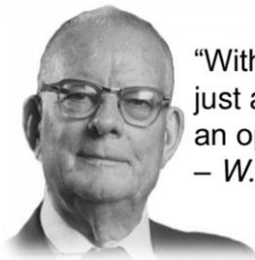
The Health Foundation. *Quality improvement.*

<http://www.health.org.uk/areas-of-work/topics/quality-improvement/quality-improvement>



**Figure 1:**  
A comparison of  
Quality Assurance  
and Quality  
Improvement





"Without data you're  
just another person with  
an opinion."  
– W. Edwards Deming

# Immigration and Data



Online system used by **Panel Physicians**  
to complete Immigration Medicals

Developed by Australia's Department of  
Immigration & Border Protection

Currently used by Immigration  
Departments for:

- Australia
- Canada
- New Zealand

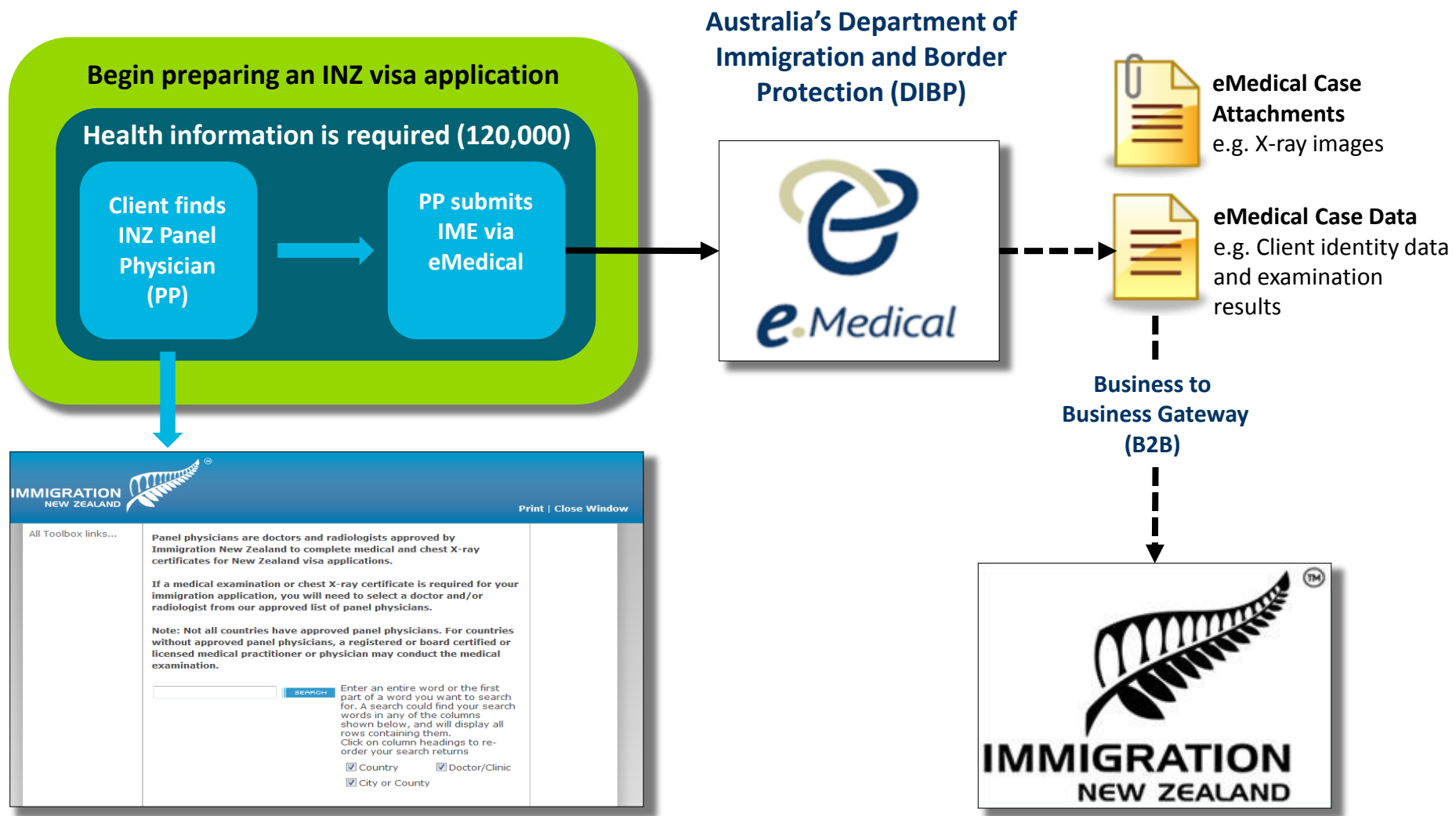


Online system used by **INZ** to assess  
Immigration Medicals

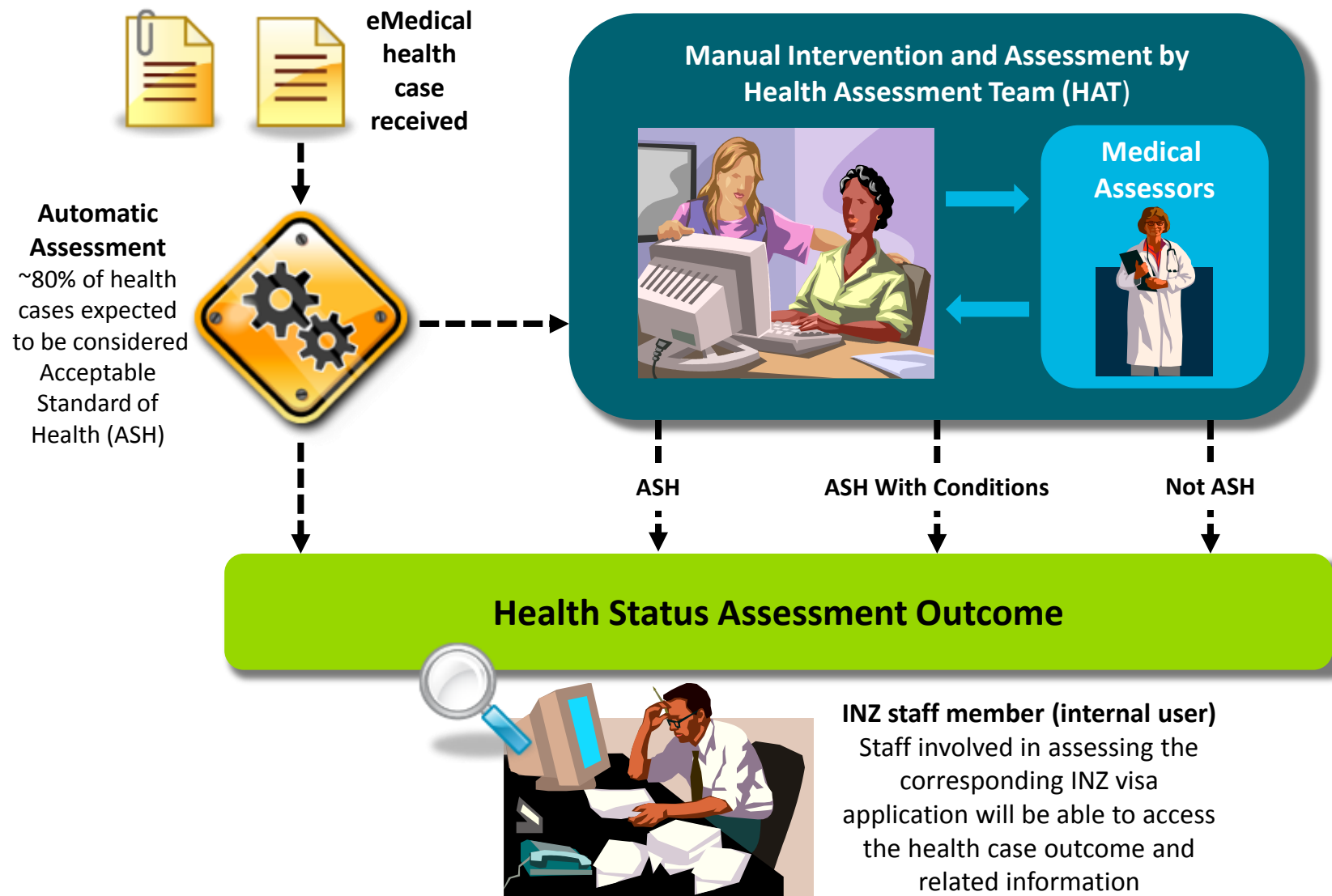
Internal system only, not external facing

Used by INZ staff, such as:

- Health Assessment Team
- Immigration Health Team
  - Medical Assessors
- Immigration Officers
  - And more...



[Commercial In Confidence]

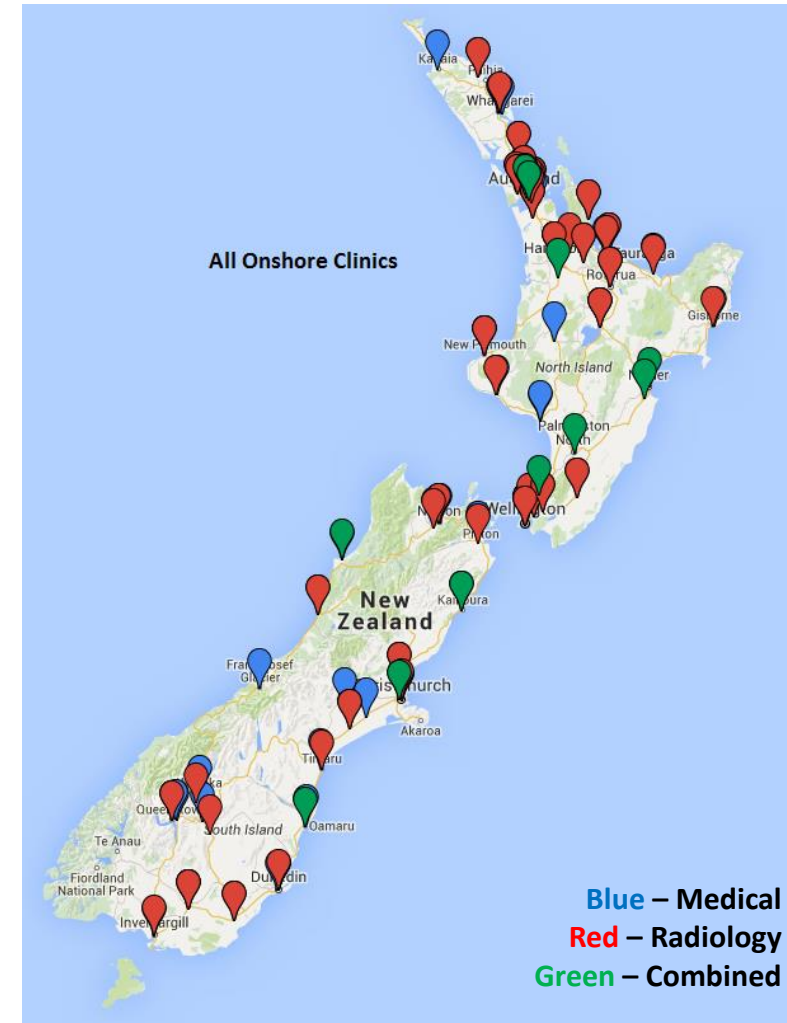


[Commercial In Confidence]



# Onshore Panel Physician Network

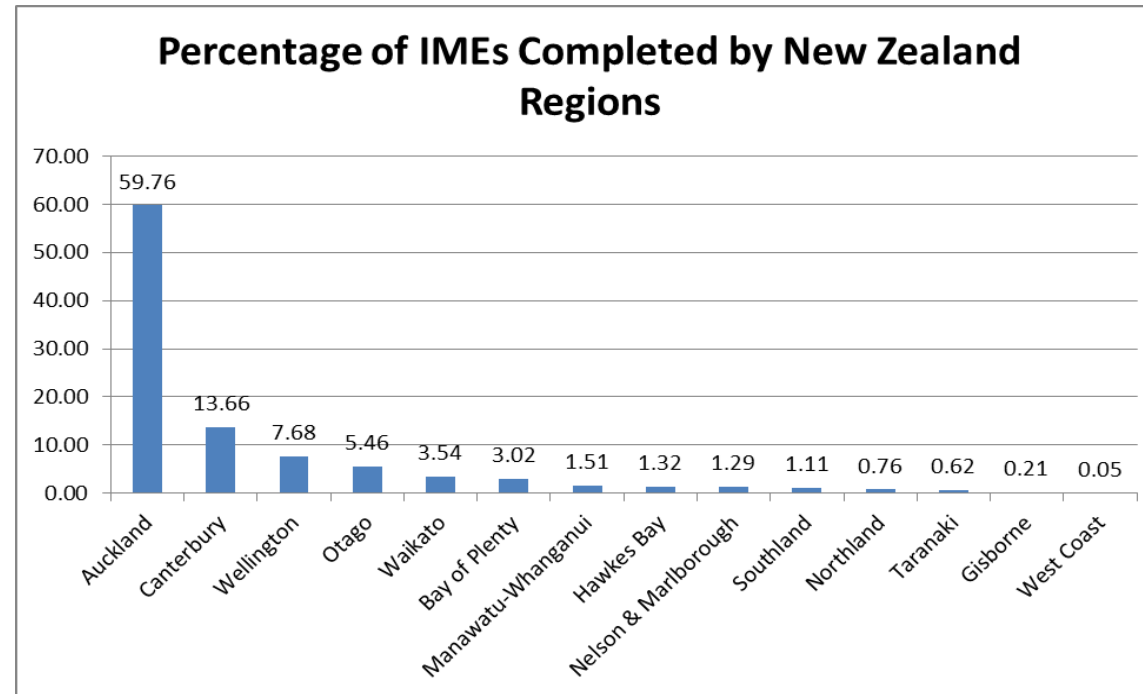
- Onshore panel completed in January 2016
- 154 onshore panel clinics
  - 82 medical
  - 60 radiology
  - 12 combined
- 16 onshore clinics also panelled for Australia



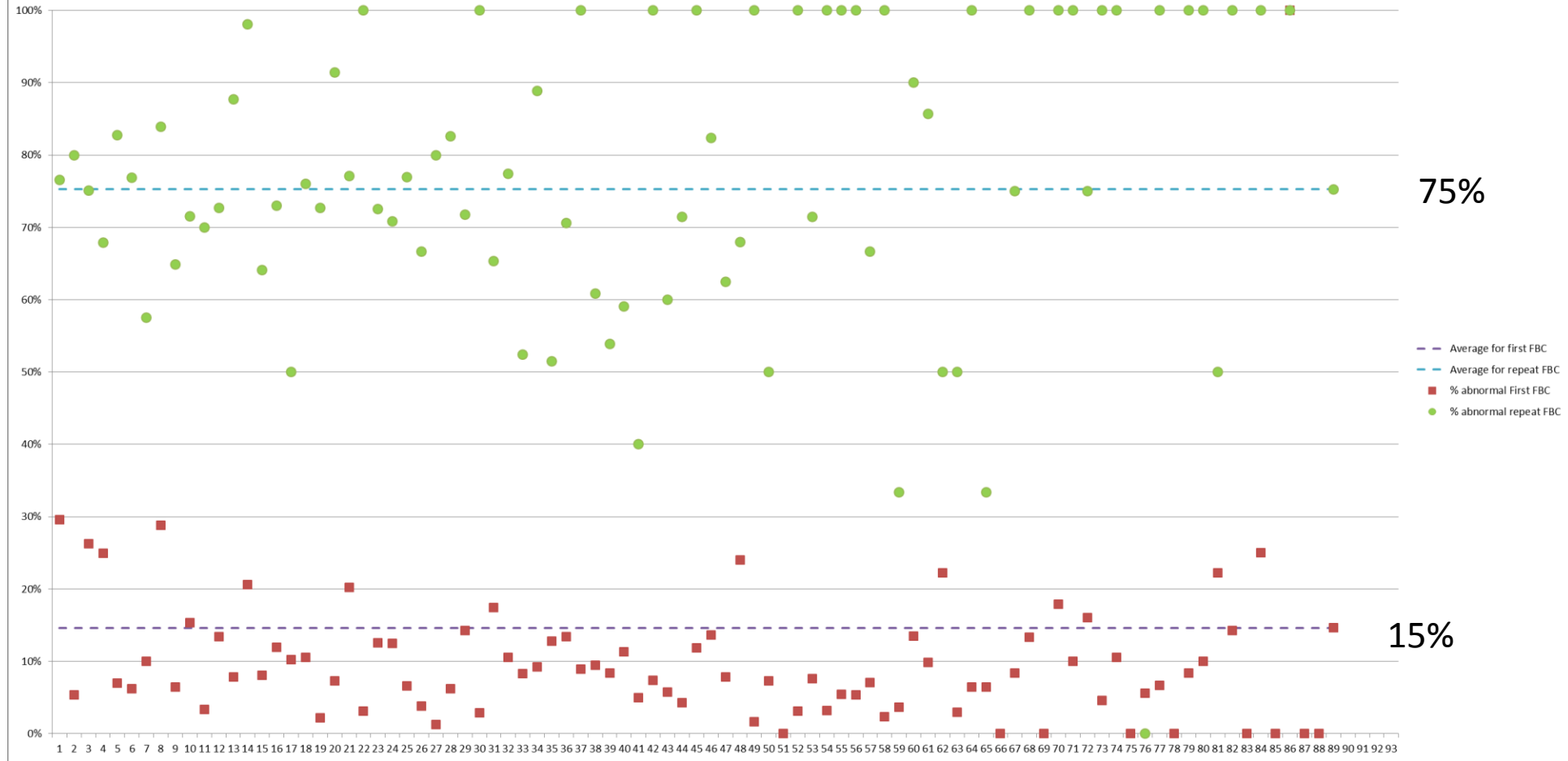
# Onshore Review

From 1 April 2015 to 31 March 2016:

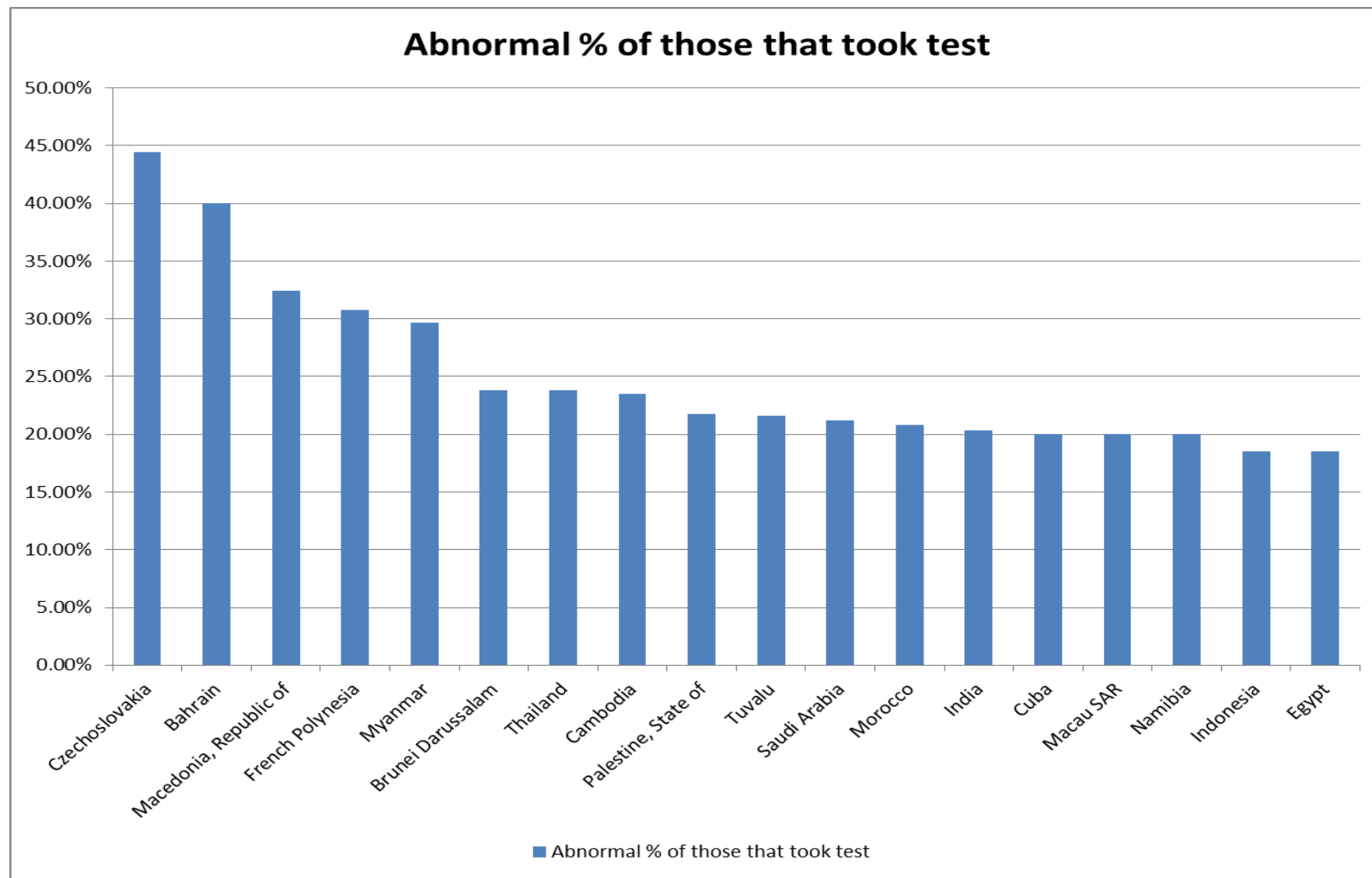
- 184,061 health cases submitted to INZ;
- 32% of these were onshore (58,290);
- 60% of onshore cases completed in Auckland region.



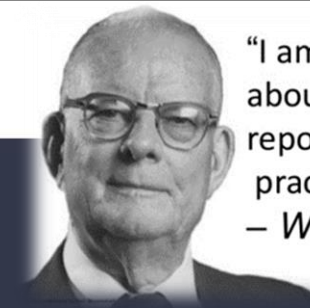
## Rates of abnormal Full Blood Count in New Zealand (year 2015/16)



**Estimated Public Hospital Inpatient Costs for Haematological conditions---  
Leukaemia, Myelodysplastic Disorder and Haemachromatosis**



Colombia, Spain, Hungary, Mexico, Netherlands, Germany,  
Canada, United States, Poland.

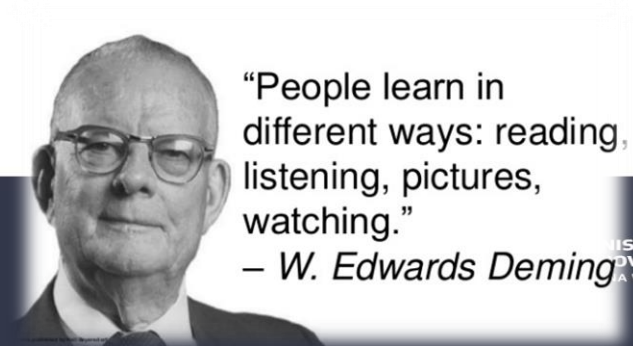


“I am not reporting things  
about people. I am  
reporting things about  
practices.”  
– W. Edwards Deming



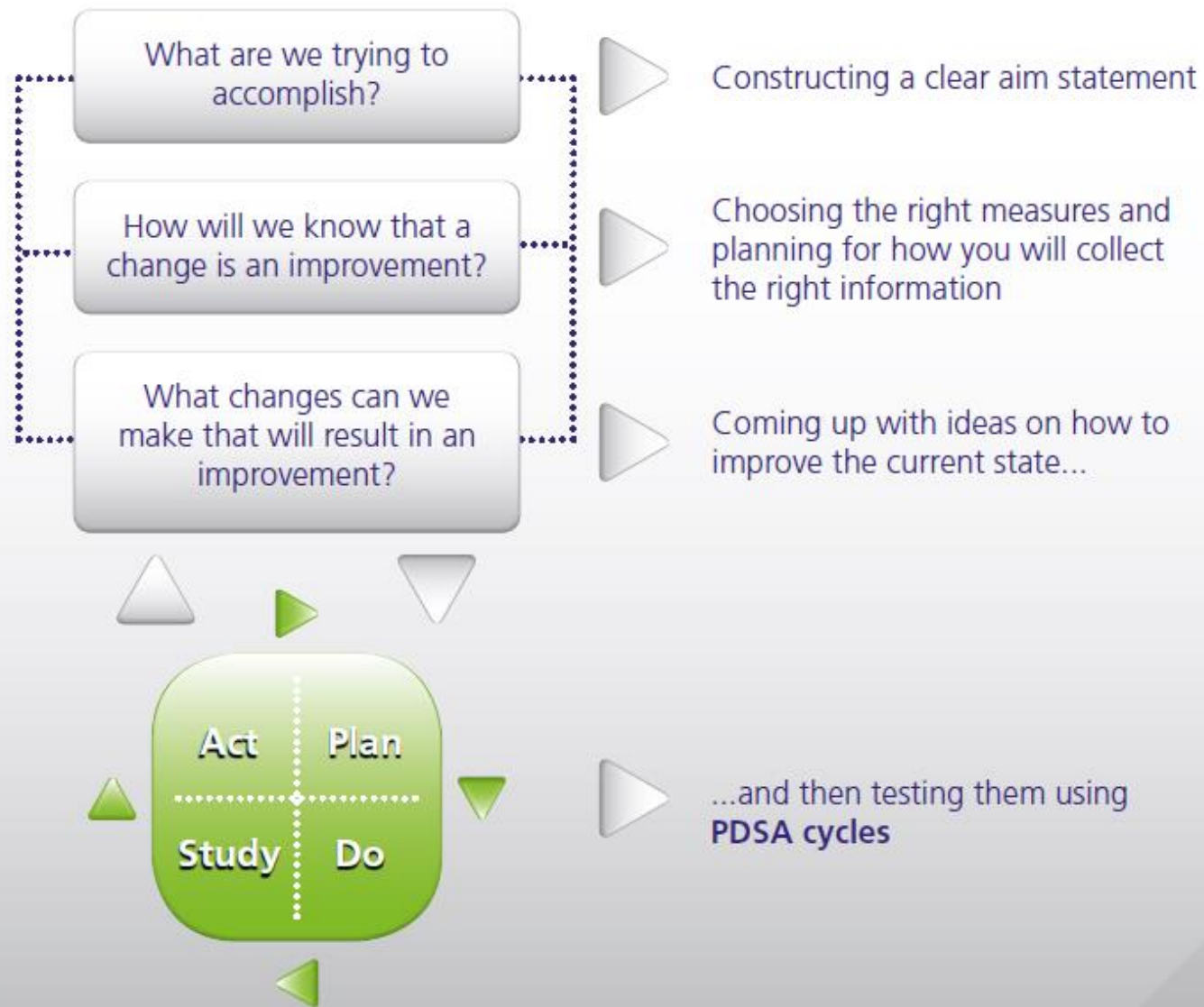
# Things we learned from looking at clinics

- Know what you are measuring;
  - Auto-clearance and B-graded rates are not the same.
- Same training and education can result in different outcomes;
- What we say and what people hear are two different things.



“People learn in different ways: reading, listening, pictures, watching.”

– W. Edwards Deming



# Data process

## 1. Measurement definition

For QI crude measurements of the right thing are better than precise measures of the wrong thing

## 2. collection

Collection process should be defined and accumulated in to some sort of data set

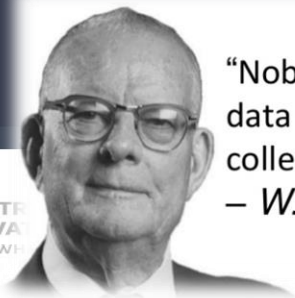
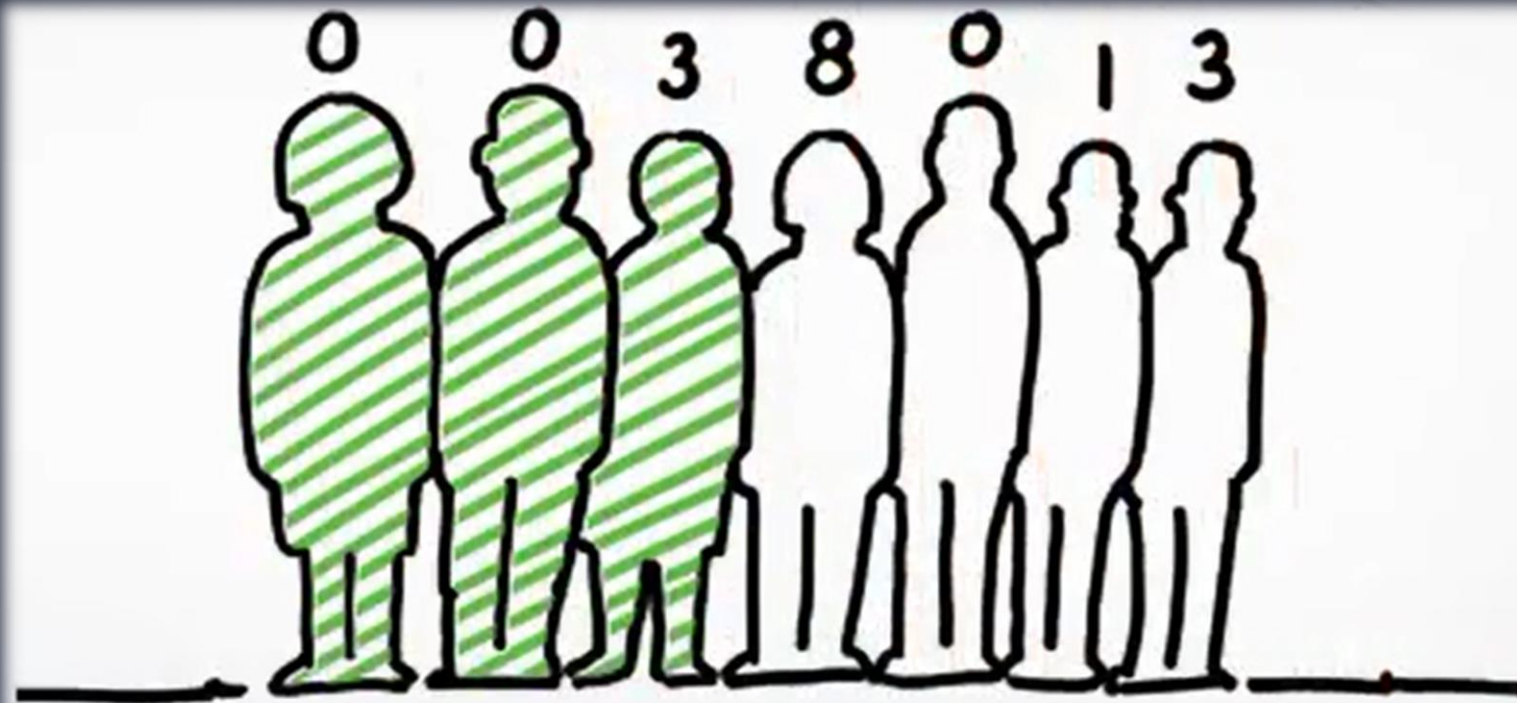
## 3. Analysis

known before data collection occurs

## 4. Interpretation

Understanding variation – common cause and special cause

# Exercise – coming up with a measure



“Nobody should try to use  
data unless he has  
collected data.”

– W. Edwards Deming



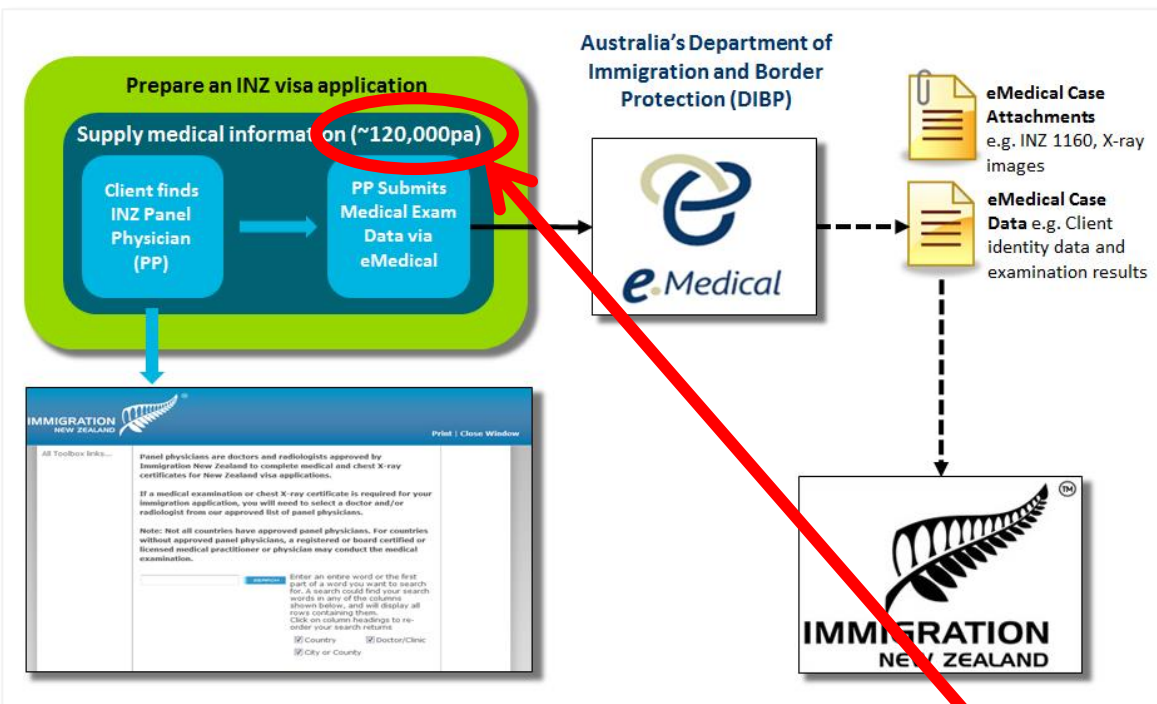
# Operational Definition for Banana Size



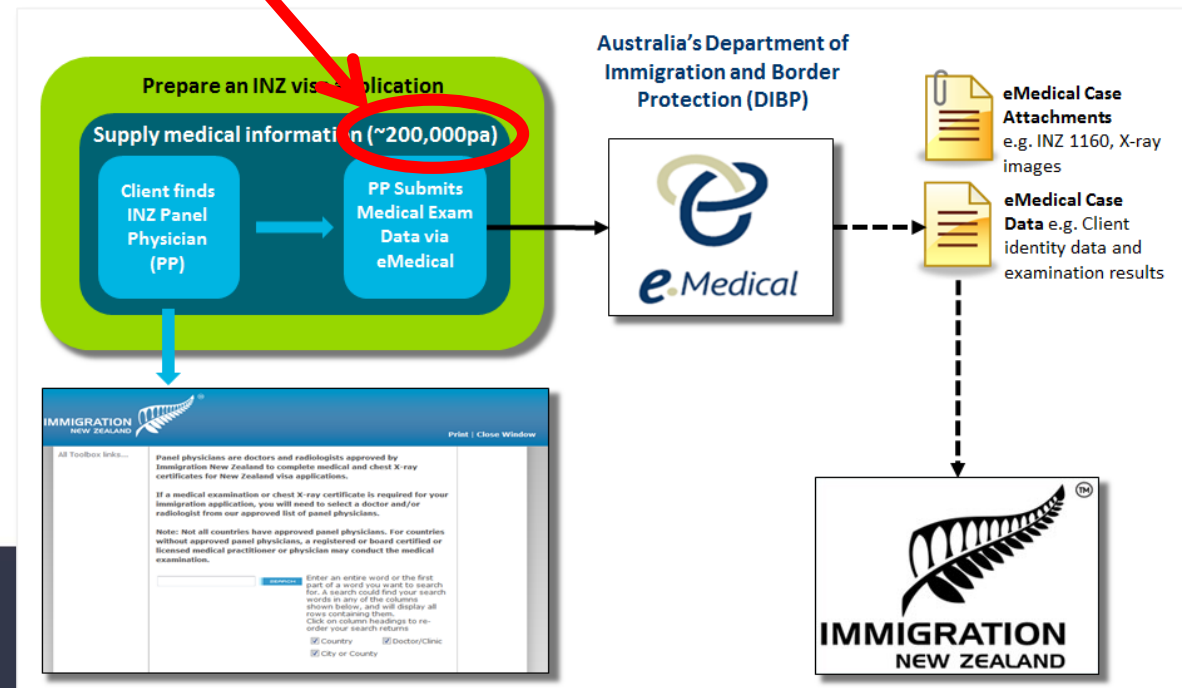
Work with team to create a step by step operational definition to capture the concept of the size of a banana

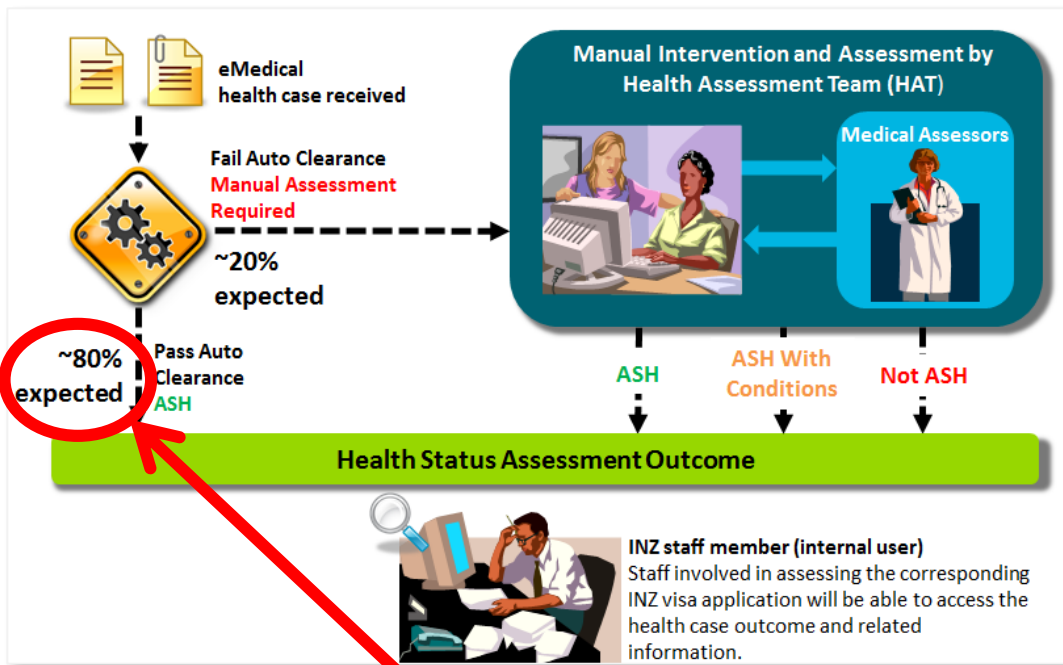
Then use another group's definition to measure your banana

Your banana measure:

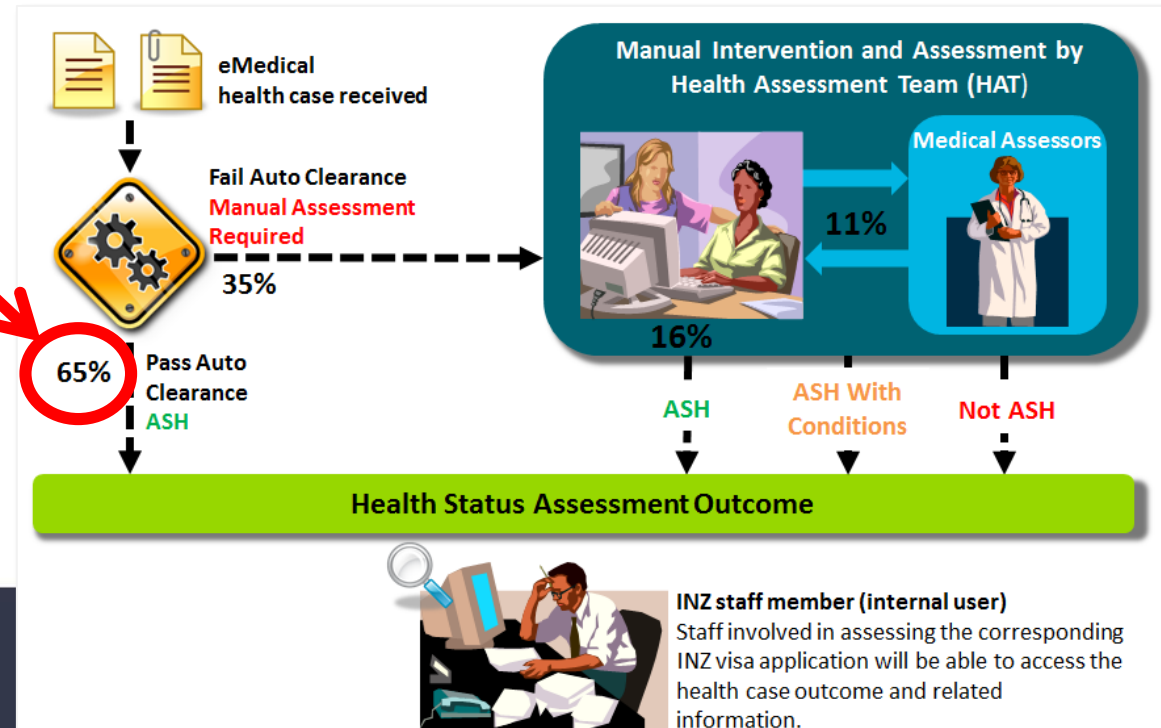


Spot the difference...



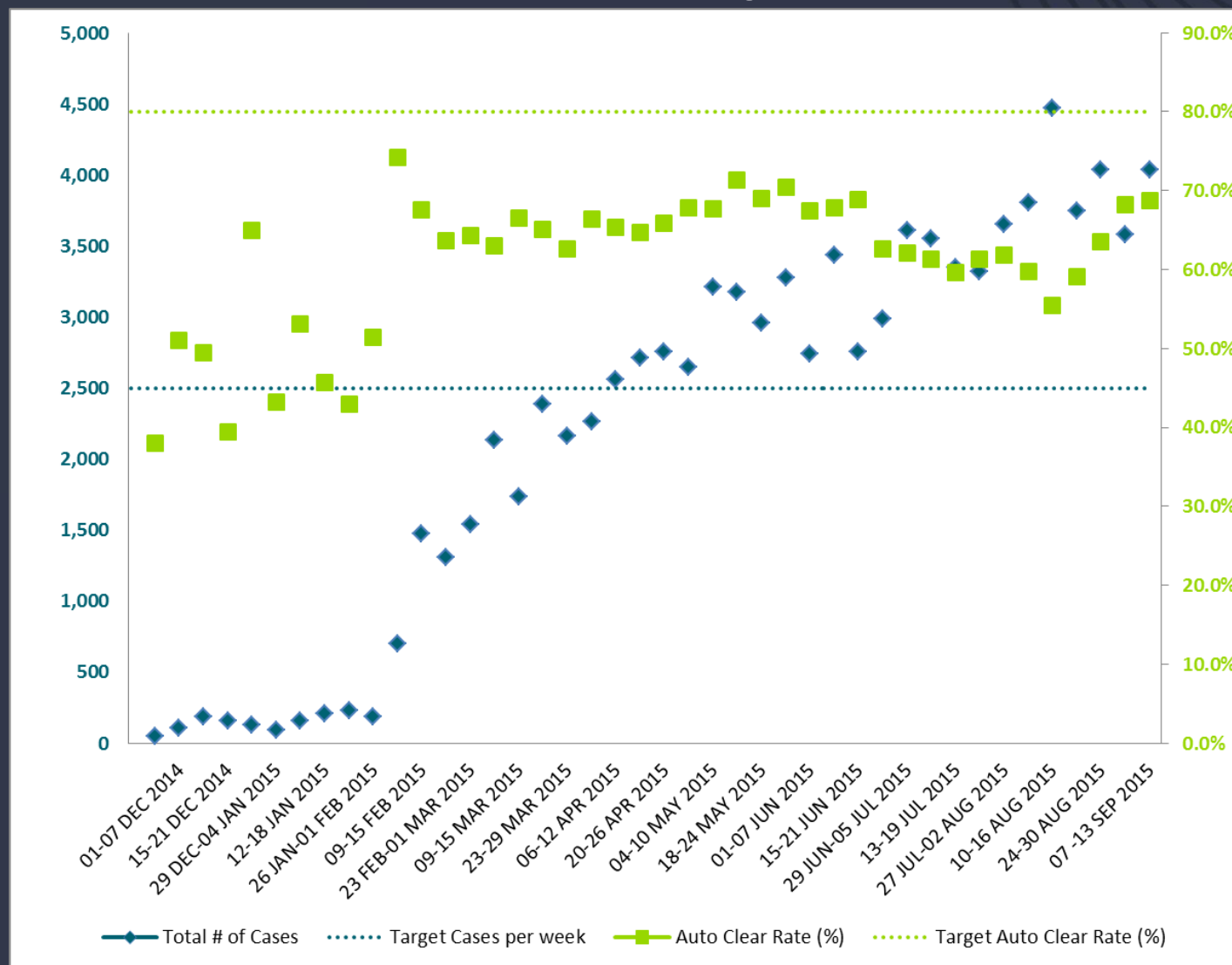


Spot the difference...





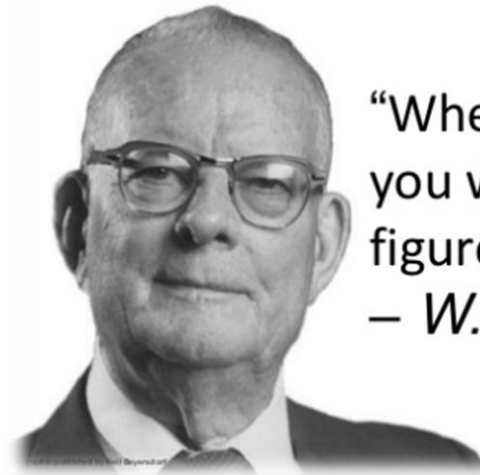
# Results of this process...



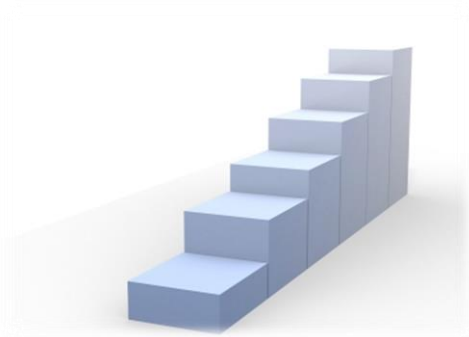


# Lets go back to our story

- Growing **medicals**
- Growing **timeframes**
- Growing **complaints**

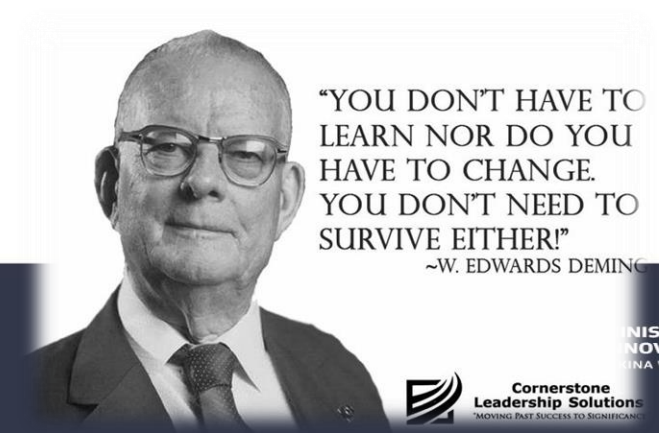


“Whenever there is fear,  
you will get wrong  
figures.”  
– *W. Edwards Deming*



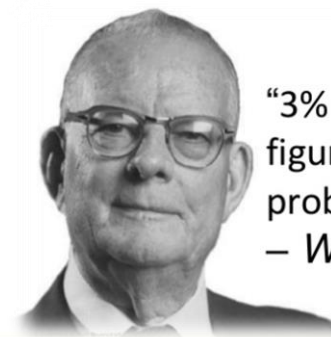
# Next steps...

- Plot the data
- Entered a 'Plan – Do – Study – Act' type cycle
  - Created a test environment to do this
  - Data analyst to help

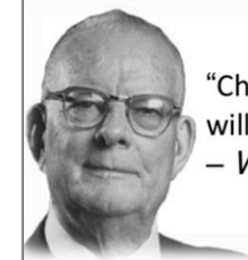
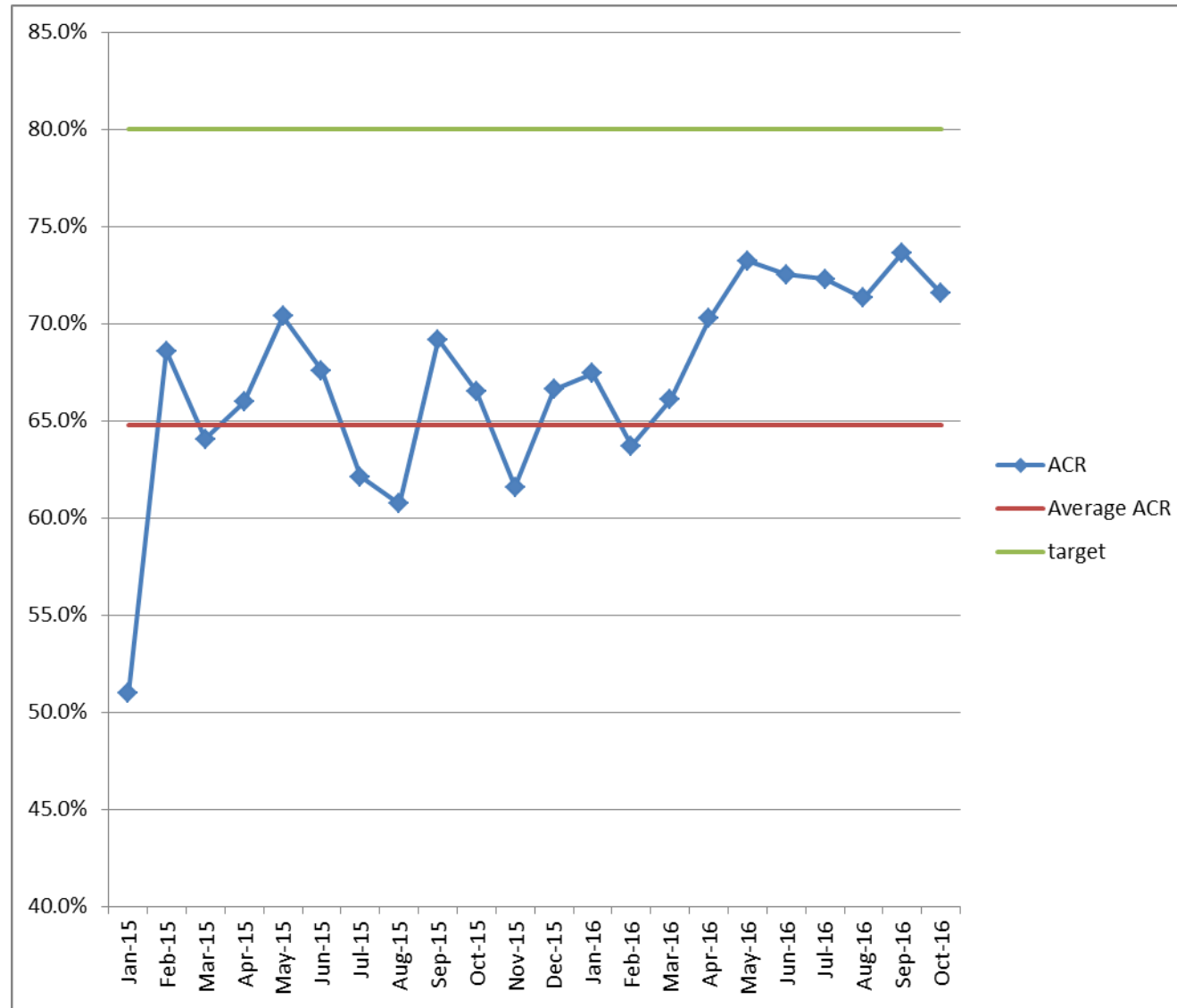


# Time to plot our own data...

Measure how many M & Ms in your packet.

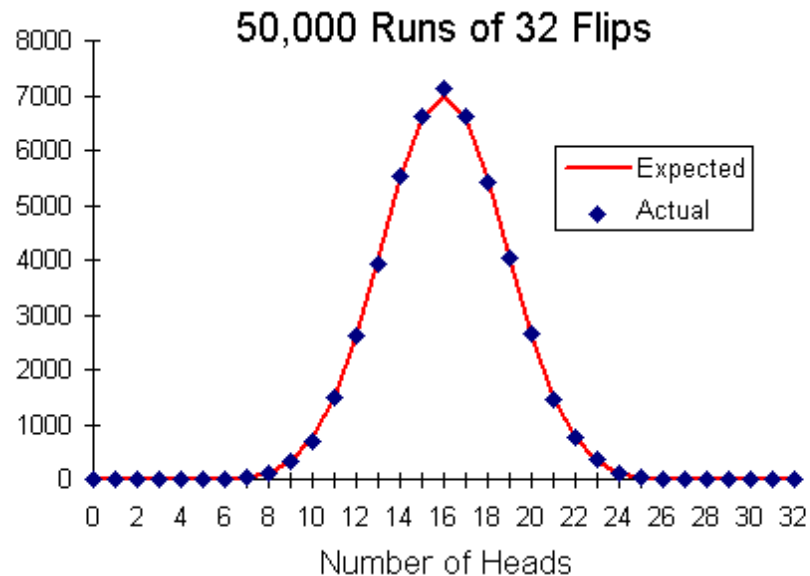


“3% of the problems have figures, 97% of the problems do not.”  
– W. Edwards Deming



“Change the rule and you will get a new number.”  
– W. Edwards Deming

# Common Cause vs Special Cause

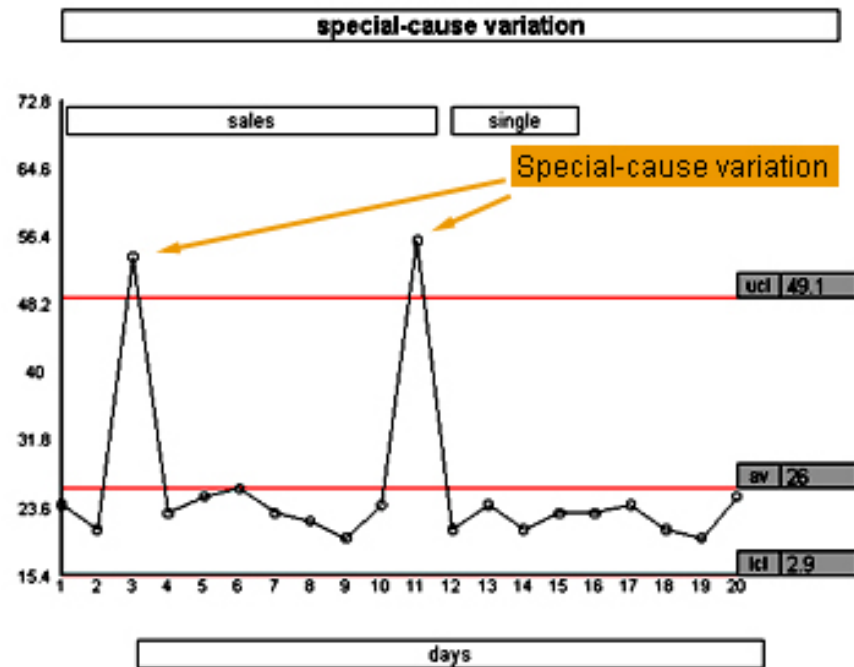


## Common cause

- Variation are present in the process due to it's inherent nature. These are **predictable** and **expected** variations.
- Pitfalls – treating common cause as special cause variation.

# Common Cause vs Special Cause

Special-cause variation

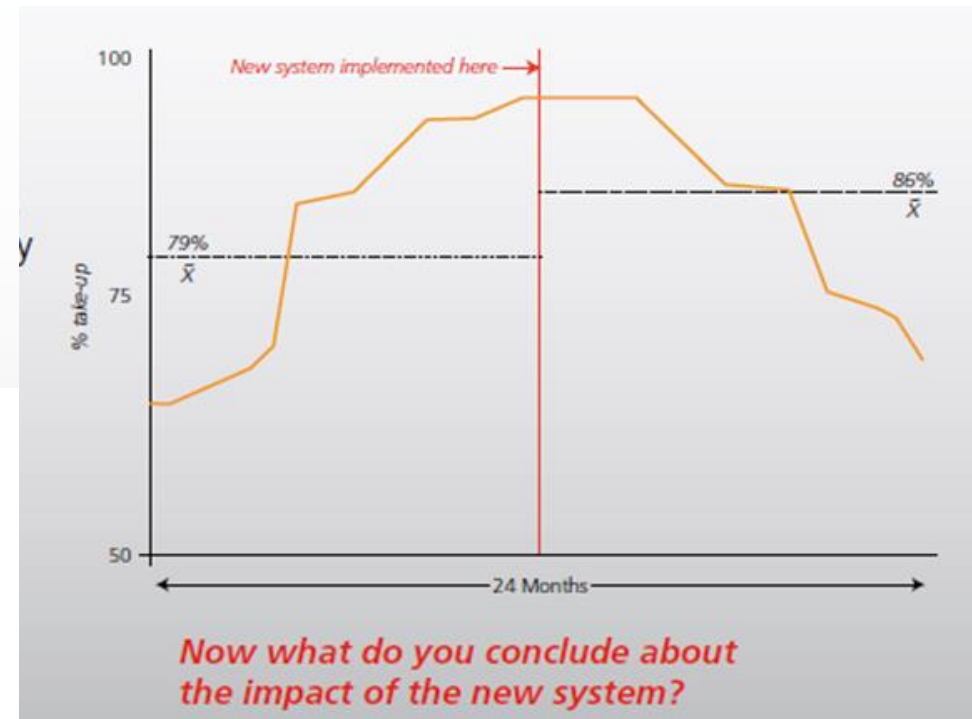
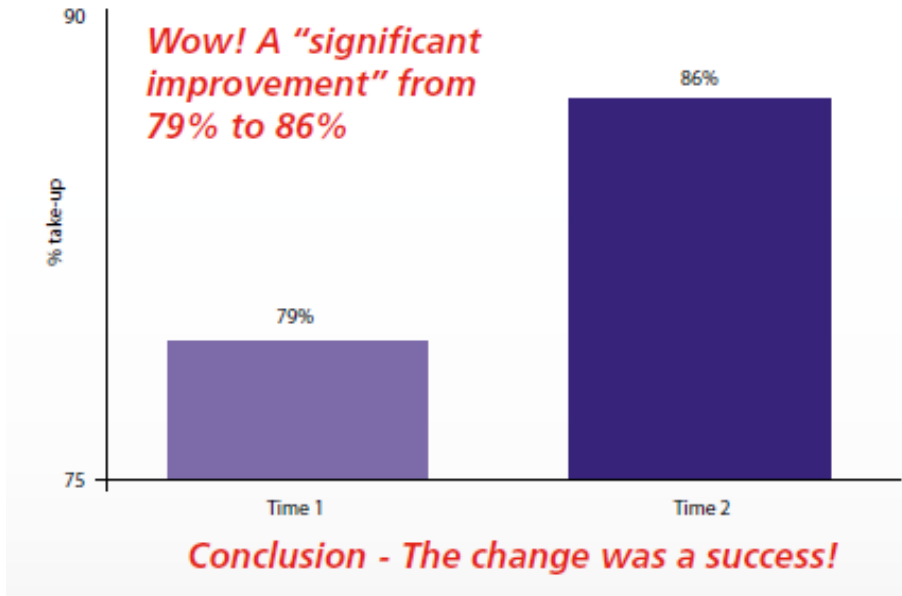


## Special cause

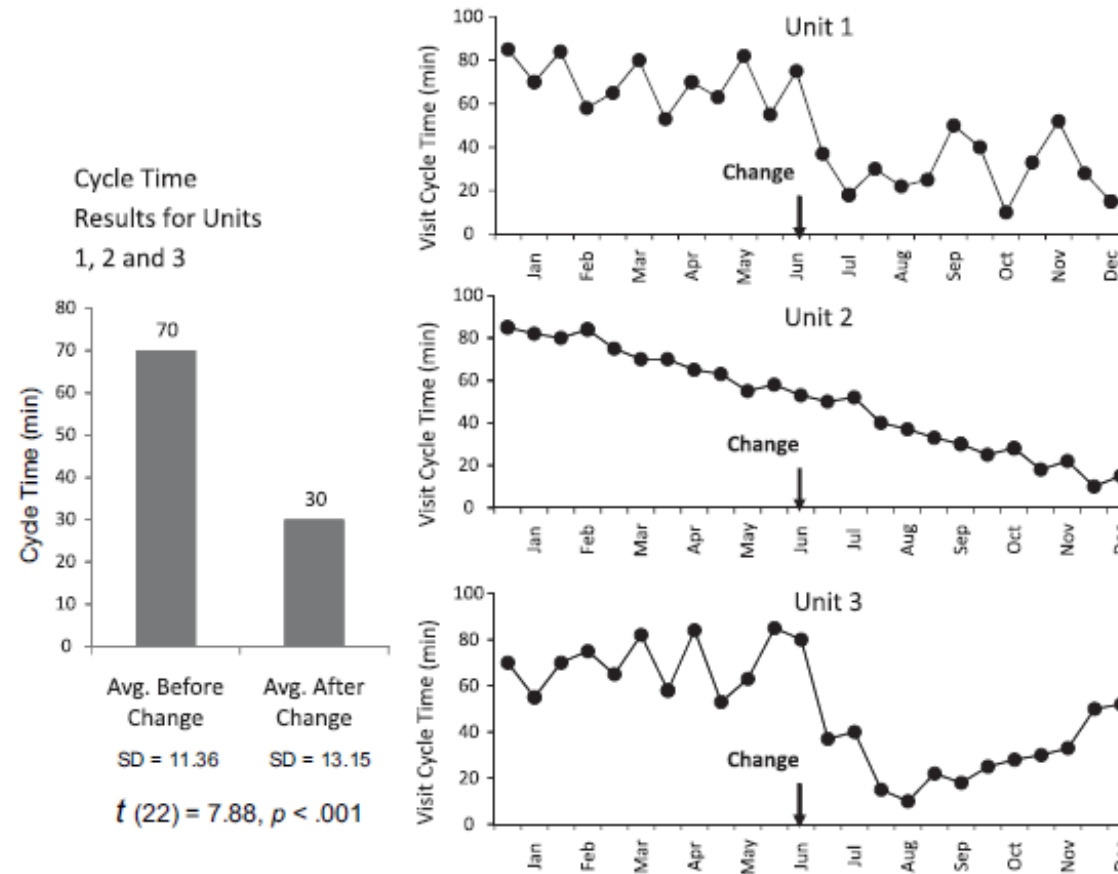
- Variation are introduced in the process by **non-random** events/factors external to the process
- If special cause variation is present, then the process is said to be **unstable**.



# Run charts vs standard statistics



# Run charts vs standard Statistics?



Perla, Provost, Murray 'The run chart: a simple analytical tool for learning from variation in healthcare processes' - BMJ Qual Saf 2011;20:46

# How to make a run chart

- Where no previous data are available;
  - monthly outcome measure – use the first 12 data points
  - weekly process measure—use the first 10 data points (remember to keep sample size at around 20 for percentages), and
  - monthly process measure – use the first six data points.

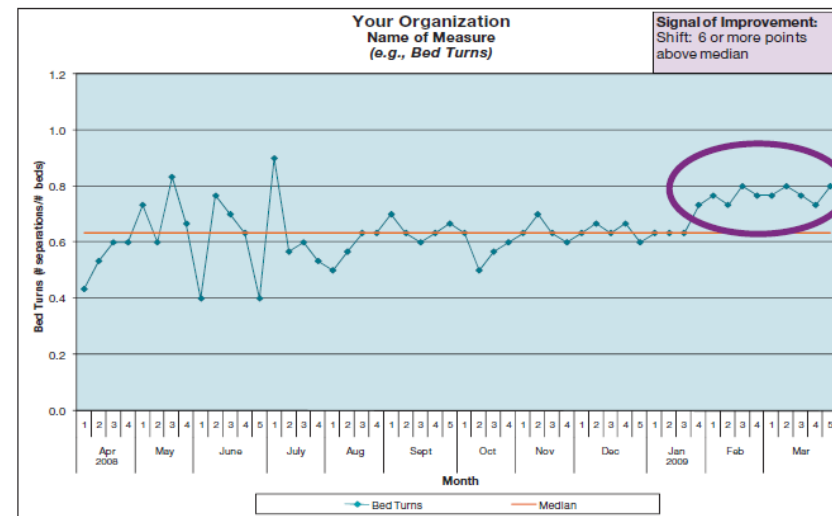
Vertical Axis Label		Number of extras seen			
Graph Label		Number of extras seen			
Date / Observation	Value	Median	Goal	End Median	
01/09/2014	15	12.5			
02/09/2014	12	12.5			
03/09/2014	8	12.5			
04/09/2014	13	12.5			
05/09/2014	9	12.5			
06/09/2014	12	12.5			
09/09/2014	11	12.5			
10/09/2014	7	12.5			
11/09/2014	19	12.5			
12/09/2014	9	12.5			
15/09/2014	14	12.5			
16/09/2014	5	12.5			
17/09/2014	16	12.5			
18/09/2014	14	12.5			
19/09/2014	18	12.5			
22/09/2014	18	12.5			
23/09/2014	5	12.5			
24/09/2014	12	12.5			
25/09/2014	16	12.5			
26/09/2014	13	12.5			

# Things to look for

## Shift

- Is six or more consecutive points either all above or all below the median
- Values that fall on the median neither add to nor break a shift.

Rule 1: Shift

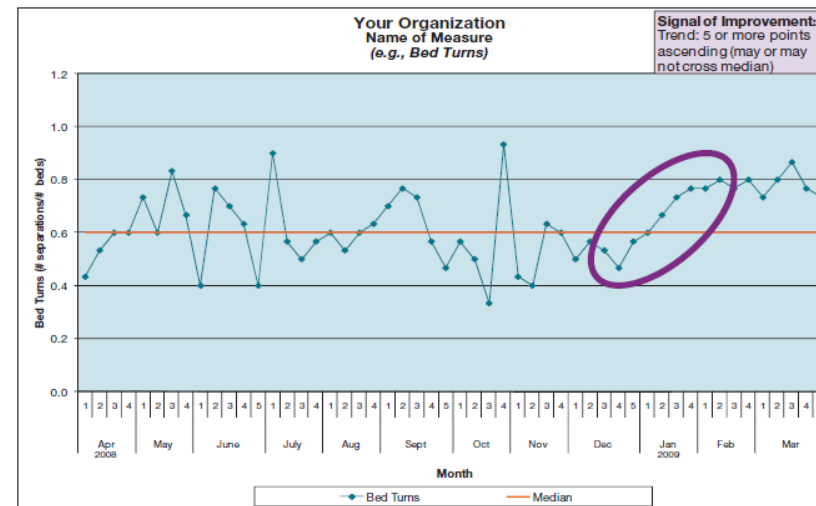


# Things to look for

## Trend

- Is five or more consecutive point all going or all going down
- Either there is or is not a trend – no TRENDING

Rule 2: Trend

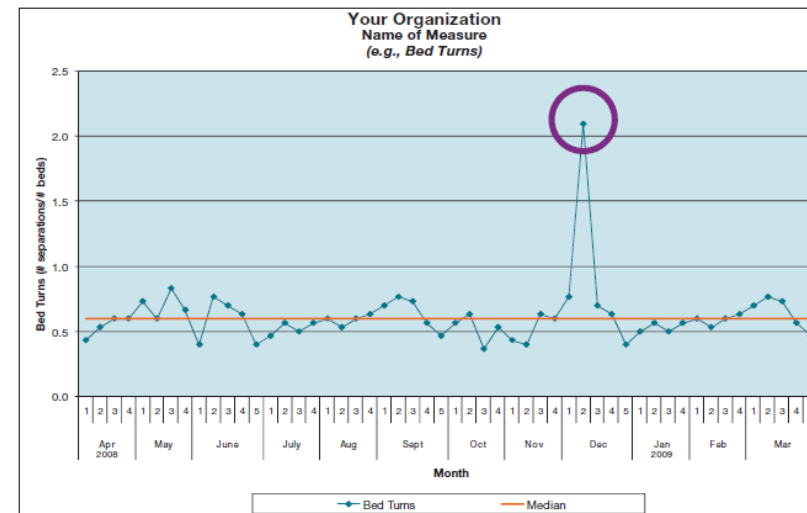


# Things to look for

## Astronomical Point

- Data point that is obviously different value
- Every data set has high and low points
- Worth trying to understand what caused it

Rule 4: Astronomical Point





# But really....

- **Easy to use quality improvement tool**
  - ‘a simple way for everyone to see where you are at’ (Clinical Nurse Manager)
- **Run chart as a visual reminder for measuring progress**
  - ‘...the whole team got behind it-including the doctors’ (Practice Manager)

## Using run charts for cardiovascular disease risk assessments in general practice

Susan Wells MBChB, DipObs, MPH, PhD, FRNZCGP, FNZCPHM;<sup>1</sup> Natasha Rafter MBChB, DRACOG, MPH, FNZCPHM, FAFPHM, MFPHM;<sup>2</sup> Kyle Eggleston BHB, MBChB, DipObstMedGyn, DipPaed, DIH, PGDipPH, MMedSci, FRNZCGP;<sup>3</sup> Catherine Turner RN, RM, PG Dip HEIN, PG Dip PHO;<sup>4</sup> Ying Huang BNur, PGDipSci, MSc;<sup>1</sup> Chris Bullen MBChB, DObst, DCH, MPH, PhD, FAFPHM, FNZCPHM<sup>5</sup>

### ABSTRACT

**INTRODUCTION:** Run charts are quality improvement tools.

**AIM:** To investigate the feasibility and acceptability of run charts displaying weekly cardiovascular disease (CVD) risk assessments in general practice and assess their impact on CVD risk assessments.

**METHODS:** A controlled non-randomised observational study in nine practices using run charts and nine control practices. We measured the weekly proportion of eligible patients with completed CVD risk assessments for 10 weeks before and after run charts were introduced into intervention practices. A random coefficients model determined changes in CVD risk assessment rates (slope) from pre- to post-intervention by aggregating and comparing intervention and control practices' mean slopes. We interviewed staff in intervention practices about their use of run charts.

**RESULTS:** Seven intervention practices used their run chart; six consistently plotting weekly data for >12 weeks and positioning charts in a highly visible place. Staff reported that charts were easy to use, a visual reminder for ongoing team efforts, and useful for measuring progress. There were no significant differences between study groups: the mean difference in pre- to post-run chart slope in the intervention group was 0.03% more CVD risk assessments per week; for the control group the mean difference was 0.07%. The between group difference was 0.04% per week (95% CI: -0.26 to 0.35,  $P = 0.77$ ).

**DISCUSSION:** Run charts are feasible in everyday general practice and support team processes. There were no differences in CVD risk assessment between the two groups, likely due to national targets driving performance at the time of the study.

**KEYWORDS:** Cardiovascular diseases; risk assessment; primary care; run charts; quality improvement

<sup>1</sup> Section of Epidemiology and Biostatistics, School of Population Health, University of Auckland, New Zealand

<sup>2</sup> Senior Lecturer, Royal College of Surgeons in Ireland

<sup>3</sup> Department of General Practice and Primary Health Care, School of Population Health, University of Auckland, New Zealand

<sup>4</sup> Population Health Strategist/Analyst, Northland Primary Health Organisations


<sup>5</sup> Director, The National Institute for Health Innovation (NIHI), School of Population Health, University of Auckland, New Zealand

# Lessons to learn

- Start to collect and review data to understand the normal variation
- Start with a stable process try and remove special cause variation before you start improving
- Measure before you start improving
- Understand common cause and special cause variation

# Cool things with data



 Immigration Health System   Workflow   Create Case   All Cases   MA Volumes   Alerts   Admin ▾

### Search Criteria

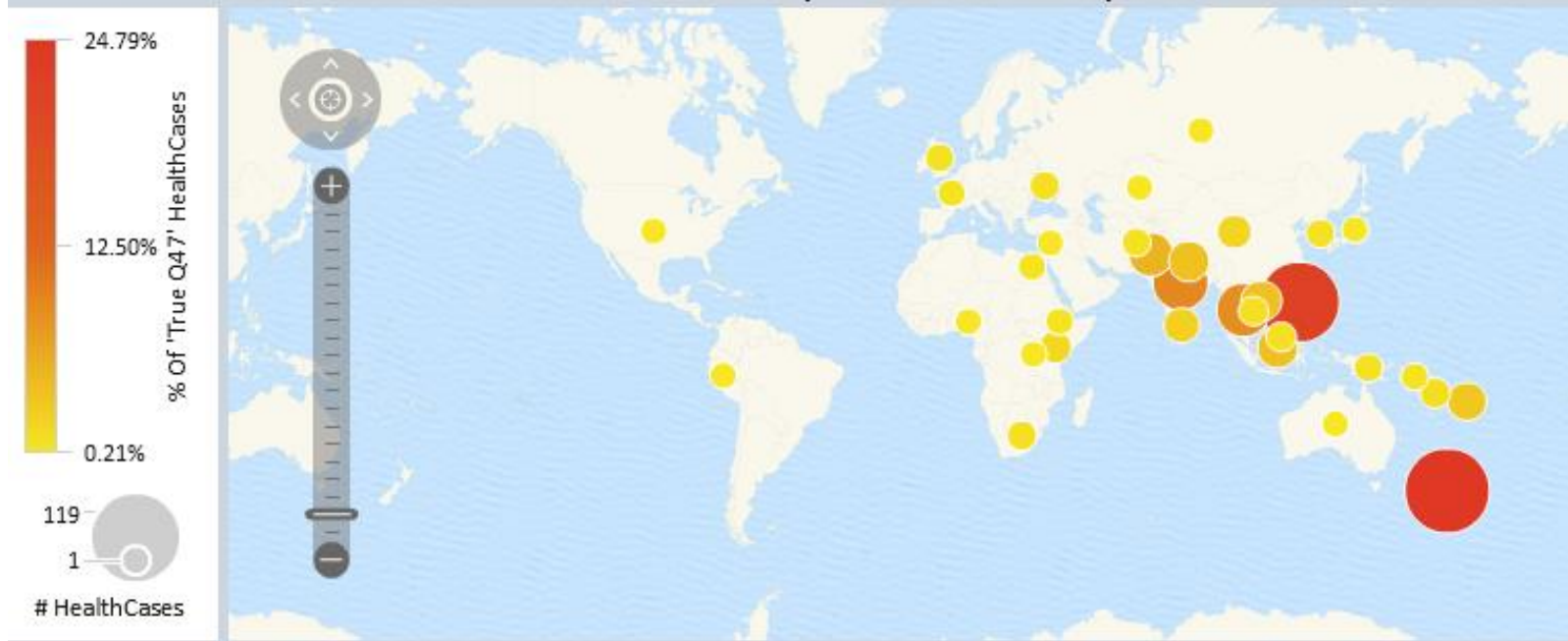
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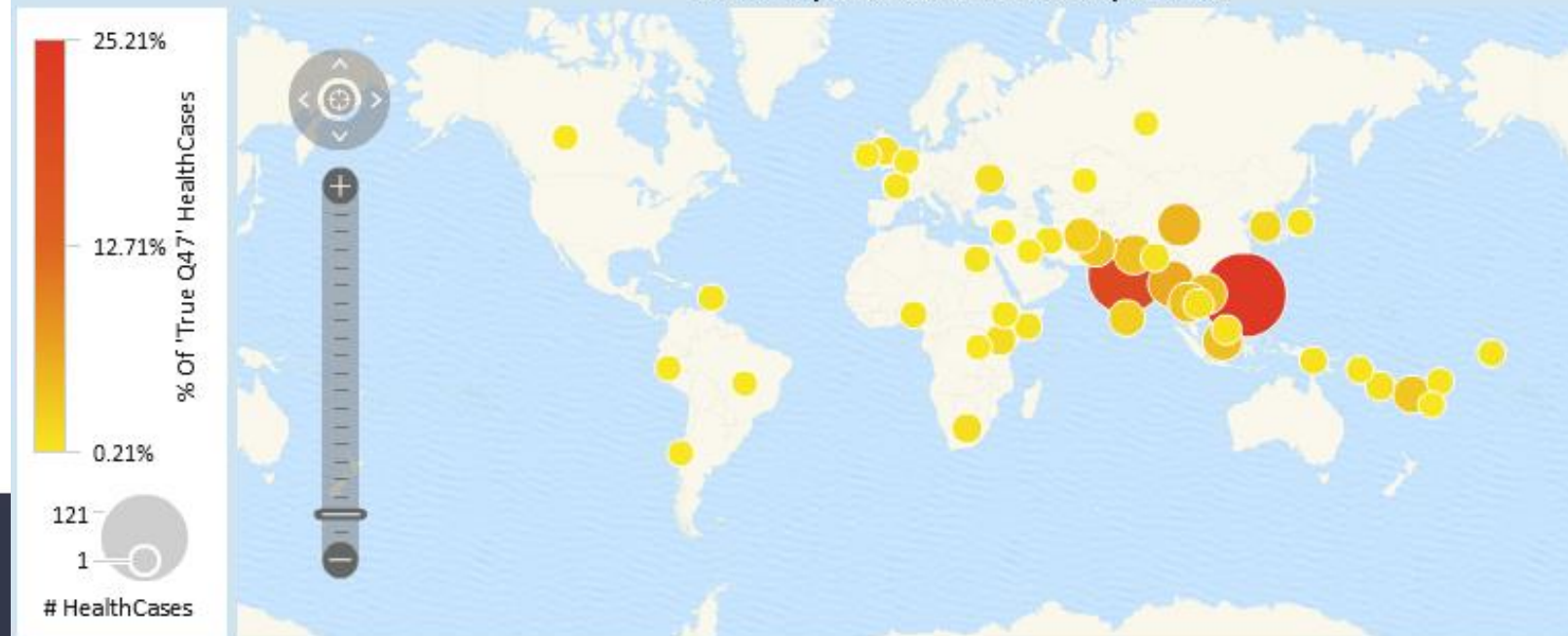
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## 1. Country Of Clinic, Drill to Country of Birth

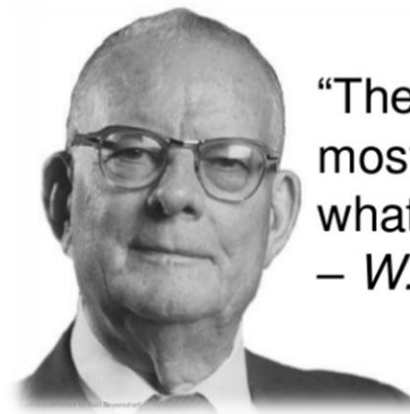


## 2. Country Of Birth, Drill to Country of Clinic



# Summary

- **Data** is important to improvement processes
- Defining the **aim** and what you want to **measure** is key before you start **Plan – Do – Study – Act** cycle
- Understand **variation**



“The problem is that most courses teach what is wrong.”  
– *W. Edwards Deming*

# Useful tools

- Steps forward
  - <https://www.stepsforward.org/modules/pdsa-quality-improvement>
- University of Toronto Family medicine
  - Introduction to Measurement in Primary Care Quality Improvement
- Institute for Healthcare Improvement
  - <http://www.ihi.org/resources/Pages/Tools/RunChart.aspx>

