

# **Title: Let's Measure and Risk Manage Aged Care Outcomes before introducing Benchmarking?**

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## **Abstract:**

This paper presents the findings of 'Action Research'. This study has been conducted for a Doctor of Business Administration degree at Southern Cross University, New South Wales. The aim of this research is to develop a measurement tool for aged care outcomes. Improvement Indicators<sup>®</sup> have been developed for aged care outcomes taking into account risk management and best practice concepts.

Without any reservations we all agree that the care and service delivery has improved since the introduction of continuous quality improvement into aged care. However, the true concept of the continuous quality improvement is overshadowed by the audit results. The authorities, employers and employees believe that higher audit results mean compliance of the outcomes. Hence there are no specific criteria or indicators to justify compliance or level of compliance. Most data collection tools (questions) aim to receive higher percentage results from audits assessments. Literature search indicates that data collection tools must be science based with clinical significance to collect valid and reliable data.

Unfortunately, Deming's 11<sup>th</sup> principle: 'Learn the capabilities of processes and how to improve them' has been ignored.

Without measurements we cannot learn the capabilities of processes. The most important part of the measurement system is the use of Statistical Process Control (SPC) tools, to identify the variations in the processes. The level of variations can only be identified through the use of indicators.

The appropriate application of SPC tools in the continuous quality improvement process is still not understood in the aged care industry. The 'Bar charts, Pie charts and check lists are used to display results but data is not always collected through adequate tools to identify the level of variations. So let's start understanding the required basic measurements and learn to manage risk before benchmarking.

## **Introduction**

Benchmarking is a most misused word in today's Australian aged care industry. Benchmarking is a competitive strategy within continuous improvement process and it is a most effective tool for improving key aspects of the business. It is about discovering, transferring knowledge and new ideas across and between organisations and developing continuous learning and managing endless change.

Benchmarking encourages questions about how we compare against others. It may be best practice, best process, or best strategy on a like – for - like basis. It may help us to understand and identify how competitors' business performance compares with our own, and it indicates where the potential for improvement lies. Benchmarking is about active measurement and comparison and the benchmarking process can not begin without appropriate and adequate tools and techniques. Thus, appropriate and adequate measurement is critical.

On the other hand, the risk identification and management also a strategy within a continuous improvement process. Generally, there are many risks involved in health care, especially in aged care. Risk – management therefore, has become a far more important strategy than any other business strategies in health care community, especially in the aged care community.

Key objectives of the research:

- To develop a valid and reliable measurement instrument such as an indicator method to monitor and measure the impact of continuous quality improvement processes of the Australian Aged Care Outcomes.
- Application of Donabedian theory (Structure, Process, Outcome) in risk management in health care.
- Provide insight into measurement and monitoring tools and techniques in continuous improvement.
- Risk – Management and monitoring systems.

## **Methodology:**

### Action Research

#### **What is Action Research?**

Dick (2002) said action research is a natural way of acting and researching at the same time.

Action research = **action and research**

Some features of action research assist the action. Some assist the research. Some assist the “and” – they help the action and the research fit together. It is a flexible spiral process, which allows action (change, improvement) and research (understanding, knowledge) to be achieved at the same time.

Act -> review -> act -> review...

Carson et al (2001) discussed Lewin’s (1946) four (4) elements of action research. Viz:

- Using a spiraling circle of activities that involve planning, acting, observing and reflecting upon what had happened;
- Doing these activities to try to improve workgroup processes of action;
- Helping to solve complex, practical problems about which little is known;
- Producing at least one report about what was found.

#### **Action research in health care**

Bowling (1997) acclaimed ‘action research as a popular technique for attempting to achieve improvements by auditing process and critically analyzing events. It is a critical, self-reflective, bottom-up and collaborative approach to enquiry that enables people to take action to resolve identified problems.’ (pp367).

Furthermore, Bowling stated that Hart and Bond's (1995) seven criteria of action research in health care are distinguished from other action research methods.

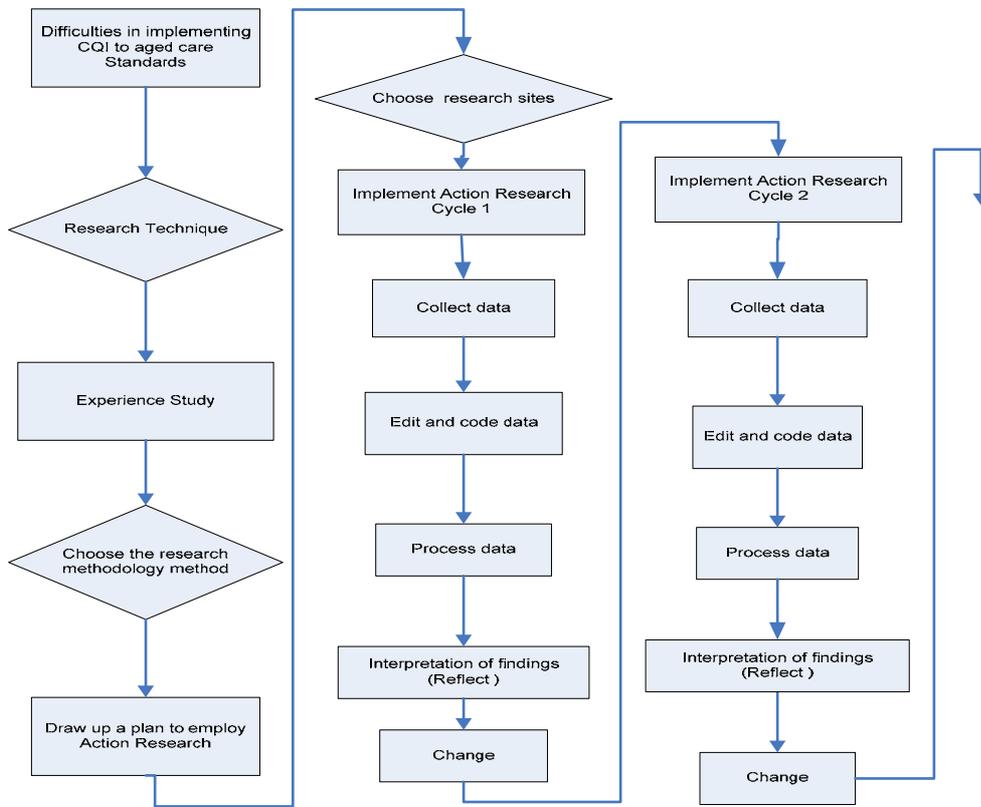
Hart and Bond's (1995) seven criteria of Action Research:

1. Is educative
2. Deals with individuals as members of social groups
3. Is problem-focused, context (specific and future) oriented
4. Involves change interventions
5. Aims at improvement and involvement
6. Involves a cyclic process in which research, action and evolution are intertwined
7. Is founded on a research relationship in which those involved are participants in the change process.

Describing action research in health care, Morton-Cooper (2000) indicated key principles. Viz:

- Practitioner-generated
- Workplace-oriented to improve practice
- Starts with a problem shared and experienced by colleagues and/or patients
- Examines key assumptions held by researchers and challenges their validity
- Adopts a flexible trial and error approach
- Accepts that there are no final answers; and
- Aims to validate any claims it makes by a rigorous justification process (pp19)

**Figure 1: Flowchart of the Research Process**



Source: Adapted from Zikmund 2000. Pp55

Figure 1 illustrates the flowchart of this research process. The particular research methodology was derived from the researcher’s industry experience and took into account the subject under study for this research.

**Types of Measurement and Monitoring Tools and Techniques in Continuous Quality Improvement in the Aged Care Industry**

Satisfaction surveys (resident / patient), medical records reviews and clinical indicators are the traditional way of monitoring and measuring continuous improvement in the aged care industry. As stated before clinical indicators measure a small part of the care delivery. Medical record review is now recognised as providing limited information. Clinical records tend to be of poor quality, inaccurate and non- standardised. They also tend to focus on specific questions and generally do not provide an overall picture of the quality of service. Satisfaction surveys have become one of the most popular approaches to measure quality service. Surveys can measure the resident perspective of quality of service.

However, this is only a part of the measurement of the service. While residents may be in a position to assess the interpersonal interactions they have with staff and the adequacy of communications between themselves and service providers, very rarely residents have the technical expertise to assess the technical side of the delivery of care.

The Canadian accreditation system is at the forefront in measuring health care delivery. The Canadians have developed four quality dimensions similar to the SERVQUAL instrument to measure quality of care in health services.

They are:

***Responsiveness***

The organisation anticipates and responds to changes in the needs and expectations of the (potential) client and/or community population(s) and to changes in the environment.

***System Competency***

The organisation consistently provides service(s) in the best possible way, given the current and evolving state of knowledge. The organisation achieves the desired benefit for clients and/or communities, with the most cost-effective use of resources.

***Client/Community Focus***

The organisation strengthens its relationship with the client and/or community by encouraging community participation and partnership in its activities.

***Work Life***

The organisation provides a work atmosphere conducive to performance excellence, full participation, personal/professional and organisational growth, health, well being and satisfaction.

Source: Harrigan (2000)

Harrigan (2000) indicated that the Minimum Data Set (MDS) to assess quality of care in institutional settings has been adopted in several countries as a basis for assessing quality of care in long term care settings and assisting in care planning. Harrigan (2000) also stated that the Minimum Data Set (MDS) approach has led to improvements in at least some dimensions of care.

Chouinard (1999) suggests that the Minimum Data Set is a good measurement tool for quality of care. The MDS approach would yield at least semi-qualitative estimates of the impact of, for example, skin care and nutritional support on the prevalence of bedsores. "A methodological approach such as total quality management allows clinicians to be involved in determining just what processes need to be measured.

Hirdes et.al (1998) stated that the Quality Indicators (QIs) are based on the Minimum Data Set (MDS) and emphasised that these QIs have the potential to contribute useful clinical information to quality improvement initiatives at modest cost.

MDS quality indicators are illustrated in table 1.

**Table 1: MDS QUALITY INDICATORS**

<ol style="list-style-type: none"> <li>1. Prevalence of any injury</li> <li>2. Prevalence of falls</li> <li>3. Prevalence of problem behaviour toward others</li> <li>4. Prevalence of symptoms of depression</li> <li>5. Prevalence of depression with no treatment</li> <li>6. Use of nine or more scheduled medications</li> <li>7. Incidence of cognitive impairment</li> <li>8. Prevalence of bladder/bowel incontinence</li> <li>9. Prevalence of occasional/frequent bladder/bowel incontinence with no toileting plan</li> <li>10. Prevalence of indwelling catheters</li> <li>11. Prevalence of faecal impaction</li> <li>12. Prevalence of urinary tract infections</li> <li>13. Prevalence of antibiotic/anti-infective use</li> <li>14. Prevalence of weight loss</li> <li>Prevalence of tube feeding</li> </ol>	<ol style="list-style-type: none"> <li>15. Prevalence of dehydration</li> <li>16. Prevalence of bedfast residents</li> <li>17. Incidence of late-loss ADLs</li> <li>18. Incidence of contractures</li> <li>19. No training/skill practice of ROM for mobility dependent residents</li> <li>20. Prevalence of antipsychotic use, in the absence of psychotic and related conditions</li> <li>21. Prevalence of antipsychotic daily dose in excess of surveyor guidelines</li> <li>22. Prevalence of anti-anxiety/hypnotic use</li> <li>23. Prevalence of hypnotic use on a scheduled basis or PRN 2+ two or more times in the last week</li> <li>24. Prevalence of use of any long-acting benzodiazepine</li> <li>25. Prevalence of daily physical restraints</li> <li>26. Prevalence of little or no activity</li> <li>27. Lack of corrective action for sensory or communication problems</li> <li>28. Prevalence of stage 1-4 pressure ulcers</li> <li>29. Insulin-dependent diabetes with no foot care</li> </ol>
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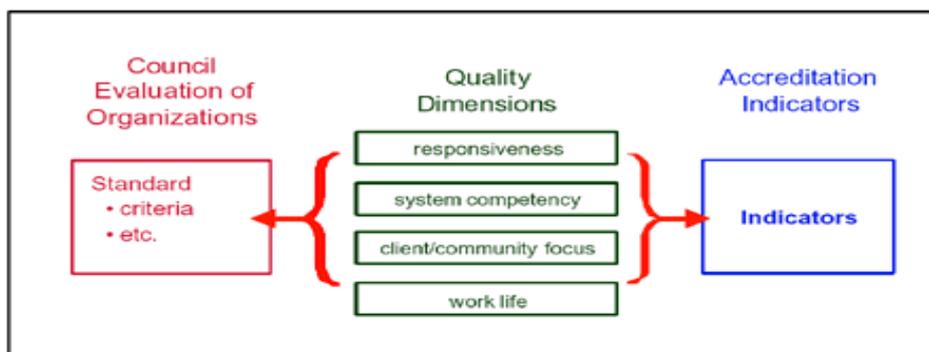
Source: Hirdes et al, 1998

Hirdes et.al (1998) stated the above QIs are aimed to determine the presence or absence of a given QI at the individual level. For example, the status of each patient is determined with respect to the present or absence of faecal impaction.

The individual data may then be compiled to provide an estimate of the occurrence of faecal impaction at the facility level. For some conditions the focus is only the prevalence of the trait while some other QIs focus on the incidence rate. The Canadian Council on Health Services Accreditation (CCHSA) uses a common list of indicators to measure their accreditation standards.

The CCHSA has developed four quality dimensions. These four quality dimensions have been identified as responsiveness, system competency, client/community focus and work life. They have developed the link between Indicators, Quality Dimensions and Accreditation Standards. Figure 2.6 illustrates the link between CCHSA standards, quality dimensions and indicators while Figure 2.7 illustrates an example of the relationship between the standard ,quality dimension and the indicator.

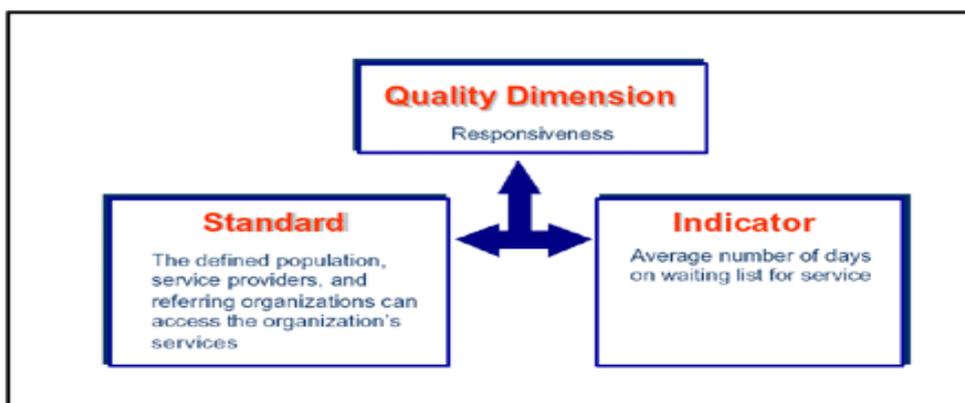
Figure 2: Link between CCHSA standards, quality dimensions and indicators



Source Harrigan (2000)

The council quality dimensions are linked between the indicators and the standard. Quality dimensions are the summary of standards and indicators are the measurement tools of standards.

Figure 3: Example of a standard, quality dimensions and indicator



Source Harrigan (2000)

The sample in this figure explains the relationship between standard, quality dimension and indicator. Due to this relationship, indicators can be used to measure the standard and quality dimension.

According to Harrigan (2000) the CCHSA supports the use of indicators within the larger framework of quality improvement.

- Measurement and reporting of indicators should challenge teams and organisations to provide better services, which in turn result in improved health.
- Indicators are seen as a guide to monitor, evaluate and improve services delivered. Indicators are neutral. Their sole purpose is to provide information. An in-depth analysis by the team or users is essential to determine what the indicator data means in terms of understanding processes.

Harrigan (2000) explains that in order to improve processes, organisations must have a measurement system. There are two questions to be asked when using indicators:

1. What does the indicator data tell staff about their processes?
2. How do they determine whether their organisation's performance was satisfactory or whether there were opportunities for improvement?

According to Harrigan (2000) accreditation offers a framework that links goals, processes of care and service and indicators. This framework can help teams and organisations to focus evaluation, quality monitoring and improvement activities. The benefits of the indicators includes indicator data which provides the organisation and the CCHSA surveyors with one more source of information to help them understand the organisation's processes.

Discussing use of indicators for health care measurements, Ibrahim et al. (1998) stated that to accept the measurements are valid and reliable; indicators must meet the internationally recognised criteria. The internationally recognised criteria for indicators are:

- Be simple to collect;
- have a demonstrated relationship to quality of care;
- be minimally reliant on subjective clinical judgments that would potentially allow biased recording;
- Able to be adjusted for differences in determinants that are unrelated to quality of care;
- Be suggestive of system wide performance; and
- Be suitable to allow a comparison of various grades of hospitals

Source: Ibrahim et al. 1998. Pilot Hospital – wide clinical indicators project

## **Development of Improvement Indicators for the Australian Accreditation Aged Care Outcomes.**

Based on the quality improvement literature review, the researcher developed indicators (called Improvement Indicators) to measure and monitor outcomes related to aged care standards. Prior to the development of Improvement Indicators, the researcher extensively studied the assessment pattern of the Australian accreditation system.

At the development stage the researcher took into account many views but focused on the basic principle of measurement. Zikmund (2000) stated that the researcher must identify the concepts relevant to the problem before the measurement process can be initiated. A concept must be made operational in order to be measured. A true measurement of concepts requires a process of assigning precise scores or numbers to the attributes of people or objects.

The values assigned in the measuring process can be manipulated according to certain mathematical rules. Zikmund (2000) says that the properties of the scale of numbers may allow the researcher to add, subtract, or multiply answers even though it may not be the best solution.

It is important to identify the process that obtains the outcome before attempting to improve the process. Therefore, the priority is to identify the process of each outcome. There are four legislative aged care standards that are divided into forty-four aged care outcomes. In theory, it is only thirty-two outcomes. These thirty-two outcomes over-arch continuous improvement, regulative compliance and education staff development. In other words, each aged care outcome must have a continuous improvement process, meet relevant regulatory requirements and satisfy inherent staff education and development requirements.

Identification of the key quality characteristics of each aged care outcome is based on three questions to provide the unique process of each outcome.

- How do we continuously improve outcome?
- What are the regulatory requirements for each outcome?
- How the education and training play major role in improving outcomes?

The researcher examined each individual indicator of each outcome from a risk management point of view before allocating values to each individual indicator. In this research the researcher used Donabedian's (Zikmund 2000)(1980) input, process and outcome framework when conducting risk assessments. Risk assessment was conducted to identify what would be the common causes of variation and what would be the special causes of variation for each indicator. After a trial and error test it was decided to allocate ratio scale measurements to the indicators.

The **Improvement Indicators** were developed with consideration of the following elements:

- Identify key quality characteristics of the aged care standards outcomes.
- Look to improve the process of each outcome by identifying the variation in the processes.
- Allocate values to each indicator so that the outcomes can be measurable with statistical process control tools and techniques.
- Values are allocated at various levels of actions.
- The higher the value, the higher the significance of the action to meet the outcome requirement
- Use of management interventions and strategies that are generally known and activities within the system.
- Focus on a client centered data collection method for health and lifestyle outcomes.
- Use a documentation centered data collection method for the management system and physical environment outcomes.
- Integrate 'Best Practice' models to meet the outcome.
- Add the 'Risk Management' concept.
- Classify the level of achievement so an improvement process lies within the data collection tool.
- Assess staff education and training for each outcome.

The researcher has also followed the international recognised criteria when developing indicators for Australian aged care outcomes.

Data gathering was mainly based on two of Donabedian's (2003), monitoring methods.

- Concurrent and retrospective monitoring methods.

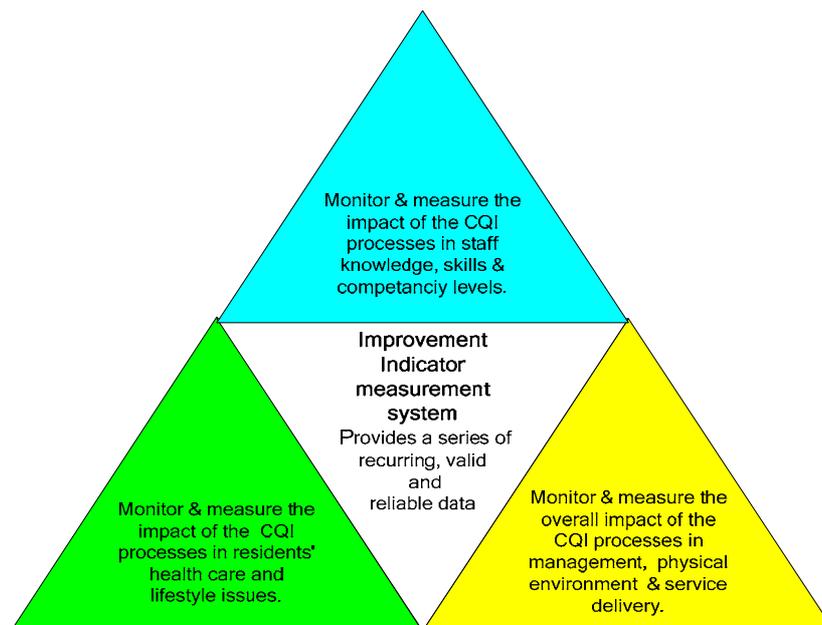
Concurrent monitoring occurs during the course of care, either periodically as a routine, or when something happens that triggers a review of a way a care is being handled. "Concurrent monitoring" as part of a quality assurance system which is simply a formal plan by which, at critical junctures in the care of a patient, someone other than the care giving practitioner assesses the progress of the case and, if needed, offers advice or perhaps actually intervenes.

Retrospective monitoring is conducted by reviewing a sample of medical records and - based on the record as well as on additional information, if needed - making a judgment on the quality of care (Donabedian 2003).

In summary, the concurrent method of monitoring aims to change practices as they happen, whereas the retrospective monitoring method aims to learn from the past and consequently make adjustments to improve practices.

The following triangle illustrates the role of Improvement Indicators in measuring and monitoring Australian Aged Care Outcomes.

Figure 5: The role of Improvement Indicators in measuring and monitoring Australian Aged Care Outcomes.



Source: Developed for this research

The above figure illustrates the inter-relationship of the four aged care accreditation standards. All three shaded triangles make a one large triangle. The uniqueness of the centre triangle is dependent on three shaded triangles being fitted together.

## Implementation method of Action research

### Details of demographics

The case study sites for this action research were five aged care organisations. The aged care organisations which were selected for this research project, had firstly achieved full aged care accreditation between the years 2000 and 2001 and continue to receive Commonwealth government funding. Secondly, they were varied in size and had a catchment from diverse geographical areas. These organisations are private for profit organisations and the level of care provided is high and low care. The organisations have been de-identified and listed in table 4 below as an organisation number.

Table 2: Organisation Selection

Organisation No.	Area	Level of care delivery	Bed numbers	Number of Staff including Registered Nurses
1	Metro	Low care	30 beds	20 Personal Care Attendants. Registered Nurse Div 1's input - limited number of hours Monday to Friday.
2	Metro	High care	30 beds	20 Personal Care Attendants and 10 Registered Nurse Div 1 input 24 hrs a day.
3	Rural	Low care	45 beds	40 Personal Care Attendants. Registered Nurse Div 1's input - limited number of hours Monday to Friday.
4	Rural	Low care	35 beds	30 Personal Care Attendants. Registered Nurse Div 1's input - limited number of hours Monday to Friday.
5	Metro	High & low	79 beds	40 Personal Care Attendants and 20 Registered Nurse Div 1 input 24 hrs a day for high level care residents.

Source: Developed for this study.

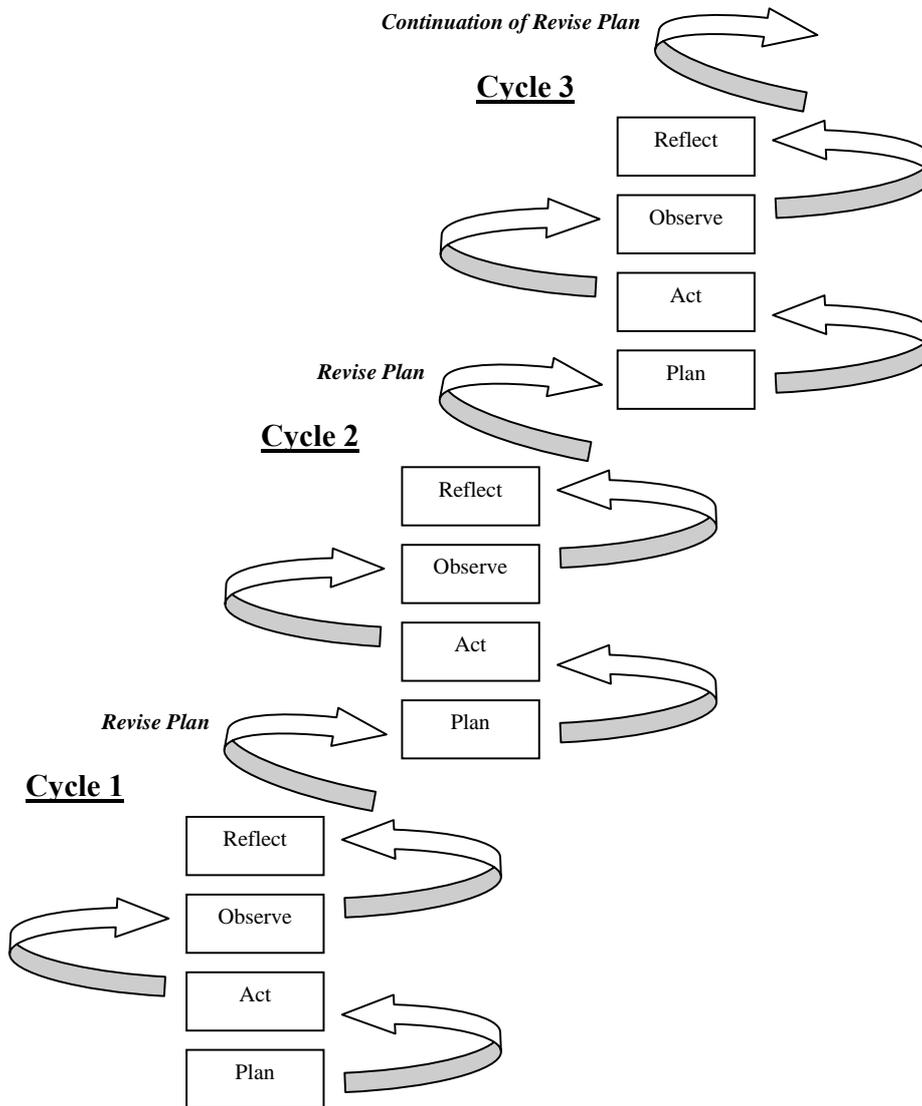
The table 2 shows:

- **Organisation No:** - the name of the organisation has been replaced with a case number to de – identify the organisation
- **Area:** - describes where the organisation operates in metropolitan or rural areas.
- **Level of Care Delivery:** - describes the type of care delivery the organisation provides.
- **Bed Numbers:** - describes the size of the organisation based on the number of beds.

- **Number of Staff including Registered Nurses:** - staffing levels play a major role in care delivery. In general, Registered Nurses (Div1) are not required to employ in low level aged care organisations where high level aged care organisations are required to employ Registered Nurses (Div1) to cover 24 hours a day. Most of the personal care is being delivered by Personal Care Attendants in high and low level care organisations. Registered Nurses both Division 1 & 2 input is high in care delivery in high level care organisations. The level of training and education of personal care attendants varies from one organisation to other.

The researcher has adapted Sankaran et al's (2001) research cyclical process; ***Plan, Act, Observe, and Reflect***. The following Figure 5 illustrates this cyclical process.

**Figure 5: The Action Research Cyclic process**



*Source: Developed for this research 2003*

The above figure illustrates the cyclic process of action research. there were 4 cycles in this research. end of each cycle there were reflection stage that changes took place before introducing changes to the indicators.

## **Findings**

There is a very little agreement on the philosophy of health care measurement specifically on what to measure. However, it has been recognised by the international health care community that the best way to measure health care is by the use of indicators.

“ --- Indicators should actually measure what they are intended to (validity); they should provide the same answer if measured by different people in similar circumstances (reliability); they should be able to measure change (sensitivity); and, they should reflect changes only in the situation concerned. In reality, these criteria are difficult to achieve, and indicators, at best, are indirect or partial measures of a complex situation.”

(Cited in Harrigan (2000) - Alberta Heritage Foundation for Medical Research, 1998)

For many years, the health care community around the world today, use many different useful indicators to measure and monitor various health care outcomes. However, this is the first time this type of study has been conducted in Australia or internationally.

The research findings of this study confirm the existing literature. This study was focused on measuring the impact of the continuous improvement process of aged care outcomes with Improvement indicators and found that improvement indicators are able to measure the impact of continuous improvement process of Australian aged care outcomes.

The quality of care issues are complex in aged care because there are many types and levels of care provided. The individuals in these organisations are chronically ill and/or disabled and must depend on others to meet the most basic of their physical needs.

Donabedian (1980) refers to three approaches to quality measurement and monitoring: structure, process and outcome and these three approaches are complementary to each other and should be used in a combined way. In the context of aged care the structural measures assess the inputs such as the level and mix of staffing, characteristics of facilities, resources etc., while process measures examine actual services or activities provided to residents.

It is evident that the process measures in aged care must focus on improving the care process in place to overcome residents' problems such as their physical, psychosocial, cognitive, hearing, vision, continence, behaviours, nutrition and hydration, oral and dental, skin integrity care needs and medication management.

Outcome measures are focused on increasing quality of life. However, quality of life is difficult to define, difficult to measure and one is not able to monitor the quality of this process. The better the quality of a process, the better the outcome will be. Therefore, outcomes measurement must be conducted in combination with the process measurement system. Hence the measurement system must be appropriate and effective. This has been evident in this research.

The Improvement indicators are based on Donabedian's theory (1980) structure, processes and outcome of care delivery. Improvement indicators are multifaceted. Some Improvement indicators measure and monitor structure of the outcome which indicates organisation ability to meet the care and service needs of the residents while others measure and monitor the processes which focused on actual care delivery (technical quality) and indicates how well the care has been delivered to residents. Some Improvement indicators also focused on monitoring risks and best practice methods.

The literature search confirmed that indicators can provide the most reliable and valid measurement. Quantitative data collected with improvement indicator data collection tool during the validation period in this research has confirmed the same. However, measurement alone does not improve quality. Valid and reliable data only confirm the assumption of improvement. However, validity and reliability of data also depends on the person collecting data. There is a danger that data can be actually manipulated to show improvement. It is important to have a system to monitor the validity and reliability of data.

Nevertheless, measuring appropriately and by validating data to ensure that data has been collected in a true and correct method, can generate opportunities for improvement and create a learning environment. In addition, variation in care delivery can be particularly difficult to assess and interpret unless there is an adequate and appropriate data collection system.

The literature search indicated that indicators such as performance indicators, clinical indicators, health outcome indicators etc. can be used to measure and monitor specific changes in health care over a period of time. There is evidence in the literature to indicate that these indicators have been used or could be used to measure what they were specifically aimed to measure. The research findings prove that improvement indicators can monitor and measure the process of the aged care outcomes.

Statistical Process Control (SPC) tools and techniques are used to control processes and variation. The key aspect of quality improvement is reduction in variation in the process. The two main causes of variation in the process are assignable (or special) and common (or chance). Special causes of variation are not inherent in the process and can be therefore readily identified. The common cause of variation is always inherent in a process. SPC tools such as run charts and process control charts can be used to distinguish between special and common causes of variation.

Control charts will indicate when there is something wrong with a process and whether the process is stable or not. It will supplement the staff's analytical skills to identify what is wrong with the process.

Montgomery (1997) stated variable control charts can be used in both manufacturing and non-manufacturing settings because the nature of the product has no bearing because measurements are taken only on the quality, function, or performance of the product. However, imagination may be required to select the proper variable or variables for measurement when control charts are being used in non-manufacturing environments. Process capacity or some may say capability should also be calculated to understand the process stability.

Due to the nature of the industry it is appropriate to use process control charts to monitor the care delivery processes. This research showed the importance of process monitoring charts in all aged care outcomes.

This study has found that the Australian Aged Care Accreditation Agency and aged care organisations, despite their commitment to continuous improvement, appear to be missing one of the key elements of quality improvement which is measuring and monitoring the impact of quality improvement. Literature (Canadian Council on Health Services Accreditation 1996; Carey 2002; Carey & Lloyd 2001; Deming 1986; Grönroos 1991; Hirdes et al. 1998; Joiner & Gaudard 1990; Loeb 2004; Montgomery 1997) advocated the use of indicators to assess and evaluate quality improvement and use of process control charts to monitor the process.

Firstly, there is no indicator system to monitor and measure the impact of continuous improvement processes of Australian aged care outcomes.

Secondly, there is no evidence that current data collection tools used in the industry have science and clinical significance.

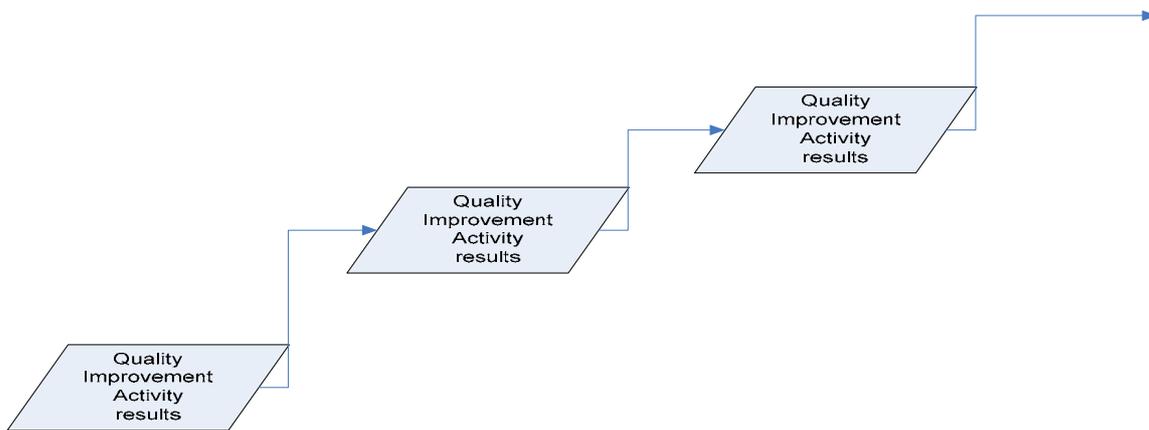
Thirdly, as the researcher's experience that not many aged care organisations use process control charts to monitor ongoing processes and outcomes. Consequently, this study proposes a data collection tool (Improvement Indicator data collection tool) that Australian aged care organisations

might effectively use to monitor and measure the impact of the continuous quality improvement process in aged care outcomes.

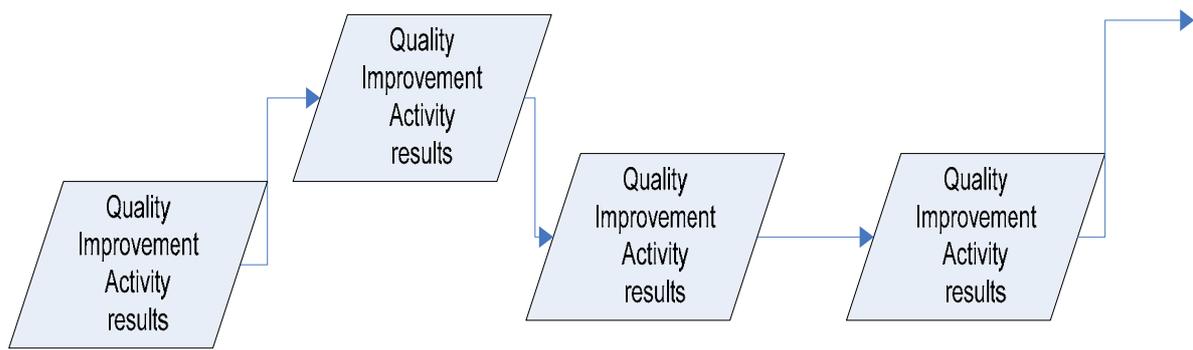
This study has provided significant evidence to support that the impact of continuous improvement changes can be measure and monitor with improvement indicators in each research cycle.

It has been stated (Berry 1995) that Deming's theory of continuous improvement needed to be modified when applying to the service industry and this is a very strong view when it comes to health and aged care industry. The achievements with continuous improvement in service industry are very much different to manufacturing industry. In manufacturing industry, the results of continuous quality improvement of individual product expected to provide climbing up the ladder description whereas service industry especially aged care industry, the results of continuous improvement for individual care and service delivery is unable to provide the same illustration. Therefore application of the basic knowledge in continuous improvement is absolutely necessary in aged care since the continuous improvement is a legislative requirement. The two different representation of continuous improvement is illustrated in figure 6.

Figure 6: (a) & (b) Difference between manufacturing industry and services industry expected quality improvement results



(a) Expected quality improvement activity results in manufacturing / production industry



(b) Expected quality improvement activity results in health and aged care industry

Source: Developed for this research

The change to the second pattern (b) in figure 6 is due to the intangibility involved in care delivery. The frail elderly populations living in a residential care setting suffers from one or more medical, physiological, psychological, social or financial problems. Continuous quality improvement approach needs to be different when dealing with these problems. Results may show up and down like shown in second pattern (b) rather than expected results shown in first pattern (a) where manufacturing industry results show up and up. Some of medical or physical aspects in care processes may not be able to improved at all. Or it may improve for a period of time, but it will fall back and need to start all over again. For example, resident’s mobility and dexterity may improve or maintain with physiotherapy and other physical activity. However, older adults are prone to fall and debilitate their mobility. If the person sustain an injury after fall it may take time to recover to the previous level of mobility and dexterity or may not recover to the same level at all.

The current practice of quality measurements in Australian aged care organisations are inadequate and would not measure the impact of changes. Furthermore, the current aged care accreditation system is also inadequate and can not measure the changes over a period of time. The continuous quality improvement is based on measurements with valid and reliable data and conducting appropriate data analysis.

To be effective in this area, aged care organisations and Aged Care Accreditation Agency must work together to develop adequate and appropriate indicators to measure and monitor the impact of continuous quality improvement processes.

### **Significance of the study**

There were many important issues became apparent during this study. However, there were two significant issues highlighted in this study. The study demonstrated the lack of knowledge and skills of aged care workers in continuous improvement in aged care and importance of continuous education and the other is the development of the improvement indicator tools to measure and monitor the impact of continuous improvement processes of aged care organisations. These two issues would have a major impact on the aged care accreditation assessment system and aged care industry at large.

The Department of Health and Ageing (Australian government) could find this study provides a significantly useful tool in assessing the quality of care delivered over a period of time because quantitative nature of the research enables the Department to obtain valid and reliable data to make science base and clinical significance decisions.

This study would be significant for the health care community in Australia and overseas. The uniqueness of measuring and monitoring the whole process of outcome is more beneficial than measuring and monitoring part of the outcome.

The research findings have increased the depth of the knowledge in continuous quality improvement measurements.

### **Limitation of the study**

The study is limited in the following ways:

- The study investigated and developed an indicator data collection system to monitor and measure the impact of continuous quality improvement process in aged care. Since the focus of the study was aged care, the findings and conclusions of the study are specific to aged care outcomes with limited number of indicators having been developed for this study to monitor and measure the outcomes. The findings and conclusions from this study can only be generalized to apply to continuous quality improvement literature that can be tested with other health care fields.
- The study used exploratory action research study because of its uniqueness and the nature of the phenomenon being investigated with a small number of aged care

organisations. There was no attempt made to compare this improvement indicator data collection tools with other indicators which are used in other health care settings.

- The staff in participative organisations collected data which imposed some limitations on the study. It was assumed that the data collected in this study was reliable and accurate and that the staff were honest in their responses when they collected the data with improvement indicators.

The researcher acknowledges the limitations of this study but the limitations do not distract the significance of the findings. In addition, this study provides a platform for further research.

## **Conclusion**

Improvement Indicators:

- Demonstrate the variations (changes) in the process of care delivery.
- Monitor and measures the outcome
- Provide series of valid and reliable data over a period of time
- Monitor risks in input and process of care delivery
- Use a research based system
- Meet international indicator criteria

## A Sample of Improvement Indicator© Monitoring & Measuring system: Explanatory notes for Clinical care outcome 2.4

### 2.4 Clinical Care Outcome

**Expected Outcome:** Residents receive appropriate clinical care.

**Indicator No. 1:** Resident /family satisfaction survey will indicate the level of satisfaction with care (medical, nursing) and other services provided by the facility.

**Methodology:** The Quality Improvement team will conduct a resident's satisfaction survey to ensure that residents are satisfied with the care and service delivery of the Nursing Home.

**Data can be collected from:**

Resident Satisfaction survey on medical, nursing and other services  
Structured, formal interviews.

**Statistical Process Control tools that can be used to analyse this data:**

Check-list  
Histogram

**Indicator No. 2:** All residents' clinical care needs are assessed within the first month of admission and thereupon assessed as frequently as possible to identify risks and to follow 'best practice' methods in clinical care.

**Methodology:** The Quality Improvement team will audit residents' documentation to ensure that residents are assessed frequently to identify risks and to follow 'best practice' methods.

**Data can be collected from:**

Audit on assessment forms - frequency of assessments.  
Audit of documentation of residents' files

**Statistical Process Control tools that can be used to analyse this data:**

Check-list

**A Sample: 2.4 Clinical Care Outcome: - Improvement Indicators Monitoring Tool**

Facility Name:.....

Auditor's Name:.....

Date:.....

**Instructions: Random Sample – Ask the family if the resident is unable to answer**

No	Indicators	Indicator Value	Res 1	Res 2	Res 3	Res 4	Res 5	Res 6	Res 7	Res 8	Res 9	Res 10	Data to be collected from
		<i>Resident Code</i> ⇨											
1	Is this resident / family satisfied with the level of care and service delivery received?	Very Happy = 1 Some what happy = ½ Not happy = 0  <b>Total value = 1</b>											Ask the resident or family or survey result (Please circle)
2	Has this resident's care needs been assessed?	≥ 12 months = 0 < 12 months but > 3 months = ½ ≤ 3 months = 1  <b>Total value = 1</b>											Assessment form
3	This resident's care plan: a) is current (< 12 months) and b) has documented evidence which indicates care has been planned in consultation with the resident/ family or c) family has not been consulted (because no family-evidence documented) but developed by health professional.	Both (a) and (b) or (c) are evident = 1 Only (a) is evident, no (b) or (c) is evident = ½ (a) is not evident but (b) or (c) evident = ½ All three (a) (b) (c) are not evident = 0  <b>Total value = 1</b>											Care Plan
4	Is there documented evidence that this resident's clinical care needs have been monitored on a scheduled basis?	None = 0 < 3 entries /month = 1 ≥ 3 entries/month = 2  <b>Total value = 2</b>											Progress notes
5	Does the resident's general presentation evidence that care is of a high standard?	Refer to questions < 6 'Y' = ½ ≥ 6 'Y' = 2  <b>Total value = 2</b>											Check List

**Monitoring Tool 1.4/1**

No	Indicators	Indicator Value	Res 1	Res 2	Res 3	Res 4	Res 5	Res 6	Res 7	Res 8	Res 9	Res 10	Data to be collected from
6	Is this resident's specialised care and treatments provided as stated in the policy?	Specialised care assessed, planned and provided by RN Div 1 = 1 Specialised care assessed and planned by RN Div 1 but provided by direct care = ½ Specialised care assessed and provided by unqualified staff = 0 Does not require specialised care = 1  <b>Total value =1</b>											Specialise care assessment forms, care plan Progress notes, Treatment Charts
7	Is there an up to date medical summary for emergency treatment for this resident?	Medical summary is ≤ 6 months old = 1 Medical summary is ≤ 12 months but ≥ 6 months old = ½ Medical summary is ≥ 12 months old or no summary = 0  <b>Total value = 1</b>											Medical Summary
8	Medical Practitioners details have been updated	Details are ≤ 12 months old = ½ Details are ≥ 12 months old = 0  <b>Total value = ½</b>											Admission form, resident data profile etc.
9	Medical Practitioner's locum details have been updated.	Details are ≤ 12 months old = ½ Details are ≥ 12 months old = 0  <b>Total value = ½</b>											Admission form, resident data profile etc.
		<b>Total out of 10</b>											
			<b>Staff 1</b>	<b>Staff 2</b>	<b>Staff 3</b>	<b>Staff 4</b>	<b>Staff 5</b>	<b>Staff 6</b>	<b>Staff 7</b>	<b>Staff 8</b>	<b>Staff 9</b>	<b>Staff 10</b>	<b>Form / Method</b>
10	<b>Ask 10 staff members (2 of whom <u>must</u> be RN Div 1 staff):</b> Have you had education and training by any form or method on clinical care?	≥ 12 months = 0 < 12 months but ≥ 6 months = ½ < 6 months = 1  <b>Total value = 1</b>											In- service Education or Seminars, conferences or workshops (Please state)

**Performance Levels:** (100 - 81%) Excellent (80 - 61%) Good (60 - 41%) Marginal (40 - 21%) Poor (20 - 0 %) Unacceptable **Monitoring Tool 2.4 / 1**

**Symbol definition:** ≥ = Greater than or equal to. ≤ = Less than or equal to > = Greater than < = Less than

**Pre – determined acceptable level of performance** (e.g. 80%) = .....

Data reliability and validity verified by:.....

**Please note: This is an Observational Audit. This audit must be done as discreetly as possible to ensure resident's dignity is respected.**

Resident code												
	Y/N											
1. Is this resident suitably dressed?												
2. Is this resident's eyes clean?												
3. Is this resident's eyes free of infection?												
4. Is this resident's face clean?												
5. Is this resident's hands and fingernails clean?												
6. Is this resident's ears free of wax?												
7. Is this resident well groomed?												
8. Is this resident wearing appropriate foot wear?												
9. Does this resident seem to be in a comfortable position?												
10. Is this resident receiving social interaction on a regular basis from staff?												
11. Is this resident's privacy and dignity being respected?												
12. Is this resident addressed by his or her preferred name by staff?												
Total 'Yes' 												

Data Collection Tool 2.4 / 2

## 2.4 Clinical Care Outcome: - Action Plan

Facility Name:..... Analyst's Name:..... Date: .....

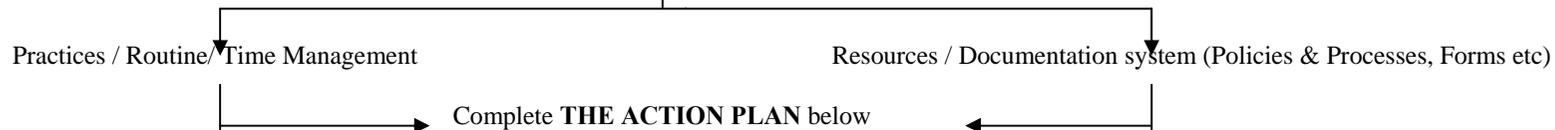
Population size:..... Sample size (N):..... How did you choose the sample? (Eg. Random or 1-10 bed or room order or target):.....

Is the information collected through the indicators adequate to monitor the process of this outcome? (*Please circle*) **YES** **NO**

If **“YES”** Complete the action plan below – 1. What indicators need to be standardised to control the process (PDSC\*\*\* Cycle). 2. How to standardise the process. 3. Set the re-audit date.

If **“NO”**:

Determine what we need to improve and how- (PDCA\* or PDSC\*\*Cycle)



Indicator No/s	Are the results within acceptable levels? Results & Y / N	The Action Plan (Standardise the process or take action/s) What action/s could be taken to further improve this indicator? Review survey / audit questions and determine activities and then prioritise.	Action/ s to be taken by whom	Action / s to be taken by when	Set re – audit date.	Set new Acceptable level of improvement

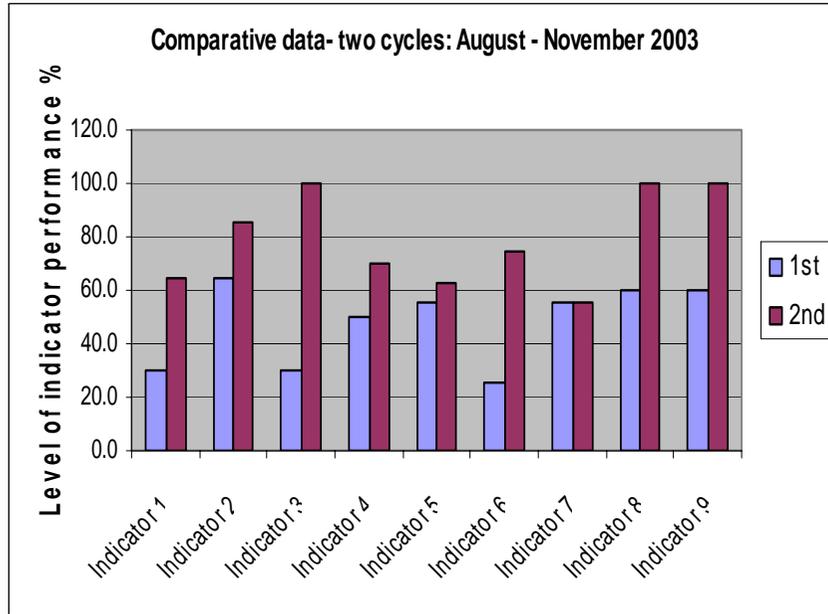
\* PDCA = Plan Do Check Act Cycle – 4 to 6 weeks / \*\* PDSC = Plan Do Check Standardise Cycle – 6 to 8 weeks / \*\*\*PDSC = Plan Do Standardise Check Cycle = 8 to 12 weeks or up to 24 weeks.

A sample of Improvement Indicator© Monitoring & Measuring system: Data Presentation- Clinical Care Outcome 2.4

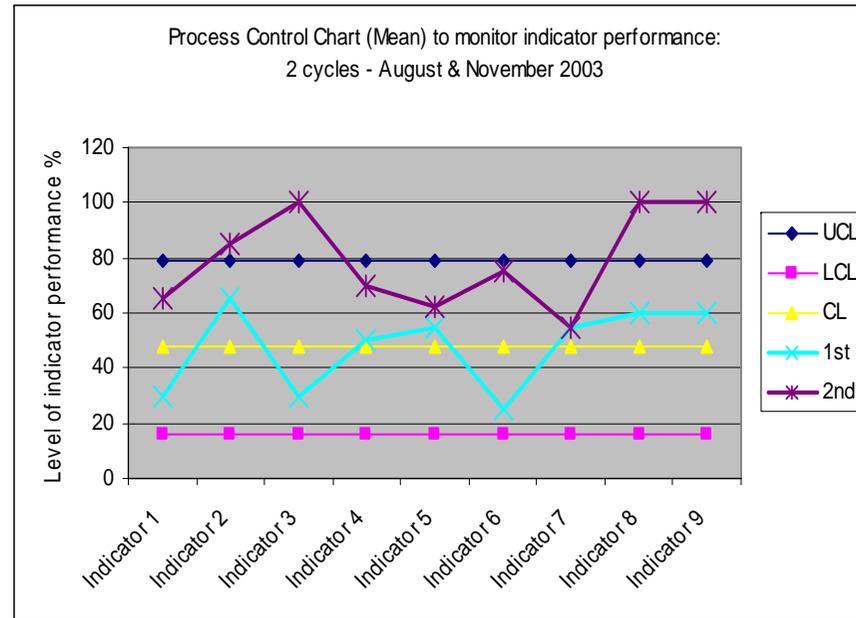
Indicators	1st	2nd	Mean	SD	UCL	LCL	CL
Indicator 1	30.0	65.0	47.5	17.5	79	16	48
Indicator 2	65.0	85.0	75.0	10	79	16	48
Indicator 3	30.0	100.0	65.0	35	79	16	48
Indicator 4	50.0	70.0	60.0	10	79	16	48
Indicator 5	55.0	62.5	58.8	3.8	79	16	48
Indicator 6	25.0	75.0	50.0	25	79	16	48
Indicator 7	55.0	55.0	55.0	0	79	16	48
Indicator 8	60.0	100.0	80.0	20	79	16	48
Indicator 9	60.0	100.0	80.0	20	79	16	48
Mean	47.8	79.2	48	15.7			

# Improvement Indicator<sup>®</sup> Monitoring & Measuring system: Presentation of Results- Clinical Care Outcome 2.4

## Understand the difference



Pretends to be process controlled



Illustrates actual – process is not controlled

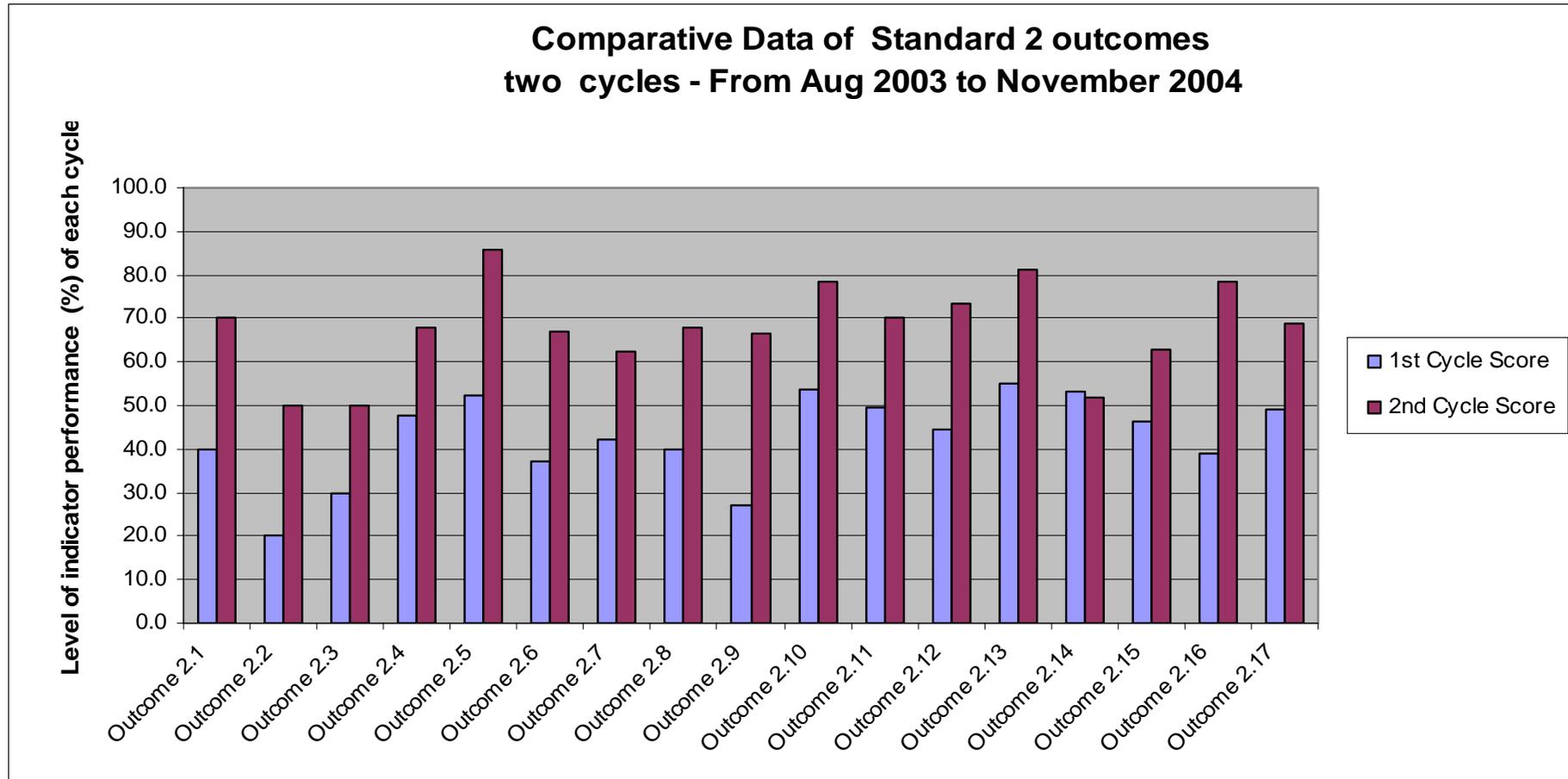
# Improvement Indicator<sup>®</sup> Monitoring & Measuring system: Data Presentation- Standard 2 Outcomes

1 <sup>st</sup> Cycle						
Outcome	Scores	CL	UCL	LCL	SD	Cp
Outcome 2.1	40	43	56	29	9.6	0.48
Outcome 2.2	20	43	56	29	9.9	0.46
Outcome 2.3	30	43	56	29	8.2	0.56
Outcome 2.4	47.5	43	56	29	7.6	0.61
Outcome 2.5	52.5	43	56	29	7.8	0.59
Outcome 2.6	37	43	56	29	7.8	0.59
Outcome 2.7	42	43	56	29	7.8	0.59
Outcome 2.8	40	43	56	29	8.1	0.56
Outcome 2.9	27	43	56	29	8.4	0.55
Outcome 2.10	53.5	43	56	29	5.4	0.85
Outcome 2.11	49.5	43	56	29	5.3	0.86
Outcome 2.12	44.5	43	56	29	5.7	0.81
Outcome 2.13	55	43	56	29	6.1	0.76
Outcome 2.14	53	43	56	29	5.4	0.85
Outcome 2.15	46.5	43	56	29	4.4	1.05
Outcome 2.16	39	43	56	29	5.1	0.91
Outcome 2.17	49	43	56	29	4.5	1.03
<b>Average</b>	43				6.9	0.71

2 <sup>nd</sup> Cycle						
Outcome	Scores	CL	UCL	LCL	SD	Cp
Outcome 2.1	70	68	84	51	10.0	0.55
Outcome 2.2	50	68	84	51	10.3	0.54
Outcome 2.3	50	68	84	51	9.6	0.58
Outcome 2.4	68	68	84	51	8.4	0.66
Outcome 2.5	86	68	84	51	8.7	0.63
Outcome 2.6	67	68	84	51	7.8	0.71
Outcome 2.7	62.5	68	84	51	8.1	0.68
Outcome 2.8	68	68	84	51	8.2	0.68
Outcome 2.9	66.5	68	84	51	8.6	0.64
Outcome 2.10	78.5	68	84	51	9.0	0.61
Outcome 2.11	70	68	84	51	9.1	0.61
Outcome 2.12	73.5	68	84	51	9.8	0.56
Outcome 2.13	81	68	84	51	10.6	0.52
Outcome 2.14	52	68	84	51	9.7	0.57
Outcome 2.15	63	68	84	51	6.5	0.85
Outcome 2.16	78.5	68	84	51	5.8	0.95
Outcome 2.17	69	68	84	51	0.8	6.83
<b>Average</b>	68				8.3	1.01

# Improvement Indicator<sup>©</sup> Monitoring & Measuring system: Data Presentation- Standard 2 outcomes

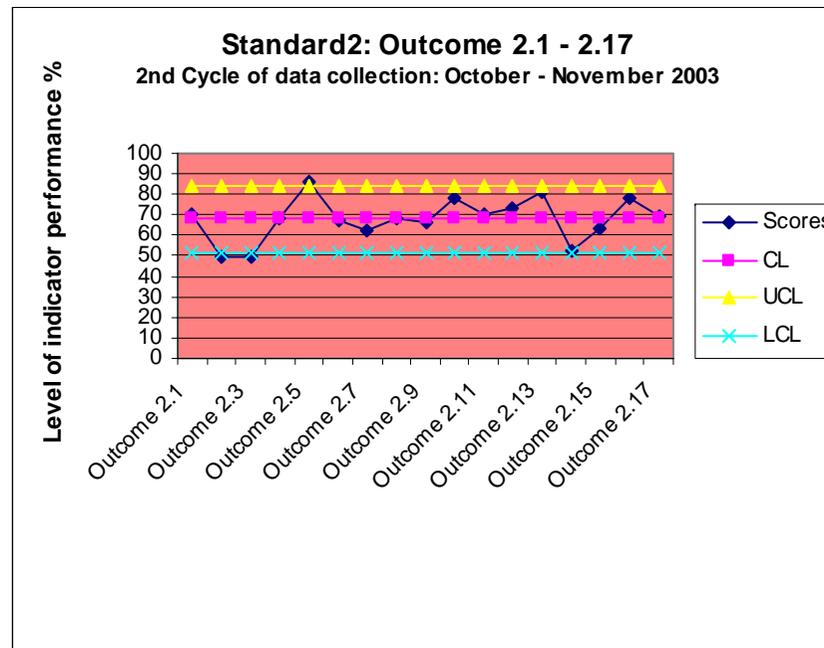
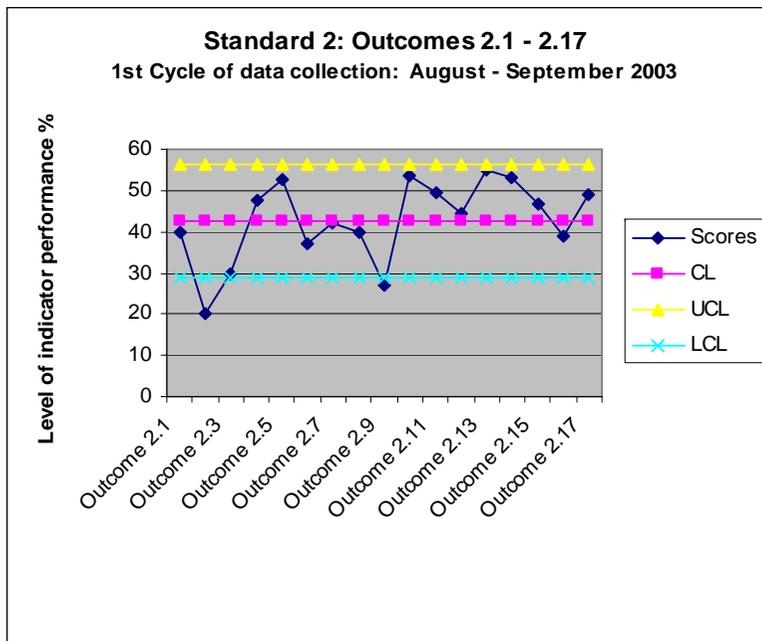
Unable to identify process variation



# Improvement Indicator<sup>©</sup> Monitoring & Measuring system:

## Presentation of Results- Standard 2 outcomes

Identify the process variation

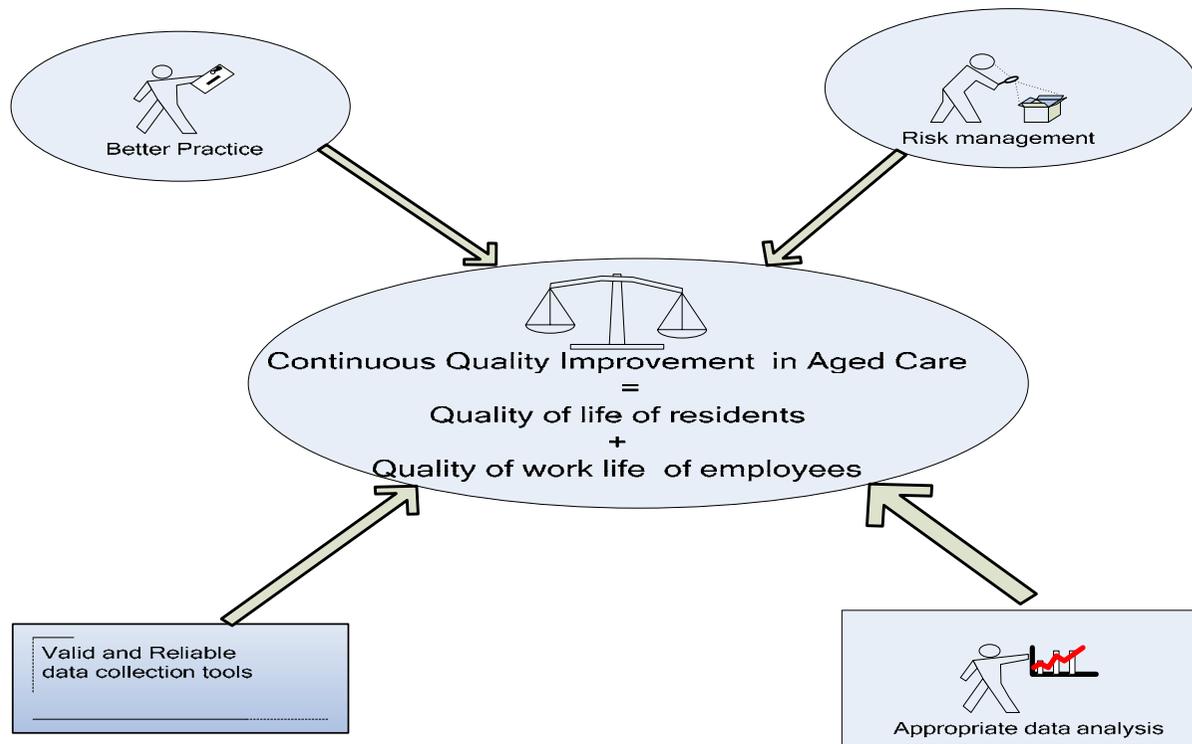


# Improvement Indicator<sup>©</sup> Monitoring & Measuring system:

Provides many statistical analysis options

t-Test: Paired Two Sample for Means		
	1st Cycle	2nd Cycle
Mean	57.24	71.5
Variance	324.70	381.1
Observations	16	16
Pearson Correlation	0.38	
Hypothesized Mean Difference	0	
df	15	
t Stat	-2.7	
P(T<=t) one-tail	0.01	
t Critical one-tail	1.75	
P(T<=t) two-tail	0.02	
t Critical two-tail	2.13	

z-Test: Two Sample for Means		
	1st Cycle	2nd Cycle
Mean	57.2	71.5
Known Variance	324.7	381.1
Observations	16	16
Hypothesized Mean Difference	0	
z	-2.1	
P(Z<=z) one-tail	0.02	
z Critical one-tail	1.6	
P(Z<=z) two-tail	0.03	
z Critical two-tail	2.0	



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