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OBSTACLES TO THE IMPLEMENTATION OF LEAN PROCESS IMPROVEMENTS AT PRIMARY HEALTH CARE CENTRES IN SOUTH AFRICA

A research report submitted by Uthestra Chetty

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Declaration

I, Uthestra Chetty, declare that this research report is my own work except as indicated in the references and the acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Masters of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

X

Uthestra Chetty

Abstract

South Africa's public health care has changed significantly since changing leadership in 2009. Since then 'PHC Re-engineering' has been identified as a key step in providing efficient and equitable public health care. Almost simultaneously, Lean management has grown in popularity in both public and private health care due largely to research conducted in the US and UK. In particular, Lean process improvements have provided rapid yet isolated results. The study is therefore significant in its potential to investigate an aspect of a possible solution to a current problem. Specifically, the study seeks to identify obstacles to implementing Lean process improvements in South Africa.

An inductive approach was adopted using qualitative research centred around a single case study of a process improvement workshop at a PHC facility in Gauteng. There were multiple sources of data, however, the mainstay was twelve individual interviews from three groups of respondents, providing multiple perspectives on the same experience. Data was gathered and then analysed using qualitative data analysis software.

The findings show a great degree of congruency with international research findings, but also reveal South African experiences in the primary health care environment. The obstacles can be grouped into those arising from the environment in which the implementation took place and those related to the type of implementation. There were no obstacles related to Lean itself.

The study finds that although there were several challenges, the overall experience with Lean was positive and that the obstacles identified can all be addressed to improve the success of the implementation. The study thus recommends the continued use and experimentation with Lean to address South African primary health care challenges.

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1. CHAPTER 1: INTRODUCTION

1.1. Purpose of the study

The purpose of this research is to identify those factors that obstruct the implementation of Lean process improvements in Primary Health Care (PHC) clinics in South Africa.

1.2. Context of the study

Having survived what was regarded as the unscientific and controversial approach to health care of the late health minister, Dr Manto Shabalala Msimang, South Africa's new administration has provided a new leader in health minister, Dr Aaron Motsoaledi (Mayosi et al., 2012). Since 2009, his evidenced-based approach has been welcomed by the scientific community, prompting the Lancet, an international peer reviewed medical journal, to collaborate with leading thinkers from South Africa's academic institutions and review the current state of SA's healthcare system. This resulted in a series of articles that pointed out the immediate and latent challenges, as well as outlining possible solutions. The series was launched by the new health minister (Mayosi et al., 2012). Some of the challenges mentioned in the series are:

- Colliding epidemics. South Africa's health care system is currently faced with four colliding epidemics, which include: HIV and TB, chronic disease and mental disorders, high levels of interpersonal violence; and most sensitive of all, high maternal, neonatal and child morbidity/mortality (Mayosi et al., 2012).
- National Health Insurance. South Africa's skewed economy is reflected in its health care landscape, resulting in two very different camps: firstly, the under resourced and overburdened public health care system sector; and secondly, the well-resourced and expensive private health care system 'Resources' in this context include 'human resources' resulting in doctors and nurses being in high demand at the public facilities. Dr Aaron Motsoaledi proposes to address this inequity with universal coverage through the National Health Insurance policy, but in order for this to work, the PHC facilities have to be improved to a more widely accepted standard

that facilitates community-based educational and preventive services which would relieve the burden on hospitals (Mayosi et al., 2012).

- Millennium Development Goals (MDG's). The millennium development goals essentially represent South Africa's involvement with the global community in addressing worldwide health issues. The MDG's were established in 2000 and had eight primary goals, such as reducing child mortality, improving maternal health and combating HIV/AIDS (Waring & Bishop, 2010). The goals therefore also address current epidemics in South Africa and were meant to be reached in 2015, but a study in 2009 showed that SA was unlikely to accomplish these goals (Chopra et al., 2009).

What is important to note from the Lancet series of articles is the repeated mention of 'Primary Healthcare (PHC) re-engineering' as a means of addressing many of these issues. The reason for this is because PHC clinics are often the first port of call for the majority of patients utilising the public sector health system as well as having a broader and deeper reach to engage with patients. Therefore, improving the management or functioning of PHC clinics offers a chance to bring both therapeutic and preventative medicine to the largest number of South Africans, especially those living in rural communities, labour camps and urban squalor (Naledi, Barron, & Schneider, 2011). In addition, patients who require continued treatment after being stabilised at hospitals are frequently 'down-referred' to clinics. These include many patients that constitute the bulk of the 'colliding epidemics' such as TB and HIV patients, chronic diseases and psychiatric patients. Therefore, whether it is for initial treatment, continued treatment or just for community education/ outreach, PHC clinics will have a pivotal part to play in the healthcare system that is envisaged for SA in the near future (Mayosi et al., 2012).

1.3. Problem Statement

To identify obstacles to the implementation of Lean process improvements in Primary Health Care (PHC) clinics.

1.4. Significance of the study

There has been research done regarding the use of Lean in South Africa, but they have mostly been at the level of Tertiary Hospitals, especially emergency departments. This study supplements the knowledge of Lean as it reviews it at the primary health care (PHC) level where it may be of great benefit to forthcoming PHC re-engineering. It was rolled out in a series of workshops in 2013. The approach is therefore retrospective and focuses on qualitative, experiential data from those who were actually involved in the project. This is in keeping with Lean philosophy where the input of those 'who do the work' is prioritised (Bhasin & Burcher, 2006). In 2013, the Department of Health (DoH) contracted the Anova Health Institute (AHI) to assist them in improving their PHC systems. The AHI in turn contracted the Lean Institute Africa (LIA) to hold a series of workshops introducing Lean through 'Introduction to Lean Workshops' (ITLW) and 'Rapid Process Improvement Workshops' (RPIW). Therefore the focus of this research will be 'Lean Process Improvements'. The workshops occurred across a number of clinics in two neighbouring provinces, Gauteng and Limpopo, during the period March 2013 - December 2013. This study revisited one of those clinics and attempted to identify factors, if any, that had obstructed the implementation of the Lean process improvements. By interviewing the three groups involved, namely the LIA, Anova and the PHC centre staff, it was hoped that a holistic, multifaceted picture may be produced.

As argued earlier, this could be of great importance considering the intended PHC re-engineering. If there are factors that, if removed, could improve the implementation of Lean at PHC centres, then we may be closer to finding an enduring solution to a complex problem.

1.5. Delimitations

In designing this research, parameters such as time constraints, experience and access to data needed to be considered. This necessitates a narrowing of the scope of the study to an appropriate level including:

- Only the obstacles affecting the implementation of Lean.

- This research is based on a rollout to PHC clinics. The focus, therefore, is on PHC and the information would unlikely be relevant to hospitals.
- Of the eight clinics involved in the workshops, only one was visited.

1.6. Definition of terms

- Andon: A subset of Visual Control management which is used to signal abnormalities with the production process or to identify deviations between the desired pace of the work station and Takt time requirements.
- Kaizen (Continuous Improvement): From the Japanese word meaning 'virtuous circle', meaning small step changes in performance as a result of continued analysis and process changes to improve the efficiency and effectiveness of production or administrative activities.
- Kanban: From the Japanese word meaning 'ticket' and referring to the information cards used to trigger the removal and manufacturing of replenishments within a manufacturing system.
- Lead Time: The total time a piece of material resides in the production to finished goods.
- Poke-yoke (Error proofing): The design of processes and devices which prevent the creation of errors and defects through physical means.
- 5S: A tool for arranging a workplace so that "there is a place for everything and everything is in its place" (Machado & Leitner, 2010). The S's stand for; Sort-Straighten-Scrub-Standardise and Sustain.
- Gemba Walks: When management regularly tours the work area with the frontline staff. There are several objectives for this walk.
- Just-in-time: The generic name given to the logistics of the Toyota Production system, as opposed to the Lean enterprise, which covers the production, management and supply chain processes.

- PDCA (Plan-Do-Check-Act) cycles: The cycle of experimentation for testing out possible solutions/countermeasures for identified challenges.
- Standardised Work: The codified and visual documentation, written by operators and specialists, to assist learning and the conduct of repetitive operations.
- Takt time: The rate of production needed to equal the average rate of product sales to customers. This calculation is used to ensure flow processes are performing effectively or that buffers are being replenished at the desired rate.
- Cycle time: The amount of time necessary to complete one cycle of a process.
- Changeover time: Is the time between processes/services when nothing of value is happening.
- Value Stream: The internal activities which must come together to produce an output.
- Value Stream Mapping (VSM): A portfolio of techniques used to visualise and diagnose the current status and future portfolio improvements within and beyond the factory. Essentially, management techniques for operations system design purposes.
- Visual Control: An approach to visualising the status of a process and to make deviations in the performance readily identifiable without the need for specialist training.

(Rich, Bateman, Esain, Massey, & Samuel, 2006; Zidel, 2006)

1.7. Abbreviations

- PHC: Primary Health Care
- QI: Quality Improvement
- CI: Continuous Improvement
- PI: Process Improvement
- BPIM: Business Process Improvement methodologies

- NPM: New Public Management
- TPS: Toyota Production Systems
- TQM: Total Quality Management
- AHI: Anova Health Institute
- LIA: Lean Institute Africa
- VSM: Value Stream Mapping
- DoH: Department of Health

1.8. Assumptions

The assumptions that could have potentially affected this research include:

- The workshops successfully introduced Lean to the clinics. All correspondence with AHI and LIA so far suggested that this was a reasonable assumption.
- The Lean Process Improvement Tools continued to be used post-workshop. All correspondence with AHI and LIA so far suggested that this was a reasonable assumption.
- There were identifiable obstacles to implementing Lean.
- The interviewees were able to recognise these obstacles.
- The interviewees were willing to openly discuss the topic with the researcher. All efforts were made to ensure compliance and clearance with relevant authorities to reassure interviewees.

2. CHAPTER 2. LITERATURE REVIEW

2.1. Introduction

In order to fully understand this topic, it is necessary to adopt a holistic approach to the literature review. A brief history of Quality Improvement (QI) in Health care helps us to understand how we came to use Lean and why it is appropriate. QI can be considered to be the broader context under which we view Process Improvement (PI) and Continuous Improvement (CI) endeavours. Following that, we then unpack the concept of Lean itself. Because Lean is a dynamic concept with no standardised definition, it is valuable to trace the evolution of Lean from the Toyota shop floor to health care before reviewing what the current literature says about the practical experiences of implementing Lean in healthc are settings.

2.2. New Public Management (NPM) vs Quality Improvement (QI)

Quality Improvement in health care has borrowed much from the quality improvement methods used in the industrial sector. From as early as the 1940's, Joseph Duran, an expert in industrial quality, recognised the similarities between the scientific method used in clinical decision-making and the approach to systemic process improvement by comparing the diagnostic journey to the remedial journey (Cummings & Worley, 2014; Juran & Riley, 1999).

Table 1: Diagnostic vs Remedial journey (Juran & Riley, 1999)

Project Definition and organization	List and prioritise the problems
	Define project and team
Diagnostic journey	Analyse symptoms
	Formulate theories of causes
	Test theories

	Identify root causes
Remedial journey	Consider alternative solutions
	Design solutions and controls
	Address resistance to change
	Implement solutions and controls
Holding the gains	Check performance
	Monitor control system

The transference of quality improvement methods used in industry thus became more acceptable conceptually. Decades later, Plsek (1999) acknowledges this beginning and identifies other tools transferred from industry(Curtis et al., 2006). Firstly, more basic tools such as flow-charts, data-collection and graphical data-analysis. Secondly, and more important to this discussion, are the concepts of 'Rapid Cycle Improvement' and 'Benchmarking', both of which are important to Lean, although under different terminology. 'Rapid Cycle Improvement' is similar to 'Rapid Improvement Event' (RIE)', 'Kaizen Blitz' or the 'Rapid Process Improvement Workshop (RPIW) studied here. 'Benchmarking' is now also referred to as 'Grasping the situation' or 'Understanding the current state' and involves the use of data (or metrics) to ensure that the success or failure of the project can be objectively assessed and measured (Machado & Leitner, 2010; Shook, 2010). Plsek (1999) concluded with four habits he believed were essential to the health care industry to adopt which include:

- view clinical practice as a process (this is crucial for the use of Lean)
- use evidence-based practice (termed 'evidenced-based medicine' in health care)
- collaborative learning (an integral part of Lean thinking)
- embrace change (similar to Continuous Improvement)

(Plsek, 1999)

What is important to note here is that the relevance of Lean's underlying principles to the health care industry was established over a decade ago in the research of 'Quality Improvement in Health Care'. The role of quality improvement in strengthening health care systems in developing countries, such as South Africa, was re-emphasised recently as a key driver in the WHO Health System Framework (see figure 1).

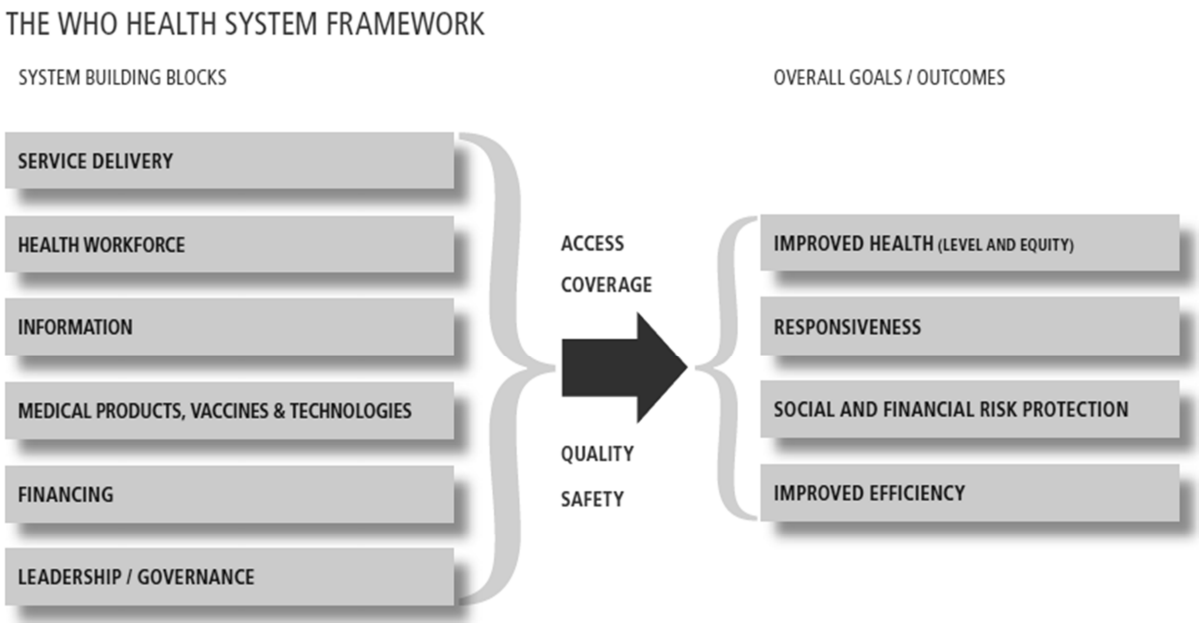


Figure 1: WHO Health System Framework (Organization, 2007)

The journey of QI continued into the public health sector in the 2000's with the adoption of private sector practices, termed Business Process Improvement Methodologies (BPIM), under the banner 'New Public Management'. A recent review of the literature of the BPIM utilised in the public sector in the UK showed that 51% of papers focused on Lean, with 35% focused on health care (Radnor, 2010). Lean has thus enjoyed greater popularity over alternative BPIM's such as Total Quality Management (TQM) and Six Sigma. It should be noted, however, that hybrid versions that attempt to correct for Lean's shortcomings in health care do exist, such as Lean Six Sigma (Koning, Verver, Heuvel, Bisgaard, & Does, 2006) and SimLean (Robinson, Radnor, Burgess, & Worthington, 2012).

2.3. Lean

The literature is awash with varying definitions and understanding of what constitutes Lean. This seems to be because Lean itself has developed over several decades and within different industries. There does, however, seem to be a consensus as to its origins and founding principles.

2.3.1. Defining Lean

The journey of Lean Management as we know it today, has been decades long. It was first developed by Taiichi Ohno on the shop floor of the Toyota engine assembly section during the 1950's. At this stage, it was called the Toyota Production System (TPS). TPS had three important concepts described in three Japanese words: Muda, Muri and Mura (Radnor, Holweg, & Waring, 2012). Muri refers to the strain or injuries that a worker might feel from the work he performs. This is considered a substantial reason for absenteeism. The concept is thus to ensure that working conditions are optimised for the worker to improve job satisfaction. Mura relates to 'unevenness', especially in demand. The concept of Mura argues that the stabilisation of demand will allow for stabilisation and optimisation of processes. Muda, or waste, is arguably the most important. In order to understand waste, one must first understand value. The very first step of TPS was to first have a firm grasp on what was considered to be of value, thereafter. Everything else was considered waste and the removal of it from all processes was the most important step for creating value (Radnor et al., 2012; Zidel, 2006). This was in stark contrast, at the time, to the Western manufacturing philosophy of 'cost reduction' (Zidel, 2006). So important to the TPS was the concept of waste removal that they defined seven different categories of waste (see table 2 for those categories with health care examples) and actively involved all employees in the identification and removal of it. The pursuit of waste was a revolutionary step in manufacturing as subsequent research has shown that in any given process, the number of wasteful steps (i.e. Non value adding steps), often outnumber the value adding steps by a ratio of 9:1 (Fillingham, 2007). The take-home message is that "going after waste", all seven categories of it, is a much more effective way to improve a process without the need for additional investment.

Table 2: Categories of Waste (Z. J. Radnor et al., 2012)

	Original Categories of Waste	Health care examples
1	Transportation	Unnecessary movement of patients
		Of commonly used equipment
2	Inventory	Excess stock in storerooms
3	Motion	Unnecessary movement of staff looking for stationery, medical supplies and equipment
4	Waiting/Delay	For doctors to discharge patients
		Patients waiting to be diagnosed and treated
5	Overproduction	Unnecessary laboratory tests
6	Over-processing	Duplication of patient information
7	Defects	Medication errors
		Incorrect processing of laboratory and radiology tests

The results saw Toyota become a considerable threat within the automotive industry making the western manufacturing world take notice. Later, a comparative study at Massachusetts Institute of Technology (MIT) revealed the competitive advantages that TPS provided. This study culminated in the landmark book “The Machine that changed the world” in 1990 (Jones, Roos, & Womack, 1990; Prahalad & Hamel, 2006). It was in this book that the term ‘Lean’ was coined and the concept arose of transferring Lean manufacturing technology to any industry that involved a process, since the issues surrounding them would be universal (Jones et al., 1990; Prahalad & Hamel, 2006). The same authors took the idea further and in 1996, Womack and Jones included the focus on creating

value *as determined by the customer* as central to Lean ideology (Hines, Holweg, & Rich, 2004; Womack & Jones, 1996). This affected their focus on removal of waste as well, since it was now the customer who determined what waste was by determining what value was. Lean therefore sought to determine value through the customer and then divide all activities into “Value-adding” and “Non-value adding” (or waste). Non-value adding activities were then further divided into type 1: wasteful yet necessary activities, and type 2: wasteful and unnecessary activities. The goal was therefore to completely remove type 2 and limit type 1 (Zidel, 2006). Furthermore, it was in this publication that the five basic principles, that still guide the world’s understanding of Lean today, were formulated.

1. Identify the customer value.
   That is, do your best to understand how the end customer defines value and seek to provide that value, how and when it is desired by the customer.
2. Identify the value stream for that product.
   Value Stream Mapping (VSM) refers to the identification of all the steps involved in providing a finished product or a service to a customer, i.e. outlining the entire process of providing value. The focus then becomes the removal of all waste from the value stream.
3. Create Flow.
   Within the value system, every effort should be made to ensure that the amount of delay between individual steps of a value stream is reduced to prevent backlog. An important term to understand here is “batching”. Batching refers to the idea of accumulating pools of similar work and processing it all at one time. It is a commonly seen practice in the health care industry and is often for the convenience of the worker, not the customer (or other employees for that matter who are forced to wait for backlogs to clear in order to continue their work). The creation of continuous flow within the value stream is an effort to remove one of the greatest wastes from the process: Delay/Waiting.
4. Create a Pull mechanism.
   The Japanese term for this is ‘Kanban’ which literally means signal cards. Cards are used to signal upstream to preceding steps when downstream

steps are ready to receive. Essentially this allows the customer to provide the first signal of demand for the product/ service, avoiding unnecessary build-up of finished goods necessitating inventory management (which is waste in Lean management).

5. Continuous Improvement (CI).

   The Japanese term for this is Kaizen and is the creation of a culture of striving to continuously improve processes, usually by constantly searching for waste. It is considered more a journey of small improvements than a step change. The lean method argues that the cumulative effect of small changes outweigh the more resource-demanding step change approach. CI is more a philosophy of Lean than a tool and requires an attitude that needs to be adopted by shop floor employees. It is important to note here that the sustainability of PI's, largely requires a culture of CI.

(Hines et al., 2004; Womack & Jones, 1996; Womack, Jones, & Roos, 2008)

The abovementioned five principles, combined with the tools that were first used in the TPS, provide a picture of what Lean looked like by the early 2000's. It is important to note that 'Lean' is a broad term encompassing a number of concepts. These concepts include the aforementioned Lean Tools used towards Lean Process Improvements along with Lean Management and Lean Thinking/Culture; all of which are interrelated and often overlap.

In 2010, Machado and Leitner analysed 24 case studies of Lean transformations in health care. From this, they were able to describe which lean tools were most used in health care, as well as outline the Lean transformation process (Machado & Leitner, 2010).

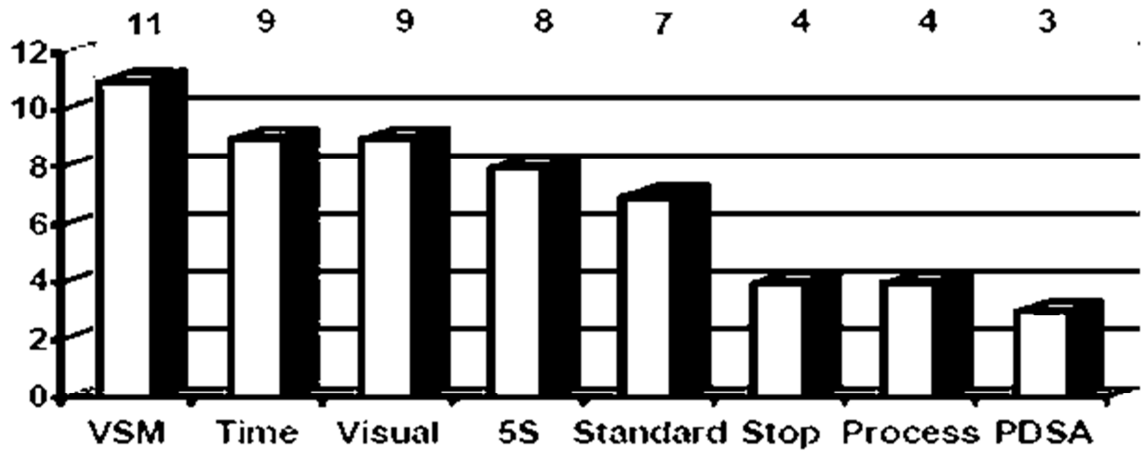


Figure 2: Occurrence of Lean Tools (Machado & Leitner, 2010)

This bar chart shows us that the visual forms of lean are found to be effective in the health care environment. The top five tools are significantly more popular than the remaining three. Value Stream Mapping, which is an expanded process flowchart to include all the processes involved in a patient's pathway, is considered by some as the primary analytical tool in a Lean transformation (Koning et al., 2006). It identifies not only the patient flow but the associated flow of materials and information; as well as increases the staff's understanding of the patient experience from start to finish. Time measurements are often used in VSM to help track individual steps. These include:

- Cycle time: This is the amount of time necessary to complete one cycle of a process.

- Takt time: This is the rate of production needed to equal the average rate of product sales to customers. This calculation is used to ensure flow processes are performing effectively or that buffers are being replenished at the desired rate.

- Changeover time: This is the time between processes/services when nothing of value is happening.

Visual Management is linked to the 5S method of organising the workplace. Colour coding, labels and signs help eliminate confusion as to the location of information and materials. This improves flow and helps in identifying problems. Also, the use of sign boards called 'Kanban' signal developments within a process

such as the beginning or end of a particular step, or even when materials need to be replenished. 5S, when translated into English stands for ‘sort, straighten, scrub, standardise and sustain’. This has been used to organise work stations to ensure ‘a place for everything and everything in its place’. Standardisation is the tool the Lean uses to reduce the level of variability in the workplace; whether this is in a particular process or the overall flow of materials and information. Once every step of every process is defined, guidelines and checklists are developed to quantify them. In Lean thinking, it is argued that greater variability leads to defects, reworks and can also jeopardize safety. Especially in health care, it is thought that standardisation helps to achieve a level of consistency in an environment known for being erratic and unpredictable. It has been postulated that the uncommonly used tools need only be adapted to deal with the high level of variability in the service orientated health industry (Radnor, Walley, Stephens, & Bucci, 2006).

Lean Thinking incorporates all the basic principles mentioned above, but adds ‘problem-solving’ and ‘continuous improvement’ at all levels as a fundamental property (Ballé, 2005). All employees are tasked with identifying problems and offering possible solutions. This is sometimes referred to as ‘creating thinking people’. This leads to rapid identification of problems, creates a sense of empowerment amongst staff and provides solutions that are most often very practically-based. Lean thinking also advocates ‘continuous learning’ which is in line with the concept of ‘continuous improvement’ (Bhasin & Burcher, 2006). Lean Culture is the entrenchment of such thinking within the organisation where it becomes the norm (Radnor, 2011).

Lean Management is predominantly the discussion around ‘how’ to create an environment where such a culture can proliferate. Toussaint and Berry (2013) outline six important principles that are essential to the dynamic of Lean management.

1. Lean is an Attitude of Continuous Improvement: The basic unit of experimenting with possible measures to improve a process is the PDCA (Plan, Do, Check, Act) cycle. Managers are asked to relinquish the role of

'Master Problem Solver' and rather mentor staff to engage in this process until they are confident and willing to start tackling process improvement projects on their own. Staff members soon start to witness the positive changes to their own work environment that they have brought about. This positive feedback re-enforces both the Lean methods as well as the culture of Continuous Improvement.

2. Lean is Value-creating: The primary goal of lean is to create or maximise value for the customer. By promoting tools such the Value-stream mapping (VSM), managers promote the identification of value and the understanding of the value chain for staff, staff thus learn to actively seek out anything that is not of value, i.e. waste, the rooting out of waste from processes being a central tenet of Lean.
3. Lean is Unity of Purpose: Another aspect often left out of Lean implementations is the link to strategy. The strategic aspects of Lean thinking have been noted as being overshadowed by the operational aspects (Hines et al., 2004). However, individual Lean projects are meant to fit into a strategic framework so that staff at different levels and from different departments all feel that they are working towards the same goal and understand their individual role within the organisation.
4. Lean is Respect for people: In terms of management, Lean differs from the typical top-down approach where senior managers tell lower-level staff what to do and how and when to do it. Instead, Lean invites and prioritises the bottom-up flow of feedback and ideas. This means that it is often the managers who have to adapt most to Lean by adopting this upside down leadership model. Lean requires managers to trust and support frontline staff to offer and implement solutions to their own problems. This requires managers to have the respect for staff ability and commitment to improve the standard of work. This is, however, a planned process. Managers must be the mentor initially, and then withdraw into a role as accountability officer.
5. Lean is Visual: Tools like the A3 method and VSM highlight the very visual nature of Lean. A VSM, for example, serves to provide real time information about the state of processes while serving as a central meeting

point for scheduled and impromptu meetings. The information is continuously updated to reflect changes. Managers utilise these methods not only for process efficiency, but to symbolise a culture of transparency.

6. Flexible Regimentation: One central pillar of Lean is the desire to standardise processes. Initially a problem area is first addressed by analysing the root cause. Once this is done, the process is re-designed to remove the issues in an effort to improve performance which then invites further attempts to continuously improve the process through PDCA cycles.

(Toussaint & Berry, 2013)

Lean Management thus promotes an environment where there is a constant drive to root out waste; and where all levels of staff possess a sense of responsibility toward leadership and decision-making. It differs from the typical authoritative style of management and promotes a collaborative style with staff at all levels and all departments (Ballé, 2005). The manager thus becomes less of an enforcer and more of a facilitator. Initially, the manager is more of mentor, explaining Lean and using regular meetings and Gemba walks to drive home the concepts. Later on, the manager facilitates the staff's efforts to identify waste/issues and then moves into the roles of 'accountability officer' (Mann, 2010).

2.3.2. Lean in Health care

2.3.2.1. Rationale and mechanisms

As mentioned previously, Lean has expanded out of the manufacturing industry, causing it to develop further as a concept. The first noted foray into health care took place in the US and the UK (De Souza, 2009). So why is Lean so popular in health care? Some believe that Lean is a natural extension of NPM into health care (Radnor et al., 2012), but there are several alternative modalities of NPM available such as Six Sigma and TQM. De Souza (2009), however, believes that the literature shows Lean to be a more sustainable means of achieving results in health care, while Waring and Bishop (2010) believe that Lean resonates with current trends to manage health care. These include the increased standardisation and regulation of clinical practice (Allen, 2009; Harrison, 2002), the re-configuration of clinical practice so that it revolves around the patient and

not the health care professionals, and lastly, the re-stratification of professional groups where clinical leaders are integrated into management roles. Lean's promise of improving quality for patients also appeals to clinicians as it operates in a manner similar to the diagnostic journey.

Financially, Lean is attractive to the policy-makers as it requires no massive investment as is often seen in health care, due to its focus on reducing waste to increase value. Improving staff morale is an additional reason of great value in this notoriously demoralised environment (Zidel, 2006). De Souza (2009) agrees that, after reviewing over 90 works of literature, it is apparent that staff empowerment, along with the concept of gradual and continuous improvement intrinsic to lean, makes Lean more adaptable to health care settings.

Four possible 'mechanisms' have been postulated to explain Lean's recent successes in and suitability for health care. They include:

- Lean's ability to create a 'shared understanding' of the processes involved in creating value
- Lean's desire to make all expectations explicit leads to better error detection and maintenance of agreed-upon standards.
- Lean's involvement of staff to become problem-solvers leads to greater sense of empowerment as they are now invited to offer solutions, thus addressing one of the biggest issues in organizational development - buy-in.
- Lean tools, such as 5S, have been shown to be very useful for organising work spaces to improve efficiency

(Mazzocato, Savage, Brommels, Aronsson, & Thor, 2010)

2.3.2.2. Implementation

How has Lean been implemented in health care thus far? Much of the research done has been in the form of case studies. An attempt was made in 2008 to classify these case studies of Lean healthcare. This produced two categories, namely 'manufacturing-like' and 'patient flow' (De Souza & Pidd, 2008). 'Patient

flow' constituted the central core of the lean health care implementations addressing the flow of patients within patient pathways. 'Manufacturing-like' case studies involved departments such as pharmacy, radiology and pathology which are concerned with the flow of materials and therefore operate similarly to manufacturing plants. De Souza (2009) took this further by reviewing over ninety publications on lean health care to produce a taxonomy that added two more categories: 'Managerial and support' as well as 'Organisational' case studies. Managerial and support case studies involve departments concerned with the flow of information. Organisational case studies focus on the strategic and cultural aspects of implementing Lean across an organisation. Studies here often follow an initial trial implementation followed by a long term structured phase facilitated by senior management. For this to occur, an overarching plan for any Lean transformation is considered very important. This requires the team to adopt a holistic, complete view of the patient care process and to fit those individual Lean tools into the transformation process. Machado and Leitner (2010) analysed the various Lean transformation processes and offer a 'Universal Standard Process'. A transformation process that approaches the hospital/clinic as a single unit is important to avoid the problem of transference, where improving one process inadvertently shifts the strain to other processes.

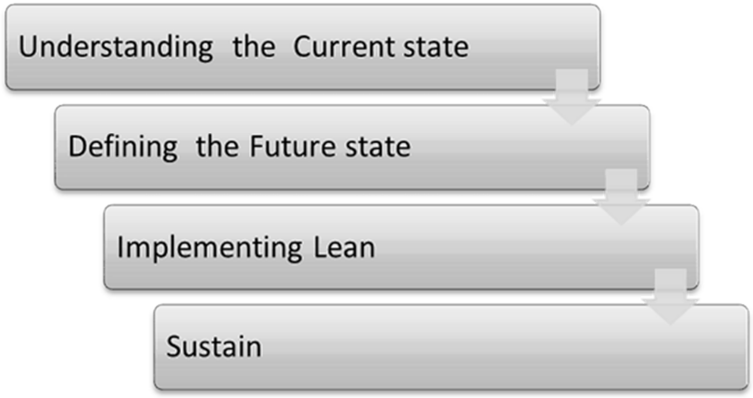


Figure 3: Universal Standard Process (Machado & Leitner, 2010)

The first step of grasping the current state requires that data be collected so that an accurate, objective picture of what is currently happening is prepared. This may include cycle time, costs, failure rate and even a patient satisfaction index (Shook, 2010). This is the benchmarking process from which to measure any

future improvements. All of this is considered along with the VSM where value as specified by the customer is outlined. After identifying value, the goal then becomes to remove all non-value adding activities from the process. Thus, the process without these wasteful steps becomes the future state to which the PI team will strive. In the spirit of continuous improvement, the future state will, at some stage, become the current state and the next future state with less waste will be sought (Shook, 2010). Lean tools, such as the PDCA cycles, are employed to test countermeasures suggested by the frontline staff. It may take several rounds of PDCA cycles to achieve the new state, using the benchmarked measurements as a reference point (Shook, 2010). The final step, often considered the most difficult, is achieving sustainability. It is here that leadership and management support is most critical to ensure that backsliding towards old work habits does not occur. Managers act as accountability officers to facilitate the transition from a project of PI to a culture of CI (Mann, 2010)I.

More recently studies have attempted to analyse exactly how Lean is implemented in health care. Two common patterns are identified, namely an organisation-wide/ system-wide implementation and more focused Rapid Improvement Events (RIE's), which are similar to Kaizen Blitz and Rapid Process Improvement Workshops (RPIW) occurring in three phases: a preparation period, which lasted as long as 2-3 weeks, followed by a 5 day event to identify changes and a 3-4 week follow-up period when changes are implemented (Radnor, Walley, Stephens, & Bucci, 2006). These RIE's employed did not use a wide range of Lean management tools and instead utilised a narrow set of process improvement tools. Radnor (2011) evaluated Lean transformation in three hospitals within the NHS with very similar findings. Radnor, Holweg and Waring (2012) report on four case studies within the NHS to find that these tool-based implementations are usually applied as technical fixes to urgent, specific problem areas producing pockets of quick, short term results without having to challenge existing management structures. The focus therefore is on the operational features of Lean resulting in isolated process improvement, forsaking the development of a culture of continuous improvement within the whole organisation.

By contrast, a ‘full implementation’ would involve a whole systems perspective, where the Lean principles are embedded, and utilise a broad use of tools and a strong link to the overall strategy. It is argued that RIEs are more difficult to sustain because they are not integrated into a strategy and because they have not laid the foundation for a culture of continuous improvement which sustains Lean (Radnor, Walley, Stephens, & Bucci, 2006).

As a response to the criticisms of Lean case studies not containing enough rigorous comparison, a helpful framework for evaluating an implementation was developed (Radnor, 2011). It consists of the following:

1. Definition of Lean: As explained earlier, there is no standard definition of lean and several opinions as to what constitutes Lean. As such, Radnor found it useful to first understand how Lean was conceptualised before embarking on an implementation.

2. Activities undertaken: Within health care, Radnor identified the two patterns of implementation activities; the more discrete, workshop-based Rapid Improvement Events (aka Kaizen event), and the broader, organisation-wide approach.

3. Organisation Readiness: ‘Organisational readiness’ was considered to be defined by the factors which ‘enabled’ the improvement to occur. The absence of such enablers would hinder the successful implementation of Lean. Such enablers included:

    - Understanding the process: For staff to view the journey of a patient through a clinic or hospital as a process and seek to understand and visualise that process as well as their role in it.
    - Understanding Customer requirements: As previously mentioned, this requires an understanding of what is of value to the customer.
    - Use of data: Data relating to the level of demand and the capacity to meet that demand.
    - Engagement of staff: Training staff to work well in teams and to improve their structured problem-solving abilities.

The abovementioned enablers remind public service managers that process improvement requires more than just tools.

4. Sustainability: Sustainability is considered important as it drives home the realisation that a Lean implementation is a long term programme and not a short term fix. There is no definition of sustainability specific to the health care context, however many research papers use the model proposed by Bateman in her analysis of PI activities within the automotive industry (Bateman, 2005). The PI activities had a similar structure to the RIE often seen in health care. It had four stages with a pre-workshop stage, a workshop, follow-up and post-follow-up. In her estimation, sustainability had five classes relative to the various stages of the implementation.

(Radnor, 2011)

Table 3: Classes of PI activities (Bateman, 2005)

Classification	Improvement in Workshop	Maintain new procedure	Close out technical issues	Continuous Improvement
Class A	X	X	X	X
Class B	X	X	X	O
Class C	X	X	O	O
Class D	X	O	X	O
Class E	X	O	O	O

Class A achieved the greatest level of sustainability by managing to achieve process improvement within the workshop, maintaining the PI after the workshop until all the issues identified had been resolved and finally, continuing to improve processes thereafter. The last category of continuous improvement requires that process improvement becomes embedded into the daily/weekly routine. In her

paper, Bateman proposed that the initial improvements could be increased if the enthusiasm and momentum could be built upon. In this way, PI can act as a foundation for CI, however it is noted that 'management sometimes expect CI to evolve out of PI without setting up a process for CI to occur' (Bateman, 2005, p. 273). This differentiation between PI and CI highlights the importance of sustainability as an integral part of a successful implementation. Obstacles to sustainability are therefore obstacles to implementation.

By analysing these Lean implementations using a framework, we are able to establish that there does exist a relationship between the approach taken to implement Lean, the conditions of readiness and the level of service improvement and therefore that a lack of conditions of readiness did negatively affect the level of sustainability and that RIE's were more difficult to sustain (Radnor, 2011).

2.3.2.3. Benefits of using Lean in the Health care setting

Apart from these theoretical possibilities for the increasing use of Lean, there are also the experienced benefits through implementations around the world. Although it is difficult to enumerate all the benefits experienced, Lean has experienced enough success so far to encourage further utilisation and research. What has been observed has been an improvement to both tangible outputs, such as reduced waiting times, increased quality of service by reducing errors and a reduction in costs through maximisation of resources (Wysocki, 2004), as well as intangible outputs such as job satisfaction and customer satisfaction (Radnor & Boaden, 2008). Table 4 provides a brief account of some of the benefits experienced by both private and public health care institutions in various countries.

Table 4: Example of Successful Lean implementations (Fillingham, 2007; Young & McClean, 2008)

Organisation	Methodology	Impact
Scotland Cancer Treatment	Lean	Customer waiting times for first appointment from an average 23 to 12 days and improvement of

		customer flow time for patients of 48%
Royal Bolton Hospital	Bolton Improving Care System (Lean)	Direct savings of £3.1m. Death rate for patients fell by a third. The time taken to process important categories of blood fell from 2 day to 2 hours. Average turnaround time in pathology from over 24 hours to 2-3 hours
Nebraska Medical Centre	Lean principles to redesign the work area in the sterile processing centre and in the clinical laboratories	Reduced staff walking by 167 miles a year. Reduced lab space by 825 sq. ft. and specimen processing turnaround time by 20%. Reduced manpower by 11 FTEs, who were redirected to other critical work. Average length of stay decreased from 6.29 days to 5.72 days
Pittsburgh General Hospital	Lean Techniques	Change to the procedure for intravenous line insertion giving a 90% drop in the number of infections after just 90 days. The new procedures saved almost

			$500,000 a year in intensive-care-unit costs.
Flinders Centre	Medical	Lean Thinking	15-20% more work, fewer safety incidents, same budget, same infrastructure, staff, and technology.

The above-mentioned table is only a small example of the benefits enjoyed by hospitals employing Lean. It is important to note that the above mentioned examples provide measurements to illustrate the improvement. This is due to Lean's objective nature by demanding the use of real data. The table of benefits also highlights the operative focus of the Lean based projects. These bottom line factors (or tangible outputs) do not, however, illuminate the equally important yet intangible improvements in working conditions and of staff morale that comes from being empowered through the process. What is also apparent is that Lean saves lives by improving processes. For example, the drop in rates of infection associated with improved procedures for establishing an intravenous line achieved by Pittsburgh Hospital. The Flinders example, in particular, shows that improvements can be made without additional resources.

2.3.2.4. Obstacles to implementing Lean in the Health care setting?

When considering the successful implementation of a programme, one has to make the distinction between the presence of a factor that impedes success (challenges, barriers and inhibitors), and the absence of a factor that promotes success (enablers) as discussed under 'Organisational Readiness'. This section deals with the former group. The latter group is, however, considered in the study. Although several obstacles have been identified, the literature provides no common framework for categorising these issues nor does it differentiate between those found in RIEs and those found in organisation-wide implementations. Researchers have, however, investigated the barriers to Lean into the public

service sector in general and then more specifically, in the public health care environment.

Radnor et al (2006) evaluated Scottish public services, including health services, and identified the following implementation barriers to Lean thinking:

- Resistance to change: Staff and management were both found to be generally sceptical of change programmes, considering them to be temporary distractions.
- Lack of ownership: Lack of ownership either of current activities or of proposed processes. Ownership of proposed processes post-RIE was specified which links the ideas of ownership and sustainability.
- Leadership failure
- Identity of improvement team members: often made up of those willing to get involved rather than those who should do so.
- Lack of Commitment to the change process: The research showed that senior management commitment provided the improvement programme with the recognition that compelled the frontline staff to fully engage with it. Lack of recognition resulted in lack of attendance and a reluctance to implement.
- Weak link between improvement programme and strategy. It is argued that this link facilitates a deeper appreciation of the importance and relevance of the project.
- Lack of resources to implement change. A particularly important resource was staff time. Staff had to be released from their duties in order to attend the workshops. Even when they were given the time to attend, they were often pulled out of workshops to attend to work issues. Another important resource was that of management consultants experienced with Lean. This was especially important in the introductory stages until the trained delegates were confident enough to continue engaging with projects and staff on their own.

- Poor communication: Overuse of jargon and lack of a clear message to staff as to the importance and relevance of the project not only to their department, but to the hospital as a whole.
- Organisation Culture: The sustainability of Lean required the development of a culture of continuous improvement where staff was willing and able to engage with, and ultimately assume ownership of, change initiatives was considered important.

More recent research has been done on experiences with Lean in the National Health Services (NHS) of the UK and provides us with a table outlining the barriers to adopting Lean, highlighting those in common with the manufacturing sector with those unique to the health care environment (see table 1 in appendices)(De Souza & Pidd, 2011).

Table 5: Barriers to Lean Implementation (Luciano Brandão de Souza & Pidd, 2011)

Barrier	Evidence	Incidence
Perception	Lack of understanding of Lean principles among health care professionals is seen as a barrier.	(H)—Unique to health
Terminology	Introduction of new language is a common issue for implementing lean in any setting. In general, health care professionals responded well to the introduction of new vocabulary and it helped them to shift from old to new practices.	(M and H)—Common
Personal/professional skills of health care professionals	There are intrinsic differences in personal and professional skills between health professional and manufacturing professionals and these differences are seen as a barrier. In the particular case of the NHS, it becomes clear that the fire-fighting mentality acts as a practical barrier	(H)—Unique to health

	to the introduction of lean.	
Organisational momentum	The constant change of strategy for improvement (locally) and governmental policy (nationally) inhibits the continuity of potentially successful programmes.	(M and H)—Common
Professional and Functional silos	The fragmentation of health care into silos (professional or functional) imposes a major barrier to the flow of patients, goods and information and consequently to the implementation of lean techniques in hospitals.	M and H)—Common
Hierarchy and management roles	Cultural issues based on the hierarchy of health care staff and the way management roles are allocated typically become a barrier for any improvement but this is especially important when lean is introduced.	(H)—Unique to health
Data collection and performance measurement	Lean implementation usually reveals problems in data collection and poor performance measures in most aspects of patient care. This often exemplifies the presence of a cultural barrier which is prevalent in health care settings.	(M and H)—Common
Resistance to change/scepticism	Resistance to change is a significant problem in any improvement programme in any organisation. It deserves special attention from those attempting to implement lean manufacturing and since staff empowerment, which is a key issue in the lean theory, is needed for engaging	(M and H)—Common

health care professionals.

Perception as a barrier: The main argument from health care professions is that standardising processes is incompatible because patients and their clinical scenarios are different. This is a misunderstanding of lean, which seeks not to treat each patient the same but rather to group patients who have similar clinical scenarios and thus would enter the same patient care pathways that are guided by protocols that are prevalent in evidence based medicine. Standardisation means to reduce the variation in set activities within those pathways, and not to treat every patient as the same. Because of the often frantic nature of health care work, it would be of benefit to have checklists or algorithms based on protocols so that errors made in haste are reduced. In Lean health care, workers no longer have to rely on their memory during emergencies (De Souza & Pidd, 2011).

Lean terminology is also considered an obstacle, especially when using the original Japanese terms. But lean experts will tell you that the English translations of those words are just as effective. In fact, some experts promote the incorporation of Lean into pre-existing or newly formulated management systems. The only caution is that there should be some level of consistency across Lean terms and concepts (De Souza & Pidd, 2011).

Personal /professional skills of health care professionals: This point argues that managers in health care are chosen for certain abilities, such as problem-solving and ‘firefighting’ skills, and that these approaches to management are the antithesis to Lean. ‘Firefighting’, for example, involves both managers and health care workers being frequently distracted away from PI/QI endeavours in favour of more urgent issues. Lean, in contrast, requires a balance between quantitative and qualitative skills. Health care managers have to learn to move away from firefighting towards more careful, structured analysis. They need to change their

decision-making processes from experience-based to data/evidence-based (De Souza & Pidd, 2011).

Organisational Momentum: This point argues that although continuous improvement programmes require substantial effort in the beginning to get started, including planning, training, etc., they will only achieve success if a *culture* of improvement is adopted. Thus, in order to maintain organisation momentum, it is essential to sustain the improvements made which has occasionally proven to be an obstacle in the public sector where changing policies mean changing programmes (De Souza & Pidd, 2011). Just outside of the organisation, the public health care environment is also marked by political interference and regulatory systems that initially complicate the transference of new management techniques, as well as disrupt the momentum in building a Lean culture (Radnor et al., 2012).

Professional and functional silos: Many hospital and health care practitioners operate in a highly segregated manner, often referred to as professional and functional silos. The silos are for the benefit of the practitioners and not the patient. Lean health care principles support the improvement of the complete care process, from arrival to discharge, rather than a series of disconnected steps. To do this, Lean suggests the formation of multidisciplinary teams with no hierarchy which allows for joint decision making (De Souza & Pidd, 2011).

Hierarchy and management roles: There is a very strong clinical hierarchy within the health care environment which results in dual lines of authority, clinical and managerial, which must be overcome to ensure buy-in of any new system (Young & McClean, 2008). Recent developments in health care have seen health care practitioners being seconded to the role of Lean Manager. This poses a challenge as a good doctor does not always translate well into a good manager. Another obstacle is that managers typically see their role as problem-solvers, especially doctors in that role, however, Lean Management specifically asks the manager to only provide the kind of team–centred, blame-averse environment where frontline staff are able to learn to become the problem solvers (De Souza & Pidd, 2011).

Data collection and performance measurement: Performance measurement is a key component for successful implementation of Lean approaches (Kollberg,

Dahlgaard, & Brehmer, 2006). Understanding the current state requires benchmarking with appropriate data to ensure informed decision-making while further data collection on completion is necessary to gauge if an improvement has been achieved or not. There is often a challenge in ensuring data collection is an accepted and continued part of the process. The challenge also comes with the motivational and behavioural consequences that chosen performance measurements have on staff perception of their job. Greater focus is given to those aspects that are monitored while other unmonitored aspects of the work are neglected (De Souza & Pidd, 2011).

Resistance to change/Scepticism: In research case studies in hospitals, the resistance was less often against Lean, but rather against the idea of change in general (De Souza & Pidd, 2011).

Radnor, Holweg and Waring (2012) believe that the reason that there are challenges to implementing Lean within the public health care environment is due to the absence of two important 'assumptions' for Lean to be effective.

- Firstly, that the party paying for the services (in public health care, this is usually government) is the same as the end-user of the services (in this context, the general public). With two potential ideas of who the customer is, there is uncertainty over who defines value, which is an essential principle for Lean and a known problem within the public health care setting (Kim, Spahlinger, Kin, & Billi, 2006; Radnor et al., 2012; Young & McClean, 2008).
- The second assumption is that demand can be influenced. This stems from Lean's principle of creating flow. Lean was born out of the manufacturing sector which enjoys stable, repetitive demand patterns. In health care, however, there is little ability to influence demand and thus very little effort to gather relevant data. Hospitals and clinics instead tend to focus on their capacity. But because of this inability to influence demand, any freed up resources will not necessarily be utilised (Radnor et al., 2012).

In keeping with early research, obstacles to the approach or readiness of an organisation often affect the sustainability of an implementation (Radnor, 2011). For example, a recurrent criticism of the RIE pattern of implementation of Lean is the over-emphasis on the operational aspects producing small 'pockets of success' (De Souza, 2009; Radnor, 2010). The introduction to Lean tools through workshops, such as the one studied here; often leave out the Lean philosophy and thinking that support the activities post-RIE. While some believe that this is sufficient for the public sector, others believe that the manufacturing sector went through the same journey and that health care will eventually catch-up (Proudlove, Moxham, & Boaden, 2008; Zidel, 2006). Others believe that leaving out the 'sociotechnical' aspects produces suboptimal results and poor sustainability. It is argued that implementing both aspects allows for 'cumulative capabilities' with improved results and greater ability to sustain the operational tools (Joosten, Bongers, & Janssen, 2009). Therefore, a focus on operational aspects becomes an obstacle to a sustainable form of Lean improvements. Since 2002, these pockets of success of mostly tool based Lean implementations in health care have produced sufficient positive results to warrant greater interest from providers and policy-makers alike. The lack of sustainability, however, has also invited greater interest from researchers in the past five years. Bateman (2005) investigated the factors affecting the sustainability of process improvements, although within the automotive industry, and was able to identify the following factors:

Contribution and Buy-in: This category proposes that if staff members are encouraged to contribute to the development of a plan-of-action, this increases the likelihood of gaining their support for and belief in that plan. This resonates with Lean's bottom-up management style where the 'people who do the work' are heavily involved in almost every decision relating to the work environment; from visualising the process, identifying problems to implementing experimental PDCA cycles to test countermeasures. The rationale is twofold:

- Firstly the decisions are practically-based by the most informed people to make those decisions.

- Secondly, staff involvement breeds a sense of ownership that is meant to give rise to a culture of continuous improvement and greater job satisfaction. The methods used to capture these contributions must be formally documented, implemented and reviewed with management on a regular basis.

(Bateman, 2005)

Maintenance and Focus: A lot of Lean implementations are initiated through workshops; 'maintenance' of these lessons learnt is considered a key step towards sustainability. For example, the standards achieved in utilising 5S during the workshops are considered an important marker, for managers, for the continued adoption of Lean management. 'Maintenance' therefore refers to the need to put the tools into practice on a regular basis. 'Maintenance' also refers to the need to have measures in place that monitor improvements. This is an important enabler, helping staff to appreciate the progress that results from their efforts, reinforcing the use of CI methods. 'Focus' refers to the need for managers to stay strongly focused on PI activities (Bateman, 2005). As previously stated, managers, especially in the health care environment, are often side-tracked by unplanned, urgent events that demand their immediate attention. This frequent 'firefighting' can detract from PI efforts unless managers deliberately return to their scheduled PI activities. Management's consistency in prioritising PI activities is considered a key enabler, demonstrating the importance of PI activities to the company (de Souza & Pidd, 2011).

2.4. Research Question

What are the Obstacles to implementing Lean process improvements in South African Primary Health Care centres?

2.5. Conclusion

Following this review of the literature, we have forged an understanding of Lean from its origin and core principles to the more recently defined concepts of Lean Thinking and Lean Management.

Thereafter, we came to understand theories of how and why Lean works in health care before looking at the research which analysed Lean implementations in health care. The latter shows us that case studies have been the most common format for Lean research and most involved patient flows, as well as the flow of materials and information. The last most uncommon category of case study was the organisational case study that focused on strategic and cultural aspects of implementing Lean across an organisation.

We then review the Lean tools, which are most often employed in Lean implementations, alongside a proposed 'universal standard process' for Lean transformations in health care. The former is considerably more important, given the recent research findings that indicate the popularity of tool-based implementations in the form of RIE's.

We then discussed a framework for evaluating a Lean implementation confirming the relationship between the approaches to Lean used, the conditions of readiness and the sustainability of an implementation.

Finally we touch on some of the benefits of implementing Lean before delving into the obstacles that have come to challenge Lean implementations, both in general and specific to health care.

3. CHAPTER 3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter proposes the methods to be utilised in answering the research question adequately. When conducting a research study, Robert Yin suggests a 'linear but iterative' process involving the following steps: plan, design, prepare, collect, analyse and share (Yin, 2014). This translates into the following sections of this chapter: research paradigm, research design, the case site description and sampling method, research instrument and procedures for data collection, analysis and interpretation. The section concludes with the limitations of the methodology and how to ensure scientific rigor though validity and reliability.

3.2. Research strategy

This study uses an inductive approach with a qualitative research strategy. According to Saunders et al., the need to understand the meaning that research subjects attach to events, coupled with an understanding of the research context, as well as the fact that the researcher is an integral part of the research process provides suitable conditions for an inductive study (M. Saunders, Lewis, & Thornhill, 2009). The aim of this study was to investigate the obstacles to implementing Lean process improvements in primary health care clinics in order to improve future attempts. As such, an inductive approach allowed for the analysis of the views of individuals involved in a Lean implementation project and to then draw reasonable conclusions based on the insights gained.

A qualitative research strategy was chosen as it involves an intense analysis of the phenomenon in order to obtain a meaningful picture of a complex, multifaceted situation. On a simplistic level, qualitative research may be defined as a 'data collection technique' or 'data analysis procedure' that focuses on non-numerical data (M. N. Saunders, Saunders, Lewis, & Thornhill, 2011). In this study the 'non-numerical data' consists of the experiences and opinions of those who were involved in the implementation. Greenhalgh and Taylor (1997) agree that a qualitative approach facilitates an understanding of various concepts through delving into the underlying rationale and contextual elements as part of the research process(Yardley, 2000). It also adequately answers questions

pertaining to what, why and how. Remenyi and Money (2006) capture certain characteristics of qualitative research that make it appropriate to this study which are:

- It is interpretivist in nature
- The object of the research is to provide an in-depth understanding of the real life situation
- Generally small sample sizes that are deliberately selected for their particular criteria
- The collection methods involve close contact between the researcher and the subjects being studied
- Data collected is usually rich and detailed
- Analysis is open to emergent concepts and ideas

3.3. Research Design

A single site case study with both explanatory and exploratory approaches was most suitable for this study (Yin, 2014). According to Yin (2014, p. 18) a case study can be defined as "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". This highlights the importance of contextual factors in gaining a thorough understanding of the phenomenon being researched. In this case, studying of one of the sites involved in a once-off, three month long, quality improvement programme by questioning its participants and ascertaining their subjective feelings and opinions regarding the whole programme.

Yin (2014) states that case studies allow for a deep understanding of certain decisions that are taken, and they explain the rationale for the decisions, as well as how they are implemented, and what the resultant outcomes are. Case studies enable the researcher to interrogate the 'how' and the 'why' elements and they allow a comparison between what actually transpired versus the intended or planned vision (Anderson, Crabtree, Steele, & McDaniel, 2005). Thus, a primary advantage of using case study methodology in this research was the ability to understand causal links as well as the intricacies and nuances of the Lean

Process Improvement as a concept from a holistic and ultimately, a more human perspective, from conceptualisation to implementation (Noor, 2008; Yin, 2009).

Noor (2008) elaborates that case studies are rich in information and provide in-depth insights into particular events and situations. The scope of the case study was restricted to a certain number of issues, such as the mandate of the project, comprehension of Lean, obstacles to implementing the Lean process improvements as well as the suggestions to improve the project.

Case studies have been previously used to increase our understanding of Lean in health care. The earliest was Spear who analysed challenges in utilizing process improvement tools (Spear, 2005). Machado and Leitner (2010) analysed twenty-four case studies of Lean implementations to explain their steps and content. Radnor (2011) proposed a model in her case study analysis of a mental clinic and two hospitals. The model proved to be successful and was used again in a multi-level, multiple setting case study to reveal contextual challenges to Lean in health care (Radnor et al., 2012). De Souza and Pidd (2011) utilised data gained through case studies of the NHS in the UK, supplemented with interviews of directors, managers and healthcare providers to produce a valuable table of the obstacles to implementing Lean in a public health care system. This research therefore borrows some of the most popular design elements of studies into Lean implementation, namely qualitative case studies that use interviews.

The primary source of data was the semi-structured interviews. There were three main groups of respondents; namely the Anova Health Institute respondents, the Lean Institute Africa respondents and the Department of Health respondents. Each group had several respondents with various roles to provide multiple perspectives. Additional sources of data include the Stretford CHC RPIW Feedback Report of June of 2013 as well as the subsequent Feedback Session to Anova in Nov 2014, which was used to compare against the interview data.

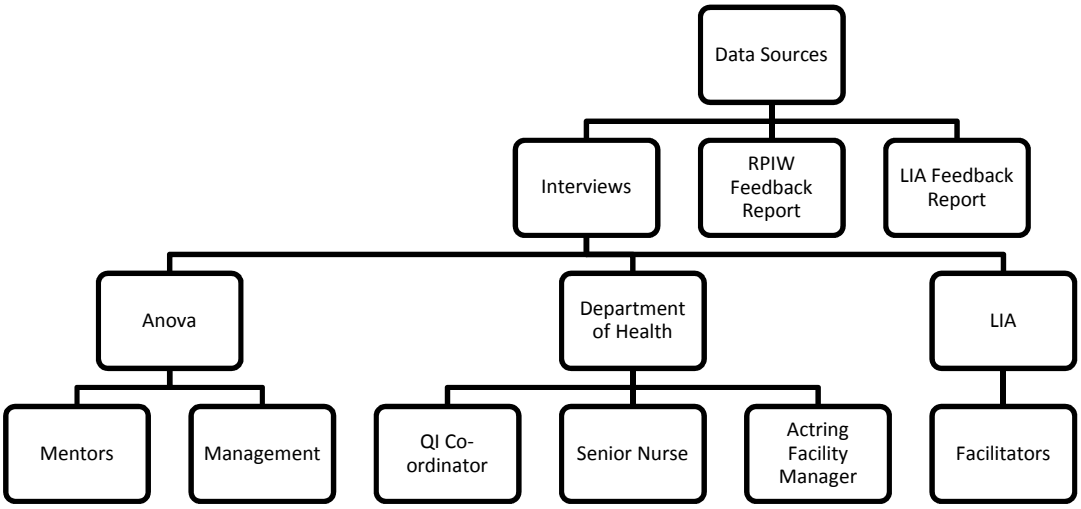


Figure 4: Data Sources

3.4. Population and sample

3.4.1. Population/Case site

The Department of Health contracted the Anova Health Institute (AHI), a Non-governmental organisation with a health systems strengthening unit, to improve the functioning of South African primary health care (PHCs) clinics. Anova in turn contracted Lean Institute Africa (LIA) to fulfil this mandate. Between March and December 2013, LIA introduced Lean Process Improvements across eight primary health care clinics – two in Gauteng and six in Mpumalanga. This was done through two distinct workshops; namely the Introduction to Lean Workshop (ITLW) followed by the Rapid Process Improvement Workshop (RPIW). Table 6 lists the sites chosen by LIA for Lean this project.

Table 6: Implementation Sites

Facility	District
Kgapane Hospital	Mopani
Stretford- Orange Farm	Gauteng
Chiawelo CHC	Gauteng
Mopani- Bus Stop Clinic	Mopani
Maputha Mahlatjie Hospital	Mopani
Nkowa Nkowa CHC	Mopani
Van Velden Hospital	Mopani
Nkhensani Hospital	Mopani

3.4.2. Sampling method

A purposive sample was used in this study when selecting the site and the interviewees, in order to best answer the research question (Creswell, 2013). According to Miles and Huberman (1994), this focuses on the setting, the actors undergoing observation or questioning and the events to be investigated and the process(Maxwell, 2012).

The researcher opted to focus on one clinic in Gauteng, Stretford CHC. Stretford clinic was chosen because it was the first clinic to host the workshops. As such, Stretford clinic would most likely have experienced any/all of the obstacles to implementation that could have occurred. Subsequent clinics might have benefitted from the lessons learnt in the earlier implementations.

It must be mentioned that some of the DoH staff were not from the Stretford clinic, but came for the training and also did the projects there.

Although the sample size is small, it is with the intent of achieving greater depth than breadth in terms of richness of experiential data (Creswell, 2003). A total of 12 individual interviews took place. Interviewees were drawn from multiple levels of management within the AHI, LIA and the PHC centre. This ensured an adequate number of pluralistic perspectives to provide an holistic understanding of the challenges faced. In terms of the spread, there were a far greater number of interviewees from Anova as they were the 'implementing organisation' and thus would be in a better position to discuss the obstacles to implementing Lean. Therefore, from Anova there were seven (>50%) respondents, while from the DoH

there were three. There were only two facilitators from LIA and both were interviewed. Effort was made to ensure that the job title of the interviewees *at the time of the implementation* was noted.

Table 7: Sampling Groups

Organization	Title
Anova	Senior Program Manager
	Project Manager/TB Technical Advisor
	Clinical Advisor
	Data Quality Manager
	Nurse Mentor
	Nurse Mentor
	Nurse Mentor
LIA	Chairman/Primary Facilitator
	Lean Coach/ Facilitator
DoH	Acting Facility Manager,
	Professional Nurse in charge of the Maternity Dept.
	Professional Nurse in charge of Chronic Department
	Quality Improvement Co-ordinator

By interviewing several players from the three organisations involved and from multiple perspectives, including clinical and managerial, it was hoped that this would provide a deep understanding of the obstacles that affect the implementation of the lean process improvements.

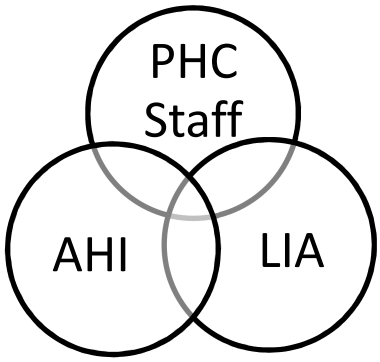


Figure 5: Sampling Triangulation

3.5. The Research Instrument

3.5.1. Purpose

The primary purpose of the research tool was to collect relevant data to help answer the research question of: 'What are the Obstacles to implementing Lean process improvements in South African Primary Health Care centres?'

3.5.2. Tools

The primary data collection tool was the semi-structured interview. Some of the main questions borrowed certain elements from the previously developed framework to evaluate an implementation (Radnor, 2011). Other aspects of the framework are assessed through supplementary questions. The interview guide is, however, only partly based on the framework and has its points of departure (see Appendix A), but did help to improve the rigor of this study.

The semi-structured open-ended approach to interviewing allows the researcher sufficient flexibility to probe and ask supplementary questions, where necessary, according to the various interviewees' responses (Saunders, Lewis & Thornhill, 2009). The question guide consisted of six to seven standard questions which arose from the preconceived themes relevant to the research question (Bryman & Bell, 2007). This line of questioning is suited to explanatory studies and finding associations and causal links between variables (Saunders, Lewis & Thornhill, 2009; Yin, 2009).

Interviews generally started out in a structured manner and occasionally transformed into an unstructured discussion which allowed for the free-flow of

information so that respondents could fully express their opinions and experiences. It was the responsibility of the interviewer to avoid leading questions which may have increased bias, as well as to prevent the interview from deviating from the research aims (Bryman, 2012).

Firstly, a question on the job title and role of the respondent was meant to help understand the respondents' role in the organisation and then in the project itself. This was an important differentiation to make as the two were not always congruent. For example, one Anova respondent had the job title of TB Technical advisor at the time, but played the role of a Project Manager, facilitating the interaction between the LIA and the DOH. The second question was meant to create a picture of what the respondents understood by the term Lean, similar to the 'definition of Lean' used in the framework (Radnor, 2011). This was important considering the lack of a standard definition and helped to gauge whether or not there was a common understanding that resembled what the literature conveyed. The first and second questions also allowed us to evaluate the level of organisational readiness. That is to say, by understanding the level of comprehension of Lean and the activities undertaken, we are able to answer the question of understanding of the process, the understanding of customer requirements, was data used and were the staff engaged (Radnor, 2011). The third question was meant to determine what respondents understood as the goal of the project. In other words, what were they tasked to achieve by implementing Lean? Was there a common understanding and a link with an overarching strategy? This was however, only posed to Anova and Lia staff as it was doubtful that DoH staff would have been in a position to answer this question. Instead they were asked the supplementary question about their experiences with the clinic. The fourth question formed the basis for this research, i.e. what obstacles were experienced in implementing Lean in the PHC centre. An important supplementary question asked respondents to prioritise the obstacles they mentioned in terms of severity or frequency. The fifth question was to check if monitoring and evaluation (M&E) was considered in this project. The purpose of M&E is dependent on the context and can include management decision-making, accountability, promoting transparency and even organisational learning (Bell &

Morse, 2008; Coleman, 1987). The question was meant to find out whether or not the project was assessed to establish success, failure or any difference it might have made to the PHC centre. Additionally, if this was considered, what were the findings? The final question asked respondents to consider what they would have done differently if they had to do the project all over again. This required respondents to consider what challenges to the project could have been avoided, or at least prepared for. It allowed for the consideration of enablers and inhibitors from a retrospective viewpoint. An important supplementary question was 'why', i.e. Why did they focus on that particular point on which to improve?

One more question was added to the LIA facilitators if they had implemented Lean in other clinics and if so, what obstacles had they faced? As Stretford CHC was the first clinic to undertake the workshops, this question really referred to the experiences of the LIA facilitators in previous projects to try and assess if their experiences at Stretford were unique.

The secondary sources of data, such as the company documents, LIA consultants' reports and workshop material presentations required no instrument to collect as electronic copies were readily available from the staff members of Anova and LIA.

3.6. Procedure of data collection

Of the twelve interviews, eleven were conducted face-to-face. Face-to-face interviews are advocated as they build rapport and allows for a more personal engagement, while enabling participant observation (Yin, 2014). Only one interview was conducted telephonically as the respondent was in a different city. The remaining interviews took place at the respondents' convenience, at their workplace and during work hours.

The interviews all started with a brief information session and a signing of the consent form (see Appendix C). During the information session research subjects were informed of the purpose of the research and reassured of the confidentiality and lack of risk associated with their participation. They were also informed that there were no right or wrong answers and that their experiences and opinions

were what the researcher was attempting to elicit. They were then asked to sign to demonstrate comprehension.

All of the respondents were comfortable to conduct the interviews in English. The interviews were recorded with a Dictaphone to allow for free flow of conversation and also to allow the researcher to make field notes that described the non-verbal communication that occurred. Non-verbal communication included body language and behavioural aspects of the subjects' responses. Use of a Dictaphone also avoided the reliance on memory and allowed for repeated examination of interviewee responses. The Dictaphone recordings were then transcribed by the researcher to ensure accuracy and to increase the familiarity with the content.

3.7. Data analysis and interpretation

3.7.1. Introduction

According to Creswell (2003), when documenting the findings, a data analysis strategy is necessary to make sense of all the data gathered during the research process. It begins with glossing over the various sources of data to get an overall sense of the information, followed by reflection. It is then imperative to sort and arrange the data in a manner that relates back to the research questions. This involves coding the information into categories, themes and sub-themes according to common patterns, ideas, opinions and thoughts that arise from the transcripts (Aronson, 1994; Braun & Clarke, 2006). Thus the steps of data analysis can be roughly summarised as:

1) Data Perusal
2) Data Organization
3) Data Coding
4) Grouping of themes
5) Synthesis of critical themes

3.7.2. Data Perusal

The researcher then had the opportunity to read through all the transcripts to get a sense of the responses from the three different groups of respondents.

3.7.3. Data Organization

After all the recordings were transcribed, they were then imported into the qualitative computer analytic software programme known as Atlas ti. Saunders, Lewis and Thornhill (2009) state that the researcher can employ the use of qualitative computer software programmes to assist in the coding process, however, Yin (2014) states that this is only helpful within the context of a good analytical strategy. Atlas ti is a computer software programme that allows for qualitative analysis of text data, such as surveys or interviews. The software facilitates the formation of a separate folder for each unit of investigation which are called Hermeneutic units. Each hermeneutic unit allows for several files of data, in this case interview data, to be imported and organised. The individual files are referred to as Primary Documents and are numbered one to twelve as they are uploaded.

There are no names, only text from the interviewer or the interviewee. Every line is numbered. The page is divided vertically into two halves. The recorded data is on the left with a blank space on the right where the coding is done (see Appendix B).

3.7.4. Data Coding

The coding process begins with dividing the responses based on the questions asked. A keyword was picked from each of the questions which represented the main focus. These keywords became the 'Code Families' (see appendix B). The main code families were:

- Roles
- Mandate
- Comprehension
- Obstacles
- Suggestions

'Secondary Code Families' also arose from the supplementary questions that allowed for further expansion on responses. Examples of these secondary code families include 'Experiences' which asked respondents to elaborate on a particular aspect of working with Lean, and 'Sustainability', which identified

questions around the continuity of the project. There were also simpler supplementary questions such as ‘why’ and ‘how’. These supplementary questions, and the coding of their related responses, proved very valuable in unearthing the stories behind the main themes that were established in the main code families.

Further coding within the code families involved picking out the word or word segments which represented a particular idea. The text was highlighted and referred to as ‘quotations’. Each of these quotations was assigned a code theme which was meant to capture the core idea behind the response. Whenever the same idea recurred the same code was assigned to it, whether or not this occurred under the same code family, i.e. coding was independent of code families (see Appendix B). The software became very useful as it stored every code, then whenever a piece of transcript was highlight, i.e. a quotation was made. Atlas ti would then offer you three possibilities of choosing from the list of existing codes, making a new code or simply using the text itself as the code. Themes were not predetermined from the literature review. Instead themes were allowed to emerge organically from the transcripts in keeping with the inductive approach. This allowed the data to corroborate or potentially challenge existing literature, opening avenues for new research as well as highlighting the key lessons learnt (Creswell, 2003).

3.7.5. Grouping of themes and synthesis of critical themes

After the themes were documented, the data was analysed by initially drawing up a spreadsheet which tabulated each time a theme was mentioned by a respondent. Only one mention per respondent is counted. This avoids the bias created by respondents who may mention a particular obstacle several times due to personal experience over the course of an interview. Each mention of a particular theme shall also be forthwith referred to as a vote. From the table, a bar chart was drawn up which identified how many times each theme was mentioned along with the percentage. This was done for two code families, namely Suggestions and Obstacles (see figure 7 & 9). From these bar charts, a second bar chart indicating those themes that have garnered the most votes (see figure 8 & 10). These are the critical themes which are then more fully discussed.

3.8. Limitations of the study

As mentioned previously, a commonly perceived limitation is that case study findings are not generalizable to a population and they have a low level of repeatability. Yin (2014) is adamant that irrespective of the research methodology used, a single study is also non-generalisable. A purposive sample also infers that the findings should not be extrapolated to other contexts. The choice of sample is often directly linked to the researcher's aptitude in choosing which respondents to interview (Flybjerg, 2006). In this study however, the choice of case sites was based on the probability of experiencing the most obstacles and the respondents were not chosen, instead all the delegates who were still under the employ of the involved organisations were interviewed.

Another limitation is that instead of incorporating all nine sites, the study is restricted to one site. This limits the scope of this study for the sake of convenience and time constraints.

A notable shortcoming of this study is that qualitative input is subjective from the researcher's and participants' perspective. The researcher has to caution himself against imposing his preconceived notions and opinions during the data collection process, being familiar with the health care setting in the role of a medical doctor.

The research results were based on qualitative responses that were taken at face-value as being honest and accurate; although body language, choice of words as well as pauses or silences were also considered to assess honesty.

3.9. Validity and Reliability

Leedy and Ormrod (2005) refer to validity and reliability as being factors that reveal the margin of error in the research methodology. According to Creswell (2003), validity in terms of generalisability, and reliability in terms of consistency of response, cannot be viewed with the same level of importance in qualitative research as they are in quantitative research. In fact, there seems to be very little consensus as to what exactly constitutes validity and reliability in qualitative research. Some authors propose that different terminology such as 'dependability', 'confirmability' 'trustworthiness' and 'authenticity', are more appropriate (Bryman & Bell, 2007).

3.9.1. Construct Validity

This aims to ascertain if the instrument effectively measured what it intended to measure (Leedy & Ormrod, 2005). Semi-structured interviews, with their open-ended questions provided an appropriate platform for interviewees to freely discuss their experiences of using Lean, but with a specific focus on obstacles to Lean implementation. This method also allowed the researcher adequate room to ask supplementary or probing questions to further delve into interviewee responses to syphon out relevant feelings and experiences.

Also, by interviewing members of staff from different departments of the same clinic, as well as members of the facilitating organisation and the organisation that commissioned the services, several perspectives of the same reality emerged with which to compare and contrast the responses and thus improve the credibility (Bryman & Bell, 2007).

Additional sources of data, such as reports pertaining to the workshops, observations within the workplace, and presentations, allowed for triangulation of data. Which is considered an important method of improving the credibility of the findings (Bryman & Bell, 2007).

3.9.2. External Validity

This refers to the statistical generalisability of the findings which is often found in quantitative research (Creswell, 2013; Tellis, 1997). In qualitative research, however, generalisability is not considered a strength. The subjective nature of people's feelings and opinions may vary with time and circumstance (Creswell, 2013). The single case study approach utilised here was meant to achieve depth, not breadth.

Generalisability would be enhanced if the PHC centres were all exactly the same. South Africa, however, is a multicultural society which has a partly geographical distribution. This results in PHC centres that have different levels of trained staff and equipment which in turn affect the challenges experienced in implementing a process improvement project.

The transferability is, however, slightly enhanced by the publication of the National Core Standards, necessitating all public hospitals and clinics to be brought into

national alignment towards quality, thus improving the generalisability of this research into Health care Quality Improvement. Additionally the use of the same facilitator, Lean Institute Africa, which conducted the same workshops at public clinics throughout the country, improves generalisability.

3.9.3. Internal Validity

Internal validity is the measure of congruency between the researchers' observations and the theoretical propositions they develop (Bryman & Bell, 2007). In this inductive research, theoretical propositions were not developed. Instead data was collected and analysed in a manner that allowed patterns of experiences and opinions to emerge organically. For this reason, a good deal of time was spent in the field to provide observations and thorough interviews so that readers could partly share the experience (Creswell, 2013). Both expected and unexpected findings were explored in order to develop a full understanding of the phenomenon being studied (Yin, 2014). Creswell (2003) describes how discrepant information may contradict the themes and the research question. However, this makes the research more credible. Yin (2014) further advises that all rival explanations that arise should be addressed fully.

To improve Internal Validity no focus groups were used as opinions and experiences can sway within the groups dynamic. Every interview was conducted one-on-one and in quiet areas at places of work.

Also improving validity, the researcher was the only person conducting the interviews, bringing a degree of consistency. This, however, also required that the researcher honestly discussed the bias that he brought when conducting this research. This allows the reader to understand the nature of the lens through which the data is interpreted (Creswell, 2013). The most obvious bias is the researcher being a medical doctor. This makes the researcher familiar with the environment, including the nature of the work with its terminology, the bureaucracy and the dynamics between the various staff groups. This assisted the researcher to understand the responses from the interviewees, while also allowing for the bias of preconceived ideas. In doing a literature review, the researcher became familiar with the concepts of Lean and the challenges faced in

implementing it in PHC centres. This creates a bias towards expected obstacles, but is diminished by the researcher having not been involved in any health care implementations.

3.9.4. Reliability

According to Bryman (2012), reliability implies that the same results should be achieved if the same methodology is used by different researchers. This is difficult to counteract, as any respondent may give a completely different answer to the same question if asked by a different person and/or at a different time. The most that could be done was to ensure that each interviewee was interviewed under the same circumstances, including the same interviewer, and that the same questions were asked. The three groups of respondents were all asked the same six questions, except for one additional question for the LIA and the Anova group and an additional question for LIA. A database of all the information gathered during the research process was made, so that independent auditors may access the raw data at any time in the future (Yin, 2014).

4. CHAPTER 4. PRESENTATION OF RESULTS

4.1. Introduction

The implementation is meant to outline the findings in terms of, firstly, the intended design and the content of this Lean process improvement project (i.e. what was supposed to happen) and, secondly, the details of the RPIW (i.e. what actually transpired at the Stretford clinic) including an outline of the three improvement projects. This quantitative data provides a foundation from which to survey the proceeding qualitative data from respondents. This includes a look at what LIA and Anova respondents perceived their mandate to be and what they understood of the term Lean. This is then followed by a close look at the obstacles and suggestions mentioned by respondents. It is worthwhile to note that secondary sources of data did not have to be actively procured or processed and thus are only further discussed under the analysis of results section.

4.2. The Implementation of the Process Improvement

4.2.1. Project Design

The RPIW held at Stretford clinic was the first of eight RPIW's conducted across two provinces (Limpopo and Gauteng) which resulted in 24 improvement projects. The overall design was consistent throughout and comprised of four stages.

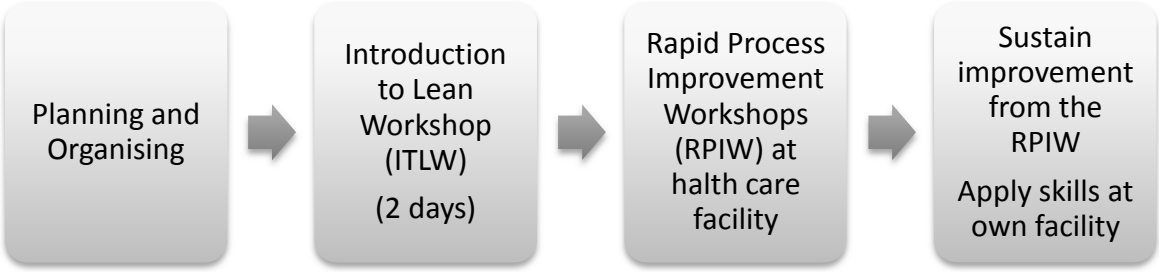


Figure 6: Project Design

The Planning and Organising stage required Anova and the DoH to provide LIA with the names of all the delegates to attend the workshops, the dates, the venues as well the projects that they would be working on during the RPIW. This phase was meant to ensure:

- Maximisation of the relatively short period of time for the RPIW.
- That relevant data was collected before the projects began.
- That only delegates who attended the ITLW, were allowed to proceed to the RPIW.

The ITLW was conducted over two days and was meant to introduce the main concepts of Lean, namely Value and Waste. Using examples and illustrations from a health care environment, delegates outlined a patient's journey through a facility. This allowed delegates to appreciate process flow diagrams and thus identify bottle-necks in the system. Within this flow, the value-adding and non-value-adding steps were identified. For example, face-to-face time with a doctor is considered value while waiting time in queues is considered waste. Delegates were then introduced to Lean PI tools which included:

- 5S
- Visual Management
- PDCA
- A3 process improvement method
- Fishbone diagram for root cause analysis
- 5 Why's

The RPIW was meant to be an extension of the ITLW. That is, after the key concepts and tools were introduced in ITLW, the RPIW was meant to provide an opportunity for the practical implementation of those concepts and tools under the supervision of the LIA facilitators. Three projects were identified as challenging or requiring attention within the host facility. Delegates were divided into three groups to tackle the projects over the next few days, culminating in a final presentation to stakeholders.

4.2.2. Stretford RPIW

The Stretford CHC is in Orange farm, Gauteng. The RPIW took place there between the 25th and the 28th of June 2013. It is important to note here that only four days were allocated for a five day programme and that there were 17 participants, of which only three had attended the ITLW (and all three were Anova employees). The projects put forth by the Facility Manager were:

1. Filing project: This was meant to address the problem of missing information and missing files from the Bhoipelong HIV patient filing system. Four of the five delegates that worked on this project were interviewed.

2. Pharmacy Waiting Time project: There had been complaints of excessive waiting time for queues at the pharmacy. Three of the six delegates that worked on this project were interviewed.

3. Integration of Services project: One of the Facility Manager's responsibilities was to integrate the various services offered by the clinic. She had concerns though of whether or not this was feasible and wanted one team to look at the demand versus the capacity of the clinic. One of the six delegates that worked on this project was interviewed.

It is important to note here that the projects are listed in order of their success. The first project was the most successful while the Integration of services project was the least successful. The construct validity of the research was therefore improved by securing most of its respondents from the more successful projects allowing for greater insight into obstacles to successful implementation.

The events of the RPIW over the next four days were as follows:

Day 1: Introductions were made and the three projects were revealed to the delegates. There was a brief introduction to Lean including concepts such as:

- Go see (also known as Gemba walks)
- Ask lots of questions
- Respect your people

- Current versus Target conditions
- Solutions versus countermeasures
- Value-adding vs non-value-adding vs necessary but not value-adding

Day 2: Delegates were asked to gather information relevant to their project to ensure an accurate sense of the current condition. From there, delegates had to start preparing an A3 paper.

Day 3:

1) Filing project: The group prepared a presentation to the clinic management team requesting that patients no longer be allowed to take files home with them and that files be kept on-site at all times. This was agreed upon. The group further resolved to utilise the 5S exercise to sort the filing area and to create a more robust filing system.

2) Pharmacy Waiting Time project: The group utilised the Fishbone method to analyse the situation. One of the findings was that the pharmacy assistant left the pharmacy during busy periods to collect the files from patients. The group was tasked with producing an alternative to the current system and to simulate it with the pharmacy team.

3) Integration of services project: The group was tasked with producing a proposal A3 (as opposed to a problem-solving one), to assess the current demand on the system by looking at the current capacity utilisation in PHC, Mental health and HIV clinics, especially during the peak days. Thereafter, they had to draw up an Operator Balance Chart to assess the constraint per task within the value chain. This would highlight the need for intervention to create capacity for integration.

Day 4: The day was spent in final preparations for the presentations to stakeholders, including senior management. Topics covered included: Title, Background, Current and Target conditions, Countermeasures and Plan. Practice and final presentations were recorded, and feedback and coaching provided by facilitators.

4.3. Understanding of the Mandate

The question of mandate was put forward to the LIA and Anova managing staff to assess whether there was a common understanding of what the ultimate goal of this project was. In other words, what were they hoping to achieve? The answers were analysed for key words and a table drawn up (Table 8).

Table 8: Mandate

Respondent	Key Words
LIA Primary Facilitator	Nothing in writing, Train Anova Staff, Train PHC staff
LIA Facilitator	Improve Service Delivery, Health System Strengthening
	Empowering Staff, Lean Thinking, Lean Methodologies: A3 problem solving, Skills development
Anova Project Manager	Unspecific, Improve Service Delivery
Anova Programme Manager	Quality Improvement, Skills development, Health System Strengthening, Sustainability, Train Anova Staff
Anova Clinical Advisor	Quality Improvement

4.4. Understanding of Lean

As with 'mandate', the answers to the question of 'What is your understanding of the term Lean' were analysed for key words, and a table drawn up (Table 9).

Table 9: Comprehension

Respondent	Organisation	Key words
Respondent 1	DoH	Problem-solving, Non-judgmental, Listen first
Respondent 2	Anova	Eliminate Waste, Eliminate inefficiencies
Respondent 3	Anova	Problem-solving
Respondent 4	LIA	Create thinking people, Problem–solving, Continuous Improvement
Respondent 5	Anova	Quality Improvement
Respondent 6	DoH	Problem-solving, Quality Improvement, Empowering Staff
Respondent 7	Anova	Smooth Processes
Respondent 8	Anova	Minimise Waste, Efficiency

Respondent 9	Anova	Improve Service delivery
Respondent 10	LIA	Create Thinking People, Eliminate waste, Quality Improvement
Respondent 11	Anova	Identify Obstacles, Grasp current condition, Use real data, Respect People, Go and See
Respondent 12	DoH	Can't Remember

4.5. Obstacles encountered in the Implementation

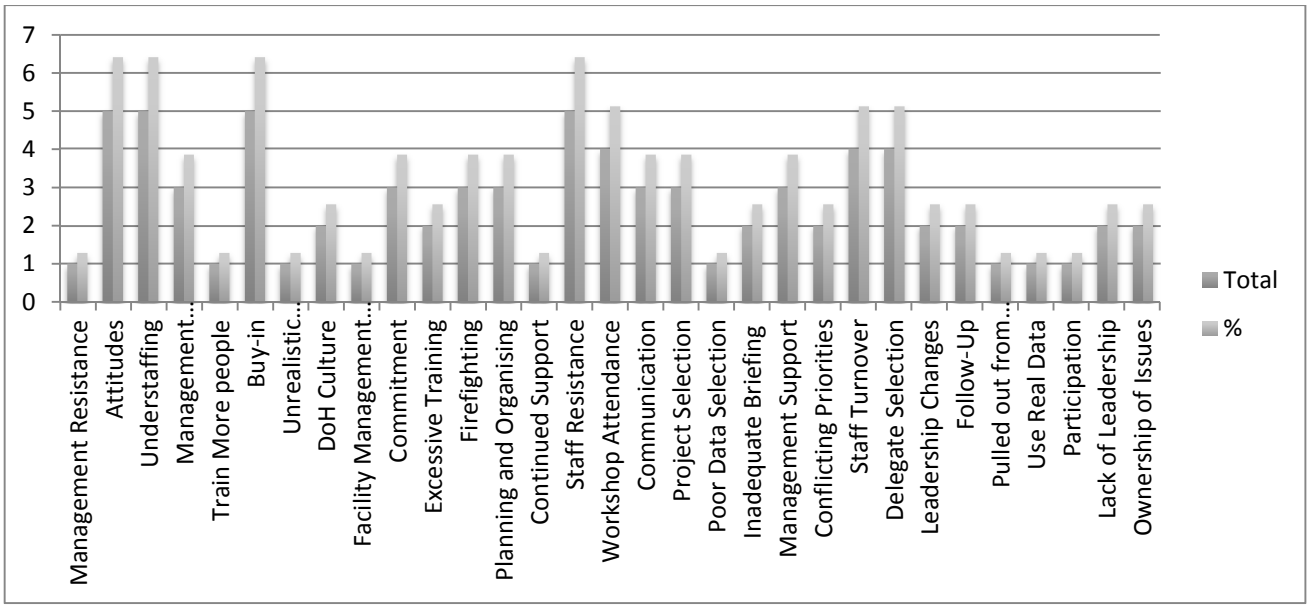


Figure 7: Obstacles to Lean Implementation

There were thirty-one obstacles mentioned by the respondents (see figure 7). From this bar chart we see that the distribution of votes is uneven with nine obstacles being mentioned by only one respondent and another eight obstacles being mentioned by two respondents. At the opposite end of the spectrum only four obstacles received five respondent votes each and another three received four respondent votes each.

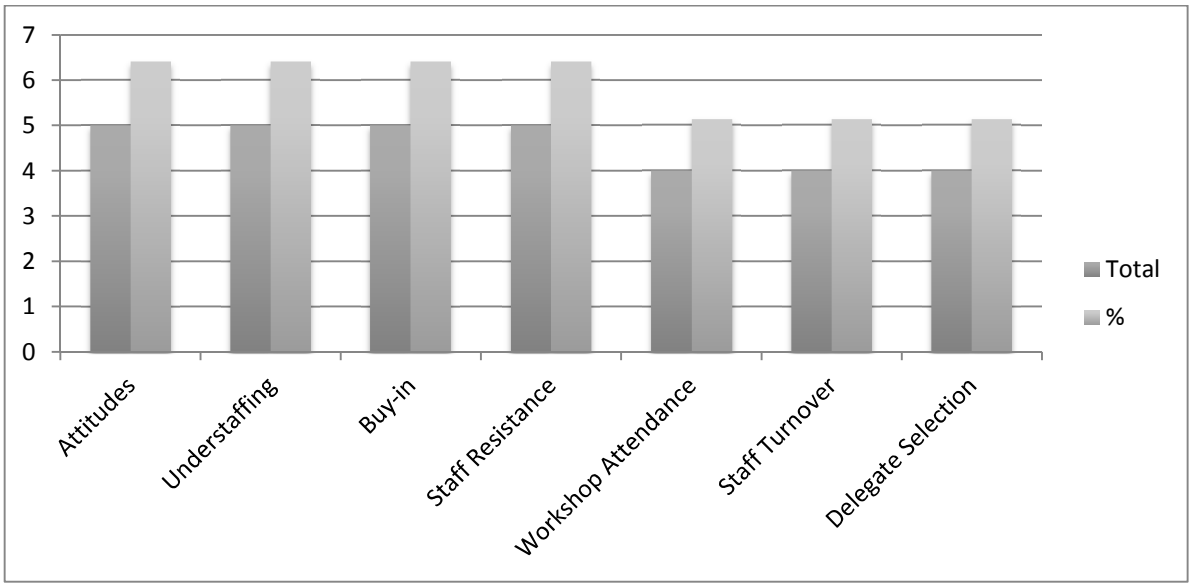


Figure 8: Obstacles Critical Themes

The focus of analysis is narrowed by reviewing only those obstacles that received the most votes; in this case, five and four votes. Each obstacle with five votes constituted 6.41% of all obstacles, therefore all four together constituted more than 25% of all obstacles. The obstacles receiving four votes each constituted 5.13% of all votes, therefore all three constituted more than 15% of all obstacles. Cumulatively, the top seven obstacles or 'critical themes' accounted for over 40% of all the obstacles (see figure 8); and, as we have seen, the remaining 60% is widely distributed over the remaining twenty-four obstacles. Furthermore, the obstacles were compared to the suggestions for improving the implementation contained in the interviews as well as in the Stretford CHC Feedback Report.

4.6. Suggestions provided by the respondents

The question of suggestions is really asking about obstacles, but from a retrospective standpoint. Respondents were asked to consider what they might want done differently if they had the opportunity to do the project all over again. This question highlights aspects of the implementation that respondents felt were problematic and could be improved upon. It was thought the answers might either corroborate those themes identified under obstacles, or identify other challenging areas worth improving upon. Additionally, the distribution of themes might also reveal insights into what respondents prioritised as the areas requiring improvement. The two sources of data here were the interviews primarily, which were then compared to the recommendations made by the LIA team in the Stretford CHC Feedback Report.

As with the obstacles, the suggestions offered in the interviews were tabulated and a bar chart was created which tallied the total number of votes each theme received as well as the relevant percentage. One respondent had no suggestions and another initially had none, but later on revealed ideas for improvement. As with obstacles, only those themes mentioned when asked specifically for areas of improvement were counted. The story behind those themes, however, were generally scattered throughout the semi-structured interview process and were considered.

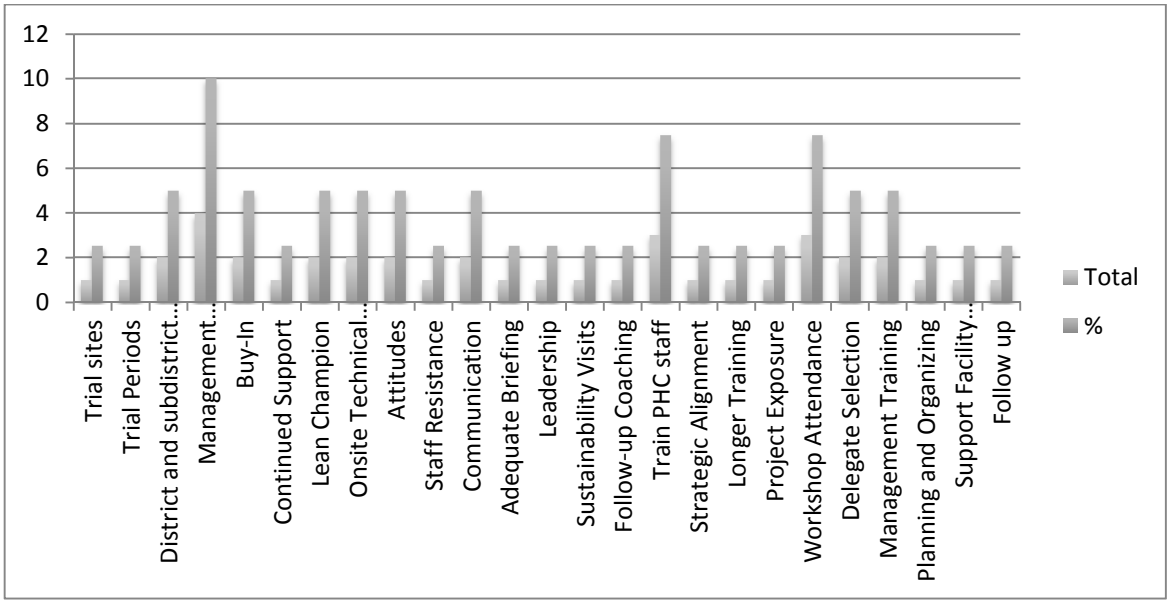


Figure 9: Suggestions

There were a total of twenty-five suggestions which were largely similar to the obstacles (see figure 9). Although there were nine new themes, most of these themes were statistically insignificant. Only one, 'Onsite technical support' received more than one vote. The bar chart further indicates that 'Management Involvement' attracted a total of four votes, followed by 'Train more PHC staff' and 'Workshop Attendance' which attracted three votes each. Thereafter, eight themes received two votes. These constituted the eleven critical themes (see figure 10).

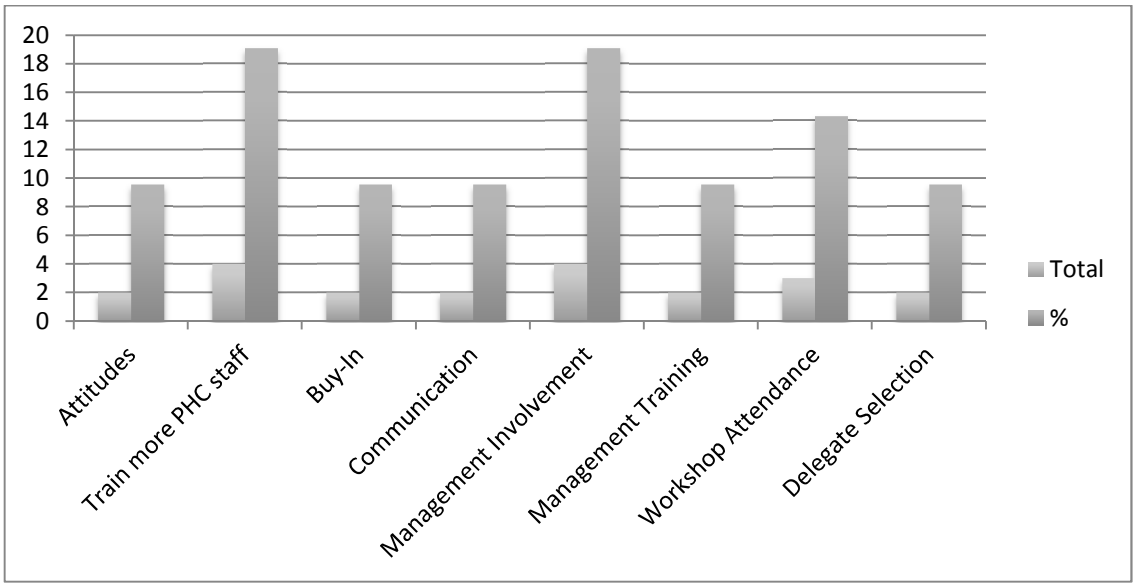


Figure 10: Suggestions Critical Themes

A table comparing the seven critical themes of obstacles with the eleven suggestions show us that all of the suggestions were already identified as obstacles (see table10). What is found is a corroboration of four of the critical themes mentioned under obstacles, namely: buy-in, attitudes, workshop attendance, and delegate selection. There is, however, a departure from obstacles in terms of themes emphasised. Besides 'workshop attendance', the two dominant themes are: 'Train more primary health care staff', and 'Management Involvement'.

Table 10: Obstacles/Suggestions Critical Themes comparison

	Obstacles	Suggestions
1	Attitudes	Attitudes
2	Buy-In	Buy-In
3	Delegate Selection	Delegate Selection
4	Workshop Attendance	Workshop Attendance
5	Understaffing	Train more PHC staff
6	Staff Resistance	Communication
7	Staff Turnover	Management Training
8		Management Involvement
9		District and sub-district priorities
10		Lean Champion
11		Onsite Technical Support

The Stretford CHC feedback report, compiled by the LIA facilitators for Anova, highlighted the areas of improvement that LIA prioritized. Table 11 outlined their comments, with the derived themes and showed substantial corroboration with both the interview suggestions and obstacles.

Table 11: Thematic Analysis of Stretford CHC Feedback Report

Suggestions	Themes
Management teams of hosting sites need to be adequately briefed on the purpose of the workshop. This briefing should include the preparation of problem projects, welcoming of the	• Adequate briefing • Project Selection

various delegates and participation of the management team during the RPIW period.	• Management Involvement
Delegates should not be allowed to proceed with the RPIW unless they have attended the ITL workshop and also have not started on time.	• Workshop Attendance
The workshop should not be reduced to 4 days as it does not allow adequate time to implement countermeasures proposed and assess immediate impact.	• Planning and Organizing
Delegate candidate profile should include a minimum number of individuals from the relevant host site to ensure that they work in the project area/site. This will also assist in ensuring that the project/s continuity is supported post the workshop. It is preferable that the CEO of the host site is on the RPIW.	• Delegate selection • Sustainability • Management Involvement
LIA should request some pertinent information from the hosting clinic/hospital before the RPIW starts. This information should be the number of patients booked in each area per day, per month for a period of 6 months. It should also include both the chronic and acute patients as well as the staff contingent in each area.	• Use Real Data • Planning and Organizing

The suggestions from LIA centred around the theme of 'Planning and organising' and other themes that emanated from that. Poor planning and organisation meant that delegates were chosen on the morning of the RPIW (delegate selection). Those delegates were chosen based on availability and most had not attended the introductory workshop (workshop attendance). Additionally, this meant that delegates had not been adequately briefed as to the purpose and plan behind their participation in the workshop (adequate briefing). LIA facilitators also prioritised the lack of inclusion of staff in choosing the projects as an area of improvement (project selection). This affected the level of ownership of the issues and buy-in for the project. Buy-in is further enhanced by motivating with actual data which the LIA facilitator felt was lacking as a result of poor planning (use real data).

The feedback report helped to corroborate two critical themes in common with the interview suggestions and obstacles which were 'Workshop attendance' and 'Delegate selection' (see figure 11). Additionally, 'Management Involvement' was also in common with interview suggestions and obstacles.

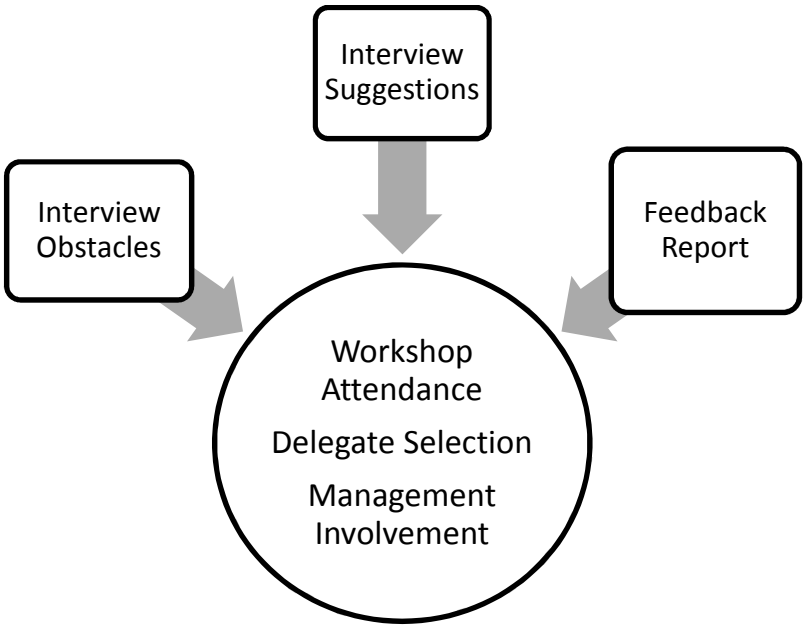


Figure 11: Common Themes

5. CHAPTER 5: ANALYSIS AND DISCUSSIONS

5.1. Introduction

The critical themes that were identified as obstacles are now more fully discussed to find the story behind the themes. The obstacles identified were compared and contrasted with those mentioned in the literature reviews which are mostly from Lean Implementations in the US and the UK. This local versus international comparison highlights the implementation challenges specific to the South African context. In addition, themes identified by interview suggestions and the Feedback Report are also unpacked. What becomes clear early on is that, although the themes are discussed separately, they are often inextricably interrelated and part of a complex web of interacting influences which does lead to repetition of themes and the stories behind them.

5.2. The Implementation of the Process Improvement

The pattern of implementation of Lean via RPIW/RIE/Kaizen Blitz has been the format of choice to fix urgent problems without challenging existing management structures in health care (Radnor et al., 2012). This implementation was similar to the three phase roll-outs consisting of a preparation phase lasting 2-3 weeks similar to the planning and organisation phase, a five day event similar to RPIW and finally, the follow up period lasting approximately three weeks(Radnor et al., 2006). This project's additional phase, not seen in the literature, was the ITLW which lasted 2 days. It is interesting to note that in this project the follow up phase did not have a timeline. It was thus less defined from the planning phase. RIE are considered by some as the method of choice for implementing Lean as it is practical, has a long history of success and facilitates a step towards the cultural change of continuous improvement (Fillingham, 2007). Other researchers however, have bemoaned the loss of cumulative capabilities (Joosten et al., 2009) and question the sustainability of these isolated successes as well as make the point that the public sector structures make organisation-wide implementations very difficult (Radnor et al., 2012).

Using the factors borrowed from Radnor's framework we are able to assess the level of 'organisational readiness' to implement Lean(Radnor, 2011).

The process view was taken for both the filing and pharmacy projects using visual management, A3 processing and Fishbone analysis to find the problems with these processes. The use of data was, however, insufficient, according to the LIA facilitators. Largely due to the projects being chosen on the morning of the workshop, there was insufficient time to collect any relevant data. As one LIA facilitator noted, “Lean is very dependent on factual information. So it’s not a subjective process. It depends solely on collecting facts, collecting data, analysing data, and to really get a rich experience out of the five-day rapid process improvement workshop.” This left LIA and the selected delegates with the difficulty had having to collect whatever data they could during the four day workshop (Radnor, 2011). In fact, day two of the RPIW was spent mostly on allowing teams to collect data to complete their assignments.

The theme of ‘Inadequate briefing’ speaks to the poor level of engagement with staff prior to the start of the start of the workshop. LIA facilitators had discussed in detail the detrimental effect of not discussing the project beforehand. Important ideas such as the relevance of the training, why am I being specifically chosen to be on this training, what is expected of me to do with this training when I get back to my department and what support systems are in place as I become accustomed to using this technology, were all specified in participant responses and speak to a low level of organisational readiness to implement Lean (Radnor, 2011).

Another aspect of the challenge in following up on projects and delegates’ usage of lean was that many of the delegates were not actually based at the Stretford CHC, but only attended the workshops there. Many delegates returned to their regular places of work where there was often no substantial support and tried to disseminate the lessons learned amongst staff members who are largely ignorant of Lean methodologies. The flaw in the sustainability was thus partly at project design level and partly at implementation level. The ITLW introduced the basic concepts of Lean, especially Value and Waste (Hines et al., 2004; Womack & Jones, 1996), delved into the basics of problem-solving, such as appreciating a process flow diagram before discussing important Lean PI tools. As illustrated in figure 2, many of the tools advocated are in keeping with those commonly used in

Lean health care transformations (Machado & Leitner, 2010). Exceptions would be the A3 process improvement method, the fishbone diagram and the five whys, which are all three still accepted tools in the Lean PI toolbox for improving problem solving abilities (Shook, 2010).

In terms of the projects for the RPIW, this does reflect the literature findings as implementations in the various industries have been studied and classified as early as 2008. Using those classifications, the "filing project" can be categorized as an organisational type concerned with the flow of information (De Souza & Pidd, 2008). The pharmacy waiting time is considered a manufacturing type, concerned with the flow of materials (De Souza & Pidd, 2008). The last project, however, does not fit into any of the previously developed categories. In fact, the 'integration of services' project fails to satisfy even the more basic criteria for a Lean process improvement project. Firstly, there is no distinct process to speak of (Plsek, 1999; Womack et al., 2008) and secondly, there is no immediate value to the customer (Womack et al., 2008). The project is arguably of greater value to the DoH or the Facility Manager than to the patients.

5.3. Understanding of the Mandate

There were five respondents to this question, including two from LIA and three from Anova. Analyses of the responses reveal that there was no definitive mandate in writing. There was therefore no consistency in the answers whether it was within both groups of respondents or across them. There were, however, five common key words that were each mentioned twice. The distribution of these words amongst respondents reveals no discernible pattern. These included:

1. Improved service delivery
2. Health systems strengthening
3. Skills development
4. Quality Improvement
5. Train Anova staff

These key words seem to be based on the original understanding that the DoH wanted help in health system strengthening in order to improve their service delivery *without* hiring new personnel. As the Programme Manager put it: '*So we*

had to find ways of how do we support the clinics to improve on what they are doing without putting a warm body in the clinic to actually do the work for them.' It was decided that Lean would allow staff to analyse and problem-solve their own challenges. Indeed, improved service delivery and an improved health workforce, through skills development, have been identified by the WHO as key building blocks in their Health Systems Framework (see figure 1). With these building blocks, quality improvement can be achieved. These four key words are therefore in keeping with what is currently understood about improving health care (Juran & Riley, 1999; Leatherman, Ferris, Berwick, Omaswa, & Crisp, 2010; Organization, 2007; Plsek, 1999) .

Anova would provide technical support by training their own staff as well. 'Training Anova staff' was mentioned by one LIA and one Anova respondent as a part of their mandate. The Primary Facilitator summarised this point well:

'Probably the primary goal was to develop their people so that whatever improvements were made would be sustained, and then also to develop the capability of the staff to receive that support from Anova and if we achieve those two things, the actual improvement in waiting times and ultimately in quality of service would also follow. By simply going for specific outcomes like waiting time or quality without developing the people would be fairly pointless, because that wouldn't have been sustained.'

This statement tells us that sustainability was an integral part of the project's goals which the commonly implemented RIE's have been criticized for failing to achieve in health care (Joosten et al., 2009; Radnor, 2010).

Although not originally intended for DoH respondents, the Acting Facility Manager was asked to comment on the goal of the project. She repeatedly mentioned the prevention of lawsuits as a primary motive.

5.4. Understanding of Lean

Similar to the understanding of the mandate, there is little consistency in the responses to this question. Unlike mandate, however, this question was posed to all twelve respondents and each describes some aspect of Lean. Two of the three

DoH respondents had difficulty with this question. One of them could provide no answer while the other initially provided a more literal meaning of the word: *'means a slim, thinner, tapered you know, making into small pieces, cutting the bigger portion'*, before providing more appropriate answers such as Problem-solving and Quality Improvement.

The relevant keywords which are mentioned most, along with their number of votes in brackets, include the following:

1. Problem solving (4)
2. Quality Improvement (3)
3. Create thinking people (2)
4. Eliminate waste (2)

The first two keywords were mentioned across the three groups of respondents. Interestingly, creating 'thinking people' was only mentioned by LIA respondents while eliminating waste, or Muda, was not mentioned by any of the DoH respondents and is one of the founding principles of Lean. This can explained by the absence of any DoH staff from the ITLW.

Of the four keywords 'problem-solving' and 'create thinking people' are two ideas found in Lean thinking. In fact, the creation of thinking people is what is meant to facilitate autonomous problem solving amongst the frontline staff. Continuous improvement (CI) is mentioned by one LIA respondent, which is both an element of Lean thinking and a basic principle of Lean (Ballé, 2005; Hines et al., 2004). One could thus argue that although sustainability was important to LIA and Anova (as part of their mandate), none of the DoH or Anova staff understood it as an integral part of Lean. Again, the absence of DoH staff from the ILTW could help explain this. CI is the only one of the five basic principle of Lean that was mentioned. Other important absentees included:

1. Identify customer value
2. Identify the value stream
3. Create flow with the value stream
4. Create a pull mechanism

(Hines et al., 2004; Womack et al., 2008; Womack & Miller, 2005)

5.5. Obstacles

5.5.1. Staff Resistance

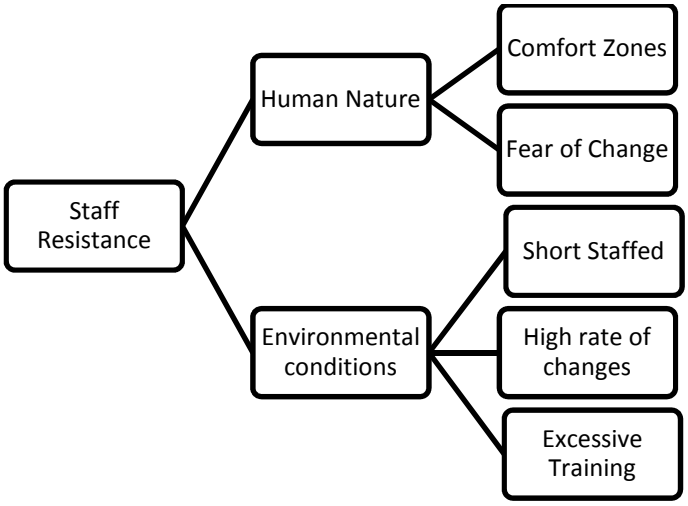


Figure 12: Staff Resistance

What is immediately striking is the distribution of respondents who mentioned staff resistance. The majority were Anova staff, who were tasked with mentoring DoH staff. The related themes that emerged can be divided into two main groups. Firstly, aspects of human nature related to the work environment. In this regard themes such as 'fear of change' and 'comfort zones' started to emerge. Nurses were said to be used to a routine originating from the clinical aspects of their work and seldom enjoyed change. These aspects, however, cannot be separated completely from the second group which are the environmental aspects of working in the primary health care clinic. In the interviews, this topic arose with all three groups of respondents. During the course of the interviews respondents describe the daily work conditions. One is struck by the seemingly unstable and very demanding nature of the clinic environment. This resulted in primary health care staff holding onto routine as a coping mechanism. An example of this instability is the bus transport system (BTS) provided to Soweto-based staff to attend work in Stretford. This was phased out within a year, prompting the staff to

return to work in Soweto. Besides the resulting understaffing, this exodus of ninety percent of the staff also meant much of the knowledge of Lean left the clinic. Nurse mentors report that clinic staff cited being short-staffed as a reason for hesitating to engage with new ideas. Other related themes that arose were the 'high rate of changes' and 'excessive training' that occurs. The Anova senior program manager reported that several training programs on topics such as managing TB, managing maternal health, mental health, to measles campaigns was too much. A senior primary health care nurse, who was in charge of the chronic department during the integration of services project, agreed that this produced hostility from the staff towards the Anova mentors who were viewed as horrible people, constantly introducing changes, seen as extra work. At the time of the Lean implementation, the integration of services project reportedly produced the greatest challenge. One Anova manager deemed it unfeasible as it required intervention at a sub-district level.

As far as both past and present research is concerned, resistance from staff is a common obstacle. It is well-documented not just in Lean in health care, but in any change initiative in any industry because it is more to do with the idea of change in the work environment (De Souza & Pidd, 2011). Change programmes are often considered to be temporary distractions (Radnor et al., 2006). Early research suggested that one way to avoid this was to implement Lean initially through a small-scale project, such as this one, to achieve a degree of buy-in (De Souza & Pidd, 2008). This pattern of implementation was therefore partly a means to avoid a well-known obstacle.

5.5.2. Understaffing

As with staff resistance, understaffing or being short staffed, was mostly noted by the Anova staff as the main challenge, although there is substantially more corroboration from the senior professional nurse on this theme. One mentor related how even on less busy days with a full staff complement she was unable to 'steal one just to say: "Come, let me show you how we can do this."', as they would often reply: 'We are short-staffed.' Even escalating the matter to the Facility Manager only produced the same response. The Acting Facility Manager fully agreed declaring that '…if you don't have enough staff also, you can't be

challenged.' She continued that the workload meant staff could not go for tea or lunch and it was 'highly impossible if there is just one person.' The professional nurse singled out shortages as their challenge with the problem compounded by sick leave and schooling, leaving few in the clinic to do the work. Primary health care nurses, or even the facility manager, would sometimes have to fill in for absentees. However, for three respondents, including the DoH Quality Improvement Co-ordinator, this was "...not an excuse." An Anova mentor agreed that "...people have shielded and used the known factors that there are shortages." This then becomes a mind-set in public service, characterized by shortages of staff and space, not quality or efficiency. The Anova Data Capturer agreed with the lack of manpower being used as a scapegoat, but insisted 'we need to work with what we have...' The QI Co-ordinator was adamant that patient care should not be jeopardized because "people don't want to go the extra mile." He also mentioned the bus transport system (BTS) as an issue because nurses would close the clinic as early as twelve o'clock to make the buses on Fridays, causing patients who had waited since 5.00 am to be rescheduled, resulting in an excessive patient load on those days. He proposed that attitudes needed to change.

Lack of resources, especially staff resources, has been previously noted as an obstacle. In addition to staff, time is also a related resource that may challenge an implementation. Enough staff members mean very little if they do not have the time to engage with the improvement project, both during and after the RIE (Radnor et al., 2006).

5.5.3. Attitudes

"People are having attitudes" declared the QI Co-ordinator. The attitudes '...come in different ways' and included the doctors and even the facility managers. Some facility managers had negative attitudes about the QI project and did not allow him to speak to the staff without an appointment. One mentor suggested that "sometimes you deal with attitudes more than the actual work." The Clinical Advisor agreed that even when the follow-up with QI projects was brought up, clinic staff "weren't so keen" and "just weren't interested." When asked about the most common obstacle, the senior nurse also singled out attitudes and the

influence of individual attitudes on colleagues. As a result, she commented that it was better to introduce something new to new staff. This comment strengthens the link between themes of 'attitudes' with that of 'staff resistance'. Although not the exact same word, 'attitudes' can be compared to the scepticism that is repeatedly mentioned as a barrier to implementation (De Souza & Pidd, 2011; Radnor et al., 2006), the difference being that 'attitude' was not dependent on a QI project. The harsh and unrelenting PHC working environment often took its toll on staff members who, over time, developed a deep-seated negativity to anything related to anything considered as 'extra work'. As mentioned earlier, this is often more to do with the idea of change programmes in general than specifically at Lean (De Souza & Pidd, 2011). The solution suggested by two of the respondents required a top down approach, starting with management. One nurse mentor felt that '….*if there's no buy-in from the superior people, management, expect zero from the operational level*.'

5.5.4. Buy in

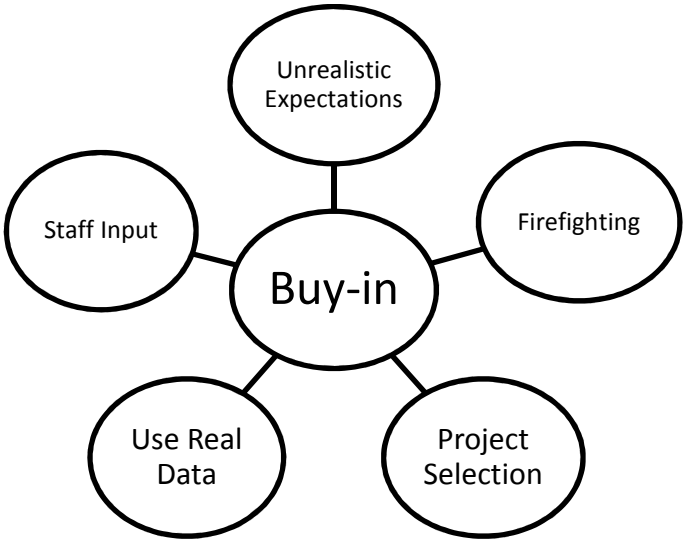


Figure 13: Buy-in

"We are dealing with the hearts and minds there, so there's a constant motivation, constant buying and selling of the whole idea to the facility."

With statements like this, the Anova Senior Project Manager weighed in several times on this theme. He believed buy-in was the biggest hurdle. From a planning perspective he had hoped that if Anova could have one Lean expert in at least

twenty five percent of the facilities, they would achieve enough buy-in to mobilise for more resources from government. From that interview, it thus becomes clear that 'buy-in' was an important motivation for choosing the RPIW as the implementation format. It was relatively small, finite and allowed Anova the opportunity to produce results and later motivate for a larger implementation. Research concurs that RIEs have a long history of consistently producing results that impress policy-makers (Fillingham, 2007). The Senior Project Manager was, however, convinced that long term buy-in was difficult to achieve for two identifiable reasons. One was the unrealistic expectations placed on Lean due to the high pressure to see results at primary health care facilities, and when results did not appear as quickly as hoped, buy-in was quickly withdrawn. The other reason relates to the idea of fire-fighting where clinic staff were so busy dealing with immediate pressures of providing a health service from day to day, that they are unable to fully engage with any QI endeavour. As well intentioned as QI projects are, the Senior Project Manager had to confess that *"it's easier said, but when they're looking at the fire and they say, are you really sure, it's also very difficult to convince them."* This is consistent with de Souza's findings that health care professionals were hired partly based upon their ability to 'put out fires'. It was considered a necessary quality for the work environment, yet posed a serious obstacle to the mind shift required to understand and implement Lean (De Souza & Pidd, 2011). This trait, however becomes an obstacle that has come to represent one of the greatest practical challenges to implementing an improvement project in health care (Fillingham, 2007).

From the Program Manager's perspective, buy-in was hindered by the Facility Manager choosing the three projects without consulting her staff. Two nurse mentors agreed that ownership of the problems improve if staff were involved in the project selection, as a problem identified by the Facility Manager was not necessarily a problem for facility staff and this was an important starting point for communication. In her analysis of the sustainability of process improvements, Bateman identified the relationship between the facilitation of contribution by frontline staff to their buy-in and ultimately, the sustainability of the process

improvements (Bateman, 2005). Engaging staff in both the problem identification as well as the formation of solutions is core to Lean thinking (Ballé, 2005).

Remaining comments focused on the practical aspects of communication necessary to achieve buy-in. Many respondents cited improved communication skills and involving staff as a take away lesson from the Lean workshops. From the acting facility manager who "managed to speak in an open-minded way" to a nurse mentor who was "trying to get what you think, what opinions do you have, or are you observing anything", it is clear that input from the facility staff was an important aspect of achieving buy-in. Research has also proposed that 'Post-RIE ownership' of the improvement activities was a hurdle to successful implementation. As in this case, this is most likely to occur when there is an external facilitator of the implementation (Radnor et al., 2006).

An important part of achieving buy-in through communication was the use of real data, as demanded by Lean (Kollberg et al., 2006). A good example was the pharmacy waiting times project chosen by the Facility Manager. A look at the data showed that the times were not as bad as initially perceived, but that certain days were overbooked and that patients received their files quite late, which related to the filing project. Using real data helped to convince the pharmacy manager into supporting the proposed improvements.

5.5.5. Workshop Attendance

There are three distinct stories that emerged from discussions around workshop attendance.

- The first already discussed was that of delegates selected for the RPIW not having attended the ITLW. This became a very practical problem, slowing down the Lean facilitators and not allowing for maximisation of the time allotted to the RPIW which affected buy-in. As a senior Anova manager put it, "*so that's why we're doing the two-day workshop, to sell more to them."*
- The second story was that of staff, especially senior staff, being 'pulled out of the workshops'. This relates back to the idea of firefighting where the most senior of primary health care staff, including the Facility Manager, were often pulled out of the workshops to attend to clinic matters. This

understandably had a detrimental effect on the quality of management involvement in the project, which then later ties in with the aspect of buy-in. The lean coach reported that sometimes the reasons for being pulled out of the workshops were more trivial and highlighted the lack of prioritisation of the QI trainings. Previous research concurs that a commitment to a Lean implementation was important to avoid the common distraction of 'firefighting' (Bateman, 2005; Radnor et al., 2006). This theme can be related to 'lack of resources' as an obstacle as it is was often the lack of sufficient staff that resulted in delegate being pulled out of the workshops (Radnor et al., 2006). One could argue that a better staff complement would have prevented managers from having to engage in firefighting activities and perhaps even ensured better attendance of the introductory workshop. Interview data revealed that, despite efforts to schedule workshops in a timely fashion, workshops were often cancelled at the last minute due to other work-related commitments. This again links to lack of sufficient resources to handle work demands (Radnor et al., 2006).

- Finally, workshop attendance also speaks to the concept of sustainability. It was hoped that by exposing both Anova and DoH staff to several workshops they would gain the confidence to eventually become Lean champions. The trained Anova staff would support the DoH staff after the RPIW. In turn, the DoH staff would repeatedly engage in other QI projects and help to disseminate the knowledge of Lean to those who had not attended any workshops.

5.5.6 Delegate Selection

The theme of Delegate Selection emerges with two related themes.

- The first is the previously mentioned 'Workshop Attendance' where respondents complained about the hindrance to the project implementation caused by incorporating delegates into the RPIW who had not attended the ITLW (remembering that only three Anova staff attended the ITLW). This was the cause of frustration for the facilitators, who already had to deal with their five day programme being shortened to four days.

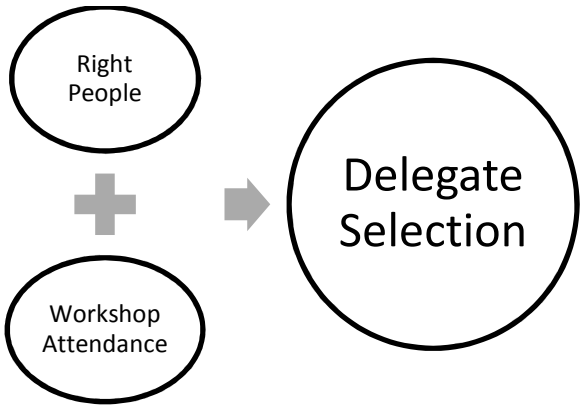


Figure 14: Delegate Selection

- Another idea related to delegate selection was that of choosing the 'Right People'. The 'Right People' being described by various respondents as:
  (1) Representatives from each department.
  (2) People who could carry Lean forward within each department. In this case, delegate selection is associated with the theme of sustainability
  (3) People familiar with Quality Assurance/ Improvement.
  Radnor et al. (2006) identified this latter group in her research where delegates were not really chosen so much as volunteers were gathered. This occurred in this project where delegates were randomly chosen on the first day of the project largely based on availability.

5.5.6. Staff Turnover

A high level of 'staff turnover' was noted by all three groups of respondents as a considerable obstacle. The turnover occurred either as staff resigning or as staff involved in temporary learnership programmes rotating through different clinics. Both resulted in staff, newly trained in Lean methodologies, leaving the clinic and thus forcing the Anova Mentors to 'start now afresh'.

Staff resignation was, according to respondents, commonplace. This extended to district management level where one Anova Programme Manager noted that: 'Every other month there was a new Acting Chief Director'. Although no reasons were offered as to why staff resigned, what was repeatedly explained was how this high staff turnover negatively affected the sustainability of the project.

Although not mentioned specifically as an obstacle, high staff turnover would necessarily affect the level of human resources necessary to conduct any implementation (Radnor et al., 2006). One has to appreciate that success of Lean is often attributed to its involvement of staff in the process of QI (Bhasin & Burcher, 2006) .

Staff turnover at senior management level affected leadership, leading one LIA facilitator to note that the discernible lack of leadership at Anova led to staff becoming *'pretty disillusioned and I think most of them left Anova'*. It was these Anova members of staff that were meant to support the PHC staff into continuing the use of Lean. This brings the idea of leadership and sustainability to the forefront (Mann, 2010). High staff turnover thus creates an unsuitable, leadership-poor environment to sustain Lean which links to another obstacle of 'leadership failure' (Radnor et al., 2006).

5.5.7. Planning and Organising:

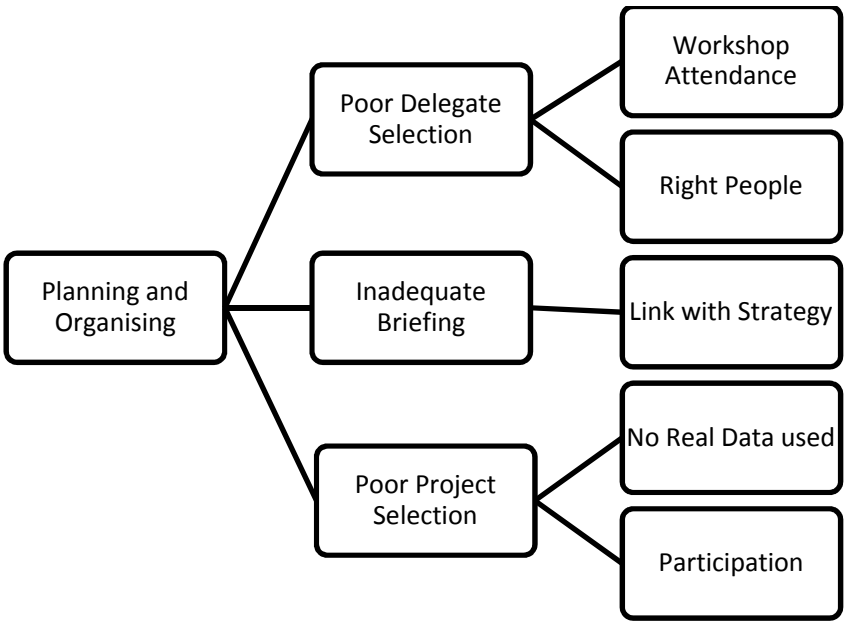


Figure 15: Planning and Organising

All three Anova managers agreed that this was a major obstacle. In fact, the Senior Programme Manager believed that this was the second most important obstacle after Buy-in. Although the idea of poor planning was not specified as an

obstacle, the consequences are. For example, the Project Manager and Clinic Advisor, who were heavily involved in the planning, believed that the project was rushed and led to poor delegate selection instead of choosing delegates who were representatives from each department or were familiar with Quality Assurance and could be developed into Lean Champions. This has been expressed under the heading 'Delegate selection' and is a known obstacle to successful implementation(Radnor et al., 2006).

Another consequence was that a lot of the delegates selected to the RPIW had not attended the ITLW, which was a prerequisite from LIA. This resulted in the workshop facilitators having to spend time, giving "a little crash course on introduction to Lean" and took away from the quality of the five-day workshop.

An important related theme is that of 'Inadequate Briefing' before the workshop. One LIA facilitator repeatedly reflected that this affected how delegates perceived and received the training, usually causing initial confusion and demotivation. It was felt that basic information management that should have been provided prior to the workshop included answers to the questions "*why am I selected, what is the intention of training me, how am I gonna bring it back to the workplace*." Further questioning of the Senior LIA facilitator revealed this to be a big problem in other primary health care centres as well. The Senior Project Manager felt this poor communication extended into the follow-up phase of the project, that is, after training, how was Anova going to provide continued support? Adequate briefing would thus have improved sustainability. The literature agrees that communication as an important feature for any Lean implementation in order to create a common understanding of the purpose and path of the implementation especially when linking the activities to an overarching strategy (Radnor et al., 2006).

Another consequence of the poor project planning was the poor 'Project Selection'. This theme occurred for two reasons.

- One, because the Facility Manager chose the projects on the day of the workshop, no real data was collected prior to the workshops. The LIA facilitator pointed out that "Lean is very dependent on information" and that *"it depends solely on collecting facts, collecting data, analysing*

data and to really get a rich experience out of the five-day RPIW." This was important for the team to really "grasp what they're trying address." This challenge of collecting data for Lean is often found in the health care environment which fails to use data to drive performance (De Souza & Pidd, 2011)

- Secondly, as mentioned under 'buy-in', it was felt that the Facility Manager choosing the projects on her own was counterproductive. A more inclusive approach could have ensured better participation in the workshops and ultimately better buy-in for the project as a whole, as well as better ownership of the issues (Bateman, 2005). As one Anova manager put it:

'And maybe the other thing, not for the facility managers to decide on her own what the project would be, to ask the department because if the people who are in that department see there's a problem and they can say what they would like to see at the end, they are able to carry it forward. But if for them it is not an issue and the managers just deciding...their involvement becomes an issue.'

Finally, poor planning and organising caused practical challenges. The stationery, equipment and even the room arranged for the workshops was considered inadequate by one LIA facilitator. Resolving the issues took time away from the already shortened RPIW schedule.

5.5.8. Train more PHC staff

Both Anova and DoH staff felt that the project would have benefited from more primary health care staff being trained. The obstacle of not enough PHC staff being trained affected both buy-in and sustainability. It was suggested that if there were more PHC staff in the workshops, as opposed to Anova staff, then it would have been viewed as less of an external intervention and more of a facility project. Also, more PHC staff from that specific facility meant a greater chance of the facility-based projects being closed out and Lean being disseminated throughout the clinic.

Additionally, it was felt that with more 'in-house' Lean practitioners the overwhelming task of promoting Quality Assurance within an under-resourced setting could be shared. The QI Co-ordinator felt that being responsible for eleven clinics while there are "so many things in quality" resulted in some clinics being neglected. In terms of who should be trained, one respondent specified that there should be a representative of each department in the clinic attending the workshops, while another suggested staff involved with QA.

Both of the ideas mentioned above are related to having enough resources to implement the changes envisioned which is a well-known obstacle related to a more than one obstacle identified in this research (Radnor et al., 2006). It is interesting to remember that Lean is often chosen for use in the public sector because of it is known to produce results without requiring additional resources (Radnor & Walley, 2008)

5.5.9. Management Involvement

According to one LIA respondent, management involvement was a requirement, whether it was the CEO of a hospital or the Facility Manager of a clinic, but it was often lacking. In the case of Stretford Clinic it happened that the existing Facility Manager was due to go on pension within two months of the start of the project. At least three respondents reported feeling that this was the reason for her lack of interest and involvement. She did, however, send a nurse who eventually became the Acting Facility Manager in her place. The importance of management involvement is highlighted by the fact that three respondents felt that it was this Acting Facility Manager's persistent involvement in the Filing Project that resulted in it being the most successful of the three projects that were embarked upon. There is, however, disagreement as to the importance of facility management involvement. Most felt it was an important driver for buy-in from the rest of the clinic staff. In fact, one Anova manager suggested that given the opportunity to redo the project, she would have spent the two weeks leading up to the project with the Facility Manager in preparation. One Anova manager, however, felt differently. She was adamant that their involvement was purely so they understood and approved the project, not to drive it. She believed that it was the frontline staff that used the methods regularly that were ultimately responsible for

the project's success or failure. She commented that for facility managers any initiative "*becomes that reporting issue eventually. They are not the people who are going to push it*." The respondent felt strongly that a Lean champion should be chosen from staff such as nurses, as the Facility Manager was often not even in the clinic. As far as the literature is concerned the topic of middle management in health care is under researched and that they potentially have an important role to play in 'health care innovation implementation' as they can fill the gap between strategy and day-to-day activities (Birken, Lee, & Weiner, 2012). This sentiment was echoed from the various groups of respondents. Including more managers in the training was suggested by two DoH staff. Even the Acting Facility Manager, who essentially represented middle management, felt that trained managers could respond better to the needs of the staff (Mazzocato, Savage, Brommels, Aronsson, & Thor, 2010). Their perceived importance is attributed to their ability to initially sell the innovation implementation and then largely to their duty in overseeing teams in the implementation process (Birken et al., 2012).The suggestion of increased management involvement, however, extended higher. Two Anova managers believed that even sub-district management needed to be involved as prioritisation at a sub-district level enhanced prioritisation at a facility level. Communication was offered as a suggestion to combat the reportedly poor management involvement within the DoH. Respondents believed that communicating directly with managers would have improved the project at the planning and organising stage, a sentiment that has been suggested by previous research (Mazzocato, Savage, Brommels, Aronsson, & Thor, 2010).

5.6. Research versus Literature comparison

A comparison with the literature provides some perspective on the challenges faced. The distinction between certain obstacles is sometimes blurred. For this reason, obstacles that are conceptually similar are grouped together. The differences between the two groups of obstacles can either be literature-based obstacles that were not mentioned by the respondents or research-based obstacles that were not mentioned in the literature. The table below demonstrates the former group, with critical themes written in bold.

Table 12: Literature vs Research-based Obstacles

	Literature-based Obstacles	Research-based Obstacles
1	Resistance to change/Scepticism	**Staff Resistance,** Management Resistance
2	Lack of Ownership	Ownership of Issues
3	Leadership Failure	Lack of Leadership, Leadership changes
4	Identity of Improvement team members	**Delegate selection**
5	Lack of Commitment to the change process	Commitment
6	Weak link to strategy	
7	Lack of Resources to implement change	**Understaffing**
8	Poor Communication	Inadequate Briefing
9	Organizational Culture	**Attitudes,** DoH Culture
10	Perception	
11	Terminology	
12	Professional Skills of Health care professionals	Firefighting
13	Organisational Momentum	**Staff turnover,** Leadership changes
14	Professional and Functional Silo's	
15	Hierarchy and Management Roles	

16	Data Collection and Performance measurement	Use real data
17	Who defines Value	
18	Influence on Demand	
19	Overemphasis on Operational aspects/ RIE's	
20	Contribution and Buy-in	**Buy-in,** Project Selection, Participation
21	Maintenance and Focus	Management Involvement, Management Focus

Out of the twenty-one obstacles found in the literature, eight were not mentioned by respondents including:

1. Weal link to strategy
2. Perception
3. Terminology
4. Professional and functional silo's
5. Hierarchy and Management Roles
6. Who defines Value
7. Influence on Demand
8. Overemphasis on Operational aspects/RIE's

Most, however, can be explained. For example, at least four of these absentees can be explained by the nature of the implementation. The RPIW's were very similar to the RIE's discussed in the literature. As such it is not surprising 'Professional and functional silo's' and 'Overemphasis on Operational aspects' are not mentioned as a more organisation-wide implementation is necessary to reveal these challenges. The same can be said for the 'weak link to strategy'. Because

this project was focused solely on improving processes, a link to strategy was unlikely to occur.

'Hierarchy and management roles' was not an obstacle because clinicians were almost completely uninvolved in this project. Therefore the hierarchy that is responsible for the 'dual lines of authority' that prevails in health care and causes the obstruction was never encountered (Young & McClean, 2008). On several occasions, supplementary questions around clinician involvement revealed that they were uninterested in the project and were never compelled by management or the facilitators to engage with it. It must be remembered that literature has also called into question the suitability of doctors as potential lean managers (Waring & Bishop, 2010).

Two unexpected absentees were 'Perception' and 'Terminology'. For almost all of the respondents, this project was their first exposure to Lean and yet challenges around their introduction to the concepts and jargon were completely absent (De Souza & Pidd, 2011). Terminology is related to the barrier of language as Lean can sometimes be implemented using the original Japanese terms, for example Muda or Muri. Terminology is not surprisingly absent as many of the Japanese Lean terms were not used. Instead, English versions were used such as 'go see' for 'Gemba walks' which were simple and easy to understand. None of the respondents had difficulty with either the terms or the related ideas. Considering that most delegates had not even attended the ITLW, this speaks well to the accessibility of Lean.

In terms of how Lean was perceived, all of the respondents had positive experiences. Any negative feedback was not regarding Lean itself, but rather the nature and/or practicalities of the implementation. Perception as a barrier is explained as a fear arising from clinical staff that Lean's goal is to standardise health care processes (De Souza & Pidd, 2011). This, to many health care professionals, is at odds with the inherent variability of clinical practice (Radnor et al., 2012). The absence of doctors from this RPIW may explain the absence of 'perception' from the list. The last two absentees were the challenges Radnor believed faced a lean implementation in any public space which are: 'Who defines

value' and 'Ability to influence demand' (Radnor et al., 2012). It was clear that during the four days of the RPIW, there was never any question as to who the customer was. Although this was never formally stipulated, the patient journey was investigated and their perspective was often the focus. The ability to influence demand was also never mentioned, but this was arguably because in the public health environment, it is generally accepted that it cannot be altered and that the focus has to be capacity and efficiency (Radnor et al., 2012). In fact, the integration of services project was a study of that relationship between capacity and demand at the facility and was the only unsuccessful project.

This brings us to the group of obstacles identified in the research yet not mentioned in the literature. These are therefore the challenges that are specific to the South African PHC environment. They are listed with their corresponding number of votes in brackets and thereafter discussed:

1. Planning and Organising (3)
2. Conflicting Priorities (2)
3. Follow up (2)
4. Unrealistic expectations of Lean (1)
5. Excessive Training (1)
6. Continued Support (1)

As discussed earlier, 'Planning and Organising" proved to be a major obstacle to this project in several ways, negatively affecting the selection of delegates, the selection of projects and briefing of delegates prior to the workshops (see figure 13). Although LIA facilitated the workshops, Anova made all the arrangements with the DoH. LIA facilitators felt that the project would have benefitted if Anova had not acted as an intermediary. Anova, in turn, complained that the DoH often cancelled or rescheduled at the last minute. According to the Anova Project Manager, this in turn, was due to other commitments, such as training. This links to the theme of 'conflicting priorities' and 'excessive training'.

'Conflicting priorities' and 'excessive training' co-occurred as challenges. They both relate to the high demands placed on the clinics by the local health care administration. Numerous trainings, often in quick succession, were difficult for

PHC staff to deal with in an already overworked, understaffed environment. This caused interventions to be viewed with disdain. It can also be argued that frequent trainings in such an environment would have been less effective by not allowing staff sufficient time to absorb and utilise the information. There is no specific mention of trainings being an obstacle to implementation; however, a loosely related obstacle from the literature is that of 'lack of resources'. It can be argued that it was the insufficiency of time and human resources that prohibited the staff from fully engaging with them and thus made the trainings excessive (Radnor et al., 2006). As the Anova Project Manager explained, the Facility Manager was powerless to intervene as these trainings were dictated at a district level. As described under 'management involvement', the Anova Programme Manager further explained that trainings eventually became a matter of reporting for the Facility Manager where he/she had to provide regular progress/status reports to each sub-district/ district manager. There were reportedly several such managers in each charge of a specific clinical discipline such as TB, HIV or maternal health. With the Facility Manager inundated with reporting responsibilities and clinic staff bombarded with trainings, it is understandable how the Lean process did not receive sufficient prioritisation. The closest related obstacle in the literature is that of 'lack of commitment' from management which is considered an important ingredient to compel frontline staff to engage with the programme (Radnor et al., 2006).

Similarly, the theme of 'unrealistic expectations of lean' proved to be a challenge to achieving long term buy-in. As the Anova Project Manager explained, buy-in was often conditional upon speedy results to long-standing problems. He further explained that it was for this reason that the focus of this project, and many initial attempts at Lean, are process improvements which literature explains is expected to yield faster results more reliably than a more system-wide application (Fillingham, 2007). As revealed earlier from the interview with the programme manager, this is also related to his desire to achieve quick wins in order to mobilise greater resources from government. On the other hand, the LIA Primary Facilitator, who has extensive experience with Lean implementations, commented on the unrealistic expectations that Anova had of Lean. He felt that Anova thought

they were buying a quick fix, whereas Lean really requires a shift in thinking requiring the adoption of a daily management practice which is often implemented through a cluster of functions and duties Lean calls ‘Leader standard work’ (Fillingham, 2007). There are authors who believe that implementing Lean tools is only 20% of the effort while the remaining 80% is focused on changing the practice and behaviours of the leaders involved (Mann, 2009).

LIA also expected Anova to continue providing support to the PHC staff after the workshop. Although Anova had planned on this, they did not plan on two of the three support staff trainees resigning. This partly explains why ‘continued support’ and ‘follow-up’ was mentioned as an obstacle. This opens up the much debated topic of the sustainability of Lean, in particular, process improvements (Radnor, 2011). Using the framework for sustainability developed by Bateman (2005), the ‘Filing project’ and the ‘Pharmacy Waiting time project’ both achieved class B. That is to say, they were able to improve in the workshop, maintain the new procedure and close out technical issues. Continuous improvement however proved unattainable which is not surprising given the RIE pattern of implementation. Sadly, for the integration of services project, they were unable to achieve an improvement in the workshop and thus were of class E activities.

6. CHAPTER 6: SUMMARY AND RECOMMENDATIONS

6.1. Summary

So what do these findings tell us about the challenges of implementing Lean in PHC facilities? The most apparent finding is that the eight critical themes that emerged can be roughly divided into two camps based on their origins. The obstacles can either be related to the PHC environment or to the method of implementation.

The obstacles related to the PHC clinic itself tell an important story about the demands of providing basic health care in South Africa. The staff, by most accounts, are overworked and demoralised. Job satisfaction is an important ingredient for any efficient organisation, be it a private or public entity. Factors in this equation include the workload and the related work force. In this regard, the PHC staff are clearly overwhelmed. The workload can be divided into the core work of attending to patients and all the related duties, as well as the supplementary work such as engaging with training. From the interviews, it becomes clear that staff members are barely coping with the core work. This results in poor job satisfaction and subsequently high staff turnover and understaffing. Those that are left behind develop a sort of 'thick skin' perceived as attitudes and are resistant to engage in anything outside of core duties. Thus, in order to address these obstacles, the staff complement needs to be addressed. However, as an essential service, health care can never be interrupted for any sort of training. There needs to be sufficient staff to manage day-to-day functions as well as to participate in QI endeavours. To short-change the latter would ultimately short-change the former. This improvement in staff complement should extend to management level. In this case study, a leadership void was reported to exist at both a facility and a district level. Filling this void might arguably have brought some much-needed stability to this environment and perhaps improved the overall efficiency and sustainability of this project. The added pressure to engage in numerous trainings arranged at district and sub-district level was repeatedly mentioned as a cause for concern.

The remaining obstacles are related to the implementation of Lean. (It must be reiterated at this point that at no point during the interviews was the value of Lean brought into question. All three groups of respondents attested to its value and user-friendliness in this context.) The implementation obstacles can largely be further divided into those due to the pattern of implementation (i.e. RIE/RPIW) and those related to Planning and Organisation (as illustrated in Figure 13). In terms of planning and organising, LIA facilitators were unhappy with Anova's handling of the arrangements and felt that the absence of a 'middle man' might have benefitted the project. Anova managers, however, were equally distressed by the difficulty in making arrangements with the DoH. There were reportedly several last minute cancellations and rescheduling on the part of DoH owing mostly to conflicting agendas. This opens up the debate of the relationship between government and NGO's in health care. One must remember that it was the DoH that approached Anova to assist them with health system strengthening. In practice, however, the DoH did not incorporate Anova's efforts into their own agenda. One could argue that without this co-operation, the project was half cocked and bound for only partial success. The greatest casualty was the buy-in, which this research and prior research has shown to be a non-negotiable factor for a successful implementation.

In terms of the pattern of implementation, one has to look at the reasons behind the choice of RIE over an organisation-wide implementation. RIE's are known to produce quick, dependable results although at the expense of adopting the culture of CI and sustainability. Another, reason however, is the desire to achieve buy-in both from policy-makers, in order to mobilise for greater resources from perhaps for a larger, wider implementation as well as from frontline staff who may show less resistance after this small exposure to what Lean can do. The two reasons are not exclusive, in which case one could argue that this implementation was successful.

6.2. Recommendations

6.2.1. Recommendations to the DoH

In terms of the relationship between obstacles and the pattern of implementation, the RIE pattern was responsible for several obstacles. On the other hand, certain literature-based obstacles were absent for the same reason. An organisation/system-wide implementation would therefore have produced additional /alternative obstacles. One is then faced with the option of choosing the pattern of implementation based on the wants or needs of the organisation or based on which potential obstacles are more manageable with this resource-constrained environment. Lean, however, is still relevant. The experience with Lean by all the respondents was all positive. The reasons it is still important is because it producers results even under the difficult conditions seen in public health care systems around the world. For example, the ability to improve quality without having to make large investments in resources, human or otherwise, is universal and Lean is able to do that. This research does show, however, that resource limitations are a cause of frustration for all those involved and does affect the potential for success. Another important example is the ability to improve the poor staff moral so prevalent in public health care in South Africa. This is also important, given the reported lack of leadership and management. But conversely, there needs to be improved leadership and management to ensure a better facilitation of implementing Lean. An important insight came from the LIA primary facilitator who has implemented several Lean projects across South Africa. He believed that Anova and the DoH wanted a quick fix so they could continue with business as usual. They did not realise that Lean requires a shift in thinking and the adoption of a daily management practice, but this seems impossible, given that there was not much management involvement and that leadership (the Facility Manager) is inundated with reporting duties.

The difficulty in planning and organising highlighted the fractured and bureaucratic nature of SA public health care. Instead of being concerned with the overall management of a facility, each district manager is only concerned with his/her assigned discipline. This is the reason behind the only failed project (the integration of services project), as it required co-operation across these disciplines and thus required district management involvement. This is a known obstacle referred to as ‘functional silo’s’ (De Souza & Pidd, 2011). A more successful and

sustainable Lean implementation requires a strong link with an overarching strategy in order to provide that 'unity of purpose' and overcome that functional division.

Planning and organising is also important because of the need for public health care to co-operate with third parties who have the necessary knowledge and skills to embark on quality improvement projects. Regardless of the particular management system employed, successful implementation requires all parties to be 'on the same page', instead of separate entities trying to achieve different goals in the same space. If all parties are on the same page there is better communication regarding all aspects of the implementation from agendas, schedules and requirements of all involved parties, instead of Anova trying to 'squeeze themselves' into the DoH schedule. This would have improved the initial selection and briefing of delegates, the selection of projects and ultimately the buy-in essential for any successful implementation.

6.2.2. Recommendations to Anova

The difficulty in planning and organising also highlighted the need for a more efficient relationship between the consulting organisation and the staff with whom they directly interact. DoH staff saw this as external interference instead of assistance towards internal problem.The use of an external organisation also resulted in a lack of ownership of the endeavour, including 'post-RIE' which affect sustainability.

Management and leadership is currently very topical internationally. Although, the development of management and leadership is most likely the responsibility of the DoH; given the mandate for this project and the known requirements of Lean ,as well as the known absence of these two crucial factors, one could argue that Anova should have compensated for this by incorporating for their development in order to ensure improved Lean implementation.

6.3. Recommendations for further research

Recommendations for future research begin with means to improve the quality of the research. It was noted that multiple perspectives produced very rich data

about the experiences with Lean. This can be further enhanced by inviting more perspectives, such as that of DoH management, which would help further dissect the obstacles this research identified as originating at district and sub-district level. Viewing these challenges from the administration's perspective might help further understand the problem. Seeking the views of patients, whose input was sought in establishing the patient journey's, might also be of value. Including the question of mandate to the DoH respondents would have allowed us to see if LIA and Anova management were able to effectively communicate this.

The generalisability of this research may also be improved by interviewing respondents from a few more of the implementation sites in other provinces.

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APPENDICES

Appendix A

Question Guide

Anova

1. Can you please tell me what was your job title at AHI at the time of the QI project, and what role did you play in it?

2. What is your understanding of the term Lean?

3. What was your mandate from the DoH? Who chose Lean for this QI project and why?

4. What obstacles have you experienced, if any, in implementing Lean at PHC clinics?

5. What systems/methods were utilised to evaluate the challenges faced on this QI project? If so, what were the findings?

6. If you could re-do this project, what would you have done differently? And why?

LIA

1. Can you please tell me what was your job title at the time of the QI project, and what role did you play in it?

2. What is your understanding of the term Lean?

3. What was your mandate from AHI?

4. Have you ever implemented Lean to PHC clinics outside of this QI project? If so, what obstacles did you encounter?

5. What obstacles did you experience, if any, in implementing Lean at PHC clinics? Prioritize by frequency/ severity.

6. What systems/methods were utilised to evaluate the challenges faced on this QI project? If so, what were the findings?

7. If you could re-do this project, what would you have done differently. And why?

DOH

1. Can you please tell me what was your job title at the time of the QI project, and what role did you play in it?

2. What is your understanding of the term Lean? Any prior experiences?

3. Tell me about your experiences/opinions of the QI workshops? What experiences have you had with those QI methods till now?

4. What obstacles have you experienced in implementing Lean at PHC clinics? Prioritize by frequency/ severity.

5. What systems/methods were utilised to evaluate the challenges faced on this QI project? If so, what were the findings?

6. If you could re-do this whole project, what would you have done differently, and why?

Appendix B
Coding Excerpt

046 INTERVIEWER: Before we go any further, can you give me an idea of what is
047 your understanding of the term LEAN?
048
049 INTERVIEWEE: LEAN is a system that was adopted or started off in Toyota, its
050 also known as the Toyota production system, and in very simplistic terms its a way of
051 creating thinking people. And that really means that it pushes to people to think beyond
052 their scope of practice and to think out of the box, to think around problem-solving and
053 continuous improvement. And there's a set of principles and methodologies that LEAN
054 has to encourage that type of continuous improvement thinking and mindset.
055
056 INTERVIEWER: I see. Now in terms of LEAN and this QI project, what was your
057 mandate from the Anova Health Institute?
058
059 INTERVIEWEE: So Anova contracted with Lean Institute Africa, which was a
060 non-governmental organisation. They approached the LEAN Institute Africa and they
061 basically wanted the LEAN Institute Africa to work with various hospitals and clinics
062 within the Gauteng and Limpopo district to look at system strengthening, with the
063 purpose of improving service delivery within those environments. So the mandate really
064 from Anova was to go and work with individuals that worked within that environment
065 and equip them and empower them with some skills, specifically around LEAN
066 thinking and LEAN methodologies to address real challenges and problems that they
067 have within that environment, and in addressing them actually develop the skills that
068 look at other similar projects using LEAN methodologies, particularly the A3 method of
069 problem-solving to improve certain challenges that they may have.
070
071 INTERVIEWER: Now, you said there were once-off workshops. So, in terms of
072 sustainability, how were they meant to continue?
073
074 INTERVIEWEE: Anova, which was our client at that time was also present on the
075 workshops. So they had representatives in the form of nurse mentors or pharmacy
076 mentors or admin mentors that attended the workshops. There were also other personnel
077 from governmental organisations, like the quality inspectors...the quality insurance
078 officers that attended the workshops as well with the personnel from the facility. And
079 the intent really was firstly to equip them with the skills as well as

- Comprehension
- creating thinking people
- problem-solving
- Continuous Improvement
- Mandate
- Health System Strengtheni
- improving service delivery
- Skills Development
- Sustainability
- equip them with the skills a

Appendix C

Informed Consent Form

The Researcher

My name is Dr Uthestra Chetty. I am a student at the Wits Business School and am conducting this research in fulfilment of the requirements of an MBA degree.

The Research

The purpose of this research is to investigate the factors that sustain the use of Lean Process Improvement methodologies at Primary Healthcare clinics in South Africa. The findings will help to bridge the gap between theory and practical knowledge.

The Process

You will be interviewed, either as an individual or within a group, for 30-45 minutes. There are no correct answers. All information regarding this topic will be useful and appreciated.

It is also important to note that there are no risks involved in participating in this study. All identifying information will be kept confidential and will not be included in the research paper. Your participation is voluntary and there is no penalty for not participating.

By signing below you indicate that you have understood the above information and are willing to participate in this study.

Name: _____

Signature: _____

Date: _____

Appendix D

Interviewee list

Respondent	Organisation	Title
Respondent 1	DoH	Quality Improvement Co-ordinator
Respondent 2	Anova	Programme Manager
Respondent 3	Anova	Nurse Mentor
Respondent 4	LIA	Lean Facilitator
Respondent 5	Anova	Nurse Mentor
Respondent 6	DoH	Acting Facility Manager
Respondent 7	Anova	Project Manager
Respondent 8	Anova	TB Clinical Advisor
Respondent 9	Anova	Nurse Mentor

Respondent 10	LIA	Lean Primary Facilitator
Respondent 11	Anova	Data Quality Manager
Respondent 12	DoH	Senior Nurse, chronic department