Clinicians’ Resistance to Antibiotic Control Measures: A Qualitative Study

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Abstract

Antimicrobial resistance (AMR) has become a serious issue worldwide. The World Health Organisation now ascribes the third leading cause of death globally to AMR (WHO, 2011d, 2008). One potential solution to the issue lies in the introduction of clinical decision support systems (CDSS) within hospitals to monitor and control inappropriate prescription by clinicians. However, clinicians often display resistance to using such systems, leading to an ineffective take-up within the clinical setting. One such system, called GUIDANCE, was introduced into a major hospital in Melbourne, Australia some years ago.

This thesis uses the qualitative theory-building methodology advocated by Strauss and Corbin (1990, 1998) to analyse the emergent phenomenon of ‘inappropriate prescription: clinicians’ resistance to control measures’. An in-depth study was conducted at a hospital over the period 2009-2012, involving 46 interviews with various clinicians, attendance at management meetings, and analysis of relevant documentation.

The study found that, while the extant literature argues that inappropriate prescription of antibiotics causes and exacerbates the problem of antimicrobial resistance, clinicians in general tend to show resistance to the adoption of control measures based on clinical decision support systems. The phenomenon and core category of ‘inappropriate prescription: clinicians’ resistance to control measures’ is examined in the thesis in terms of its associated context, conditions, strategies, and consequences.

The thesis contributes to the theoretical and practical literature in relation to the nature of resistance to CDSS. Emphasis is placed on the psycho-social variables that constitute the essence of the resistance process. The thesis contributes to the literature by presenting a framework of an aligned system of clinicians’ non-resistance and argues that such a system could avoid the deleterious effects of psychological maladjustment that may otherwise be encountered within the context of clinicians’ resistance to control measures. The essence of any attempt to eliminate the potency of resistance to change must be based on simultaneous efforts to negotiate a new and revised personal compact for clinicians that reflects mutual acceptance of the changing perceptions of the role of clinicians in the evolving nature of healthcare systems worldwide.
Acknowledgements

I would like to express my deepest gratitude to my supervisor, Professor Robert Jones, at Swinburne University of Technology, who provided me with guidance, advice, support, respect, and motivation throughout my project and, best of all, made my journey stress free. Opening my eyes to grounded theory taught me much about research and made my journey enjoyable and challenging.

I would like to thank Professor Eugene Athan, my external supervisor at the hospital site, who explained this project so clearly, supported me throughout the data collection phase, provided guidance on the medical literature, made me feel comfortable and gave me his time and knowledge when I needed it most.

Thanks to the rest of my supervisory team, Dr. Samir Shrivastava and Dr. Soma Pillay for their guidance and support. I would also like to thank Executive Dean Michael Gilding for providing me with work and the University for granting me a scholarship enabling me to support myself during my research journey. Special thanks to Prof. Pam Green, Prof. Santina Bertone, Prof. Barry O’Mahony and Ms Michelle Brocker for providing practical support during my research candidature.

Further thanks to all the anonymous clinicians at the hospital who participated in my study and who generously gave their valuable time, experiences, wisdom, stories and insight into my research topic so that I might produce this thesis. I also thank the senior management and the ethics committee at the hospital for their approval and support of my research. Special thanks to Dr. Greg Weeks, Ms Clare Paslow and Mr Dominic Breslin for their direction and support with my data collection. Thanks to the GUIDANCE Group (Associate Professor Kirsty Buising and Ms Susan Luu) for agreeing to meet with me and explaining the GUIDANCE software.

Finally, I would like to thank my family and specially Vish, my best friend and partner in life, whose enduring love and support made my research journey possible and who stood by me throughout my ups and downs in my research process.
Declaration

I, Farinoush Farhadieh, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy from the Faculty of Business and Enterprise, Swinburne University of Technology, Melbourne, Australia:

Contains no material which has been accepted for the award to myself of any other degree or diploma, except where due reference is made in the text of this thesis;

To the best of my knowledge contains no material previously published or written by any other person except where due reference is made in the text of this thesis;

Has been approved by the Swinburne University Human Research Ethics Committee (SUHREC), Application 2009/227 and I certify that all conditions pertaining to this ethics clearance have been properly met and that annual reports and a final report have been submitted.

Signed

Farinoush Farhadieh
Dedication

This thesis is dedicated to my loving family.

With great gratitude to my parents specially my

Mother,

Whose unconditional love, motivation and encouragement

enabled me to achieve such success and honour.
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<td>Antimicrobial Resistance</td>
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<td>CDSS</td>
<td>Clinical Decision Support System</td>
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<td>WHO</td>
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<td>ACSQHC</td>
<td>Australian Commission on Safety &amp; Quality in Healthcare</td>
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<td>AIHW</td>
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<tr>
<td>IOM</td>
<td>Institute of Management</td>
</tr>
<tr>
<td>DOH</td>
<td>Department of Health (Australia)</td>
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<tr>
<td>DH</td>
<td>Department of Health (UK)</td>
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Chapter 1
Purpose, significance, and context of the thesis
Chapter 1

Purpose, significance, and context of the thesis

1.1 Chapter overview

This chapter serves as a broad introduction to the thesis by presenting the purpose, significance, and context of the thesis. The research question is presented, together with a subsequent introduction to the problems of antimicrobial resistance (AMR), inappropriate prescription of antibiotics by clinicians, an explanation why the research question is significant, and the contribution that the findings of the thesis can make to the literature in terms of theory and practice. The scope and context of the thesis is also presented. A single hospital site situated outside Melbourne in Australia was chosen as the research site because this hospital represented many of the main elements contained within the research question. Inappropriate prescription had earlier been identified as a problem at this hospital, together with a noticeable reluctance on the part of clinicians to embrace monitoring and control measures. A qualitative methodology using grounded theory was chosen as the research methodology. Figure 1.1 shows the structure of this chapter.

Figure 1.1

Chapter overview

1.1 Chapter overview

1.2 Purpose and significance of the thesis

1.3 Scope and context of the thesis

1.4 Structure of the thesis

1.5 Summary

1.2 Purpose and significance of the thesis

The purpose of this thesis is to analyse the research question *why do clinicians resist the introduction and implementation of monitoring and control mechanisms aimed at reducing inappropriate prescription of antibiotics?* Although there is no consensus about the standard definition of ‘inappropriate prescription’, two popular definitions are presented below:

- Prescribing a potent medication (broad-spectrum) which can have a significant risk to the patient’s health, either in terms of an adverse drug event or antimicrobial resistance, when there exists a lower-risk drug (narrow-spectrum) for treating the same illness/disease and is backed by evidence to show that this is equally or more effective (Gallagher, Barry, & O'Mahony, 2007).

- Overuse of medication for a longer frequency or duration than clinically specified, under-use or misuse of medication for an irrational reason or a shorter duration than clinically specified, or use of multiple drugs which have been shown by evidence to have a drug reaction (Aronson, 2009; Maronde, Lee, McCarron, & Seibert, 1971; Institute of Medicine (IOM), 1999).

Antimicrobial resistance has become a world-wide problem in recent years. The reasons are complicated, but research studies have shown that the problem has been caused by inappropriate prescription of antibiotics.

Antibiotics are essential drugs to treat bacteria-producing infectious diseases. Many of the available antibiotics are no longer effective because of emerging resistance, which is mainly caused through inappropriate antibiotic use by prescribers, self-prescription by consumers, counterfeit sales, and dispensing by unsanctioned dealers. In addition, lack of standard treatment guidelines, training for prescribers, and pressure from the pharmaceutical industry are important determinants influencing resistance acquisition (Sosa, 2006:7).

Although clinicians belong to an eminent profession, and are regarded as amongst the most intelligent and highly educated people in the workforce, it is estimated that more
than 50% of the antibiotics they prescribe are inappropriate (WHO, 2011a, 2003b, 2000). In developing countries, the World Health Organisation has estimated that 70% of patients are not treated in accordance with standard treatment guidelines (WHO, 2011a, 2011d, 2002a). This has caused global concern over recent years because the inappropriate prescription of antibiotics leads to higher morbidity and mortality rates because of increased antimicrobial resistance. But this problem is not restricted in significance to developing countries only. It has been estimated that AMR is amongst the top ten causes of death in the USA (Lazarou, Pomeranz, and Corey, 1998; White et al., 1999). In the UK, inappropriate prescription is estimated to cost over €5.6 million per year (Hitchen, 2006). In Australia, the popular media has recently become involved in highlighting the magnitude of the problem. In March 2013, the mass circulation Melbourne newspaper The Age ran a graphic special report entitled ‘superbug reports spark concern’ claiming that this amounted to a ‘health scare: antibiotic-resistant bacteria on ascendency’. Box 1.1 reveals how this issue has become of special urgency and significance.

Box 1.1

Superbug infections in Australian men after prostate biopsies

Healthy Australian men are falling ill with superbug infections after prostate biopsies and doctors fear the bacteria is coming from contaminated food. In a worrying trend, head of infectious diseases at the Austin Hospital, Professor Lindsay Grayson, said there has been increasing reports of men suffering serious infections after prostate biopsies because of the proliferation of antibiotic-resistant bacteria. While the infections have mostly occurred in recent travellers to regions where superbugs are more prevalent, such as Asia and India, infections are occurring in men who have not been to these places, meaning they may have picked them up in Australia – where they do breed in hospitals – or other First World countries. Professor Grayson said he was particularly concerned about the possibility of meat, poultry and seafood containing superbugs, especially overseas, because of the widespread use of antibiotics in farming.

Source: Medew (2013:15)

Medew (2013) goes on to state that there are fears the world is heading for a post-antibiotic era. Infections may not be able to be treated because of multi-drug resistance: “resistance is caused by inappropriate use of antibiotics because the more they are used
the more chances bacteria have to adapt and become resistant to them” (Medew, 2013:15).

Considering such findings, it is surprising to learn that many countries do not actually take any measures to monitor their antibiotic usage (WHO, 2006, 2003a). Despite recommendations by the WHO (2010, 2001c, 2002a) to implement national policies about the rational use of antibiotics, more than half the countries in the world are still not implementing even basic policies regarding antibiotic prescription.

However, some countries, including Australia, have taken measures to monitor and control the inappropriate prescription of antibiotics by clinicians. Such measures usually take the form of new software and other information technology (IT) interventions. These are referred to as clinical decision support systems and defined by Berner and Lande (2009:3) as “computer systems designed to impact clinician decision making about individual patients at the point in time that those decisions are made”. However, these seem to have had only limited effect on reducing the incidence of inappropriate prescription of antibiotics. Australia is a relative newcomer in the development and implementation of IT systems in healthcare and more studies in this regard are needed (Zaidi et al., 2008). For this reason, it is imperative to analyse the barriers that exist to the adoption of such systems within the healthcare context. Why is there a reluctance to embrace such possible solutions? Is it because of the nature of the technology itself, such as poor user functionality or ease of use? Or does the problem lie at a broader organisational level, with such factors as inadequate funding or training the main source of the problem? On the other hand, there is a possibility that personal factors may be at play, such as a negative attitude of clinicians towards IT interventions or lack of knowledge about how to use such tools.

Accordingly, the value of the research presented in this thesis lies in its practical and theoretical contribution to the literature, as well as having implications for clinicians’ behaviour, government policy and funding, and healthcare systems, practices, and procedures. Also, the findings in this thesis could prove extremely significant in a country like Australia where the adoption of sophisticated IT prescribing tools in hospitals is still relatively new (Australian Commission on Safety and Quality in Healthcare (ACSQHC), 2008). Furthermore, in providing suggestions of how to reduce
inappropriate antibiotic prescription, this thesis could have an indirect impact on the reduction of mortality and morbidity rates, and the reduction of extended length of stays in hospitals, leading to significant cost savings for the public healthcare sector.

1.3 Scope and context of the thesis

In an attempt to address the research question the scope of this thesis is restricted to a case study within a major public hospital situated outside Melbourne in the state of Victoria, Australia. This hospital is the largest hospital in the regional area of Victoria and the only tertiary hospital outside the Melbourne Metropolitan area. The hospital has over 400 acute beds. Its emergency department treats over 47,000 patients per year, whilst the number of inpatients amounted to over 66,000 in 2008-2009. The hospital forms part of a broader healthcare provider network in Victoria which extends across 21 sites and covers the full spectrum of health services from primary care, acute care, emergency, community services, aged care, to rehabilitation and mental health. The healthcare provider network employs over 6000 people, 77% of them female, with a median age of 44 years.

The choice of this hospital as the research site for the thesis was made on purposive grounds. The hospital management had made a policy decision to improve their antibiotic usage. In an attempt to monitor and control inappropriate prescription, a significant expenditure on resources was made to invest in an antibiotic approval system known as GUIDANCE. This is a web-based decision support tool, which falls under the general category of ‘clinical decision support systems’. The overall initiative was led by the head of Infectious Diseases (ID). One of the key responsibilities of the Department of Infectious Diseases was to monitor antibiotic usage at the hospital and reduce the incidence of infections associated with excessive use and misuse of these antibiotics. The department controlled the prescription of antibiotics through a restriction policy. This policy stipulated that if any clinician wished to prescribe a broad-spectrum (potent) antibiotic, they either had to use the GUIDANCE antibiotic approval system, or telephonically contact the ID department and discuss the nature of the prescription to obtain approval for prescription. However, the GUIDANCE project failed at the implementation stage. Despite training sessions and other awareness measures, the take-
up rate amongst clinicians was low. Most clinicians did not adopt the GUIDANCE software. Nor did they follow the telephone approval system. Management complained that most of the rules and procedures devised by the ID team associated with clinical decision support systems were ignored by clinicians. Since the hospital had invested significant resources in the program, senior management was committed to identifying the major reasons for the project’s failure so that adequate measures could be taken to successfully re-implement the system.

GUIDANCE was developed as an IT support tool in 2002 by a not-for-profit organisation known as the GUIDANCE group situated in the Victorian Infectious Diseases Service (VIDS) at another Australian hospital (Royal Melbourne Hospital). This development was supported by a government grant under the auspices of the Commonwealth Biotechnology Innovation Fund. As a result of this development, members of the GUIDANCE group became well respected as pioneers in the field of antimicrobial stewardship in Australia, and their software tool started to be used in hospitals in several Australian states (Guidance Group, 2013).

Usage of the GUIDANCE system to obtain antibiotic approval was, however, not without inconvenience. This approval component of the software uses the national antibiotic guidelines of Victoria to either approve or reject the broad-spectrum antibiotic requested by the clinician. A number of prescribed steps had to be followed. To be able to prescribe a restricted broad-spectrum antibiotic, clinicians were required to log in to the system using a username and password. After successful login, the clinician had to follow these steps:

- **Step 1**: The clinician provides details of the patient’s disease for which they are seeking antibiotic approval.
- **Step 2**: The clinician then chooses their preferred antibiotic from a list of restricted broad-spectrum antibiotics.
- **Step 3**: The clinician enters more specific information about the patient. Depending on the restricted broad-spectrum antibiotic the clinician has chosen in step 2, the software approves or rejects the request.
A qualitative theory-building methodology was adopted to collect, code, and analyse the data. Myers (1997, 2013) states that using qualitative methodology as the research paradigm is most appropriate and effective when investigating social and cultural phenomena, especially in providing insight into people’s experiences. The specific methodology employed in this thesis is the Straussian approach to grounded theory (1990, 1998). This analytical approach helped gain an in-depth understanding of the clinicians’ perceptions and attitudes towards antibiotic prescription. Data was collected by means of personal interviews, document analysis, participant observation, attendance at management meetings, and personal examination of the GUIDANCE system. Care was taken to use theoretical sampling throughout the study and also to incorporate all major categories of relevant personnel at the hospital – pharmacists, senior managers, interns, residents, and registrars. Chapter 3 of the thesis gives a detailed exposition of the Straussian approach to grounded theory, whilst chapter 4 provides an audit trail to explain how the data was systematically collected, coded, and analysed.

1.4 Structure of the thesis

The thesis is structured into seven chapters.

Chapter 1 – Purpose, significance, and context of the thesis. This chapter explains why the research in this thesis was undertaken, the nature of inappropriate antibiotic prescription, the problem of antimicrobial resistance, the research site, an explanation of the antibiotic-approval system GUIDANCE, and the research methodology adopted to answer the research question.

Chapter 2 – Antimicrobial resistance: a literature review. This chapter presents a literature review of the various topics and issues that constitute the serious problem of antimicrobial resistance. It explores the nature of AMR together with a range of associated issues such as the nature of medication errors and inappropriate prescription, the prescribing behaviour of clinicians, the perceptions of clinicians and the general public towards AMR and inappropriate prescription, the nature of AMR campaigns, types of interventions, and finally the nature of clinical decision support systems in combatting AMR and inappropriate prescription.
Chapter 3 – Research methodology. This chapter presents the research methodology adopted in the thesis, namely a qualitative approach using the Straussian method of grounded theory. The nature of this methodology is explored together with a justification of why this particular methodology has been adopted in the thesis.

Chapter 4 – Data collection and analysis. This chapter provides a detailed analysis of how data collection, coding, and analysis were conducted in the thesis. It presents a comprehensive audit trail so that the reader can understand how the data was collected, how the interviews were conducted, how theoretical sampling was employed to progress the theoretical analysis, how the various categories and properties emerged, and how the paradigm model was put together around the core category and phenomenon of “inappropriate prescription: clinicians’ resistance to control measures”.

Chapter 5 – Findings: exposition of the paradigm model. This chapter constitutes the findings section of the thesis. The paradigm model is explained in detail as it relates to the phenomenon of inappropriate prescription: clinicians’ resistance to control measures. Each of the major components of the paradigm model is explained sequentially – phenomenon, context, conditions, strategies, and consequences.

Chapter 6 – Resistance to change. This chapter focuses on the theoretical themes that have emerged from the thesis findings. In particular, the identification of the phenomenon of inappropriate prescription: clinicians’ resistance to control measures places emphasis on the resistance exhibited by clinicians to any attempt by hospital authorities to control their prescriptive behaviour.

Chapter 7 – Conclusion. This chapter examines the findings of the thesis (as presented in chapter 5) and compares them with the extant literature (chapter 6) in order to analyse what contribution the thesis has made to the extant literature. It also examines the implications of the thesis; criteria for evaluation of the thesis; and limitations of the thesis.
1.5 Summary

This chapter has provided the background to the thesis’ research question *why do clinicians resist the introduction and implementation of monitoring and control mechanisms aimed at reducing inappropriate prescription of antibiotics?* The world-wide problem of antimicrobial resistance has been emphasised, together with the issue of inappropriate prescription of antibiotics by clinicians. Despite an increasing realisation world-wide about the dangers of AMR, and the widespread belief that this is caused by inappropriate prescription, clinicians still tend to resist adopting monitoring and control measures for prescription, especially when these measures are IT-based. This issue has been analysed in this thesis by using a qualitative emergent methodology to collect, code, and analyse data obtained from a major hospital site in Melbourne, Australia.

The next chapter is devoted to a literature review of antimicrobial resistance and inappropriate prescription of antibiotics by clinicians, as well as examining the role of clinical decision support systems and the attitudinal and behavioural reactions of clinicians towards them.
Chapter 2
Antimicrobial resistance: a literature review
Chapter 2
Antimicrobial resistance: a literature review

2.1 Chapter overview

The purpose of this chapter is to provide a literature review of the various topics and issues that constitute the serious problem of antimicrobial resistance. This issue is not parochial but rather constitutes a world-wide threat. As will be shown in this chapter, although all medical errors constitute serious threats to patient safety around the world, by far the most significant components of these errors are those due to medication mistakes. Inappropriate prescription of antibiotics carries with it the serious side effect of antimicrobial resistance. This chapter explores the nature of AMR together with a range of associated issues such as the nature of medication errors and inappropriate prescription, the prescribing behaviour of clinicians, the perceptions of clinicians and the general public towards AMR and inappropriate prescription, the nature of AMR campaigns, types of interventions, and finally the nature of clinical decision support systems in combatting AMR and inappropriate prescription.

The World Health Organisation (WHO, 2011d, 2009), estimates that in developing countries 70% of patients are treated with medicines which are not in accord with standard treatment guidelines. Throughout the world, it is estimated that over 50% of all medicines are prescribed, dispensed, or sold inappropriately (WHO, 2002a; WHO, 2009). Many doctors tend to prescribe antibiotics to patients who do not need them (Pechere et al., 2007). In addition, many patients tend not to adhere to their dosage or use antibiotics without prescription (Grigoryan, 2007). Also, in those countries where over-the-counter delivery of antibiotics is permitted, more than 75% of them are sold without any prescription (Lansang et al., 1990). Despite this situation, very few countries actually monitor their antibiotic usage (WHO, 2006). Inappropriate use of medicines is estimated to be among the top ten causes of death (White, Arakelian, & Rho, 1999; Lazarou, Pomeranz, & Corey, 1998). It is also expensive, costing the UK in excess of €5.6 million annually (Hitchen, 2006). In the US the cost to each hospital is US$5.6 million annually (Kass, 2001; Agency for Healthcare Research and Quality (AHRQ), 2001).
Figure 2.1
Chapter overview

2.1 Chapter overview
2.2 Background
2.3 Medication errors
2.4 Antibiotics and antimicrobial resistance
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2.12 Clinical Decision Support Systems and their importance
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2.14 Clinicians' adherence to Clinical Decision Support Systems
2.15 Barriers in implementing Clinical Decision Support Systems
2.16 Summary
2.2 Background

It is a generally accepted fact that most people hold doctors and hospitals in extremely high regard. The medical profession as such is held in such high esteem that most people trust the judgement of medical practitioners whenever they are sick or suffering from a disease. Until recently, the belief that hospitals are the safest place to be at times of serious illness would not have been seriously challenged in popular judgement. However, the reality is somewhat different. The Australian Patient Safety Foundation reported that a person is twenty times more likely to die from a simple hospital stay than taking a commercial flight or participating in road traffic (Runciman & Moller, 2000).

Research has shown that more than 30% of patients admitted to hospitals experience an adverse event (Aranaz-Andres et al., 2009), and that around 70% of these adverse events are preventable (Soop, Fryksmark, Köster, & Haglund, 2009). Thirty three percent of adverse events lead to patient death or disability (Sari, Cracknell, & Sheldon, 2008); every adverse event adds an extra ten hospital bed days (Ehsani, Jackson, & Duckett, 2006); and in Europe, adverse events cost €355 million every year (Hoonhout et al., 2009).

The United States Institute of Medicine revealed that medical errors alone have contributed to more than 98,000 deaths in the USA, far in excess of the statistics for breast cancer (42,297), AIDS (16,516), or even car accidents (43,458) (Kohn, Corrigan, & Donaldson, 2000).

Medication errors and adverse drug events cause more than 770,000 injuries, account for more than 7,000 deaths annually and cost hospitals up to $5.6 million a year (AHRQ, 2001; Phillips, Christenfeld, & Glynn, 1998). Patients affected remained in hospital 8-12 days longer than patients who did not experience any errors and the cost of those extra days was estimated at more than $24,000 (AHRQ, 2001).

Not only do adverse drug events (ADE) cost money, but preventable adverse drug events further cost the healthcare system more than $2 billion annually (Kohn, Corrigan, & Donaldson, 2000). Such events are experienced in two out of every 100
admissions which results in average increased hospital costs of $4,700 per admission or $2.8 million annually throughout the hospital system (Bates et al., 1997).

Medical errors take a variety of forms, for example: misdiagnosis, wrong site surgery, retained instrument or other material inside a patient’s body, misidentification of a patient, and medication errors. For the purpose of the research this thesis will be concentrating only on medication errors. Among the various forms of medication errors, inappropriate antibiotic prescription is arguably the most common and most dangerous to the patient, society, and the environment because it leads to antimicrobial resistance which spreads to the wider environment, thus leading to increased morbidity and mortality rates. According to the World Health Organisation (2000), antimicrobial resistance is the third leading cause of death in the world. Hinchcliff et al. (2012) analysed articles and reports across the Australian print media for the period 2005-2010 in regard to discussion and coverage of medication errors. They concluded that despite the well-known high prevalence of such errors in Australia coverage is very limited. The authors suggested the need for researchers to work with the media to increase consumers’ knowledge and awareness of the issue because there is a potential role that consumers can play in identifying and preventing such errors.

In addition, Gallagher et al. (2003) investigated the respective attitudes of patients and physicians regarding the disclosure of errors. They concluded that patients are eager to receive information regarding the disclosure of errors, such as why such errors happened, how they happened, and how they can be prevented. Patients also placed great value on receiving an apology from their physicians as a necessary part of their emotional support and recovery. In contrast, physicians believed that they should only report such errors, without the necessity to go into any additional details about why and how such errors occurred. They also felt that an apology from their side would indicate a legal liability.

Blendon et al. (2002) reported that many physicians and members of the public believe that a medical practitioner in a hospital who is found to be responsible for a serious medical error needs to have some sanction against him/her. The public were more likely to believe that the surgeon should be sued for malpractice, fined, and his/her license possibly suspended. Forty two percent of the public reported that either they or some of
their family members had been affected by some form of medical error. The two major
causes of errors pointed out by physicians and the public were “understaffing of nurses
in hospitals” and “overwork, stress or fatigue on the part of the health professional”
(Blendon et al., 2002:1935). Recently, the news media appears to have given greater
prominence to reporting instances of patients who have died as a result of medical error
and the payments made by hospitals in the form of recompense. These payments are
reported to run to billions of dollars every year, but still many hospitals are not taking
any serious measures to prevent these errors from occurring (Australian Department of
Health (DOH), 2009). The Australian Sydney Morning Herald reported that in 2005-
2006 more than $150 million was paid to families who sued their doctors for
malpractice following injuries or death (AAP, 2007). In addition, the Australian
Institute of Health and Welfare (AIHW, 2011) released statistics on the extent of
medical indemnity claims in Australia for the year 2007-2008 which showed that there
were 2,255 new medical indemnity claims in that year within the public and private
sectors. Most claims occurred within the public sector. Almost 70% of these claims
involved an amount less than $10,000 but 3% of these claims were settled for $500,000
or more (AIHW, 2011).

Box 2.1 provides details of a typical cross section of medical errors and payout cases
that have occurred in Australia within recent years. The cases are taken from a website
which provides legal information and current affairs news on Australian health and
medical negligence law.
Box 2.1

Some cases of medical errors and compensation payouts in Australia

**Cricketer Nathan Bracken is suing for medical negligence that has allegedly ruined his career**

Bracken is suing Cricket Australia and three of its medical professionals claiming they failed to "investigate, diagnose and treat" his right knee injury suffered the day before a one-day match against England in 2007. He alleges that he should have been referred to an orthopaedic specialist for arthroscopic surgery. He is suing for lost earnings of at least $1 million. Source: Herald Sun 09.02.12.

**NSW: Alleged cancer misdiagnosis at Gosford Hospital**

Graham Lord alleges that a pathology lab at Gosford Hospital bungled his pathology tests, resulting in him being wrongly told he had an aggressive stomach cancer. As a result, Graham received 7 rounds of chemotherapy and had 80% of his stomach surgically removed through a gastrectomy. Subsequent independent testing of his biopsy results revealed he had no cancer. According to the Sunday Telegraph, Graham is taking legal action for medical negligence compensation. He continues to suffer physical and psychological difficulties allegedly as a result of the bungle. Source: news.com.au, 13.11.11.

**ACT: Canberra Hospital errors**

Recent internal ACT Health documents obtained through Freedom of Information reveal a series of medical errors at Canberra Hospital. One woman had surgery performed on the wrong hip. Another patient had a delayed diagnosis of a severe spinal injury, while another was having surgery when a tube that carries urine from the kidneys to the bladder was cut. A child was also given an overdose of paracetamol. Source: abc.net.au, 26.10.11.

**NSW: Failure to diagnose appendicitis resulted in death at Westmead Children's Hospital**

Jacob Belim, aged 8, died at the Westmead Children's Hospital from septic shock after his appendix ruptured. A coroner yesterday blasted the handling of his condition by staff there and at Liverpool Hospital. Jacob's GP, Dr Chandra Gounder, detected Jacob was suffering from appendicitis - three days before his death - and wrote a referral letter describing his abdomen as "distended, tender and rigid". Dr Gounder also contacted Liverpool Hospital to tell them "this boy looks like having (a) ruptured appendix. Please investigate", but Deputy State Coroner Scott Mitchell found her message "failed to draw anybody's attention to her correct diagnosis". "He was misdiagnosed, left in a significantly dehydrated state, his antibiotic medication was delayed, he missed out on having a surgical review and his transfer to Westmead occurred hours later than it should have," Mr Mitchell said. NSW Deputy State Coroner Scott Mitchell on Monday said the boy's death was a preventable tragedy. Source: The Daily Telegraph, 16.08.11.

**VIC: Bungled births are leaving children severely injured**

A record $33.2 million in compensation payouts have been made in the past year over bungled births in Victoria's public hospitals. Victorian Managed Insurance Authority figures reveal payouts were made in compensation for 29 botched obstetric cases in the year to June 30 2011.
A further $4 million was paid to two claims over newborns, while across all specialties 154 patients received more than $57 million. This compared with the previous year, where 31 obstetrics patients were paid $27 million but across all categories 149 patients got $79 million.

After obstetrics, the most money went to victims of botched brain and spinal cord surgery. Six were awarded nearly $4.5 million. Source: Herald Sun online, 30.07.11.

**VIC: Surgical instrument left inside patient**

Dandenong Hospital could face legal action after a 30-centimetre surgical tool was found inside a patient who had had a keyhole operation. Marion Fernando suffered severe pain after a hysterectomy at Dandenong Hospital on July 7. When she was still in agony days later, her husband Rohan Weerapperumage took her to the emergency department where a metal tool was discovered in her bowel passage. She had a further operation on July 12 to have the tool removed. "She couldn't stand, she couldn't sit, she couldn't go to the toilet," Mr Weerapperumage told the Weekly. "It was very bad, severe pain." Source: Greater Dandenong Weekly, online 18.07.11.

**NSW: 53 patients at clinic have been exposed to risk of HIV, Hepatitis B and C**

The bungle occurred when a newly employed nurse mistakenly believed the Accu-Chek Multiclix, a device used to check blood sugar levels, automatically changed needles. Dr Michael Jones, chairman of the private radiology company PRP Diagnostic Imaging which runs the Gosford clinic, said the nurse didn't realise she had to change the needle manually for each new patient. Instead, the needle was left unchanged between November 28 and January 28, and used on 53 patients and two staff members. Patients were this week sent letters of apology instructing them to undergo blood testing for HIV and hepatitis B and C. Source: smh.com.au 09.02.11.

**WA: Boxer Danny Green alleges misdiagnosis**

World champion boxer Danny Green has hit out at Busselton Hospital for alleged misdiagnosis of his appendicitis. Green says he went to Busselton Hospital on New Year's Eve with severe stomach pain, but says his condition was dismissed by a doctor as not serious. His family were so concerned about his condition they raced him to a medical centre 30 minutes away. He was finally correctly diagnosed and underwent emergency surgery to remove his appendix and a cyst the size of a softball which had compressed and occluded his bowel. Green said that he had been hospitalised at least 10 times over 7 years for what was initially misdiagnosed as irritable bowel syndrome. The president of the Australian Medical Association (WA), David Mountain, said had Green been punched in the abdomen after the abscess evolved the consequences might have been fatal.” Source: news.com.au 08.01.11; adelaidenow.com.au 08.01.11; smh.com.au 07.01.11.

2.3 Medication errors

Medication error is one of the most common forms of medical error in hospitals due to the fact that almost every patient who visits or is admitted to a hospital is given some form of medication (Runciman et al., 2003; Wilson et al., 1995). The National Coordinating Council for Medication Error Reporting and Prevention website (NCCMERP, 2013) defines a medication error as:

"Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labelling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use" (NCCMERP, 2013).

The National Coordinating Council for Medication Error Reporting and Prevention requests everyone (researchers, software developers, and institutions) to use this definition (NCCMERP, 2013).

A longitudinal study conducted by Phillips, Christenfeld, & Glynn (1998) found that in 1983, approximately 2,900 people died of medication error in the US alone and by 1993 this number had increased to almost 7,400 deaths. In Australian hospitals, the rate of adverse drug reaction increased fivefold from 2.5% to 12.9% between 1981 and 2002 (Burgess, Holman, & Satti, 2005).

The Australian Institute of Health and Welfare reported that 262 million prescriptions were filled in Australia for the year 2008 (AIHW, 2010). Out of the top ten most commonly prescribed medicines, four were antibiotics (Britt et al., 2008, 2010). Australian research suggests that more than half the amount of antibiotics prescribed in Australian hospitals could be classified as unnecessary – a proportion that is very high compared to Europe or America (Fielding et al., 1999; Robertson et al., 2002; Robertson, Dartnell, & Korman, 1999).
2.4 Antibiotics and antimicrobial resistance

The Oxford English Dictionary defines medicine as “a drug or other preparation for the treatment or prevention of disease”. According to Burkholder (1959:1457), antibiotics are defined as “substances produced by living organisms, which, in small amounts, can inhibit the life processes of other organisms”. Hence, antibiotics have the power to destroy or reduce the growth of bacteria or other organisms.

The discovery of antibiotics (also known as the “Wonder Drugs”) in the 1940s by Sir Alexander Fleming (who received the Nobel Prize in medicine for his achievement in 1945) has saved many lives throughout the world, and has thus reduced mortality rates and increased life expectancy. Before the antibiotic era, many diseases were incurable, but since the advent of antibiotics a number of diseases (such as syphilis, gonorrhoea, leprosy and tuberculosis) has been virtually eradicated from most countries. As early as 1959, Burkholder (1959:1464) was claiming that indiscriminate use of antibiotics could be harmful, warning that highly potent antibiotics should be regarded as “dangerous drugs”. However, his warning went largely unheeded, probably because of the ‘wonder’ cures experienced by many patients without suffering obvious harmful side effects. The belief that antibiotics could ever be dangerous to patients was not taken seriously at that time.

With the benefit of hindsight the medical profession has now become aware that when the ‘wonder drug’ is used appropriately it can cure and eradicate many diseases. However, when prescribed inappropriately it can induce antimicrobial resistance (WHO, 2011d, 2001c). According to WHO (2011a), antimicrobial resistance is also referred to as drug resistance. Such resistance occurs when micro-organisms, such as parasites, fungi or viruses, become resistant to an antimicrobial medicine. As a result, infections can persist within the body and be spread to others. Antimicrobials or antimicrobial agents are medicines used to treat patient infections caused by microorganisms such as viruses, fungi and parasites. Figure 2.2 shows the respective effects of antibiotics on resistant and non-resistant bacteria.
Micro-organisms which become resistant to most antibiotics are referred to as *super bugs*. There are three primary reasons why antimicrobial resistant super bugs are such a major concern: first, they kill the patient; second, they spread to other patients in the hospital ward and wider community; and third, they incur high financial costs to patients, hospitals, and the wider society (WHO, 2011a). Antimicrobial resistance also jeopardizes the achievement of healthcare progress. Organ transplantations, chemotherapy and major surgeries can be compromised because of antimicrobial resistance (WHO, 2011c, 2009, 2008). Figure 2.3 shows the diagrammatic process that follows from inappropriate prescription of antibiotics.
Figure 2.3
Inappropriate prescription and its side effects

Figure 2.4
Antibiotics and their types

Figure 2.4 shows the different types of antibiotics, prescription methods, bacterial spectrum and causes of AMR.
According to the World Health Organisation (2011), AMR is the third most critical global patient safety challenge in the world. Two studies carried out approximately ten years ago estimated that AMR cost the USA around $5000 million and Europe more than €9000 million at that time (Institute of Medicine, 2003; Strategic Council on Resistance in Europe, 2004; Smolinski, Hamburg, & Lederberg, 2003). Many authors ascribe AMR to the widespread availability of antibiotics, a contributing factor to their indiscriminate use (Hogerzeil, 1995; Paskovaty et al., 2005; Robertson et al., 2002). The inappropriate use of antimicrobial agents is one of the most serious and chronic medicine-use problems experienced within hospitals worldwide, and Australian hospitals are no exception (Hogerzeil, 1995; Paskovaty et al., 2005; Robertson et al., 2002). National and international organisations alike have recognized the growing problem of antimicrobial resistance and have published recommendations to combat this problem (Interagency Task Force on Antimicrobial Resistance (ITFAR), 2001; UK Department of Health (DH), 2000; WHO, 2001). There are several studies on inappropriate use of antibiotics, many of which report that 41% to 91% of all antibiotic prescriptions in teaching hospitals were considered inappropriate (Hogerzeil, 1995; Paskovaty et al., 2005; Robertson et al., 2002). In several hospitals, the departments with the highest antimicrobial resistance tended to be those with the highest use of antibiotics (Borg et al., 2008). The challenges associated with antibiotic usage persist mainly because there is no consensus as to the cause, effect, and solution to the resistance problem (American Society for Microbiology, 1994; Centers for Disease Control and Prevention, 2000; UK Department of Health, 1998; US Agency for International Development, 1998; WHO, 2001a, 2001b).

WHO’s country data (2000-2003) showed that more than 11 million people die annually as a result of infectious diseases. If serious combative action is not taken, there is a risk that many countries will return to the pre-antibiotic era, where large numbers of children died and many surgeries were not possible due to the risk of infections. Inappropriate antimicrobial use has been shown to increase rates of mortality and morbidity. Patients with antimicrobial resistance are more likely to experience ineffective treatment which then causes delayed recovery or death. Roberts et al. (2009) calculated that the probability of such ineffective treatment is twice as high for patients suffering from AMR than for other patients. A study carried out in Australia and New Zealand by Turnidge et al. (2009) showed that AMR patients had a 20% higher mortality rate than
other patients. In addition, research conducted in the United States by Roberts et al. (2009) showed that more than 13% of patients suffered from AMR. These patients remained in hospital for up to 12.7 additional days compared with non-AMR patients, experienced a 6.5% higher mortality rate, and additionally cost the hospital between $18,588 - $29,069 for each patient.

2.5 Inappropriate prescription

The percentage of hospital-based medical errors attributed to medication errors varies widely between 4% and 25% (Dawson et al., 1993; Leversha, 1991; Fry, Jones, & Swan, 1985) and around the world more than 50% of antibiotics prescribed are inappropriate (Cruickshank & Ferguson, 2008; Drew et al., 2009; Willemsen et al., 2007; Dellit et al., 2007; Fielding et al., 1999; Robertson, Dartnell, & Korman, 1999; Robertson et al., 2002; Scheetz et al., 2009; Kumarasamy et al., 2003; Davey et al., 2013). It is estimated that globally 50% of all medicines are used irrationally (Bagozzi, 2004), leading to adverse drug reactions (one of the six leading causes of death in the United States), drug resistance, heart diseases, chronic illness and eventually death. Inappropriate prescription of antibiotics is one of the major factors in the irrational use of medicines which stands at 50% globally. WHO (2009, 2011a, 2011b, 2011c) found that inappropriate antibiotic use globally for the years 1990-2006 was a growing problem, increasing year on year, and is a major issue in every geographic region. WHO (2010) reported that over 50% of medical practitioners globally do not follow any stipulated guidelines for the rational use of antibiotics because such strategies had not been implemented in their hospitals. The consequences of this lack of guidelines and strategies were AMR, adverse drug reactions, lost resources, and eroded patient confidence.

AMR is a particularly serious issue in many undeveloped and developing nations, especially in areas like Africa and the Indian sub-continent, where antibiotics can readily be purchased over the counter without prescription. Accordingly, many ‘patients’ are able to commence a cycle of over-use of antibiotics to treat a variety of ailments, stopping and starting a course of antibiotics at whim. But more developed nations, such as in Europe and North America, are also not immune from worldwide
developments. The rate of AMR in the world’s richer nations is increasing rapidly, not helped by greater flows of population across the globe in recent decades, approaching rates experienced in less developed countries (WHO, 2009; Hitchen, 2006; Pirmohamed et al., 2004; AHRQ, 2001).

A worrying issue is that the development of new antibiotics by pharmaceutical companies is not proceeding at a rate sufficient to tackle the growing problem of AMR to existing antibiotics. The amount of profits pharmaceutical companies can generate from the development of new antibiotics is generally lower than for a range of other more profitable drugs. For example, drugs that are taken for chronic illnesses such as high blood pressure or diabetes are taken every day for the rest of the patient’s life. In contrast, antibiotics are taken only over a short period of time whilst the patient is sick, but are discontinued when the patient recovers. Thus, in volume terms alone, antibiotics are less profitable than other chronic illness drugs. Another issue relates to the high cost of research and development for new antibiotics. This cost can be as high as $500 million, exacerbated by the often lengthy development phase. It can take up to ten years from the time development is commenced to the time the drug finally appears for sale on the market (Spellberg et al., 2004; Smolinski, Hamburg, & Lederberg, 2003). Therefore, from the point of view of the pharmaceutical industry, development of antibiotic medicines is inhibited by the high financial cost. Projan (2003, 2004) found that only a handful of pharmaceutical companies worldwide were currently conducting research into and development of new antibiotics at the time of his study.

The magnitude of inappropriate prescription around the world has been confirmed in a wide range of research studies. Albrich, Monet, and Harbath (2004) calculated that almost half of the antibiotic consumption throughout the world is unnecessary. Von Gunten et al. (2009) analysed the charts of 600 patients receiving antibiotics in three Swiss hospitals and confirmed that more than 45% of antibiotics prescribed by clinicians were inappropriate either in terms of dosage, duration, route of administration, or in terms of microbial spectrum (either too narrow or too broad). Hecker et al. (2003) conducted a study in a 650-bed university-affiliated hospital in Cleveland on the unnecessary use of antimicrobials and concluded that 30% of the antimicrobials prescribed were unnecessary, mainly due to being prescribed for longer than the recommended duration. The authors concluded that their findings closely
correlated with those of other investigations during the 1970s, such as Maki & Schuna (1978), Castle et al. (1977), Kunin, Tupasi, & Craig (1973), and Scheckler & Bennett (1970).

Borg et al. (2008) conducted an ARMed-funded project (Antibiotic Resistance, Surveillance, and Control in the Mediterranean Region) which investigated antibiotic consumption in 25 hospitals from the southern and eastern Mediterranean countries of Cyprus, Egypt, Jordan, Lebanon, Malta, Tunisia and Turkey for the duration of one year. They concluded that almost all the hospitals they investigated prescribed broad spectrum antibiotics in preference to narrow spectrum and hypothesised that this practice constituted the main reason for the region’s high antimicrobial resistance problem. In a Serbian study, Velickovic-Radovanovic et al. (2009) confirmed the association between the use of antibiotics and the frequency of AMR for that country. Another study conducted in Spain by Caminal and Rovira (2005) with a sample of 29 primary healthcare centres and 251 GPs concluded that 43.7% of antibiotics were inappropriately prescribed. Out of the 43.7%, antibiotic treatments that were not required but were still prescribed amounted to 27.9%; antibiotic treatments that were required but a non-recommended antibiotic was prescribed amounted to 12%; and antibiotic treatments that were required but were not prescribed amounted to 3.8%. Therefore, the most common cause of inappropriateness was attributed to unnecessary prescription of antibiotics, which brought in its wake financial loss to the hospital system and adverse medical effects for the patient. Another study conducted in France by Cars, Molstad, & Melander (2001) found that country to be one of the highest antibiotic consumers in Europe. Although studies have found that in developed countries about 50-60% of antibiotics prescribed are inappropriate, the major problem lies in developing countries such as India, Pakistan, East Africa, West Africa, and China where inappropriate prescription is as high as 80-97%. A range of studies have indicated the magnitude of this problem. In China, inappropriate prescription occurred in 97% of cases (Hui et al., 1997). In Ghana, it was as high as 81% (Bosu & Afori-Adjei, 1997). In India, 90% of all antibiotics prescribed were found to lack any dosage specification (Uppal et al., 1993). In Tanzania, 91% of prescribed antibiotics were found to have the incorrect dosage written on them (Gilson et al., 1993). Table 2.1 shows the rate of inappropriate use of antibiotics in teaching hospitals in a range of various countries (Hogerzeil, 1995).
2.6 Clinicians’ perceptions of antimicrobial resistance

It goes without too much argument that clinicians play an extremely significant role in antibiotic prescription. Therefore, their perceptions of antibiotic prescription and AMR are important factors in any attempt to manage the issue worldwide.

Simpson, Wood, & Butler (2007) interviewed forty GPs to understand their perceptions of AMR. They concluded that many GPs felt there was insufficient evidence to link antibiotic prescribing to AMR and poor clinical outcomes for the patient. In the continuation to this study the authors also concluded that GPs justify their use of broad spectrum antibiotics through their desire to do their best for their patients (Wood, Simpson, & Butler, 2007). Cabana et al. (1999) concluded that physicians are likely to
alter their behaviour only when their knowledge, beliefs, attitudes, and skills are aligned with the means to achieve them. In another study Wester et al. (2002) surveyed 490 physicians at four hospitals in the USA to measure their knowledge, beliefs and attitudes in regards to AMR. Most of the respondents (87%) believed that AMR is a global problem. Nearly all clinicians (97%) believed that widespread antibiotic use and inappropriate antibiotic use were the two major factors explaining AMR. However, only 55% believed that it was a problem in their own hospital because many respondents felt that AMR is more of a theoretical possibility than an existing issue. Similar findings were reported by Giblin et al. (2004) who concluded that most clinicians believe that AMR was a large problem nationally but not in their hospitals or in their practice. However, when Paluck et al. (2001) conducted a similar study they reported that 77% of GPs agreed that widespread use of antibiotics was an issue in their own hospital.

A systematic review of 24 studies undertaken by the Department of Health (USA), University of Oxford, and University of Bristol confirmed that prescription involving longer duration and multiple courses of antibiotics was associated with higher rates of resistance (Costelloe et al., 2010). The effect of resistance was found to be greatest in the first month after treatment but resistance also persists for up to 12 months subsequently. This increases the resistance to first-line (narrow) antibiotics in the population and increases the demand and usage of broad-spectrum antibiotics in the community (Costelloe et al., 2010). This review confirmed an earlier study by the UK Department of Health (1998) which recommended a prescription regime involving the fewest number of antibiotics for shorter periods of time.

2.7 Factors influencing clinicians’ prescribing behaviour

A wide range of studies have been conducted with the objective of discovering the major factors that influence the behaviour of clinicians when prescribing antibiotics. De Souza et al. (2006) interviewed non-consultant doctors to identify those factors which influence their actions when deciding to prescribe antibiotics. The most important reason given by doctors was the opinion of their senior colleagues in their assigned team. The doctors agreed that hospital policies are valuable and adherence to them should be promoted even though most of them were not aware of any guidelines
or policies in their hospital relating to antibiotic prescription. As a doctor’s career progressed it was found that their personal experience became the major determining factor in prescribing antibiotics, in preference to hospital guidelines or university knowledge. Another major factor that clinicians perceive as influencing their prescribing behaviour relates to their patients’ expectations and demands (Coenen et al., 2000; Macfarlane et al., 1997; Altiner et al., 2004; Linder & Singer, 2003; Britten & Ukoumunne, 1997). The reason why clinicians should allow their patients’ expectations to override their own professional judgement is, however, an under-researched topic.

Researchers also suggest that two additional broad-based factors are influential in impacting upon medication errors: personal factors and system factors (McBride-Henry & Foureur, 2006; Etchells, Juurlink, & Levinson, 2008).

A wide range of studies have identified a number of significant personal factors that can impact upon the prevalence of medication errors, including: distraction, lack of knowledge, dosage calculations, workload, number of hours on shift, or failure to adhere to policy and procedures (Hicks et al., 2004; Dean et al., 2002; O'Shea, 1999; Wakefield et al., 1998; Cohen & Cohen, 1996; Mayo & Duncan, 2004; Tissot et al., 2003; Raju et al., 1989; Segatore et al., 1994; King, 2004; Andersen & Webster, 2001; Meurier et al., 1997; Leape et al., 1995; Oldridge et al., 2004; Wong, Ghaleb, & Barber, 2004; Preston, 2004; Schneider et al., 1998; Jarman, Jacobs, & Zielinski, 2002; Bates et al., 1998; Ridge & While, 1995; McBride-Henry & Foureur, 2006).

Similarly, a wide range of studies have identified a number of significant system factors that can impact upon the prevalence of medication errors, including: lack of adequate staff, inadequate access to policy and medication information, organisational culture, communication channels, incident reporting culture, pharmaceutical related issues, organisational routines, or physical environment and lighting (Vincent, 2003; Dean et al., 2002; Wakefield et al., 1998; Blegen & Vaughn, 1998; Leape et al., 1995; Clancy, 2004; Page, 2004; Stucky, 2003; Andersen, 2002; Cohen & Cohen, 1996; Hicks et al., 2004; Brush, 2003; Poster & Pelletier, 1988; Bagian, 2004; Singer et al., 2003; Baker, 1999; King et al., 2003; Vincent, Taylor-adams, & Stanhope, 1998; Andersen, 2002; Baker, 1994; Raju et al., 1989; Traynor, 2004; Tissot et al., 2003; Orser, 2000; Berntsen, 2004; Bulla, 2004; Cook et al., 2004; Lamb, 2004; Mayo & Duncan, 2004;
2.8 Public attitude towards AMR and antibiotic prescription

Emslie and Bond (2003) conducted a survey amongst 351 respondents in Scotland which found that 45% were concerned about AMR. As a follow-up, Hawkings, Wood, and Butler (2007) conducted a qualitative study with the objective of achieving greater understanding of the general public’s attitude towards AMR. Their overall conclusion was that the general public felt no need to take any ownership of the issues related to AMR, either from the standpoints of cause or control. In other words, the general public minimised its responsibility for playing any role in causing the problem or as a solution to the issue of AMR. The authors appeared to adopt a stance of some sympathy to these views by pointing out that the three major factors responsible for causing AMR were independent of any actions that could be taken by the final consumer, namely: poor hospital hygiene (63%), poor standards of healthcare (15%), and over-prescribing of antibiotics by physicians (13%). However, it has been argued that the prevalence of over prescribing by physicians could be related, in some measure, to consumer demand for antibiotics from patients. In a study conducted by Butler et al. (1998) it was concluded that even though doctors knew the ramifications of over prescription of antibiotics, they still went ahead and prescribed antibiotics in order to keep a good relationship with their patient. In a Belgian study, Coenen et al. (2006) found that doctors readily prescribed an antibiotic to patients whenever the doctor perceived that this was what the patient wanted. Additionally, Boyd, Edgar, and Foster (2008) interviewed 919 adults in the USA who had taken antibiotics during the preceding twelve months and confirmed that almost all the healthcare providers prescribed antibiotics to those patients who asked their clinician for an antibiotic.

However, it is possible to argue that factors such as misconceptions, lack of awareness, ignorance, and confusion, can play a role in patient perceptions (Barden et al., 1998; Palmer & Bauchner, 1997; Bauchner, Pelton, & Klein, 1999; Mainous et al., 1997). A study conducted by Brooks et al. (2008) indicated that less than half of the patients surveyed had never heard of AMR. Of those respondents who had heard of AMR, many
could not explain what AMR is, what caused it, or how it affected the patient. The majority of the patients stated that they never asked a clinician for an antibiotic, especially for minor ailments such as colds, coughs or influenza, and they claimed to always listen to the advice of their doctor. Most patients held the belief that they did not consume enough antibiotics to become resistant to them and did not see any relationship between AMR in the community and their own consumption of antibiotics. The significance of misconceptions amongst the general public about antibiotic use and its benefits was highlighted in a study by Belongia et al. (2002) who surveyed 405 adults and 275 parents of children in Wisconsin and Minnesota. The authors claimed that public misconceptions can lead to inappropriate prescribing because some adults and parents indicated taking antibiotics without first consulting with their doctor or obtaining an antibiotic prescription over the telephone without visiting the doctor’s practice.

2.9 AMR campaigns and antibiotic prescription

In 1995, the Centers for Disease Control and Prevention (CDC) partnered with the Food and Drug Administration (FDA), to launch a national campaign for “appropriate antibiotic use in the community”. In 2003, this was re-vamped with the new title “get smart: know when antibiotics work”. This message was disseminated through print, television, radio and outdoor media with the objective of reducing AMR (CDC, 2013).

Figure 2.5
‘Get Smart’ campaign for reducing AMR

Source: CDC (2013)
In 2008, the European Health Council published a report which stressed the growing problem of AMR (Council of the European Union, 2008). After this, the UK Department of Health launched a campaign in February 2008 to increase public knowledge and awareness about antibiotic use. A variety of posters were designed and printed in newspapers and magazines, as well as being distributed to GPs, health centres, and pharmacies (UK DH, 2009).

**Figure 2.6**

Campaign posters aimed at increasing public awareness of AMR

![Campaign posters](Source: UK DH (2009))

In November 2008, nine months after the start of the campaign, the European Union launched the first European Antibiotic Awareness Day (EAAD). In order to assess the impact of this campaign McNulty et al. (2010) conducted a study to find out if the public’s knowledge, attitudes and behaviours had changed after this campaign. The authors’ findings indicated that the public did remember the posters but their knowledge and understanding regarding antibiotics had not changed. Accordingly, the authors could not detect any positive outcome from the campaign. In addition, the study also
revealed the significant finding that 90% of the public who asked their GP for antibiotics were prescribed antibiotics. This shows that these campaigns were not effective, and a prime reason was attributed to the fact that the advertising medium was limited to only posters and leaflets. The use of television to spread the message was considered to be a better option.

Since France has been identified as one of the highest antibiotic consumption countries in the world (Cars, Molstad, & Melander, 2001), the French government launched a campaign in 2001 with the goal of reducing the extent of antibiotic prescription. The campaign was called “keep antibiotics working” and every year in winter since 2002 the French National Health Insurance has promulgated a campaign theme through television and radio called “antibiotics are not automatic”. Sabuncu et al. (2009) evaluated the effectiveness of these campaigns from the period 2002-2007 and found a significant reduction in unnecessary antibiotic prescription. Goossens et al. (2006) also evaluated the separate campaigns in Belgium and France and these authors also concluded that a significant reduction in antibiotic prescription had occurred. The goal of the campaigns was to reduce antibiotics prescription by 25% over a five-year period. However, the campaigns exceeded this expectation. In France the reduction was 26.5%, whilst in Belgium the reduction was 36%. The authors concluded that these high rates of reduction could be attributed to the use of television as the major communication channel. Television is regarded as more effective in changing the public’s attitudes and behaviours. A short evocative commercial involving a small boy was considered to be particularly powerful in transmitting the message:
In addition, other campaigns have also been conducted elsewhere in the world. In Canada, many health-related organisations partnered together and launched the first Canadian ‘antibiotic awareness day’ in November 2010. In 2011, the same exercise was repeated, but this time it was extended into an ‘antibiotic awareness week’ involving seminars, conference, posters, and a dedicated website: http://antibioticawareness.ca.

In Chile, an official report (PAHO, 2000) found a high rate of antibiotic consumption over the preceding ten-year period. As a result, the Chilean Ministry of Health introduced stricter controls by making antibiotics available at chemists and by prescription only. Other campaigns were also conducted by them through television, radio, posters, and leaflets about AMR and the use of antibiotics. These campaigns were found to be effective in reducing the consumption of antibiotics and total expenditure on antibiotics. The Chilean Ministry of health used this campaign as an example for other countries to follow by arguing that whenever the medical authorities display determination, public education, and political will, then inappropriate prescribing can be reduced and lives saved (Bavestrello & Cabello, 1996; PAHO, 2000).
In 2001, the World Health Organisation (WHO, 2001a) released a “global strategy for the containment of antimicrobial resistance” which stressed the significance of the problem of AMR and provided recommendations to each country. Unfortunately, this campaign launch coincided with the 9/11 attack on the twin towers in the USA. For this reason the campaign impact was dissipated and became somewhat lost in the subsequent barrage of communication messages. There was a gap of ten years until the WHO again launched a similar campaign in April 2011 (‘world health day’) with the objective of raising awareness of the many different stakeholders around the world. The concept of a ‘world health day’ started in 1948; since 1950 it has been celebrated on 7 April of each year, with a different theme being selected as a priority area for the world. In 2011, the theme for world health day was “antimicrobial resistance: no action today, no cure tomorrow”.

Figure 2.8
World health day, 7 April 2011

![World Health Day 2011](source: World Health Organisation (2011c))

2.10 Consensus regarding AMR: “antimicrobial stewardship”

One of the major initiatives aimed at reducing the impact of AMR through the organisation and establishment of an antimicrobial management program is the approach which has been called ‘antimicrobial stewardship’ (AMS) (Dellit et al., 2007;
MacDougall & Polk, 2005). AMS has been defined by MacDougall and Polk (2005:640) as “an ongoing effort by a healthcare institution to optimize antimicrobial use among hospitalized patients in order to improve patient outcomes, ensure cost-effective therapy, and reduce adverse consequences of antimicrobial use (including antimicrobial resistance)”. The aim of AMS is to reduce inappropriate prescribing, morbidity, mortality, and cost (Rybak, 2007).

The importance of AMS as a strategy for the reduction of AMR has steadily increased in recent years. WHO (2001b) reported that programs involving infection control interventions reduce the frequency of infections and AMR. They recommended that all hospitals should establish an infection control intervention program with the aim of reducing AMR. This recommendation was also included in the national actions of the US, European, and Canadian governments in order to address the problem (CDC, 2001; European Commission, 1999; Health Canada, 1997). This approach was upgraded and made more specific by WHO (2011a, 2011d) recommending AMS as the solution to AMR. The Australian Commission on Safety and Quality in Healthcare has prioritised the improvement of AMS in Australia (ACSQHC, 2008a, 2008b, 2008c, Roughead & Semple, 2008). The Commission has provided ten recommendations to Australian hospitals in relation to AMS strategies and the resources required to implement a fast and effective AMS program (Duguid & Cruickshank, 2011). A number of European Union countries, Austria, Belgium, Czech Republic, Germany, Hungary, Italy, Poland, Slovenia, and Slovakia, commenced a project in 2006 called “antimicrobial stewardship international” (Allerberger, Frank, & Garies, 2008). This project has involved both the training of staff and the implementation of AMS tools.

Various studies have shown that the implementation of effective AMS programs throughout the world has reduced inappropriate prescribing by 30%, as well as having achieved reductions in resistance rates, morbidity, drug-related adverse events, mortality, antibiotic expenditure, overall hospital costs, and adverse patient outcomes (Cruickshank & Ferguson, 2008; Dellit et al., 2007; MacDougall & Polk, 2005; Fishman, 2006; Owens, 2008; Drew, 2009; Edwards et al., 2011; Ohl & Ashley, 2011; Rybak, 2007; Schentag et al., 1993; Lacy et al., 1996; Carling et al., 2003; Salama et al., 1996; Lutters et al., 2004). In an Australian study (Bannan et al., 2009) it was found that
clinicians who used an AMS program supported the system. Almost all felt that the program provided useful advice and was educational.

A more detailed examination of the different surveillance systems established by various countries in order to monitor and control antibiotic usage and AMR is presented below.

In the USA, the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) jointly published a report making specific recommendations for the control of AMR through AMS programs which effectively monitor antibacterial usage (Shlaes et al., 1997). In Europe, as a result of a 1998 European Union conference on the “microbial threat”, all participants agreed that AMR was becoming a global issue which required comprehensive strategies to deal with it. In 2001, recommendations were made to hospitals to establish policies, guidelines, and practices for clinicians in order to monitor AMR and antibiotic prescription. The European Surveillance of Antimicrobial Consumption program (ESAC) was launched in November 2001, with the support of 34 European countries, to action the necessary initiatives. The Antibiotic Resistance, Prevention, and Control project (ARPAC) was established in 2002 to keep a record of antibiotic use in European hospitals and provide recommendations on AMR and antibiotic use (Davey et al., 2005; Owens, Fraser, & Stogsdill, 2004). In Australia, the AMR problem came into national focus in 1985 when through collaboration between clinicians and scientists from around the country AGAR (Australian Group for Antimicrobial Resistance) was formed. AGAR collected information and tested the level of AMR and its infections around Australia. In 1997, the Australian Ministry of Health and Family Services along with the Minister of Primary Health and Energy established a joint committee called JETACAR (Joint Expert Technical Advisory Committee on Antibiotic Resistance) which included experts from health, veterinary science, and agriculture (JETACAR, 1999). This committee devised and recommended a plan for AMR (DHAC-DAFF, 2000). In 2000, the Australian government established EAGAR (Expert Advisory Group on Antimicrobial Resistance) which suggested that an integrated surveillance program should be implemented similar to JETACAR. Finally, in 2006 the Australian Commission on Safety and Quality in Healthcare (ACSQHC) was established. ACSQHC became an independent body in 2011 with the responsibilities of monitoring
and analysing AMR, as well as medication safety and patient safety in Australian hospitals (ACSQHC, 2012).

In Denmark, the Danish Medical Agency project (DANMAP) was established with the objective of collecting and analysing data on antimicrobial agents in food, animals, and humans. Every year DANMAP provides an annual report to the Danish Medicine Agency to report its findings (Owens, 2008; Khan et al., 1999). Similar surveillance programs for AMR and antibiotic use have also been established in various other countries including the Netherlands, Sweden, Germany, and the USA (Joint Commission Perspectives on Patient Safety, 2006; Cooke & Holmes, 2007; Rogers, 1995; LaRocco, 2003). In addition, programs have been established that are not just specific to one country but which span several countries and continents. For example, in 2009, the US President, the Swedish Prime Minister, and the European Council and Commission Presidents formed a US-EU Agency to combat AMR called the Transatlantic Taskforce on Antimicrobial Resistance (TATFAR). In 2011, TATFAR published a report recommending AMS in hospitals (TATFAR, 2011).

2.11 Types of interventions to improve AMR and clinicians’ behaviour

The extant literature contains a number of strands with regard to types of interventions aimed at improving clinicians’ behaviour. Studies can be classified into several categories. The most common are: continuing medical education (Davis et al., 1995); implementation of guidelines (Effective Healthcare, 1994; Grilli & Lomas, 1994); or clinical decision support systems (Hunt et al., 1998). Meta-analyses have also been conducted, for example, a meta-analysis was conducted of 16 studies which evaluated computerised clinical decision-support systems in the clinical ambulatory setting. This study concluded that such systems generally prove to be effective (Shea, DuMouchel, & Bahamonde, 1996).

According to a study at the Royal Children’s Hospital, the introduction of a simple and low cost intervention of a laminated guideline clipped to a doctor’s identification badge, proved to be successful in reducing antibiotic prescription (South et al., 2003). Another study in the same hospital showed that the implementation of a simple web-based
antimicrobial approval system resulted in increased prescribing in accordance with antibiotic guidelines and a reduction in the use of CEFX (Microbial) over 15 months (Richards et al., 2003). Hunt et al. (1998) reviewed 68 studies on the effectiveness of clinical decision support systems and found that they can improve clinicians’ decisions relating to prescribing, diagnosis, preventive care, practitioners’ performance, and patient outcomes. Balas et al. (1996) reviewed 98 studies on the effectiveness of computerised information systems and concluded that they can improve the quality of care. Evans et al. (1998) have also shown that the implementation of computer-assisted programs can lead to an improvement in antibiotic prescribing.

A Ugandan study demonstrated that when antibiotic treatment guidelines are disseminated to clinicians together with training in therapeutic problems and supervisory visits to clinicians, the result was an improvement in prescribing behaviours compared to other clinicians who only received the guidelines without training or supervision (Kafuko, Zirabumuzaale, & Bagenda, 1996). In France, as discussed earlier, the consumption of antibiotics and the prevalence of multi-resistance bacteria are both very high in hospitals and in the community (Cars, Molstad, & Melander, 2001; Vander Stichele et al., 2006; Goossens et al., 2006; The European Antimicrobial Resistance Surveillance System (EARSS) Annual Report, 2001-2005). However, a multi-centre study in French hospitals which had some kind of surveillance system in place showed such hospitals experienced a reduction in antibiotic use compared to other hospitals having no such systems (Miliani et al., 2008). A systematic review of 79 studies of intervention in changing prescribing behaviour performed by Gill et al. (1999) found that those with multi-faceted interventions proved to be more successful than the ones with just one intervention. Another study conducted by Dormuth et al. (2004) revealed that educational materials sent to physicians were shown to change prescribing behaviour.

Other review studies, however, have concluded that the provision of educational materials alone is not particularly effective in changing prescribing habits even though it might improve the knowledge and attitude of clinicians. However, the provision of educational materials combined with feedback mechanisms has proved to be effective in improving physicians’ practices (Anderson & Lexchin, 1996; Soumerai, McLaughlin, & Avorn, 1989; Freemantle et al., 1999).
2.12 Clinical Decision Support Systems and their importance

It has been argued that clinical decision support systems can greatly aid the fight against AMR in hospitals and in the community. This section surveys some of the main studies that have been performed on this topic.

CDSS has been defined in various ways. One definition regards CDSS as electronically-stored knowledge systems available for presenting the appropriate information to healthcare professionals so that they are able to make decisions more accurately and efficiently with fewer errors (Thursky, 2006; NHIMAC, 2002). Hunt et al. (1998:1339) defined CDSS as “any software that directly aids clinical decision making in which characteristics of patients are matched to a computerized knowledge base for the purpose of generating patient-specific assessments or recommendations that are then presented to clinicians for consideration”. However, Wyatt and Spiegelhalter (1991) regard CDSS as an application or software which is designed to help healthcare providers make a better clinical decision by using two or more items of patients’ data.

The Australian Commission on Safety and Quality in Healthcare (ACSQHC, 2011) has recommended using computer technology to support AMS programs and this has been taken up, for example, by the health departments in both NSW and Victoria who have recommended using electronic antimicrobial approval systems for the reduction of AMR. However, ACSQHC (2011) additionally recommends that CDSS needs to be integrated with other clinical tools in order to make such systems easily accessible for clinicians. The US Centers of Disease Control and Prevention campaign, ‘to prevent antimicrobial resistance in health care settings’, also supports and approves CDSS to improve the quality of antibiotic prescribing (CDC, 2002; Evans et al., 1998).

These recommendations are the result of a range of research studies that show the introduction of CDSS can bring about effective outcomes such as: improving the quality of prescribing; reducing inappropriate prescription; reducing AMR; decreasing medication errors; improving the quality and efficiency of healthcare; making more accurate decisions; improving practitioner performance; and enhancing clinicians’ adherence and compliance to recommendations, policies and guidelines (Kaplan, 2001; Thursky, 2006; Sintchenko, Coiera, & Gilbert, 2008; Hunt et al., 1998; Shiffman et al.,
A major drawback though, is that the development and implementation of CDSS requires large financial and human investment and, hence, the failure of such systems has the potential to waste limited health care resources. CDSS can be as simple as checking the Antibiotic Therapeutic Guidelines online or can be embedded into an application which clinicians and pharmacists use on a daily basis. However, there is emerging consensus that CDSS needs to be far more nuanced than this in order to be effective. The large expense associated with CDSS is due to the variety of separate design features required to be incorporated in CDSS before the system can be expected to become effective.

Kawamoto et al. (2005) identified four features that needed to be included in any CDSS before any improvement in clinical practice could be observed: provide decision support automatically as part of clinician workflow; deliver decision support at the time and location of decision making; provide actionable recommendations; and use a computer to generate the decision support.

To overcome the drawbacks of a phone-based approval system, Austin Health, a tertiary hospital in Melbourne, Australia, developed an Infectious Disease Electronic Antibiotic Advice and Approval System (IDEA3S) which showed significant improvement in antibiotic prescribing behaviour (Grayson et al., 2004). In another attempt at reducing AMR, a computerised antimicrobial approval system was implemented in another teaching hospital in Melbourne and data was analysed before and after implementation. The findings showed a significant reduction in broad-spectrum antimicrobial usage (Buising et al., 2008). This study supports the results of a range of other studies conducted in Australia that have evaluated CDSS after implementation and all have shown a reduction in antibiotic prescription (Richards et al., 2003; Thursky et al., 2006; Sinchenko et al., 2005). In the USA, Pestotnik et al. (1996) evaluated a computerised antibiotic decision support order entry system in a hospital and observed that antibiotic use decreased by 22.8%. In addition, mortality decreased from 3.65% to 2.65%, which in turn decreased the antibiotic cost per patient by more than 50% (from $123 to $52). In the same hospital, Evans et al. (1998) analysed an intervention in the form of a computer-assisted management program before and after its implementation. The authors concluded that subsequent to the implementation of the intervention a 70%
reduction in clinical errors from antibiotic prescription, such as mismatches, excess dosage, and adverse drug events could be observed. This in turn decreased the cost of antibiotic use and the total cost of hospitalization.

There are a number of other significant CDSS studies in the literature to be mentioned at this stage. Shojania et al. (1998) evaluated a Computerised Physician Order Entry (CPOE) system and discovered a 32% reduction in the number of orders for one particular antibiotic which saved the hospital one third of its annual cost. Garg et al. (2005) performed a review of 97 studies and concluded that 64% of the studies showed that CDSS improved physician performance but only 13% reported that it improved patient outcomes. The authors suggested that research studies might be biased if the evaluator of a CDSS is also a developer of the same. Jaspers et al. (2011) performed a review of 91 studies on CDSS effectiveness and concluded that 57% of the studies showed a significant positive improvement in practitioner performance but only 30% showed a positive improvement in patient outcomes. Another noteworthy study was conducted to analyse the impact of a computerized antimicrobial approval system. The system was installed at the Royal Melbourne Hospital in 2005. The drug committee at the hospital specified a list of 28 restricted antimicrobial agents. Clinicians needed approval before prescribing these specific drugs. Data was collected five years before and two years after implementation. The findings revealed a significant change in antibiotic use and prescribing habits. The research suggested that there might be a positive impact on the rate of multi-drug resistance and patient outcomes (Buising et al., 2008).

2.13 Clinicians’ perceptions of Clinical Decision Support Systems

What does the extant literature reveal about the perceptions of clinicians with regard to CDSS? A study conducted by Zaidi, Marriott, and Nation (2008) researched the perceptions held by clinicians with regard to the adoption of a web-based antibiotic approval system called GUIDANCE. Seventy percent of the clinicians who had used the system found it easy to use and 80% of these believed that the system would reduce the amount of inappropriate prescription. Clinicians also reported that the system was easy to learn, easy to show others, and it was also easy to find information. In addition, the
majority of clinicians believed that the system would improve their knowledge about antibiotics and antibiotic guidelines, as well as adherence to, and knowledge about, evidence-based practice. The authors found there to be a correlation between the perceptions held by clinicians and actual use of the system by clinicians.

Participants in the research study of Zheng et al. (2005) believed that CDSS could have positive implications for their medical practice. Rosenbloom, Talbert, and Aronsky (2004) also investigated clinicians’ perceptions and reported that 72% of clinicians believed that such a system would improve the quality of patient care they provided. Ahearn and Kerr (2003) conducted a study which investigated the perceptions of GPs with regard to the use of information technology tools in the prescribing process. The respondents suggested that better design of the interface would improve the usefulness of the system. Schectman et al. (2005) reported that personal attitudes of physicians strongly affected their adoption propensity in the sense that the rate of adoption depended upon personal attitudes towards the efficiency and effectiveness of the system. Non-adopters of the system believed that it was too time-consuming and that their patients preferred a hand-written prescription to an electronic one. Ward et al. (2002) conducted a research study that investigated clinicians’ knowledge, attitude towards guidelines, and their adherence to such guidelines. A finding of particular interest in this study was that the extent and quality of feedback given to physicians has a significant influence on their adherence to guidelines.

Sittig et al. (2006) conducted a study that investigated the factors why clinicians accept CDSS. Important facilitating factors included their beliefs that CDSS helps them to take better care of their patients, reminds them of something they may have forgotten, and is worth the extra time it takes to use such a system. Clinician characteristics such as age, gender and work experience had no significant impact on the decision to accept or ignore CDSS. The authors concluded that, overall, clinicians felt that CDSS is beneficial to them and advances their knowledge. The findings of this study are interesting in the light of other studies which point to contradictory evidence, such as the finding that clinicians ignore or override a high percentage (50-90%) of recommendations given by decision support systems (Weingart et al., 2003; Tierney et al., 2003; Overhage et al., 1997).
2.14 Clinicians’ adherence to Clinical Decision Support Systems

Following on from the previous section, with the increasingly widespread use of CDSS in medicine (Sintchenko et al., 2005) an understanding of the factors that influence clinicians to use, or not to use, such systems would be helpful. As indicated above, a high percentage of CDSS recommendations are routinely ignored by clinicians (Feldstein et al., 2004; Overhage et al., 1997; Tierney et al., 2003; Weingart et al., 2003). Physician adherence to CDSS may be impeded by a variety of barriers and it is also recognised that there exists much resistance to systems aimed at changing the normal behavioural practices of clinicians (Conroy & Shannon, 1995).

Phansalkar et al. (2008) investigated a range of factors that could impact on and influence the acceptance of, and adherence to, computerized protocols by clinicians. The authors suggested a model comprised of nine separate factors: work importance, belief regarding control, social pressure, culture, belief regarding self-efficacy, attitude towards information quality, environmental support, role relevance, and the last behavioural intention. The strongest predictor was the individual clinician’s belief in their self-efficacy. Other studies (Cabana et al., 1999; Haagen et al., 2005; Ward et al., 2002) identified a clinician’s attitude as a factor in determining their acceptance of CDSS, but Phansalkar et al. (2008) argued that it is their attitude specifically towards information and its quality that determined their future use of CDSS and not just attitude. The authors suggested that adopting a CDSS in a routine practice requires the clinicians to perceive it positively. This positive perception is achieved by making clinicians feel competent in using it, imparting knowledge about the protocol, and making them feel that using the protocol will improve their performance.

A research study at the Royal Melbourne Hospital by Zaidi et al. (2008) aimed to measure clinician perceptions regarding the ease of use and usefulness of a module of an antibiotic approval system. Specific findings from the study were as follows: 83% of clinicians believed that the system would decrease the inappropriate use of antibiotics; 64% believed that it would improve the quality of patient care; 74% believed that the system would improve their adherence to evidence-based use of antibiotics; 78% believed that it would increase their knowledge about evidence-based use of antibiotics;
85% believed that it would increase their knowledge about local antibiotic prescribing guidelines; but only 53% believed that it would save time.

2.15 Barriers in implementing Clinical Decision Support Systems

The literature shows a range of results with regard to factors that impede the efficacious implementation of CDSS. Physicians face serious challenges and complex sets of factors whilst using the system, including political, organisational, technological, social, and practice-related factors, all of which, either individually or collectively, have the capacity to result in system failure during implementation (Agostini, Concate, and Inouye, 2008; Graber & Mathew, 2008; Berg, 1997; Aarts & Berg, 2004; Berg, 1999; Aarts, Doorewaard, & Berg, 2004; Cabana et al., 1999; Rousseau et al., 2003; Tierney, 2001).

Despite the fact that many decision support systems (whether computerized or not) have been implemented around the world to assist doctors in their decision-making, there is a growing body of evidence in the medical literature that such implementation has not been as successful as many commentators would like to see, nor have the hospital management motivated physicians sufficiently to observe a significant change in their behaviour. What are the barriers to successful implementation?

Cabana et al. (1999:1459) defined a barrier as “any factor that limits or restricts complete physician adherence to a guideline”. The authors analysed 76 published studies on barriers to clinicians’ adherence to guidelines. They identified seven categories of barriers which they re-classified into three main themes: knowledge (lack of awareness, lack of familiarity); attitude (lack of agreement, lack of self-efficacy, lack of outcome expectancy, inertia of previous practice); and behaviour (external barriers). This classificatory framework of knowledge-attitude-behaviour was advocated by the authors as a guideline for physician adherence that could be used as a diagnostic tool for analysing why physicians do not follow practice guidelines. The authors stressed that before a practice guideline could affect patient outcomes, it must first affect a physician’s knowledge, then impact on attitude and finally behaviour (Cabana et al., 1999; Pathman et al., 1996; Worrall, 1999).
Grol (1992) suggested that an analysis of barriers to implementation of any new guideline should follow a step-by-step process: namely, orientation, insight, acceptance, and change. According to the author, doctors have their own barriers which are strongly related to factors such as competence, motivation, attitude, and personal characteristics. These are impacted by a number of factors, including age, experience, membership of professional organisations, learning style, self-confidence, and willingness to change.

Other important studies include that of Trivedi et al. (2009) who investigated the barriers in implementing a CDSS for depression. They observed that computer literacy and hardware/software requirements were the initial barriers. Additionally, there were barriers regarding duplication of work and perceived negative impacts on work flow. A wide range of organisational factors also presented substantial barriers. The authors summarised their findings by placing barriers into six different categories: lack of computer literacy; technical requirements and the availability of on-site IT support; site-specific issues; buy-in and support from administrative staff, senior medical staff, and management; clinician autonomy and flexibility of the CDSS; and the impact on patients’ attitudes. Legare et al. (2006) also conducted a study that investigated the barriers to implementation of the Ottawa Decision Support Framework (ODSF). The main barriers identified were: forgetting about the process and tools provided by the system; not believing that a specific element of the system is supported scientifically; challenging the physician’s autonomy; and lack of agreement about using the system. In addition, Legare et al. (2008) reported that the three most common barriers to implementing CDSS are time constraints, lack of applicability due to patients’ characteristics, and the clinical situation. Finally, Solberg (2002) has suggested that significant barriers to implementation are mostly associated with the lack of organisational and leadership support for the change during the implementation process.
2.16 Summary

This chapter has presented a literature review of the topic area of antimicrobial resistance. It has noted the serious nature of the world-wide threat posed by AMR, including its ramifications, cost, and extent. A particularly significant observation provided by this literature review is that many countries have not yet instituted effective preventative measures. While this observation is more pertinent for undeveloped and developing nations of the world, AMR is still a serious problem within the more developed nations. For example, the extant literature shows that many clinicians remain resistant towards measures that attempt to monitor and control their prescribing behaviour. This resistance is particularly noticeable towards computer-assisted control measures, commonly referred to as clinical decision support systems.

The severity of clinicians’ resistance has been instrumental in providing the focal point of this thesis, namely, an analysis of why clinicians tend to resist the institution and implementation of such monitoring and control mechanisms. The next chapter will present the research methodology adopted in this thesis, a qualitative approach using the Straussian method of grounded theory. The nature of this methodology will be explored together with an explication of why this particular methodology has been adopted in the thesis.
Chapter 3

Research methodology
Chapter 3
Research methodology

3.1 Chapter overview

In chapter 2 it was noted that antimicrobial resistance has become an extremely serious issue worldwide. The severity of clinicians’ resistance has been instrumental in providing the focal point of this thesis. The research question pursued in this thesis takes its inspiration from the various issues outlined in chapter 2, and can be stated as “why do clinicians tend to resist the institution and implementation of monitoring and control mechanisms in regard to antimicrobial resistance (AMR)”.

The current chapter will present the research methodology adopted in this thesis, namely a qualitative approach using the Straussian method of grounded theory. The nature of this methodology will be explored and an explication for the adoption of this particular methodology in this thesis will be provided. The chapter is divided into eleven sections. Initially an explanation is given for the rationale behind the research methodology followed by a consideration of the selection of the research design. This is then followed by a discussion of the qualitative approach to research with an emphasis on five different approaches – narrative analysis, phenomenology, ethnography, case studies, and grounded theory. Section 3.5 is a long section which deals with the coding procedures within the Straussian school, placing emphasis on open coding, axial coding, selective coding, the paradigm model, and the core category. The chapter is rounded off with an examination of a number of significant aspects of the Straussian school, including theoretical sampling, sampling procedures, theoretical sensitivity, and the use of literature in grounded theory. Figure 3.1 shows this structure in diagrammatic form.
3.2 Rationale for the research methodology

Crotty (1998:1) states that “research students and fledgling researchers…often express bewilderment at the array of methodologies and methods laid out before their gaze”. For Crotty (1998) terminology is often not consistent from one research text to another, and even worse, is sometimes contradictory. To shine a light on this issue Crotty (1998:2) suggests that researchers adopt a template comprised of the following four questions:
• What methods do we propose to use?
• What methodology governs our choice and use of methods?
• What theoretical perspective lies behind the methodology in question?
• What epistemology informs the theoretical perspective?

These separate terms are defined as follows (Crotty, 1998:3):

- **Methods**: the techniques or procedures used to gather and analyse data related to some research question or hypothesis.
- **Methodology**: the strategy, plan of action, process, or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes.
- **Theoretical perspective**: the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria.
- **Epistemology**: the theory of knowledge embedded in the theoretical perspective and thereby in the methodology.

Thus, for example, an epistemology of ‘objectivism’ postulates that things exist as meaningful entities, with truth residing in them as objects, and hence, careful research can uncover that truth. The theoretical perspective that relates to this is that of ‘positivism and post-positivism’ which is founded on a scientific approach “based on universal causal laws which are used to explain concrete social events and relationships” (Sarantakos, 1993:36). On the other hand, an epistemology of ‘constructionism’ postulates that truth and meaning do not exist as an objective truth, but rather are constructed by the human mind when it comes into contact with world realities. The theoretical perspective that relates to this is that of ‘interpretivism’ which is not founded on a scientific approach but rather on the view that the basis for explaining social events depends on people’s own interpretations (Sarantakos, 1993).

Crotty (1998) states that it is extremely important for a research study to adopt an appropriate research methodology. This choice must be fully justified. As shown in the previous section, the research question in this thesis is “why do clinicians tend to resist the institution and implementation of monitoring and control mechanisms in regard
to antimicrobial resistance (AMR)”. In investigating this question I was interested in analysing the perceptions and behaviours of clinicians as well as the meanings they ascribe to particular situations. This lends itself more appropriately to a qualitative research methodology which can take into account the diversities involved in the meanings, words, and perspectives of clinicians as well as addressing the issues involved in the social phenomenon. Qualitative research is the most appropriate approach to addressing the research question because it can bring out the complexities involved in human actions. Qualitative investigations allow researchers to understand how people behave in their daily lives (Berg, 2001). It is also appropriate to employ qualitative research when the research study involves uncovering tacit knowledge and deeper structures of the meanings from people’s perceptions about self and reality made by the individual in context (Wertz et al., 2011).

As shown in chapter 2, there is a dearth of research studies that explore the reasons behind clinicians’ resistance to control measures relating to inappropriate prescribing in Australia. Qualitative methodology usually plays a vital role where there is a lack of substantive evidence or little knowledge in the field of study. Therefore, a qualitative approach can provide an opportunity to discover something new from the data by developing a deeper understanding of the complexity of the phenomena, categories, and their relationships (Strauss & Corbin, 1990; Morse & Richards, 2002). In investigating the research question it was my intention in this thesis to develop a deeper understanding of clinicians’ perceptions, views, issues, and problems in dealing with the prescription process and their resistance to control measures. This could not be achieved by a quantitative survey or numeric analysis of data.

The qualitative research methodology selected for this thesis is grounded theory (Glaser & Strauss, 1967; Glaser, 1978; Strauss, 1987; Strauss & Corbin, 1990, 1998). The main focus of grounded theory is to move beyond description and to generate theory from grounded data. This type of research was first developed by Glaser and Strauss (1967). The approach adopted by these two authors was based upon a positivist epistemology in the sense that the processes and structures postulated by them were believed to actually exist as objective entities and hence could be ‘discovered’ within the data. In contrast, a more constructivist approach to grounded theory has subsequently been advocated by Charmaz (1990, 1991, 1995, 2000, 2003, 2006). Despite their initial collaboration,
Glaser and Strauss subsequently developed their own individual approaches to grounded theory. Glaser has always advocated an emergent approach in which theory will develop from data without being forced into pre-determined categories or by the use of capricious tools and techniques. This latter approach is more the domain of Strauss, leading Glaser to severely criticise this approach calling it ‘forced full conceptual description’ (Glaser, 1992). As a result of this split Glaser has published a series of books that emphasise an orthodox or classical school of grounded theory (Glaser 1978, 1992, 1994, 1996, 1998, 2001, 2003, 2005), whilst Strauss has pursued an approach that emphasises a systematic and conceptually descriptive school of grounded theory (Strauss, 1987; Strauss & Corbin, 1990, 1998; Corbin & Strauss, 2008). The main differences between these two schools of thought are summarised in box 3.1.

Jones and Noble (2007) argue that these differences have caused considerable ambiguities for grounded theorists. They recommend that researchers should clearly state which school of thought they are adopting in their research design. For the purpose of this research I have chosen to use the Straussian school of grounded theory. There are three reasons for this choice. First, Strauss allows a researcher’s personal knowledge and experience to influence the data whereas Glaser argues that these influences should be bracketed out. Since I possess some personal experience and interest in the research area I was eager to call upon this background knowledge to aid my theoretical sensitivity. Second, Glaser argues that research findings should be presented in a conceptual ‘one-upped’ style which distances the theorising from the attraction of the raw data itself (Glaser, 2001). In contrast, Strauss allows the research findings to be presented in the form of conceptual description. Since I did not want to lose the richness and attraction of the raw data itself by conceptualising it to a higher level, I therefore chose to follow the Straussian approach. Third, I was interested in discovering the conditions, consequences, and strategies of clinicians themselves in relation to the research question and so the usefulness of employing the Straussian paradigm model rather than a Glaserian emergent model was an additional attraction for me as a researcher.
Box 3.1

Differences between the Glaserian and Straussian schools of grounded theory

The Glaserian school of grounded theory regards everything as emerging within a grounded theory study (the sample, data, research question, concepts, categories, concerns, theory) so that the researcher cannot say in advance what a grounded theory study will look like. In addition, it is assumed that the researcher harbours no prior knowledge, perceptions, familiarity, or awareness about the study topic. The researcher is expected to push back (bracket) any previous knowledge, and this includes avoiding any detailed prior literature review. This state of affairs allows the theory to emerge from the data naturally without any undue bias from prior influence which could distort the data collection and analysis (Glaser, 2001; Strauss & Corbin, 1990; Jones & Noble, 2007; Locke, 1996). The process of building a theory stresses that the researcher searches for the main concern of the participants and how the participants attempt to solve their main concern. This demarcates what Glaser calls the core category of the study in terms of the ‘basic social process’. The resultant theory is built around the core category in terms of other categories and concepts that are linked together in a coordinated manner. The style of writing should be conceptual and not descriptive in nature. Finally, the main processes of analysis (data collection, coding, and analysis) should all be performed simultaneously and not sequentially.

The Straussian school of grounded theory does not expect researchers to bracket out their previous knowledge and experience from the analysis of the data. Strauss believes that such insight is a positive aspect of research and should be incorporated into the approach. Thus, a researcher’s perceptions, knowledge, literature, and awareness of the topic plays an important role in influencing and shaping the data in a better manner. With respect to generating theory, Jones and Noble (2007) note that during their initial collaboration both Glaser and Strauss agreed that grounded theory should be employed only to build theory. However, Strauss later modified this belief and also endorsed that grounded theory could be used either to develop themes or to engage in descriptive pursuits. Strauss also advocated a systematic set of tools and techniques to be employed whilst collecting, coding, and analysing data. In particular, he emphasised the primary role of the ‘paradigm model’ in structuring a theory. This model encompassed: the phenomenon, context, causal conditions, intervening conditions, strategies, and consequences. This structure was regarded as pre-determined and thus contained ready-made boxes for researchers to fit their data into. Later, Strauss relaxed these systematic strictures and moved towards a more flexible approach, by allowing sorting of memos to determine the nature of the theory. This approach was more in accord with that advocated by Glaser.

Source: derived from Jones and Noble (2007)
3.3 Selection of the research design

Creswell (2008) defines research as a process involving steps, which are used to collect and analyse information which increases our understanding of a topic or issue. The process involves three steps: identifying a research question; collecting evidence or data to answer the research question; and presenting the findings that address the research question. Neuman (2000) explains that the research process must be systematic and suggests the following research process sequence: choosing a topic; focusing on the research question; designing the study; selecting an appropriate research methodology; and collecting, analysing, interpreting, and presenting the data.

There are two major types of research – quantitative and qualitative. These two approaches differ from each other in terms of their logic and structure and they also address different questions and goals in a research study (Maxwell & Loomis, 2002). Quantitative research relies on the collection and analysis of numerical data. Qualitative research, in contrast, relies on the collection and analysis of words in relation to the different types of situations that people find themselves involved in (Robson, 2011:19).

**Box 3.2**

**Major features of quantitative and qualitative research**

<table>
<thead>
<tr>
<th>Quantitative research</th>
<th>Qualitative research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include measurement and quantification</td>
<td>Verbal communication and meanings</td>
</tr>
<tr>
<td>Concepts are tested</td>
<td>Natural settings</td>
</tr>
<tr>
<td>Reliability and validity of research is measured</td>
<td>Interpretation through values of the researcher</td>
</tr>
<tr>
<td>Statistical analysis of data is needed</td>
<td>The researcher feels much closer to the data</td>
</tr>
<tr>
<td>There is always a distance between the researcher and data</td>
<td></td>
</tr>
</tbody>
</table>

Source: derived from (Robson, 2011:19)
Across the spectrum of quantitative and qualitative research, Christensen, Johnson, and Turner (2011) suggest that data can be collected through a number of different techniques as shown in figure 3.2.

**Figure 3.2**

Data collection techniques

- **Tests.** Tests are usually designed to measure different aspects of people’s performance, personality, aptitude or achievement. Usually tests are standardized and come with their own reliability and validity measurements. Researchers often set up so-called ‘hypothesis tests’ whereby they attempt to reject (or otherwise) an initial null hypothesis (Christensen, Johnson, & Turner, 2011).

- **Questionnaires.** Questionnaires often form an integral element of a survey approach to collecting data. Recipients are requested to respond to a set of
questions that relate to various demographic aspects or experiences, opinions, or perceptions of the respondent. Questions can be either open-ended or closed and often take the form of Likert-type questions to be filled in according to a numerical scale. Paper-and-pencil surveys have traditionally dominated the field, but web-based surveys are now becoming increasingly popular (Christensen, Johnson, & Turner, 2011).

**Interviews.** During an interview, an interviewer presents a series of closed or open-ended questions to an interviewee. Sometimes, interviews can be conducted more as a discussion rather than as a series of questions. Interviews can be conducted in one of several ways: face-to-face, over the telephone, or by using video conferencing or Skype. The structure of an interview can vary from highly structured (strictly following a sequence of pre-set questions according to a script) or unstructured (allowing the interview to meander according to unfolding developments). During an interview, the data is captured either by the researcher taking notes or by using audio recording (Christensen, Johnson, & Turner, 2011).

**Focus groups.** Focus groups comprise a number of participants who are collected together in a common area for the purpose of discussing a specific topic given to them by the researcher. Ideally, the number of participants should be between six and twelve. The researcher moderates the focus group by ensuring that it remains focused on the discussion topic. The deliberations of a focus group can also be audio recorded, and sometimes researchers observe and note the behavioural reactions and interactions of panel members, depending on the topic under discussion (Christensen, Johnson, & Turner, 2011).

**Observations.** During an observation, a researcher is present at a certain event in person and observes the nature of unfolding features. This is a common data collection method in qualitative research. Observers can either be participants in the scenario (for example, actually working in a specific workplace) or else can observe the scenario from a distance as a non-participant (for example, during a guided tour of a workplace) (Christensen, Johnson, & Turner, 2011).
Secondary data. This refers to data that has already been collected (for example, government statistics) and is available for the researcher to analyse. Secondary data can take the form of documents, physical data, or archived data. The range of documents can include letters, diaries, photographs, videos, newspapers, annual reports, and so on. Physical data can come in the form of ‘the contents of someone’s trash’ like soil, or DNA on a human body or clothing. Archived data could be in the form of political, social, or historical data collected and saved for a considerable period of time (Christensen, Johnson, and Turner, 2011).

Each of these methods has their strengths and weaknesses. Table 3.1 outlines major strengths and weaknesses.
Table 3.1
Strengths and weaknesses of different data collection techniques

<table>
<thead>
<tr>
<th>Research method</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tests</strong></td>
<td># Usually developed and standardised&lt;br&gt;# Measure many types of characteristics&lt;br&gt;# Allow comparisons between populations</td>
<td># Can be expensive&lt;br&gt;# Selected items in the tests might not have any response&lt;br&gt;# Researchers cannot probe or ask open-ended questions</td>
</tr>
<tr>
<td><strong>Questionnaires</strong></td>
<td># Good for measuring attitudes and perceptions&lt;br&gt;# Can be inexpensive&lt;br&gt;# The response rate can be quite high&lt;br&gt;# Exact information can be provided due to closed-ended questions</td>
<td># Should be kept short otherwise people will not complete it&lt;br&gt;# Need to be validated&lt;br&gt;# Analysis takes a lot of time and effort&lt;br&gt;# Some selected questions might not be answered</td>
</tr>
<tr>
<td><strong>Interviews</strong></td>
<td># Allows probing and follow-up&lt;br&gt;# Allows for in-depth information&lt;br&gt;# Allows for measuring attitude and understanding the participant’s perception and way of thinking&lt;br&gt;# Usually a good response rate</td>
<td># Expensive and time consuming&lt;br&gt;# Data analysis is time consuming&lt;br&gt;# Respondents might not be honest or truthful&lt;br&gt;# Researcher may be inexperienced or biased</td>
</tr>
<tr>
<td><strong>Focus groups</strong></td>
<td># Useful for gaining lots of ideas at the same time&lt;br&gt;# Can provide in-depth data&lt;br&gt;# Allows for probing and follow-up&lt;br&gt;# Allows for understanding people’s reactions and thinking processes</td>
<td># Can be difficult to organise&lt;br&gt;# Can be expensive&lt;br&gt;# Data analysis can be time consuming&lt;br&gt;# Can be dominated by one or two participants</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td># Good for seeing directly what people do and do not do&lt;br&gt;# Can be used for participants with weak English skills&lt;br&gt;# Can see things that otherwise people would be reluctant to talk about</td>
<td># People may change their normal behaviour under observation&lt;br&gt;# Cannot observe large populations of people&lt;br&gt;# Data analysis is time consuming</td>
</tr>
<tr>
<td><strong>Secondary data</strong></td>
<td># Can collect historical data&lt;br&gt;# Inexpensive and data analysis is much easier</td>
<td># Some data might be incomplete&lt;br&gt;# The people involved might not be around to ask questions&lt;br&gt;# Access to some confidential data might be limited</td>
</tr>
</tbody>
</table>

Source: derived from Christensen, Johnson and Turner (2011:55-61)
3.4 Qualitative approach

Strauss and Corbin (1990) describe qualitative research as a kind of research which does not use any statistical or numerical tools to reach its findings. Qualitative research is mainly concerned with examining and analysing projects which involve people’s lives, stories, behaviours, attitudes, perceptions, organisational functions, or relationships. It is particularly useful when investigating a phenomenon about which little is known and there exists a desire to uncover some of the important variables that influence the phenomenon in question (Glaser, 1998). Denzin and Lincoln (2000:3) state that “qualitative research opens your eyes and makes the world visible”. It can be used to study just one individual, a group of people, or even an entire organisation.

Yin (2011) considers that qualitative research possesses five features:

1. Understanding the meaning of people’s lives
2. Interpreting the perception and views of those people involved in the research
3. Reporting on the contextual settings in those people’s lives
4. Explaining the existing and emerging concepts which can help in understanding human behaviour
5. Gathering, incorporating and presenting data from multiple sources of evidence

Other authors consider that when undertaking qualitative research, critical importance should be attached to a wide range of features including: the research purpose; the surroundings, situation, and settings; ethnicities; institutions; languages; context and environment; cultural background; interactions between the researchers and respondents; and the analytical and inquisitive powers and ideas of the researchers (Morrow, 1992:80). As a consequence, a wide range of skills are needed to effectively conduct qualitative research. These include: being inquisitive and wanting to know and understand more from the participant; observing every move of them and the environment; possessing good interactional and communication skills; able to analyse, recognize, and interpret the data; and abilities to avoid bias when drawing upon past experience and theoretical knowledge (Strauss & Corbin, 1990). Implicit in these requirements are various personal features of the researchers themselves who actually conduct the research. Such features include: their cultural background, values,
profession, life and work experiences, personal character, reflective abilities, and biases. A researcher’s upbringing and perceptions are critical to the research endeavour as these allow the reader to make an informed judgement about the overall context within which the research was performed. Morrow (1992:80) states that the ‘personhood of the researcher should be evident’.

Strauss and Corbin (1990) explain that there are different types of qualitative research such as grounded theory, ethnography, phenomenology, life histories, and conversational analysis. On the other hand, Wertz et al. (2011) suggest a different set of five ways in which to do qualitative research – grounded theory, phenomenology, discourse analysis, narrative analysis, and intuitive inquiry. In contrast, Creswell (2013) provides yet another set of five different approaches to qualitative research – grounded theory, phenomenology, narrative analysis, ethnography, and case studies. These Creswellian types (2013) are summarised below, with the exception of grounded theory which has already been discussed in section 3.2 of this chapter.

3.4.1 Narrative analysis

Narrative analysis involves the collection and reporting of people’s life stories and experiences in terms of documents or conversations. It can take different forms such as biography (where the researcher records the experiences of the participant and his/her life), auto-ethnography (where the researcher records their own experience as the central character), life history (where the total story of an individual’s life is recorded) (Creswell, 2013), and oral history (“the collection of stories and reminiscences of a person or persons who have firsthand knowledge of any number of experiences”) (Janesick, 2010:2).

3.4.2 Phenomenology

Phenomenological research focuses on finding a common meaning to different individuals’ life experiences, and either interpreting or describing the findings. There exist different types of phenomenology, but perhaps the most common distinction is between hermeneutical phenomenology and transcendental phenomenology. In
hermeneutical phenomenology the researcher brings their own unique background, experiences, and perceptions into play whilst interpreting the data with which they are presented. In contrast, transcendental phenomenology involves pure description of the phenomenon whilst bracketing the role of the individual researcher, so that invariant aspects of the particular phenomenon are expounded (Creswell, 2013:79).

### 3.4.3 Ethnography

Ethnographic research focuses on finding patterns and similarities of people’s values, beliefs, language, actions, routines, and attitudes within a culture-sharing group. There are several types of ethnographic research, but a broad distinction can be drawn between realist ethnography and critical ethnography. In the realist approach the researcher describes features of a culture as they are seen by a third party without the intrusion of bias, political opinion, or judgemental evaluations. In the critical approach the researcher views features of the culture from the standpoint of power and politics and offers an analysis which is aimed at uncovering elements of power, inequality, and victimisation (Creswell, 2013).

### 3.4.4 Case studies

Case study research usually focuses on a single case situation or event within a real-life context and usually relies on multiple sources of information to support the analysis, for example, documents, interviews, reports, and observations. There are several types of case study research, three of which are of note. An instrumental case study is one where the researcher studies the concerns and issues represented by just one single case. A collective case study is one where the researcher analyses just one concern or issue but collects information from multiple cases. An intrinsic case study is one where the researcher does not base the analysis on any particular issue or concern but rather on the case itself because of the unique nature of that particular case situation (Creswell, 2013).
3.5 Coding within the Straussian school

In this thesis I have followed the approach advocated by the Straussian school of grounded theory. Coding procedures play a central role in the systematic approach to grounded theory advocated by the Straussian school. Strauss (1987:20-21) defines coding as “the general term for conceptualising data; thus, coding includes raising questions and giving provisional answers (hypotheses) about categories and about their relations. A code is the term for any product of this analysis (whether category or a relation among two or more categories)”. There are three types of coding: open, axial, and selective.

3.5.1 Open coding

In his first book, Strauss (1987) states that open coding comprises the initial step in the analytical process where the researcher scrutinises the data line by line or even word by word. In his second book (Strauss & Corbin, 1990:61) he gives a more detailed definition to open coding as “the process of breaking down, examining, comparing, conceptualizing, and categorizing data”. Three steps comprise the process of open coding: labelling and conceptualisation of the phenomena, discovering and naming categories, and developing categories in terms of their properties and dimensions.

Labelling and conceptualisation of the phenomena. The first step of analysis in open coding is conceptualisation. Conceptualisation refers to the breaking open of a paragraph or a sentence into an idea, an incident or an event and allocating these a name or a label. This naming or labelling would then represent a phenomenon (Strauss & Corbin, 1990:63). This conceptualising is conducted first by asking questions about what that particular phenomenon is and what it is trying to represent; the second step involves making comparisons between the different incidents and labelling similar incidents with the same phenomenon. A concept is defined by Strauss and Corbin (1990:61) as “conceptual labels placed on discrete happenings, events, and other instances of phenomena”. To understand conceptualisation in detail Strauss and Corbin (1990) take an example of a “lady in red” standing in a busy restaurant. The researcher observes and records the actions
of this lady in red and allocates conceptual labels to the different pieces of the raw data. Box 3.3 gives some examples of this procedure.

**Box 3.3**

**Labelling and conceptualising raw data**

<table>
<thead>
<tr>
<th>Raw data</th>
<th>Label/Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Intently looking around, focusing here and there, and taking mental notes of what’s going on”</td>
<td>“Watching”</td>
</tr>
<tr>
<td>“She seems to be keeping a track on everyone and everything”</td>
<td>“Monitoring”</td>
</tr>
<tr>
<td>“The maître d’ and the lady in red look around, they judge what’s happening and talk for a few moments”</td>
<td>“Conferring”</td>
</tr>
<tr>
<td>“The woman looks like she knows what she is doing and is competent”</td>
<td>“Experienced”</td>
</tr>
<tr>
<td>“Although she is standing in the midst of all this activity, she doesn’t seem to disturb it”</td>
<td>“Unintrusiveness”</td>
</tr>
<tr>
<td>“She seems to notice everything”</td>
<td>“Attentiveness”</td>
</tr>
</tbody>
</table>

Source: derived from Strauss and Corbin (1990:64)

**Discovering and naming categories.** Strauss and Corbin (1990:61) define a category as “a classification of concepts”. Such classification is performed by comparing one concept with another. If they appear to be similar, they are placed in the same category. The process of grouping similar concepts that relate to the same phenomenon is called categorising (Strauss and Corbin, 1990:65). This is shown in box 3.4.
Box 3.4
Categorising concepts

Concepts: Monitoring, conferring, watching
Category: Type of work for assessing and maintaining the work flow

Justification for grouping these concepts together: why is she monitoring? Is it for customer satisfaction? Is it for quality of service? Is it for timing? Is she watching and conferring with the maître d’ for the same reasons? If these reasons amount to a similar phenomenon, then the researcher can categorise them all as assessing and maintaining the flow of work. Since all these are for a special type of work in a restaurant, like preparing and bringing food to the table, then the researcher can label it as type of work for assessing and maintaining the work flow.

Concepts: Experienced, unintrusiveness, attentiveness
Category: Food orchestrator

Justification for grouping these concepts together: these three concepts are very similar in that they all refer to certain attributes or qualities of a person. But attributes or qualities of what or whom? The answer refers to a person who is good at understanding and having knowledge of assessing and maintaining the flow of restaurant work. The restaurant work pertains to food. Therefore, the category can be labelled food orchestrator.

Source: derived from Strauss and Corbin (1990:66)

 développent categories in terms of their properties and dimensions. A property is defined as “an attribute or characteristic pertaining to a category” and a dimension is defined as “the location of a property along a continuum” (Strauss & Corbin, 1990:61). During the process of analysis it is important to develop a category in terms of its properties and follow this up by dimensionalising those properties. Developing properties and their dimensions is a significant activity since they form the basis for making relationships between the categories and their subcategories. Each category can contain general properties or sub-properties. Each of these sub-properties can also be dimensionalised. Box 3.5 illustrates this process.
Box 3.5
Properties and their dimensions

<table>
<thead>
<tr>
<th>Category</th>
<th>Properties</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Intensity</td>
<td>high----low</td>
</tr>
<tr>
<td></td>
<td>Hue</td>
<td>darker----lighter</td>
</tr>
<tr>
<td></td>
<td>Shade</td>
<td>darker----lighter</td>
</tr>
<tr>
<td>Walking</td>
<td>Frequency</td>
<td>often-----never</td>
</tr>
<tr>
<td></td>
<td>Extent</td>
<td>more-----less</td>
</tr>
<tr>
<td></td>
<td>Intensity</td>
<td>high--------low</td>
</tr>
<tr>
<td></td>
<td>Duration</td>
<td>long--------short</td>
</tr>
</tbody>
</table>

Source: derived from Strauss and Corbin (1990:72)

3.5.2 Axial coding

Whereas open coding opens up the data into codes, concepts, categories, properties, and dimensions, axial coding, in contrast, puts the data back together and starts making connections in new ways between the categories and subcategories. This type of coding is defined very differently by Strauss. In his first book, Strauss (1987:32) defines axial coding as “intense analysis done around one category at a time in terms of the paradigm items”. In his second book (Strauss & Corbin, 1990:96), a more comprehensive definition is given of axial coding, namely “a set of procedures whereby data are put back together in new ways after open coding, by making connections between categories. This is done by utilizing a coding paradigm involving conditions, phenomenon, context, action/interactional strategies and consequences”. In axial coding, the process of relating categories to subcategories and vice versa is known as the paradigm model. The definitions of these separate elements are presented in figure 3.6.
In order to explain the linkages involved in the paradigm model, Strauss and Corbin (1990:98) give this simple example: “when I have (condition) arthritic pain (phenomenon), I take aspirin (strategy). After a while, I feel better (consequence)”. To understand it better, the authors present another more detailed example which relates to
a person who is suffering from a broken leg that was incurred several hours ago whilst walking in the woods. This is depicted in figure 3.4.

**Figure 3.4**

Paradigm model for a broken leg

**Causal Condition**
- A broken leg
- Properties of a broken leg
  - Multiple fractures
  - Compound break
  - Sensation present
  - Broken two hours ago
  - Fall in the wood

**Phenomenon**
- Pain
- Specific dimensions of pain
  - Intensity: high
  - Duration: continuous
  - Location: lower leg
  - Trajectory: early
  - Obtained help: long wait

**Context (pain management context)**
- Under conditions where the pain is
  - Intense
  - Continuous
  - Located in the lower leg
  - Early in the trajectory
  - There is a long wait for help
  - The potential for consequences is high

**Strategies (for pain management)**
- Splint the leg
- Go for emergency help
- Keep person warm

**Intervening Conditions**
- Lack of training in first aid
- No blanket
- A long way to go for help

**Consequences**
- Pain relief, reduced pain

Source: derived from Strauss and Corbin (1990:105)
Box 3.6 shows the type of questions that should be asked by the researcher to assist the process of finding relevant linkages within the paradigm model.

**Box 3.6**

**Finding linkages in the paradigm model through questioning**

| **Phenomenon:** | What is going on here?  
| | What is our data indicating or trying to tell us?  
| | What is the central idea, main event or happening?  
| | What are the actions or the interactions in the data about?  

**Causal conditions:**

| What caused this event (phenomenon)?  
| What are the incidents that seem to precede it?  
| They are usually pointed to in the data by ‘when’, ‘while’, ‘since’, ‘because’, ‘due to’, ‘on the account of’.  

**Context:**

| What is the location of the event (phenomenon)?  
| Under what conditions are the action/international strategies taken?  

**Intervening conditions:**

| What conditions will help facilitate the action/international strategies?  
| What conditions will constrain and limit the action/international strategies?  

**Action/Interactional strategies:**

| What can you do to manage, handle, carry out or respond to the central event or happening (phenomenon) under a particular set of conditions (context)?  

**Consequences:**

| What are the outcomes of the actions and interactional strategies which were taken to manage the phenomenon?  

Source: derived from Strauss and Corbin (1990:100-106)

Strauss and Corbin (1990:99) stress that this model will enable researchers to think more systematically about their data and will teach them, after continuous practice, how to work on more complex models. They also argued that if researchers do not make use of this model, then their analysis will lack the required amount of density and precision.
This gave the impression that the use of the paradigm model was a necessary technique which was compulsory for researchers to use. Without it, any grounded theory analysis would be defective. However, this compulsion was substantially softened when Strauss and Corbin published the second edition of their book (1998). This could have been due to the severe criticism received from Strauss’ former co-author Glaser (1992:44) that his approach amounted to no more than “full conceptual description”. Glaser’s specific criticisms were that Strauss’ approach was too prescriptive and forced researchers to follow a pre-set model and pre-determined categories rather than allowing the data to speak for itself through natural emergence.

Strauss and Corbin’s second book (1998:124) made a number of substantial changes to several aspects of the paradigm model. In the first instance, the concept of the phenomenon was re-defined as “a problem, an issue, an event, or a happening that is defined as being significant to respondents”. This brought the concept into closer alignment with Glaser’s idea that the researcher should search the data for the main concern of the participants (Glaser, 1978). Second, the use of the paradigm model as a compulsory element was dropped in favour of a more flexible approach whereby the paradigm model became merely one of many other possible schemes for organising the data. Third, the paradigm model was re-defined as “an analytical tool devised to help the analyst integrate structure with process”. This new definition stressed the integration of structure with process. Structure was defined as “the conditional context in which a category (phenomenon) is situated” whilst process was defined as “sequences of action/interactions pertaining to a phenomenon as they evolve over time” (Strauss & Corbin, 1990:123). Four, the components of the paradigm model were simplified into a smaller number of elements, namely: phenomenon; conditions (causal, intervening and contextual); actions/interactions; and consequences. The distinction between the three different types of conditions (causal, intervening, and contextual) has now been softened in favour of a more significant process linkage that it is important for the researcher to focus on, namely “the complex interweaving of events (conditions) leading up to a problem, an issue, or a happening to which persons are responding through some form of action/interaction, with some sort of consequences” (Strauss & Corbin, 1990:132). This is depicted in figure 3.5.
3.5.3 Selective coding

Selective coding is defined by Strauss and Corbin (1990:116) as “the process of selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development”. The core category is defined by Strauss and Corbin (1990:116) as “the central phenomenon around which all the other categories are integrated”. This approach is very similar to the development of the paradigm model. Strauss and Corbin (1990:124) repeat that “the relating of categories to the core category is done by means of the paradigm - conditions, context, strategies and consequences”. Five steps are suggested by Strauss and Corbin (1990:118) to complete this process, although they
stress that linear ordering does not need to be followed. In practice, the researcher should move back and forth from one step to another. The five steps are: (i) explain what the *story line* is about - the story line is defined as “the conceptualisation of the story, the core category” (Strauss & Corbin, 1990:116); (ii) use the paradigm and relate all the other subsidiary categories to the core category; (iii) relate all those categories in terms of their dimensional level; (iv) check each of those for validation in terms of the data; and (v) fill in those categories that need further modification and improvement.

This systematic and prescriptive approach underwent a substantial revision in Strauss and Corbin’s second book (1998). The authors now defined selective coding as “the process of integrating and refining the theory” (1998:143). The paradigm model technique which was previously used was dropped as a universal one-best-way approach to the process in favour of more flexible techniques based upon facilitating the identification of the core category. Three new techniques were suggested: writing storylines, drawing diagrams, and sorting through memos. These techniques paid more attention to the concept of emergence widely advocated by Glaser (1978, 1992), and again were probably introduced as a result of Glaser’s criticism (1992) that the approach of Strauss and Corbin was based on the process of forcing data into pre-selected categories rather than allowing the theory to emerge from the data. In particular, the process of sorting memos played a crucial role in Glaser’s approach to selective coding (1978, 1992).

The concept of a core category has undergone substantial revision and re-definition as Strauss’ thinking on this issue evolved over the years. Originally, Strauss (1987:21) referred to the core category as “central to the integration of the theory”, whereas this definition was later re-focused to “the central phenomenon” (Strauss & Corbin, 1990:116). Then, in his second book with Corbin the name of the core category was changed to the “central category” and referred to as the “main theme of the research” which has “analytic power” (Strauss & Corbin, 1998:146). In a detailed analysis of these three books, Jones and Noble (2007:89-90) have identified 19 different ways in which Strauss and Corbin refer to the concept of a core category, as shown in box 3.7.
Box 3.7

The shifting concept of the core category

1. “central to the integration of the theory” (Strauss, 1987:21)
2. “best holds together (links up with) all the other categories” (Strauss, 1987:18)
3. “what is the main story here, and why?” (Strauss, 1987:31)
4. “story line” (Strauss, 1987:180)
5. “main theme” (Strauss, 1987:35)
6. “trajectory” (Strauss, 1987:189)
7. “explicating the story line” (Strauss and Corbin, 1990:119)
8. “central phenomenon around which all the other categories are integrated” (Strauss and Corbin, 1990:116)
9. “main idea” (Strauss and Corbin, 1990:121)
10. “main problem” (Strauss and Corbin, 1990:119)
11. “primary issue” (Strauss and Corbin, 1990:120)
12. “what seems most striking” (Strauss and Corbin, 1990:119)
13. “central category” (Strauss and Corbin, 1998:146)
15. “central integrative concept” (Strauss and Corbin, 1998:156)
16. “central explanatory concept” (Strauss and Corbin, 1998:161)
17. “central idea under which all the other categories can be subsumed” (Strauss and Corbin, 1998:146)
18. “what this research is all about” (Strauss and Corbin, 1998:146)
19. “main issue or problem with which these people seem to be grappling” (Strauss and Corbin, 1998:148)

Source: Jones and Noble (2007:89-90)

Strauss and Corbin (1998:147) proffer six criteria for judging the credibility of the core category in any particular study:

1. The core/central category must be central, which means that all the other categories and their properties should be related to it.
2. The core category should appear very frequently in the data, which means that in almost all the coding cases there should be indicators pointing to it.
3. The core category should easily relate to other categories in a logical and consistent manner and not by forcing the data.
4. The name that is given to the core category should be broad and abstract enough that it can be used to do research in other essential areas so that it leads to a development of a more general theory.

5. As and when the core category is polished and refined analytically, the theory starts to move forward and grow in depth.

6. The core category should be able to explain the maximum variation and main point made by the data.

3.6 Theoretical sampling

Grounded theory employs a method of sampling known as theoretical sampling, as opposed to other sampling methods (such as random sampling) which tend to dominate quantitative analysis. In theoretical sampling the basic question that needs to be asked is “what groups or subgroups of populations, events, or activities does one turn to next in the data collection, and for what theoretical purpose?” (Strauss, 1987:38). Therefore, the process of collecting more data is based on two factors - the nature of the emerging theory, and the theoretical sensitivity of the researcher. When this process is performed well the theory emerges in a more efficient manner (Strauss, 1987:39). Table 3.2 shows the varying definitions of theoretical sampling as detailed by the grounded theory authors over the years.
Table 3.2
Definitions of theoretical sampling

<table>
<thead>
<tr>
<th>Reference</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glaser and Strauss (1967:45)</td>
<td>The process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next, and where to find them, in order to develop his theory as it emerges.</td>
</tr>
<tr>
<td>Strauss (1987:38)</td>
<td>Whereby the analyst decides on analytic grounds what data to collect next and where to find them.</td>
</tr>
<tr>
<td>Strauss and Corbin (1990:176)</td>
<td>Sampling on the basis of concepts that have proven theoretical relevance to the evolving theory.</td>
</tr>
<tr>
<td>Strauss and Corbin (1998:201)</td>
<td>Data gathering driven by concepts derived from the evolving theory based on the concept of making comparisons, whose purpose is to go to places, people, or events that will maximise opportunities to discover variations among concepts and to densify categories in terms of their properties and dimensions.</td>
</tr>
</tbody>
</table>

In theoretical sampling several important factors need to be borne in mind by the researcher (Strauss & Corbin, 1998:203):

- Sampling should be cumulative.
- There needs to be a degree of consistency.
- Comparisons of each category need to be performed systematically.
- A certain degree of flexibility is needed.
- Sampling needs to be performed carefully.
- Sampling and analysis should occur sequentially.

Theoretical sampling is tied to the associated concepts of theoretical sensitivity and theoretical saturation. These concepts are elaborated in the following sections. Before that, however, it is necessary to outline how the process of theoretical sampling follows the three types of codes that have previously been explained.
3.7 Sampling procedures

Sampling should be logical and also should follow the three types of coding procedures, as explained below:

**Sampling in open coding (open sampling):** Here the aim is to discover as many categories as possible, along with their properties and dimensions. At this phase the sampling is very much open to all possibilities. To be able to perform this type of sampling, a researcher requires skills or training in interviewing and observation techniques. This will help the researcher know what questions need to be asked, what activities to observe, and how to read or view data and documents to ensure consistency in gathering data and be able to make discoveries (Strauss & Corbin, 1990:182). Three variations or techniques can be followed in order to perform open sampling (Strauss & Corbin, 1998:208-209). These can either be employed singularly or combined in different ways, whichever is found to be most advantageous. The first way is to start by looking *purposefully* at the data, person, site, or event in terms of categories, dimensions, and properties. The second way is to proceed *systematically* by following a list or starting from one person or place and progressing to others looking for evidence of each category, and then making comparisons between each of them. The third way is to proceed *fortuitously* by becoming alert to incidents or events that are suddenly or unexpectedly heard, read, or observed by a researcher and are then pursued with some vigour in subsequent sampling. Regardless of whether the researcher proceeds in a manner which is purposeful, systematic, or fortuitous, s/he should also return to the data themselves, reorganizing them according to theoretically relevant concepts.

**Sampling in axial coding (relational and variational sampling):** Here the researcher will attempt to validate and uncover the relationships between the paradigm model and its components. Even in this type of sampling asking questions and comparing categories are essential procedures. This type of sampling is regarded as relational and variational because it aims to discover as many differences as possible in the data at its dimensional level. Here again, Strauss and Corbin (1990:185-186) stress that the researcher can proceed either in a purposeful or systematic manner (or both) as with the previous discussion of open sampling.
Sampling in selective coding (discriminate sampling): Here the researcher will decide which document, person, or site to pursue in order to generate opportunities for maximising or minimising differences in the data. The researcher will want to verify the storyline, ensure credible relationships between the categories, and also fill in any categories that are poorly developed. This aim could be achieved either by visiting the old documents, sites, or persons or by visiting totally new ones (Strauss & Corbin, 1990:187; Strauss & Corbin, 1998:211).

The grounded theorist carries on with data collection and theoretical sampling until the point at which theoretical saturation occurs. Glaser and Strauss (1967:61) define saturation as “no additional data are being found whereby the sociologist can develop properties of the category”. Saturation implies the simultaneous satisfaction of three criteria: (i) no new or relevant data seem to emerge regarding a category; (ii) the category is well developed in terms of its properties and dimensions demonstrating variation; and (iii) the relationships among categories are well established and validated. Strauss and Corbin emphasise that “theoretical saturation is of great importance: unless a researcher gathers data until all categories are saturated, the theory will be unevenly developed and lacking density and precision” (1998:212).

3.8 Theoretical sensitivity

Glaser and Strauss (1967:46) stress that a researcher should be sufficiently theoretically sensitive to be able to conceptualize and formulate a theory. Strauss and Corbin (1990:41) consider that theoretical sensitivity is “a personal quality of the researcher”, regardless of the three techniques previously discussed. The more sensitive the researcher is towards the concepts, the more likely it is that s/he would be able to find indicators of those concepts in the data and in the field. An answer to the question ‘what is theoretical sensitivity’ could comprise many factors, as indicated in box 3.8.
Box 3.8
What is theoretical sensitivity?

- An awareness of the subtleties of meaning of data
- The attribute of having insight
- The ability to give meaning to data
- The capacity to understand
- A capability to separate the pertinent from that which isn’t
- Involves the researcher’s personal and temperamental bent
- Involves the researcher’s ability to have theoretical insight into his area of research, combined with an ability to make something out of his insights
- An important creative aspect of grounded theory
- An ability not only to use personal and professional experience imaginatively, but also literature

Source: Glaser and Strauss (1967:46), Strauss and Corbin (1990:42)

Theoretical sensitivity arises from a number of sources. Four of them are described by Strauss and Corbin (1990:42-43):

1. Literature – Reading different theories, research studies, and documents such as biographies or government publications.

2. Professional Experience – Possessing professional experience in the same field of research can help the researcher to understand how things work, the meaning of different events and actions, and why and what will happen under certain situations or conditions. However, professional experience also carries with it the disadvantage of potentially blocking a researcher’s insight into conceptual aspects that may lie outside their paradigm or dominant manner of viewing the world.

3. Personal Experience – Possessing personal experience in either the same or similar fields can also help a researcher to discover relationships by making comparisons between relevant concepts. This again may possess the disadvantage that a researcher can become blinkered by assuming that their experience is shared by other participants.

4. Analytical Processes – Honing a researcher’s analytical abilities can be achieved through a number of processes, such as: collecting data, asking questions, making comparisons, thinking, observing, reflecting on what you see, generating
hypotheses, developing and creating conceptual frameworks, understanding concepts, and drawing relationships.

Strauss and Corbin (1990:75) warn against the presence of “blinders” in limiting a researcher’s theoretical sensitivity. Blinders are constituted by our assumptions and perceptions of how the world works. They are developed as a result of past experiences and constitute a paradigm from within which researchers make decisions about the nature of the world around them. A very simple example is given by the authors to show how researchers can sometimes be blinded by their paradigm and not see what lies beneath the surface.

“If you see two men early in the morning shabbily dressed sitting in a park drinking from a long bottle which appears to be an alcohol bottle wrapped in a brown paper bag, what is our immediate reaction to this situation?” Strauss and Corbin (1990:75).

Researchers may respond “two homeless winos drinking again”. This perception may be due to their assumptions, past experience, or distortions created by media articles. But who is to say that other conceptual interpretations of the situation might not be possible such as friendship, loneliness, survival, broken dreams, or grief? Researchers would not be able to make any progress on this issue if they operated solely behind their blinders. They would not know the truth unless they actually looked for what is beneath the obvious. To enhance theoretical sensitivity Strauss and Corbin (1990:44-46) make several suggestions as shown in box 3.9.
Box 3.9
Enhancing theoretical sensitivity

Periodically step back and ask what is going on here? Does what I think and see fit the reality of the data?

Maintain an attitude of scepticism - every category, hypothesis, theory, comparison, literature, or experience should be regarded as provisional and never as fact, so that they can be checked against the actual data.

Follow the research procedure - the data collection, coding and analysis is designed to give rigor to the research, helping you to break through biases and lead you to examine your assumptions. In order to have a valid, reliable emerging theory that is grounded, the procedure must be followed carefully.

Source: Strauss and Corbin (1990:44-46)

Strauss and Corbin (1990:76) suggest that researchers can employ a number of different techniques aimed at enhancing theoretical sensitivity by “opening up our thinking about the phenomena we are studying”. These techniques include:

Use of questioning – The main purpose of this technique is to open up the data in terms of categories, subcategories, properties and their dimensions. Strauss and Corbin (1990:79) mention that the main questions researchers need to ask relate to the following data interrogations – “who, what, how, how much, when, where, and why”. With reference to the example previously presented of people who take aspirin to relieve their arthritic pain, a researcher might want to use the following sequence of questioning to open up the data:

1. WHO provides pain relief to people with arthritis?
2. WHAT gives relief?
3. HOW is the pain experienced and handled?
4. HOW MUCH relief is needed?
5. WHEN does the pain occur?
6. WHY is the pain relief important?
7. WHERE is the pain exactly?
**Analysis of a word, phrase or sentence** – This technique can be helpful by teaching researchers to give enhanced meanings to a word, a phrase, or a sentence. Researchers are encouraged to scan a few pages from their data, then go back and see if any word, phrase, or sentence looks significant or important. These significant words, phrases, or sentences then need to be given as many meanings as possible “from the most probable to the most improbable” (Strauss & Corbin, 1990:82). This technique should help researchers to bring to the surface all their assumptions about what they believe is being said, thus forcing them to question the data further and examine their response. Strauss and Corbin (1990:83-84) emphasise that “unless we validate possible meanings during interactions with the speaker, or train ourselves to ask what meanings the various analytically salient terms have for our respondents, we limit the potential development of our theory”.

**Comparison techniques** – Comparison techniques can help researchers to break through their assumptions and perceptions and discover new dimensions in their data. Three types of comparison techniques are suggested:

i. **Flip-flop technique** – This type of comparison technique encourages researchers to “turn a concept upside down and imagine the very opposite” (Strauss & Corbin, 1990:84). By making comparisons between opposite meanings researchers can increase their analytical and conceptual thinking and introduce more variability into their theorising.

ii. **Systematic comparison of two or more phenomena** – This technique encourages researchers to identify a particular concept or phenomenon which is then systematically coded for categories and properties. For example, the concept of *body image* may possess one particular category called *weight*. The researcher could then demarcate two extremes of weight, namely overweight and normal weight, and subject these extremes to questions such as what, why, where, when and so on. This process would raise insights and hypotheses in the mind of the researcher who could then go back to the field and conduct further interviews. This would help to densify the data and also encourage researchers to think outside their usual paradigm.
iii. \textit{Far-out comparisons} – This technique encourages researchers to make comparisons between one particular concept and a totally different concept (for example, weight-lifting and playing the violin). These unconnected concepts can then be subjected to extensive questioning to uncover similarities and differences. Again, this process should help to introduce variation and density into the data and open up additional avenues for the researcher to explore.

\textit{Waving the red flag technique} - This technique is particularly applicable to researchers who are so immersed in their perceptions, assumptions, or culture that they are unable to see anything else. Strauss and Corbin (1990:92) suggest that when researchers find themselves using words of phrases like \textit{always, never, it couldn’t possibly be that way, everyone knows that’s the way it is done, or there is no need for discussion}, then the researcher needs to “wave the red flag”. Such an action comprises a signal that something is going awry. The researcher should immediately become suspicious and want to take a closer look at the data. This can be achieved by asking a series of questions of the data such as \textit{what’s going on here} or \textit{why never}? Such questions can open up the data and uncover the truth which otherwise might have been submerged or blinkered. Strauss and Corbin (1990:93) emphasise that “the analytic issue here is never to take anything for granted”.

\section*{3.9 Use of literature in Grounded Theory}

Literature plays an important role in grounded theory. Strauss and Corbin (1990) demarcate two types of literature - technical and non-technical. These are explained as follows:

\textit{Technical literature} - Technical literature is defined as “reports of research studies, and theoretical or philosophical papers characteristic of professional and disciplinary writing” (Strauss & Corbin, 1990:48). In grounded theory, this type of literature is important because it can be used as background material to be compared with the theoretical findings of the grounded theory. In quantitative research this type of data is also important because it enables researchers to discover the gaps in
their research area and also to help them understand the significant variables and their relationships in their research topic. As a result, quantitative researchers can test those relationships.

So, in quantitative research, researchers need to know the variables beforehand in order to conduct their testing processes. But, in grounded theory, researchers do not test relationships among variables but actually discover new variables and new relationships between them. Accordingly, in grounded theory, if researchers already know the variables, then it would act as a hurdle in the discovery of new variables. In grounded theory the phenomena is always explained in accordance with the unique theoretical framework involved in the particular research area. Each research situation is different to any other and other established theories may not apply to the researcher’s particular area. Therefore Strauss and Corbin (1990:50) state that “it makes no sense to start with received theories or variables because these are likely to inhibit or impede the development of new theoretical formulations”. Thus, in-depth reviews and analysis of the extant literature and its variables and categories are ruled out. In grounded theory, once the categories have emerged, then the researcher can go back to the technical literature to understand what other researchers have written or stated about that particular category. However, this is not to deny that some researchers do come to the research topic with professional or personal knowledge and experience in the area. In this case researchers can make use of this knowledge and experience to add more sensitivity to their analysis. Strauss and Corbin (1990:51-52) state that technical literature can be useful in five ways in grounded theory:

1. It can be used to stimulate theoretical sensitivity.
2. It can be used as secondary sources of data.
3. It can stimulate questions.
4. It can direct theoretical sampling.
5. It can be used as supplementary validation.

Non-technical literature – Non-technical literature is defined as “biographies, diaries, documents, manuscripts, records, reports, catalogues, and other materials” (Strauss & Corbin, 1990:48). All data emanating from such sources can be readily
used in grounded theory as primary data to supplement the data collection process. For example, it can help in understanding an organisation or a life history study. Researchers can also double-check the validity of these documents or reports through the use of interviews and observations or any other sources of data.

3.10 Corbin and Strauss (2008)

This chapter has concentrated on the methodology of Strauss and Corbin as contained in three main books published in 1987, 1990, and 1998. However, several years after the death of Strauss, his co-author decided to go ahead and publish a third edition of the book (Corbin & Strauss, 2008). In terms of advancing the methodological integrity of the grounded theory process advocated by the two authors this book adds little to what had already been published in the three previous books. Perhaps the major contribution of this third edition is that Corbin adds substantial material about a particular grounded theory piece of research that deals with the survival strategies of Vietnam veterans. The book is replete with examples of how Corbin constructs individual memos and how these memos are used to advance her thinking and analysis in the topic area. However, because of the lack of methodological advancement displayed in this book it has not been used to reference any of the techniques of the Straussian school presented in this chapter of the thesis.
3.11 Summary

This chapter has provided an analysis of the research methodology adopted in the thesis. An explanation has been provided of why qualitative methodology was considered most appropriate for analysing the research question as well as the justification for choosing the Straussian school of grounded theory as the methodology of choice. Considerable care has been taken in this chapter to present the major features of this school of grounded theory including the details and nuances of coding (open, axial and selective), core category, paradigm model, theoretical sampling, and theoretical sensitivity.

The next chapter will build on chapter 3 by presenting a detailed analysis of how data collection, coding, and analysis were conducted in this research study. The aim of chapter 4 will be to present a comprehensive audit trail so that the reader can understand how the data was collected, how the interviews were conducted, how theoretical sampling was employed to progress the theoretical analysis, how the various categories and properties emerged, and how the paradigm model was put together around the core category and phenomenon of ‘inappropriate prescription: clinicians’ resistance to control measures’.
Chapter 4
Data collection and analysis
Chapter 4
Data collection and analysis

4.1 Chapter overview

This chapter builds on the previous chapter by presenting a detailed analysis of how data collection, coding, and analysis were conducted in this research study. The aim of chapter 4 is to present a comprehensive audit trail so that the reader can understand how the data was collected, how the interviews were conducted, how theoretical sampling was employed to progress the theoretical analysis, how the various categories and properties emerged, and how the paradigm model was put together around the core category and phenomenon of “inappropriate prescription: clinicians’ resistance to control measures”.

The chapter commences with an account of the researcher’s background and relates this to the issue of researcher bias in qualitative methodology. The chapter is then progressed through the four stages of data collection that were conducted for this thesis. Data was collected at a major hospital site in Victoria, Australia, and involved the following: six scoping interviews, attendance at eight management meetings, examination of the functionality of a computer system employed at the hospital, and, finally, forty interviews with end-users of the computer control system.

The paradigm model has been adopted in this thesis as the integrative mechanism for explaining the phenomenon of “inappropriate prescription: clinicians’ resistance to control measures”. The reason for this is explained in this chapter.
4.2 Researcher bias

An issue that is frequently raised in regard to qualitative research and the interpretation of findings relates to that of researcher bias. Strauss and Corbin (1998) report that every researcher brings with themselves biases, beliefs and perceptions that reflect their gender, experiences, culture and worldview. They explain that this is not a negative trait. Such differences can enhance theoretical sensitivity during theory building. Maxwell (2005) notes that qualitative research is not concerned with eliminating the differences researchers inevitably bring to a study, but rather to understand how differences in researcher values, perceptions and expectations impact upon, and influence, the study. Locke (2001, 1996) stresses how important it is that every researcher recognizes and understands in advance what their research biases, values,
perceptions, and judgements are. Guba and Lincoln (1998, 1981) state that a researcher’s biases, values, beliefs and perceptions should be noted in the research report so that the reader is aware of them while reading the analysis. Creswell and Plano-Clark (2011:267) concur with this by arguing that “researchers need to disclose their role (i.e. reflexivity) and its impact on the interpretations they make in a study”.

For this reason I will now list the major values and beliefs that I, as a researcher, have brought into this study by way of my worldview:

- I held early ambitions to become a physician and highly respect those careers that deal with saving lives and helping people.
- I believe that knowledge makes a person wiser and more confident.
- I believe in altruistic values such as helping the poor and needy.
- I believe in honesty, fairness and equality among men and women.
- I believe that all women should have the opportunity to study and work.
- I oppose bullying and harassment and believe that bullies should be punished for their behaviour.
- I believe that clinicians should be guided by a passion for caring for their patients and not by the fascination of the status or financial benefits it can bring.
- I believe that clinicians should follow institutional policies and guidelines if these help them in saving lives.
- I believe Governments should spend more money on public hospitals and upgrading facilities and infrastructure in hospitals.
- I believe that doctors should be more considerate with their patients and spend more time with them.
- I believe that doctors should be held accountable for committing medical errors that cause death or serious suffering.

Strauss and Corbin (1998) are aware of the significance of the interplay between the researcher and the research act – the researcher is shaped by the data and the data are shaped by the researcher. Both objectivity and subjectivity, in the appropriate balance, are needed in order to ensure effective analysis. Objectivity is important but it is realised that complete objectivity is neither possible nor desirable. Strauss and Corbin
(1998: 43) state that “what is important is to recognize that subjectivity is an issue and that researchers should take appropriate measures to minimize its intrusion into their analyses”.

Strauss and Corbin (1998: 43-46) put forward several techniques that can control the intrusion of bias into analysis whilst simultaneously retaining subjectivity: think comparatively; obtain multiple viewpoints of an event; gather data in different ways such as interviews, documents, and observations; step back and ask ‘what is going on here?’; maintain an attitude of scepticism; and follow the research procedures of grounded theory. These pieces of advice have been uppermost in my mind whilst gathering, coding, and analysing data in this research thesis. Thus, for example, I have obtained multiple viewpoints of events from sources such as interns, residents, registrars, pharmacists, and senior management. Comparative analysis has been foremost in my mind whilst coding and analysing the data, as have my frequent attempts to step back from the richness and grab of the data in order to ask the big picture question ‘what is really going on here?’ An attitude of scepticism has also been at the front of my mind, not to trust implicitly a particular version of events that has been provided to me from one source, but to check with other sources as this data becomes available. Giving voice to participants has been a constant endeavour. I have also gathered data in different ways such as interviews, observations, and written documentation. Last, but not least, I have maintained extreme diligence to follow the procedures of Straussian Grounded Theory, as the reader will observe as s/he follows the analysis in the thesis.
4.3 Researcher’s background

A researcher’s values and beliefs are mainly derived from their habitus and prior experiences (Bourdieu, 1991). I began my PhD as a 25-year-old student. I was born in Iran as the youngest of three children. My family moved to Dubai when I was very young and I commenced my schooling there. After spending five years in Dubai, my parents decided to send me and my siblings for secondary and higher education to India. India was an easy choice due to the lower cost of living and higher standard of secondary education. Another important factor in the decision process was that the preferred language of communication in most schools in India was English.

Being a child at that time naturally I was not consulted in the decision making process. Moving to India was a difficult adjustment for me as I had built some great friendships in Dubai and the fear of the unknown associated with life in a new place used to haunt me.

Adapting to the Indian culture and ways of life was difficult. I disliked the food and language was a barrier as in the beginning we could not speak English. I started learning English in India when I was twelve years old. My mother decided that the best way for us to improve our English was if we attended a boarding school. I completed my secondary education in Bangalore followed by a Bachelor’s degree in Information Technology from the same city. My mother had always encouraged us to pursue higher studies and as a result I chose to study for a post graduate MBA degree. I was fortunate to complete my MBA at one of the premier business schools in India. After completion of my MBA, I commenced employment at Oracle, one of the largest enterprise software companies in the world. When I started working in industry as a business development consultant for Oracle, I was shocked to see the amount of politics involved in the day-to-day business of an organisation. I worked in the sales department and would witness that the staff including management were not honest in their dealings with customers. Often products were sold to customers which they did not require simply to fulfil the personal objectives of the sales staff. I felt I was a misfit in a commercial working environment and possibly too honest to survive in such a business culture.
Excellence has always been an integral part of my family’s values and, consequently achieving excellence in education has been of particular importance. As completing a doctorate is one way of achieving excellence, my sister and I decided to undertake this course of study. This decision was influenced by my mother’s desire to empower her daughters to live independent lives and her determination to do what was required to ensure they did not become typical Iranian wives but develop their full potential.

My parents have instilled some great values like honesty, discipline and to be respectful to elders, and for that I am very thankful. We are expected to take care of our parents emotionally and financially once we start earning. I find it interesting that Western people have a perception of Iranian people as being very conservative, narrow minded people. To the contrary, I believe Iranians are very broad minded, gregarious and fun loving people. I chose to study in Australia as my brother and sister were already there studying for their doctorates.

My journey as a student can be best described as a roller coaster. My undergraduate degree and MBA mainly involved coursework. Individual research was very new to me. I had never written a thesis before. During my previous academic life sharing from each other’s assignments was common practice, as was rote learning and memorising from books. But in Australia this practice is regarded as plagiarism. I have therefore had to adapt to new academic practices. In addition, my research study has at times been a very lonely journey. It has taken time to get used to not always being told what to do or not having a set structure to follow. Also, the journey has included periods of stress, tension and anxiety. Feelings of worthlessness and feelings of not knowing anything haunted me at the beginning of my study and eventually turned into concerns of never being able to finish the thesis. Nevertheless, I have successfully navigated through the ups and downs, and on reflection this experience has taught me much about myself and brought to light abilities that I was not aware I possessed.

4.3.1 Choosing my PhD topic

My interest in the research topic was sparked by both a professional and personal interest. Since childhood I had an ambition to become a medical professional and
wanted to make positive changes to people’s lives. In a more focussed manner this issue came to my attention when I was working on an Australian Research Council grant called *adverse events in hospitals* which was concerned with the errors made in hospitals. As part of this research project I visited a hospital in Victoria, Australia, which was facing major issues regarding medication errors, included within which was the inappropriate prescription of antibiotics by clinicians. The hospital had invested in very expensive computer software to assist clinicians in making better decisions by obtaining approval before prescribing antibiotics. However, many clinicians were not using the system. As a result of their refusal to use the system antimicrobial resistance had increased in the hospital. This had resulted in several adverse effects including an increased spread of disease and infections, longer stays of patients in the hospital, and higher rates of mortality and morbidity. These negative events directly impacted on the reputation of the hospital. Extended lengths of stay also meant greater expenditure. The situation was obviously a major concern for the hospital. I felt that choosing this topic as the area of my doctoral research could bring about many practical and theoretical advancements both for the individual hospital and for clinical practice in general.

My perception is that the general public hold physicians in very high regard. This seems to be a cultural phenomenon judging from my experiences in Middle Eastern, Asian, and Western societies (Dubai, Persia, India, and Australia). Physicians are often regarded as possessing higher intelligence than most people in society. The amount of respect afforded to them may lead many people to blindly believe the words of physicians. Their decisions are not questioned. People tend to accept what they are told. As a child I always wanted to become a physician (a heart surgeon) because of the way people in this profession were talked about and respected. I also realised that it is one of the few professions where you can save lives and help people. I do like to be able to help people and change their lives. For me it is important that I pursue a career that I enjoy and feel good about myself by helping others.
4.4 Data collection

My data collection was not without difficulties. This was partly due to my recent arrival in Australia and my unfamiliarity with the culture. However, other issues contributed to the problematic nature of the process. The hospital chosen as my research site was a few hours’ drive from my base in Melbourne. This meant I had to travel for two hours every time I had to interview a clinician. In addition, since clinicians are usually extremely busy, there were times when I travelled to the hospital only to find out that my scheduled interview had been cancelled. This caused immense frustration and waste of time as I thought I could have utilized this time in a more efficient manner.

Appointment cancellations were, more often than not, the norm with senior management. Their hectic and unpredictable work schedules, although understandable, made interview schedules very uncertain. Sometimes I waited in the clinician’s lunch area all day just to get access to one clinician for one interview. This meant I would leave my office at 8 am and return at 6 pm with just one interview conducted.

Another issue that arose during my data collection was that I sometimes felt that my research participants were not very open in sharing their points of view. I could not help but feel that because I was not a clinician myself that I was not afforded complete respect for the work I was doing. I did not feel as if I was on an equal footing with them. Furthermore, I noticed a swagger in most of the clinicians when I met them. They appeared to be full of self-importance. Some of them even told me that they (clinicians in general) were the most intelligent people on this planet! I find it fascinating that although clinicians study for their degrees over many years, and their training is so exacting, that the error rate in clinical practice is so high (see chapter 2). In fact, error rates in most other industries and professions are far lower. No other industry would tolerate their members committing the same number of errors as are committed in clinical practice without remedial action. Some industries, for instance motor-car assembly, even aim for zero defects (Liker, 2004).

My data collection process proceeded through four distinct stages: scoping interviews, attendance at meetings, examination of software functionality, and finally, major interviews. Table 4.1 shows brief details of each stage.
Table 4.1
Four stages of data collection

<table>
<thead>
<tr>
<th>Stages</th>
<th>Method of data collection</th>
<th>Explanation of the method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Scoping interviews</td>
<td>Interviewed six clinicians to obtain a broad understanding of the research topic.</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Attended meetings</td>
<td>Attended eight meetings conducted by the GUIDANCE project team over six months and collected raw materials and data on policies and implementation of GUIDANCE.</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Examined software functionaity</td>
<td>Used the GUIDANCE software and took printouts to understand its functionalities.</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Major interviews</td>
<td>Major stage of data collection. Interviewed 40 end-user clinicians to understand their perceptions on inappropriate prescribing and non-adherence to GUIDANCE.</td>
</tr>
</tbody>
</table>

4.5 Stage 1: Scoping interviews

The data collection process began with six scoping interviews. The purpose of these interviews was to obtain a broad overview of the scope of the research topic and to facilitate the creation of main themes for future interviews and data collection. These were not audio recorded. However, I took field notes as the interviews were in progress to remind me of the significant issues raised by each respondent. Each interview was unstructured. My questions were open-ended and very broad. They did not follow any specific structure or pattern. In the main I started each interview with the broad question “could you tell me about your perception and experiences regarding the issue of antimicrobial resistance at this hospital?” Glaser (1978) recommends that researchers should concentrate more on listening rather than engaging in extensive dialogue with interviewees. He calls this big-ear listening (Glaser, 1998). I followed this advice, only intervening to ask for clarification or for the respondent to give me specific examples. The six scoping interviews were conducted one at a time. Each lasted for at least one hour, and some considerably more. After each interview my field notes were analysed and emerging themes were noted.

The six people I interviewed in these sessions were chosen because they were all involved in the GUIDANCE project in the hospital in some capacity. Since the inappropriate prescription of antibiotics was a problem in the hospital resulting in an
increased rate of antimicrobial resistance, the head of Infectious Diseases had introduced several measures to deal with the problem. When these strategies did not work the hospital had purchased a software tool called GUIDANCE. This software allowed clinicians to record a range of information related to the patient. The software would then proactively suggest the appropriate medication to be prescribed, mainly narrow-spectrum antibiotics. If a clinician wanted to prescribe some other restricted broader antibiotic, s/he needed to input additional justification in order to seek an approval from the system. This would allow the hospital to keep a record of the antibiotics being prescribed and allow clinicians to reflect on their medication prescription. The GUIDANCE project had been initiated by the head of Infectious Diseases together with the head of Pharmacy. They also hired a Project Manager to take charge of the GUIDANCE software, together with the assistance of an ID pharmacist and an ID consultant. Hence, the six participants in the scoping interviews were:

1. Head of Infectious Diseases
2. Project Manager in charge of implementation of GUIDANCE
3. ID Consultant
4. ID Pharmacist
5. Head of Pharmacy
6. Prescribing clinician (Registrar)

4.5.1 Interview 1

The first interview was with the head of Infectious Diseases in the hospital. This participant was chosen based on the assumption that he would be the most knowledgeable person about antimicrobial resistance in the hospital. His role was to monitor and report on the infection rate in the hospital and to pursue measures to reduce antimicrobial resistance. His team was also responsible for giving advice to clinicians about the antibiotic prescribing and restriction process.

I commenced the interview with the broad question “could you tell me about the issue of antimicrobial resistance in the hospital?” As previously stated, I maintained silence during most of the interview, allowing the interviewee to make whatever points he
wanted without interruption. I probed the respondent only to obtain greater understanding or clarity on some issue, or to ask for some examples. He started his response by explaining how he had spent a considerable amount of money to purchase the GUIDANCE system in order to aid clinicians to make better prescribing decisions.

However, very few clinicians used the system or adhered to hospital policy. He explained that it was hospital policy that clinicians were expected to contact the Infectious Diseases team and ask for advice before prescribing a broad-spectrum antibiotic. Very few clinicians adhered to that policy. In the main, clinicians tended to ignore obtaining approval from the ID team and prescribed whatever antibiotic they wanted. The respondent explained in depth about the concept of restricted antibiotics and how dangerous it could be for a patient if they were prescribed inappropriately. He also explained how, in under-developed countries, antibiotics are sold over the counter. Patients are permitted to buy them (and not finish their courses on time) which exacerbates the problem of antimicrobial resistance. When these people travel to other countries they transmit this resistance to other communities. When patients develop resistance to broad-spectrum antibiotics no other antibiotics can attack the infection and doctors become unable to cure the patient. His fear was that many parts of the world were in imminent danger of experiencing this scenario. Pharmaceutical companies are no longer developing new antibiotics. The cost of such development is prohibitively high and the total time taken to discover, develop, test and release new antibiotics can be as long as ten years. Another important issue raised by this respondent was the penalties that could be imposed on the hospital in terms of fines if it failed to meet the guidelines relating to levels of prescription of broad-spectrum antibiotics.

This interview lasted for two hours during which time I took twenty pages of notes. Afterwards I immediately coded my notes, going through the data line by line and attempting to put the codes into broader categories. Table 4.2 shows the major codes that emerged from interview 1.
Table 4.2
Major codes from interview 1

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimicrobial resistance</td>
</tr>
<tr>
<td>Growing problem of AMR at the hospital and in the world</td>
</tr>
<tr>
<td>Inappropriate prescribing</td>
</tr>
<tr>
<td>Government fines</td>
</tr>
<tr>
<td>Clinicians’ behaviour</td>
</tr>
<tr>
<td>Clinicians’ attitude</td>
</tr>
<tr>
<td>Non-adherence to policies</td>
</tr>
<tr>
<td>Non adherence to GUIDANCE software</td>
</tr>
</tbody>
</table>

4.5.2 Interview 2

The second interview was conducted with the project manager of the GUIDANCE program to understand the nature of her role and the difficulties she faced with clinicians who did not adhere to using the GUIDANCE system. As previously, my questions were very broad and unstructured. I wanted to obtain an understanding of the project in more detail.

The project manager was new to her role and worked only part-time in the position. To make up the rest of her time at the hospital she worked as a pharmacist. She explained that her role was to analyse the GUIDANCE tool and track how many clinicians had logged in and gained approval, as opposed to those who had not gained approval. Since the project manager was also a pharmacist she had an expert knowledge of the prescription process and had access to the list of prescriptions dispensed by the pharmacy. She had to meet with the senior management and the GUIDANCE team on a monthly basis and give updates on the usage of the system. She would print weekly audit reports on the GUIDANCE program and would advise the head of ID on which clinicians from which departments had used the system and which had not. During her interview she spoke at length about the challenges around successful adoption of the GUIDANCE tool. She believed that, in general, clinicians mostly rely on their prior knowledge and experience while prescribing and not so much on what the software or the Infectious Diseases team advises them to prescribe. In addition, clinicians were so busy that they had very limited time to research new developments or become
acquainted with new antibiotics. One potential problem that was emphasised during her interview was the absence of any formal training about how to use the system. This was due to the perception that the tool is simple to use and can be easily navigated. However, she realised that there might be a lack of awareness among the clinicians regarding the tool and wanted to gain some funds to market it in depth.

This interview lasted for almost two hours and again generated many pages of notes. Some of the themes had already emerged in interview 1. However a number of new themes emerged from this interview and these are shown in table 4.3.

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of adherence to GUIDANCE</td>
</tr>
<tr>
<td>Lack of awareness about GUIDANCE</td>
</tr>
<tr>
<td>Lack of funding towards marketing</td>
</tr>
<tr>
<td>No formal training</td>
</tr>
<tr>
<td>Monitoring</td>
</tr>
</tbody>
</table>

4.5.3 Interview 3

To gain more understanding of the assistance and support process I next interviewed the Infectious Diseases consultant. I wanted to obtain his views on those medications and antibiotics which were restricted, and to understand the advice he gives to clinicians to enable them to make better prescribing decisions. The ID consultant reports to the head of Infectious Diseases. He is responsible for ensuring that clinicians do not prescribe antibiotics inappropriately. One of his main functions is to give telephonic approval to clinicians who want to prescribe a broad-spectrum restricted antibiotic, as well as informing them how to enter the data on GUIDANCE. However, it should be noted that even before the introduction of the software it was hospital policy that clinicians should gain telephonic approval from the ID consultant for prescribing a broad-spectrum antibiotic. The consultant confirmed that this policy has traditionally not been adhered to at the hospital.
The ID consultant focused on several aspects relating to his perceptions about the behaviour of clinicians. He believed that many clinicians were stubborn. They were not prepared to listen to advice from the ID team. They believed themselves to be more qualified to prescribe than the ID consultant. Clinicians were not prepared to alter their habits. As a result, clinicians suffered from a lack of awareness of different types of antibiotics and therefore tended to follow a routine of prescribing similar antibiotics. For these reasons inappropriate prescription happened on a daily basis.

This interview lasted for one hour. As before, my coding uncovered a number of similar codes. The new codes are shown in table 4.4.

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge about antibiotics</td>
</tr>
<tr>
<td>Inappropriate decisions on a daily basis</td>
</tr>
<tr>
<td>Stubborn behaviour</td>
</tr>
<tr>
<td>Inability to communicate</td>
</tr>
<tr>
<td>Lack of belief in advice from ID team</td>
</tr>
<tr>
<td>Lack of awareness of different antibiotics</td>
</tr>
<tr>
<td>Lack of knowledge about policies by clinicians</td>
</tr>
</tbody>
</table>

4.5.4 Interview 4

My fourth interview was with an ID pharmacist in the pharmacy department. I wanted to understand their point of view about the process followed when a restricted or inappropriate antibiotic prescription reached the pharmacy department. This hospital had a very large pharmacy department. There were more than twenty pharmacists employed under the management of a head of Pharmacy. Each pharmacist was assigned to a particular department in the hospital. My interviewee mentioned that she had seen inappropriate prescriptions arriving at the pharmacy on a regular basis. She would have to contact the offending clinicians and inform them about the policy and how and why they needed to obtain approval. This was an on-going struggle for her. Nevertheless, she was able to rationalise why this form of behaviour occurred. Clinicians are always in a
hurry. They have limited time to think about the antibiotic they are prescribing. Accordingly, they just go ahead with whatever has worked for them in the past in line with their experience. She believed that lack of knowledge and training about antibiotics and various hospital policies might be the leading cause of this behaviour. In an attempt to help, she and her fellow pharmacists would actually enter the names of the inappropriate prescriptions on GUIDANCE to help the project manager keep a record of the prescriptions.

This interview also lasted for approximately one hour. The most important codes to emerge are shown in table 4.5.

### Table 4.5

**Major codes from interview 4**

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge</td>
</tr>
<tr>
<td>Clinicians have no time to think</td>
</tr>
<tr>
<td>Clinicians are disinclined to spend more time on learning</td>
</tr>
<tr>
<td>Wrong dosage</td>
</tr>
<tr>
<td>Arguments with clinicians about broad vs narrow antibiotics</td>
</tr>
<tr>
<td>Not following hospital policies</td>
</tr>
<tr>
<td>Mistakes by clinicians</td>
</tr>
<tr>
<td>Clinicians’ negligence</td>
</tr>
<tr>
<td>Calling doctors and reminding them about their dosage</td>
</tr>
</tbody>
</table>

4.5.5 Interview 5

My fifth interview was with the head of the Pharmacy department. I realised that pharmacists play an important role in releasing medication to the patient. For this reason I wanted to obtain a greater understanding of how the pharmacy department operated. The best person to provide this information was the head of the Pharmacy department. This person spoke about his role. He was responsible for ensuring that no inappropriate prescriptions were released by pharmacists. He played a significant role in assisting the work of the ID department to reduce inappropriate prescribing.
He also spoke at length about clinicians not adhering to the hospital policy and prescribing inappropriately far too frequently. Most mistakes related to wrong dosages, wrong duration, and prescription of broad rather than narrow-spectrum antibiotics. His department then had to contact the clinicians concerned and ask them to change the prescription. He believed that clinicians’ attitudes played an important role in prescription habits. He cited examples of what happened when the pharmacist held back and would not make the medication available to a patient because it was not approved or was inappropriate. Clinicians would react by “getting pissed off” and inform the pharmacist that the patient is at risk, thus placing the responsibility on the pharmacist if the patient did not improve or died. This caused the pharmacist to immediately dispense the medication. Even though they knew that the prescription was inappropriate and not approved, they were not prepared to take the risk of potentially involving a patient in an adverse outcome. He also stressed that clinicians are driven by habit and experience. They invariably prescribe according to what has worked in the past. New clinicians also learn from their seniors and follow in their footsteps. Role modelling is extensively practiced in clinical work. If senior clinicians ignore or bypass policies, then younger doctors will learn that this is normal practice and thus acceptable. This is why gaining the support of senior personnel was such a significant step in any process of changing the culture in regard to the GUIDANCE system.

This interview again lasted for approximately one hour and the following main codes emerged as shown in table 4.6.

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinicians’ behaviour</td>
</tr>
<tr>
<td>Educating the clinicians</td>
</tr>
<tr>
<td>Not issuing the medication</td>
</tr>
<tr>
<td>Training clinicians</td>
</tr>
<tr>
<td>Change in hospital culture</td>
</tr>
</tbody>
</table>
4.5.6 Interview 6

My sixth interview was with a clinician who actually prescribed antibiotics. By this stage in my scoping interviews I realised that I was hearing similar points of view about the GUIDANCE system and inappropriate prescription so I thought it would be wise to interview a doctor who actually prescribed medication and understand how they feel about the whole system. I also wanted to gain an understanding of the medical college system in Australia regarding such issues as the number of years of study that are involved, the nature of the internship period, their induction experiences, and so on.

I started this interview by asking several informational questions regarding his university career, and what happens when medical students complete their course, to the process of applying for a job, intern life, and working at the hospital. After these questions were answered I then followed up with questions regarding antibiotic prescription, antimicrobial resistance, and the GUIDANCE program. This clinician explained in depth about his experiences at medical school, and the curriculum in relation to antimicrobial resistance and the prescription of antibiotics. I was surprised to learn that such training is minimal at medical school. He described the internship period as “scary”. There was so much to learn and absorb. However, he believed that hospitals did not give sufficient in-depth induction and training. According to him, antibiotic prescription differed from department to department. Some prescribed inappropriately as and when they liked. Other hospitals where he had worked tend to keep a watch but at this particular hospital “no one here keeps a watch”. He had heard that a restriction policy did exist but was not aware of what it was and had never used it. His awareness of GUIDANCE was also absent. He had never used it. He had a vague recollection that during his induction someone “may have spoken about it for 15 minutes” but no one had ever followed it up. So, basically, he was confused about the whole scenario. He strongly voiced the opinion that junior doctors invariably follow the words and actions of the senior doctors. They do not question senior doctors about their prescription habits on the grounds that “they know best”. For him, clinicians are highly knowledgeable and usually want the best for their patients.

This interview lasted for two hours. The major revelation for me was the clash of opinions between the project management team and those personnel who actually
prescribed the antibiotics. This disconnect made me aware that I needed to interview more prescribers in order to obtain a wider understanding. Table 4.7 shows some of the new codes that emerged from the interview.

**Table 4.7**

Major codes from interview 6

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>No monitoring</td>
</tr>
<tr>
<td>No training</td>
</tr>
<tr>
<td>No induction</td>
</tr>
<tr>
<td>Confusion</td>
</tr>
<tr>
<td>No knowledge or awareness about GUIDANCE</td>
</tr>
<tr>
<td>No awareness about policy</td>
</tr>
</tbody>
</table>

4.5.7 Emergent themes from the scoping interviews

After completing the six scoping interviews, together with coding and analysis of the transcripts, I was able to take a step back from the data. I wanted to try and conceptualise the main theme that was emerging from the data. The main issue of concern for all participants was the phenomenon of antimicrobial resistance. Without wishing to overly repeat the discussion in chapter 2, AMR refers to the resistance of a microorganism to an antimicrobial medicine to which it was previously sensitive. It is the result of the use (or, rather, the misuse) of antimicrobial medicines, and develops when a microorganism mutates or acquires a resistance gene (WHO, 2011a, 2011c). Resistant organisms are able to withstand attack by antimicrobial medicines, such as antibiotics, to such an extent that standard treatments become ineffective. Consequently, infections persist and may spread. The participants explained how AMR had increased substantially in Australia and across the world, and there was wide agreement that the main cause of this was inappropriate prescription. The participants also stated that AMR increases patients’ risk to become more vulnerable to infections which might lead to their death as no other treatment would then work on their body, and that management is constantly struggling to reduce the incidence of AMR at the hospital, but with questionable outcomes.
In line with the process of open coding (Strauss & Corbin, 1990) I attempted to coalesce the data into separate categories and sub-categories. My first attempt gave rise to four main categories (clinician behaviour, GUIDANCE program, management factors, and antibiotic prescription) together with a large number of sub-categories. These are shown in table 4.8.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Sub-categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinician behaviour</td>
<td>Attitude, Communication, Non-compliance with policies, Non-compliance with GUIDANCE, Resistance to change, Negligence, Preoccupied mind, Not ready to listen to feedback</td>
</tr>
<tr>
<td>GUIDANCE program</td>
<td>Lack of: training, awareness, feedback, monitoring, reporting</td>
</tr>
<tr>
<td>Management factors</td>
<td>Lack of: motivation, support, in-depth induction, information about hospital policies</td>
</tr>
<tr>
<td>Antibiotic prescription</td>
<td>Inappropriate prescription by clinicians, Lack of knowledge about antibiotics, Main cause of AMR</td>
</tr>
</tbody>
</table>

4.6 Stage 2: Attendance at the GUIDANCE meetings

After the first stage of analysis was completed I realised that I needed to obtain more understanding of the GUIDANCE system itself. I needed to obtain more insight into issues such as why clinicians were not using this tool, its ease of use, functionality, ease of access, and associated factors. Following the process of theoretical sampling I
therefore asked myself “where can I now go to find out about this information?” As a result of conducting the six scoping interviews I was aware that regular monthly meetings were held to discuss the GUIDANCE system. I therefore requested permission, which was granted, to sit in on these meetings as an observer. In total I attended eight meetings over six months.

The meetings were organised by the project manager of GUIDANCE, and the attendees were usually the Infectious Diseases department members and other heads of departments in the hospital. The purpose of these meetings was to update senior management at the hospital about the progress of the GUIDANCE project. Of particular importance was the issue of how the hospital could take steps to increase adherence to GUIDANCE by clinicians in order to effect an improvement in the rate of inappropriate prescription. The attendees at these meetings would discuss plans, policies, protocols, and procedures in relation to inappropriate prescribing, and make suitable recommendations. Some of the topics discussed at these meetings included the attempt to create a policy for the GUIDANCE program, whether the usage of the software should be made compulsory, and the re-implementation of the program with greater awareness. The attendees at these meetings also received audit reports regarding clinician usage of the system and the results would be analysed and discussed. In these meetings I would usually sit silently and listen to the conversations that were taking place. The attendees were not comfortable with me audio recording the meetings and so I took notes manually of the issues discussed and my other observations. At every meeting I would also collect a range of documents that I thought might be useful for my research. However, most of this literature cannot be included in my thesis due to issues of hospital confidentiality. The documents I collected are shown below, and were regarded as data for the purpose of my analysis.

- Policy documents - policies written about the GUIDANCE software, including important information for clinicians, as well as the respective roles of the pharmacist, GUIDANCE team, and clinicians.
- GUIDANCE blueprint - the new blueprint to re-implement the GUIDANCE system and raise awareness.
- Advertisement campaign documents - screen-saver snapshots, helpline for GUIDANCE support, list of restricted antibiotic name tags printed and
added to clinicians’ employee cards, GUIDANCE helpline number tag attached to employee cards.

Audit reports - weekly audit reports which recorded the names and departments of those clinicians who actually logged into GUIDANCE and obtained approval, as opposed to those who displayed non-conformance.

Offer letter sample - discussion documents about ways to make usage of GUIDANCE compulsory, including becoming part of the clinicians’ offer letter.

Reward cards - discussion documents relating to the introduction of motivational rewards such as chocolates and $4 coffee cards for those clinicians who use GUIDANCE.

Funding approval to buy a new version of GUIDANCE - approval documents to update the software and purchase the new version of GUIDANCE which has better features and functionalities.

4.6.1 Meeting 1

At this meeting the senior managers from each of the different departments were introduced to the members of the GUIDANCE team. The team explained that their role was to reduce the amount of inappropriate prescription at the hospital. Their initiatives in this regard were discussed in detail. The problem of antimicrobial resistance was raised and discussed, together with the issues that were faced by the hospital. Strategies such as emailing each head of department as and when clinicians failed to obtain approval for restricted antibiotics were debated. Audit reports were analysed showing the number of clinicians who failed to obtain approval. These reports revealed the actual numbers of clinicians involved according to different departments and units. Table 4.9 shows the list of units involved in the analysis.
At this meeting data was also presented relating to the list of antibiotics prescribed during the preceding week. This is shown in figure 4.2, where green depicts ‘with approval’ and red ‘without approval’.
Figure 4.2
Prescription of restricted antimicrobials

Figure 4.3 shows the rate of compliance with GUIDANCE according to different units in the hospital. Based on this data the project manager would email each head of department to inform them about the number of antibiotics that were prescribed without approval in their particular unit.
Figure 4.3
Compliance with GUIDANCE approval according to hospital unit

Compliance with obtaining GUIDANCE approvals

- Medical 1
- Medical 2
- Medical 3
- Medical 4
- Medical 5
- Cardiology
- Neurology
- Endo/Diabetes
- Gastroentero...
- Oncology
- Haematology
- Renal medicine
- Infectious...
- Respiratory
- Palliative Care
- Paediatrics
- Obs/gynae
- ICU
- Surgical 1
- Surgical 2
- Surgical 3
- Surgical 4
- Vascular...
- Cardiothoracic
- Orthopaedics
- Plastics
- Urology
- ENT
- MC ortho
- MC neuro...
- MC...
- GEM 1(NW)
- GEM 2 (CW)

- nil restricted
- number of approvals
- number without approval
4.6.2 Meetings 2 and 3

During these two meetings discussions were held about the protocol and policy relating to antimicrobial prescription. The various responsibilities of a range of medical officers and clinical prescribers were discussed, including staff specialists, pharmacists, and pre-registrants. Attendees were given an exact definition of the primary role of the Infectious Diseases staff, namely: responsible for giving or refusing approval to prescribe a restricted antimicrobial for a particular patient. Attendees were also given an exact definition of the primary role of the staff in the Pharmacy department, namely: responsible for checking whether approval to prescribe a restricted antimicrobial has been obtained, and if approval has not been obtained, reminding the doctor that Infectious Diseases approval must be obtained. Pharmacists may send a Pharmacist Alert to the Infectious Diseases unit through a temporary approval if there is an ongoing prescription for a restricted antimicrobial that does not have approval. The names and number of restricted antibiotics were also written and discussed as shown in table 4.10. By the end of these two meetings a policy had been finalised to be sent for approval.

Table 4.10

<table>
<thead>
<tr>
<th>Restricted antimicrobials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aciclovir IV</td>
</tr>
<tr>
<td>Amikacin</td>
</tr>
<tr>
<td>Amphotericin</td>
</tr>
<tr>
<td>Anidulafungin</td>
</tr>
<tr>
<td>Azithromycin</td>
</tr>
<tr>
<td>Aztreonam</td>
</tr>
<tr>
<td>Caspofungin</td>
</tr>
<tr>
<td>Cefepime</td>
</tr>
<tr>
<td>Ceftazidime</td>
</tr>
<tr>
<td>Ceftriaxone</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
</tr>
<tr>
<td>Clarithromycin</td>
</tr>
<tr>
<td>Colistin</td>
</tr>
<tr>
<td>Cycloserine</td>
</tr>
<tr>
<td>Daptomycin</td>
</tr>
</tbody>
</table>
4.6.3 Meeting 4

The agenda for this meeting was concerned with a range of issues related to the GUIDANCE program itself. In the main these issues were concerned with what the system actually does and how it can be improved. Error rates again occupied the attention of the attendees. Discussion also took place with regards to integrating GUIDANCE into another major tool called “BOSS” (a hospital management software), since BOSS was very popular and clinicians usually logged into that daily. The audit reports on clinician usage of GUIDANCE and the incidence of antibiotic prescription without approval were discussed in detail.

4.6.4 Meeting 5

This meeting was also attended by staff members from the Royal Melbourne Hospital (RMH) since they were the creators of the GUIDANCE system. The main purpose of the meeting was to increase the hospital’s understanding of how RMH was progressing with their implementation of the system. RMH claimed to have a high success rate in using the software and a lot could be learned from their experience. The RMH team members discussed how they were implementing GUIDANCE in their hospital and strategies they had employed for it to be successful. They also focused on the issues and problems they had with their staff and how they overcame those hurdles. Of particular interest was their explanation of the various incentives they employed to encourage staff to use the software. They would email a clinician when non-adherence was recorded and follow this up with a meeting to discuss any issues.

4.6.5 Meeting 6

At this meeting discussions were held around the issue of re-implementing the GUIDANCE software. The project manager was of the opinion that this process should start again from scratch. It was decided to put additional resources into marketing the system within the hospital. Different marketing strategies were discussed in depth. Some of these approved strategies included:
Posters about GUIDANCE to be distributed around the hospital.
Creating a hotline number to call, in case of a query relating to GUIDANCE.
ID card prints, which would display the names of all restricted antibiotics, and which would be carried at all times together with the employee’s identity card.
Screen-savers, to be added to each clinician’s computer, as a reminder about GUIDANCE and restricted antibiotics.
Chocolates and $4 coffee cards, to be used for rewarding clinicians who utilise GUIDANCE.

4.6.6 Meeting 7

This meeting took the form of a report-back session. The project manager informed the team about her discussion with members of the Information Technology team and how they would assist in resolving a number of IT issues relating to the integration of GUIDANCE into the BOSS system. IT personnel also participated in the discussion via speaker phone and provided detailed information about the timeline of the project and other issues.

4.6.7 Meeting 8

The final meeting I attended was focussed on a discussion of the new version of the GUIDANCE software. The GUIDANCE developers and creators were on call to describe the new features of the software and stressed the reasons why the hospital needed to upgrade. Discussion also took place about a range of cost issues and negotiations around reducing the fees.

The following themes emerged from coding my field notes of the eight management meetings together with the associated documentation.
Table 4.11
Major codes from eight management meetings and associated documentation

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence / non-adherence to guidelines</td>
</tr>
<tr>
<td>Implementation procedure</td>
</tr>
<tr>
<td>Restriction and policy on antibiotics</td>
</tr>
<tr>
<td>Monitoring</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Training</td>
</tr>
<tr>
<td>Compliance</td>
</tr>
<tr>
<td>GUIDANCE software usage</td>
</tr>
<tr>
<td>Lack of motivation</td>
</tr>
</tbody>
</table>

4.7 Stage 3: Usage of GUIDANCE

After the second stage of data collection, coding and analysis I was intrigued by the nature of resistance displayed by clinicians towards using the GUIDANCE software. I asked myself a number of questions:

- Can there be a problem with the GUIDANCE program?
- Is the program easy to follow and user-friendly?
- What is its functionality?

At this point my previous IT knowledge proved beneficial. I decided to analyse the GUIDANCE software myself. I explored in detail its functionality, the login process, the errors it gave, the time it took to process information and its ease of navigation. In other words, I interrogated the system’s usability. I undertook a number of runs through the system to understand how clinicians received approval by using the system. I took snapshots of the main pages. I timed the number of minutes it took to enter a username and password. I tested how well the system was connected or not connected to other applications. I also arranged meetings with the creators of GUIDANCE who belong to a non-for-profit organisation mainly working at the Royal Melbourne Hospital.
Navigating through the GUIDANCE software involved a number of separate steps for clinicians to complete before obtaining approval for prescription. Figure 4.4 shows that following login the clinician has to search for the patient’s details.

**Figure 4.4**
Searching for patient’s details

The patient’s details then have to be confirmed as shown in figure 4.5.
Figure 4.5
Confirm patient’s details

![Guidance DS Interface]

Source: Thursky and Buising (2008)

Figure 4.6 shows that the next step in navigating through the GUIDANCE software requires the clinician to choose the particular disease.
Figure 4.6
Choosing the disease

Source: Thursky and Buising (2008)

Figure 4.7 shows that more information is then displayed relating to the drug and the disease.
Figure 4.7

More information about the drug and the disease

Source: Thursky and Buising (2008)

Finally, GUIDANCE then generates an approval with an appropriate approval number as shown in figure 4.8.
The following themes emerged from my analysis of the GUIDANCE decision support tool, and these are shown in table 4.12.
Table 4.12
Codes derived from analysis of GUIDANCE

<table>
<thead>
<tr>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>User friendliness of GUIDANCE</td>
</tr>
<tr>
<td>Error rates of GUIDANCE</td>
</tr>
<tr>
<td>Useful information about antibiotics</td>
</tr>
<tr>
<td>Useful information about patients’ records</td>
</tr>
<tr>
<td>Navigation through the software</td>
</tr>
<tr>
<td>Time taken to log in and log out</td>
</tr>
<tr>
<td>Integration with other software in the hospital</td>
</tr>
<tr>
<td>Training on GUIDANCE</td>
</tr>
<tr>
<td>Number of computers at the hospital</td>
</tr>
</tbody>
</table>

4.8 Draft conceptual model

At this stage of my data collection and coding I stepped back and reviewed my data from a distance. It is easy for a researcher to become entranced by the richness of their data and lose sight of some of the more important conceptual arguments that are emerging. This was an appropriate time for me to obtain some distance from my data. By this stage my data had come from three main sources:

1. Six scoping interviews with staff members from the Infectious Diseases department in charge of the GUIDANCE project aimed at reducing inappropriate prescription.
2. Attendance at eight GUIDANCE management meetings, during which I collected data on hospital policies and documents in regards to the implementation of GUIDANCE.
3. The usage and functionality of GUIDANCE.

A number of issues were competing for attention in this data. Even though senior management mainly blamed the clinicians and their personal factors for non-adherence to policies and inappropriate prescribing I realised that there was more to the problem than this. The software itself was also a problem. The computers at the hospital were old and few. In addition, senior management were not keeping a proper watch on what was happening on the clinicians’ side. They were not adequately educating or training
clinicians about new antibiotics or antimicrobial resistance, or even about the GUIDANCE system itself. The clinicians were also not punished or rewarded for what they did. Their actions, and the consequences of these, were largely overlooked. This made me realise that although clinicians were the people actually responsible for prescribing, it was not only personal factors that bore the sole responsibility for the problem. I also had to consider the significance played by both organisational and information technology factors in sourcing and perpetuating the problem.

In order to progress this line of thinking, I memoed some of my major ideas. For me, the main theme that had emerged from the data thus far indicated that the research problem was one of “inappropriate prescription”. This was comprised of three main sets of causal factors – personal, organisational, and information technology (IT). These are shown in figure 4.9.
Of course, it was obvious to me in sketching this draft conceptual model of “inappropriate prescription” that there was a missing segment to my data collection which could also contribute greatly to the density of themes emerging from the data. This missing element related to those people within the hospital who were actually responsible for using GUIDANCE as end-users. During the previous three stages of data collection and coding I had primarily concentrated on management personnel. It was now time for me to extend the focus of my interviewing to include the broad sweep of clinicians who used the system, or not, out in the field. I had to get an understanding of why clinicians were not adhering to hospital policies and guidelines. It was difficult for me to understand that clinicians would not want to use a system that had as its objective the saving of patients’ lives. What were the reasons for this non-adherence? If
a doctor’s mission is to do no harm, then why would they not follow guidelines that could save a patient’s life?

4.9 Stage 4: Major end-user interviews

Figure 4.9 above provided the foundation for the next stage of data collection and coding. During this stage I wanted to densify the codes that comprised the three main categories of personal, organisational, and IT factors. This stage of data collection lasted for six months and comprised forty interviews with end-users of the GUIDANCE software. The questions which I asked of these participants were now of a more focussed nature compared with the unstructured questions that I asked previous interviewees. Table 4.13 gives an indication of the type of questions asked. However, I did not follow a rigid format with every interviewee. I still remained open to flexibility as and when required depending upon the experience of the respondent and the nature of their specialist area. I wanted to maintain a degree of freedom during the interviews in order to ask follow-up questions, explore unexpected interviewee responses, probe for more elaboration when necessary, and ask the respondent to provide examples of issues they were discussing. I encouraged the interviewees to freely express themselves when talking about their antibiotic prescribing habits, knowledge and understanding of AMR, their perception of antibiotic approval systems, their satisfaction with the IT systems at the hospital, and how things could be improved in the hospital setting in relation to the above issues.
<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Inappropriate antibiotic prescribing</td>
<td>What is inappropriate prescribing? Does it happen often at the hospital? What are the reasons behind it? Are you aware of all antibiotics and their side effects?</td>
</tr>
<tr>
<td>Antimicrobial resistance (knowledge)</td>
<td>What is AMR? How does it occur and why? How big is the issue? Does your hospital have an AMR problem?</td>
</tr>
<tr>
<td>Non-adherence to guidelines</td>
<td>Are you aware of the hospital guidelines about prescription and approval of restricted antibiotics? What are the guidelines? Are you adhering to them? What are the reasons behind clinicians not adhering to guidelines?</td>
</tr>
<tr>
<td>Attitude/behaviour</td>
<td>Have you ever taken advice from the ID team? Do you often think about the antibiotic that you prescribe? Do you think your knowledge and awareness are good in terms of AMR and antibiotics?</td>
</tr>
<tr>
<td><strong>Organisation Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Restriction and policy on antibiotics</td>
<td>What do you know about the hospital’s antibiotic restriction policy? Do you think there should be a restriction policy for prescribing broad-spectrum antibiotics at the hospital?</td>
</tr>
<tr>
<td>Education and knowledge</td>
<td>Have you been educated on AMR and inappropriate prescribing? Do you think knowledge about AMR and its associated problems is necessary for clinicians?</td>
</tr>
<tr>
<td>Monitoring and reporting</td>
<td>Do you know the hospital’s rate of inappropriate prescription? Have you seen reports on AMR? Do you think you are monitored for your prescription and usage of the IT system guidance?</td>
</tr>
<tr>
<td>Feedback and rewards</td>
<td>Do you receive feedback on how well you have worked? Have you received any rewards or recognition that encourages you to use the system or follow the policies in regards to antibiotic prescription?</td>
</tr>
<tr>
<td>Cultural environment</td>
<td>Do you think the hospital environment and culture has an effect on your prescription? Does this hospital have a learning culture? Do you ever question your consultant about the antibiotic prescribed?</td>
</tr>
<tr>
<td><strong>IT Factors</strong></td>
<td></td>
</tr>
<tr>
<td>IT facilities</td>
<td>How is your perception of this hospital’s IT department? Are they helpful and do they resolve your issues on time?</td>
</tr>
<tr>
<td>Expectations from DSS</td>
<td>What do you expect from an electronic decision support system?</td>
</tr>
<tr>
<td>Training</td>
<td>How much training have you had on GUIDANCE? How has the hospital trained you?</td>
</tr>
<tr>
<td>GUIDANCE awareness</td>
<td>What do you understand about the GUIDANCE program? Have you used it? What do you like or dislike about it?</td>
</tr>
</tbody>
</table>
All the interviews were conducted on the hospital premises. Senior management staff members were interviewed in their offices, whilst interviews with more junior medical staff were conducted in a meeting room in the staff lounge, and pharmacists were interviewed in the pharmacy department’s meeting room. The participants were requested to sign a written consent form before the interview. All agreed for the sessions to be audio recorded. Two recorders were used at each interview so that if one failed the other would still record the discussion. The interviews lasted between twenty minutes and 1.5 hours. Initially, I attempted to recruit participants through an email invitation. However, this proved to be less than successful. I received very few responses. I later learned that clinicians are not very diligent at checking their official email on a regular basis, and when they do it is usually in a rushed manner between hospital commitments. As a result of this setback I applied for, and received, permission from the hospital’s senior management and ethics committee to collect my data in the following manner:

First, I sat in the visitors’ lounge room which was also used by clinicians many times during the course of a working day. This was a large area. It consisted of a television room, kitchen, two ping-pong tables, computer room, locker rooms, toilets, dining table, mailboxes, and a tutorial/meeting room. I sat in this meeting room waiting for clinicians to arrive. Flyers were placed on the dining table and a small note was pinned on all their mailboxes explaining the project and detailing the interview process. I stayed in this room conducting interviews for six weeks between the hours of 9 am and 5 pm. In total, I interviewed 24 clinicians, comprising seven interns, ten residents, and seven registrars.

During the course of these interviews I soon realised that I was missing a major type of hospital personnel, namely, the pharmacists. Pharmacists had their own department where they used to congregate. Hence, they did not visit the visitors’ lounge room. They used their own laboratory, lunch room, and meeting room. With the permission of the head of Pharmacy I sat in their meeting room for a period of two weeks. During this time I interviewed ten pharmacists. These interviews were very useful in obtaining a range of divergent opinions because each pharmacist was allocated to a separate department.

Despite these extensive interviews with clinicians and pharmacists there was still a gap in my data sources, namely in the form of senior management. These
personnel had their own offices. In order to interview them I had to contact their personal secretaries to make individual appointment times and interview the managers in their own offices. I managed to interview six senior managers over a period of two months.

The process by which these interviews were conducted shows clearly the demarcation between the different types of clinical personnel, namely, interns, residents, registrars, pharmacists, and senior management. Table 4.14 shows the definitions of each of these types of clinical personnel.

Table 4.14
Definitions of clinical personnel

<table>
<thead>
<tr>
<th>Group</th>
<th>Interns</th>
<th>Residents</th>
<th>Registrars</th>
<th>Pharmacists</th>
<th>Senior management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interns</td>
<td>All States and Territories require recently qualified medical graduates to successfully undertake and complete at least one year of supervised practice, generally known as an internship. Internship is undertaken in hospital positions accredited for this purpose. Interns in Australia are ‘undifferentiated’, meaning that they undertake rotations through many different specialties. Rotations differ from hospital to hospital and state to state. However, most states require three core terms to be completed: a medical term (general or subspecialty internal medicine); general or sub-specialty surgery; and emergency medicine.</td>
<td>Upon successful conclusion of the intern year, doctors qualify for full registration by the Medical Board of their State or Territory, and are licensed to engage in independent medical practice. However, because Provider Numbers are not issued to doctors who have not completed postgraduate studies, nearly all doctors continue their training as Resident Medical Officers (RMOs) in hospitals, which typically lasts two years.</td>
<td>Upon completion of their two years as a resident, they then have to pass an examination and choose their field of study. They then become a registrar and work in a particular department.</td>
<td>A pharmacist is a person who prepares, formulates, dispenses, and provides clinical information on drugs or medications to health professionals and patients, through completion of a university program in pharmacy of at least 4 years' duration and who passes state and federal licensure examinations.</td>
</tr>
</tbody>
</table>

Source: Australian Medical Association (2012)
These three rounds of data collection from end-users resulted in a total of forty interviews from different areas within the hospital. Six of the interviews were with senior management (mainly directors), seven with residents, ten with registrars, seven with interns, and ten with pharmacists (each associated with a different department – neurology, cardiology, medical, paediatric, renal/gastro, infectious diseases, intensive care, and oncology). There were 24 males and 16 females in the interview groups. Only six of the interviewees were aged 40 years or more. Almost half of the sample had four years or more of experience. Table 4.15 shows the demographics of the interview sample.

Table 4.15
Demographics of the interview sample

<table>
<thead>
<tr>
<th>Roles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management</td>
<td>6</td>
</tr>
<tr>
<td>Resident</td>
<td>7</td>
</tr>
<tr>
<td>Registrar</td>
<td>10</td>
</tr>
<tr>
<td>Intern</td>
<td>7</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>24</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 40 years</td>
<td>34</td>
</tr>
<tr>
<td>40 years or more</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experience</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4 years’ experience</td>
<td>22</td>
</tr>
<tr>
<td>4 years’ experience or more</td>
<td>18</td>
</tr>
</tbody>
</table>

Each of the five different clinical roles represented in my forty interviews revealed similar properties within the confines of their separate groupings – interns, residents, registrars, pharmacists, and senior management. Because of this similarity, I decided to progress my coding of the interviews according to these separate roles. This coding was performed within the framework of the research problem of “inappropriate prescription”. In particular, I was looking for those sets of conditions which tend to lead to inappropriate prescription in each case, together with strategies suggested for tackling the problem.
4.9.1 Interviews with interns (7)

Interns are those doctors who have just finished medical school and are practicing in their first year at the hospital. All of them appeared to be excited about their job and were a very young group of doctors. In the main they readily admitted that they were new to the job. Because of this they generally were not aware of what was happening at the hospital. In particular, hospital policies were either unknown or only vaguely known. There was just too much for them to learn and absorb in their first year. They felt lost much of the time and were subject to too much pressure and stress. Their lack of knowledge and experience led some of them to admit to being fearful and “scared” a lot of the time. There existed an endemic culture of following without question the words and actions of their senior doctors, such as registrars and consultants. If they noticed what they thought might be inappropriate prescription, this was just regarded as part of the learning process. Their seniors knew better than them and were not to be questioned. If they observed a senior doctor prescribing a broad-spectrum antibiotic, this was probably because their experience had taught them that in some circumstances it is better to cover all possible risks. When clinicians are uncertain about a patient’s ailment then the broader antibiotic will cover most eventualities and cure everything. Better to be safe than sorry with individual patients.

Interns were largely unanimous in their desire to receive more training from the hospital in understanding policies, procedures, and programs. They all mentioned that the hospital provided only three hours of induction training to them. This was an intense period of over-information. Different presenters walked in and out of the training room at 15 minute intervals. There was too much information to grasp in such a short period of time. It was felt that the period of induction should be far longer, perhaps one week, so that information could be provided at a more leisurely pace. Because of the short induction period, combined with their hectic schedule on the job, the interns’ understanding of hospital policies and programs was very poor. Their understanding of antimicrobial resistance and bacteria was also very limited. According to the interns, only one subject on antimicrobial resistance was offered at medical school. Most of them had forgotten much of the content. Knowledge about GUIDANCE was either non-existent or extremely vague. So was their knowledge of any restrictions on antibiotics. This lack of knowledge and awareness was exacerbated by the system of rotation that
interns were subject to during their first year. They tended to rotate to three or four hospitals, or to different departments in the same hospital. In such an environment it was difficult for them to properly absorb the idiosyncratic policies and practices from one department to another or one hospital to another.

Because of their similar backgrounds and working conditions I decided to code the interviews of the seven interns as one block. Figure 4.10 shows the conditions leading to inappropriate prescription as identified by the interns.

**Figure 4.10**

*Conditions leading to inappropriate prescription identified by interns*

<table>
<thead>
<tr>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation of medical staff</td>
</tr>
<tr>
<td>Lack of knowledge</td>
</tr>
<tr>
<td>Lack of awareness</td>
</tr>
<tr>
<td>Pressure, stress, anxiety</td>
</tr>
<tr>
<td>Lack of resources</td>
</tr>
<tr>
<td>Lack of training</td>
</tr>
<tr>
<td>Fear of the unknown</td>
</tr>
</tbody>
</table>

4.9.2 Interviews with residents (7)

Residents occupy the next level higher than interns in the clinical hierarchy although they are still referred to by the hospital as junior doctors. Despite their higher status, I found residents’ responses similar to those of the interns. Even though they had longer experience at the hospital than the interns, their knowledge about AMR was still generally poor. So also was their knowledge of hospital policies and programs. Some of the residents did show an awareness of the problem of inappropriate prescription and realised that it was an issue of some importance. However, they ascribed this to the attitudes and over-confidence of the senior staff. They mentioned that clinicians are overloaded with work and whatever medication has worked for them in the past tends to be prescribed on a habitual basis. Some residents expressed surprise at the absence of monitoring and supervision in the hospital. Even though they had been employed there for some time there had been little conscious effort to keep a watch on what they were
doing. The general impression amongst the residents was that the hospital conducted no monitoring or reporting on inappropriate prescription, including the usage of GUIDANCE. There were no education or training activities conducted on the topic of antibiotics or AMR. The hospital was not a learning organisation. Senior management made little or no attempt to cultivate a culture where clinicians wanted to learn new things.

Because of their similar backgrounds and working conditions I decided to code the interviews of the seven residents as one block. Figure 4.11 shows the conditions leading to inappropriate prescription as identified by the residents.

![Figure 4.11](image)

**Figure 4.11**

**Conditions leading to inappropriate prescription identified by residents**

- Attitude, belief, over-confidence
- Lack of time
- Monitoring and reporting
- No watch-dog
- Experience versus theory
- Organisational culture and environment

4.9.3 Interviews with registrars (10)

Registrars occupied a level one step above the residents in terms of the hospital hierarchy and were referred to as senior doctors. When I interviewed the registrars I immediately noticed that they exuded a presence that was not noticeable amongst the interns and residents. They displayed a swagger that an observer like myself would normally associate with people who knew that they occupied an important role in the hospital. I could immediately feel the confidence in their behaviour and attitude. This feeling of importance could be noted in the way that they framed their arguments around the issue of inappropriate prescription. Their tendency was to regard themselves as above suspicion and to put the blame on factors that lay beyond their own domain.
For example, they tended to lay a lot of the blame on patients, especially those who did not follow instructions by stopping their medication before the prescribed time. Patients were also blamed for putting pressure on doctors to prescribe medication. They also blamed the junior doctors and not themselves for most of the inappropriate prescribing that had led to the increased incidence of AMR. They acknowledged that AMR was an important issue but believed that more training and education should be given to the junior doctors and not themselves. If the hospital wanted to tighten up on policies regarding antibiotic restrictions, then these should only be imposed on the junior doctors.

Some actually mentioned that they (senior doctors) are amongst the most knowledgeable people in society. They should not be subject to policies and programs that monitor and approve (or disapprove) their behaviours. Rather, they should be accorded automatic trust to always act in the best interests of their patients and professional practice. In addition, some registrars put the blame on senior management who they believed were more motivated by cutting costs. One method to achieve such savings was by putting restrictions on the prescription of certain antibiotics. Hospital funding was constantly under pressure. Hospital management would put pressure on clinicians to release patients as soon as possible in order to speed up the throughput of patients, often within a few hours. Beds were in short supply and so was the time availability of medical staff. For this reason, a broad-spectrum antibiotic was the most convenient medication to prescribe so that the patient would not have to be seen again so soon. Several registrars questioned me about the use of the word “inappropriate”. They believed it to be a harsh word to use in the circumstances. They mentioned that a better description would be a “different choice” of drugs. Just because a “theory” or “senior management” had determined what antibiotics needed to be prescribed “this did not make it right”.

Because of their similar backgrounds and working conditions I decided to code the interviews of the ten registrars as one block. Figure 4.12 shows the conditions leading to inappropriate prescription as identified by the registrars together with associated strategies.
4.9.4 Interviews with pharmacists (10)

What was immediately noticeable in my interviews with the pharmacists was that they are far more knowledgeable than both junior and senior doctors about issues such as GUIDANCE, AMR, and hospital policies and procedures. Inappropriate prescription was a major issue for them. They observed it on a daily basis. Once observed they would attempt to correct it by contacting the prescribing clinician. They tended to be confused by what they regarded as the passiveness of senior management. Such managers did not play an active role in reducing the prevalence of the practice. They were not responding to inappropriate prescription by clinicians, or to the inadequate usage of GUIDANCE. No punishments were meted out for non-adherence. The pharmacists tended to lay emphasis on what they regarded as the large egos and over-confidence of clinicians. They had to deal with such attitudes face-to-face on an ongoing basis. Clinicians were accused of not wanting to listen to pharmacists about any issues involving prescription. Clinicians always felt that “they knew best”. Unfortunately, according to some pharmacists, clinicians remained “unaware of what was happening to their patients” due to their distance from the problem. Accordingly, the number of sick patients was increasing. Pharmacists showed some frustration about the process in the sense that they would diligently enter antibiotics onto the GUIDANCE system only for clinicians to ignore it. And there was no need for such
non-adherence to be so prevalent, since the “process is easy and takes just a few minutes of the clinician’s time”. Not that GUIDANCE was perfect. Improvements could be made in a few areas, particularly relating to speed and user-friendliness. But this was a distraction from the real issue which related to the unwillingness of clinicians “to think and spend more time with patients”. For this reason mistakes were made with antibiotic prescription.

Because of their similar backgrounds and working conditions I decided to code the interviews of the ten pharmacists as one block. Figure 4.13 shows the conditions leading to inappropriate prescription as identified by the pharmacists together with associated strategies.

**Figure 4.13**

*Conditions and strategies for inappropriate prescription identified by pharmacists*

**Conditions**
- No time to think
- Ego, attitude
- Clinicians not aware of outcomes
- More sick patients at hospitals
  - Consequence for patient is severe
  - Happens all the time
  - Hospital setting

**Inappropriate prescription**

**Strategies**
- Management support
- Clear instructions

### 4.9.5 Interviews with senior management (6)

Most of the six senior managers I interviewed were at the level of Director and were actively involved in the policy-making process at the hospital. This included the induction process for junior doctors. What was noticeable during these interviews was that senior management held completely different views from clinicians. From their point of view the hospital provided perfectly acceptable training for all staff in regard to policies and programs. For them, it was the attitudes and egos of clinicians that mainly explained non-adherence issues in the hospital. The senior managers stressed that they
looked intensively at big-picture issues and were constantly engaged in analysis of a wide range of issues. This was not the case with clinicians who were more absorbed in the details of everyday practice. Consequently there could be a mismatch between what clinicians thought was happening and what was actually happening. Not surprisingly, it was the senior management who displayed the most amount of knowledge about AMR and antibiotic usage. Government funding was a major issue for them. Such funding was invariably not sufficient to ensure perfect practice. Making this situation worse was the system of fines that could be imposed on the hospital by the government if clinicians did not change their prescribing habits. Some senior managers stressed the importance of changing the culture of the hospital. Others stressed that issues such as resources, training and incentives are important. One of the directors expressed the opinion that the Heads of Units were the main cause of inappropriate prescription and the poor hospital culture. She mentioned that junior doctors look for guidance to their respective Heads of Unit (who are mainly consultants). When these Heads engage in inappropriate practices, such as not following policies, then junior doctors tend to adopt the same habits.

For this senior manager, it was important to obtain the support of all Heads of Units before satisfactory progress could be made about adherence to GUIDANCE and restrictions on antibiotics. Another initiative that could bring a change in the hospital’s practices and culture would be the creation of an antimicrobial stewardship team. This would involve ID clinicians “walking the wards” on a regular basis checking patients’ files and correcting prescriptions whenever they detected an inappropriate prescription.

Because of their similar backgrounds and working conditions I decided to code the interviews of the six senior managers as one block. Figure 4.14 shows the conditions leading to inappropriate prescription as identified by the senior managers together with associated strategies.
4.10 Paradigm model

Figure 4.9 earlier in this chapter showed that the research problem identified by that stage of the data collection and analysis was one of “inappropriate prescription”. This was comprised of three main sets of causal factors – personal, organisational, and information technology (IT). However, that model had been devised in the absence of an important source of additional data, namely that emanating from the end-users themselves. As a result, a further forty interviews were conducted with five sets of end-users – interns, residents, registrars, pharmacists, and senior managers. The additional codes arising from these interviews are shown in figures 4.10 – 4.14 above.

By this stage in my data collection, coding and analysis I was becoming more convinced that theoretical saturation had been reached. I had completed four stages of
data collection as shown in table 4.1 – six scoping interviews, attendance at eight GUIDANCE management meetings, a personal examination of the GUIDANCE functionality, and forty interviews with end-users. Theoretical saturation refers to the point in category development where no new properties are emerging during analysis.

During my final set of interviews I had been noticing that the same arguments kept repeating themselves, to the point where I was saying to myself “I have heard these issues before”. This was occurring often enough for me to take the decision to halt any further data collection. My major objective now was to integrate the theory. Strauss and Corbin (1998:143) refer to this as “selective coding”. Once the major categories are integrated into a larger theoretical scheme then researchers are entitled to call this model a theory.

The choice of a central, or core, category, is a significant part of selective coding. As shown in box 3.7 in chapter 3, Strauss and Corbin (1990, 1998) had displayed a good deal of laxity when defining what was meant by a core category. Jones and Noble (2007:89-90) had identified nineteen different ways in which Strauss and Corbin had explained the concept of a core category during the course of their two books. These included: the main idea, main problem, primary issue, and the main story. The research topic I have chosen to study in this thesis is that of antimicrobial resistance. But what has caused antimicrobial resistance? My data appeared to be unequivocal about the answer to this question, namely inappropriate prescription. But this answer merely suggests another question, namely, why is inappropriate prescription occurring? The answer to this question would suggest a complex interaction between personal, organisational, and IT factors. But the issue is more nuanced than this. Hospital authorities at my research site had tried to institute strategies to address the problem, namely in the form of a computer decision system called GUIDANCE. This had not worked. Clinicians tended to ignore the system. Resistance was commonplace. Non-adherence was the norm. But why? To me, it was this final question that represented the crux of the problem.

Using the Straussian representation of the core category as “what is the main story here, and why?” (Strauss, 1987:31), I memoed the main story along the final lines:
Antimicrobial resistance has rapidly become a major topic of world significance, principally because of the tendency of clinicians to indulge in inappropriate prescription. Inappropriate prescription is caused by a set of factors that encompass personal, organisational, and IT elements. However, hospital management has attempted to control the problem through a strategy of clinician adherence to a specially developed piece of computer software called GUIDANCE. This has been resisted by clinicians. The problem continues.

I summarised this story line as ‘inappropriate prescription: clinicians’ resistance to control measures’. This story line summary became my core category. When I had decided on this core category it became very clear that my research was primarily concentrated on theorising why clinicians displayed such strong resistance to the notion of being controlled or monitored by a piece of computer software.

Strauss and Corbin (1990) had advocated the use of the paradigm model as being a compulsory part of the act of theoretical modelling. However, as shown in chapter 3, in their second book the paradigm model became merely one of numerous modelling procedures that could be adopted to integrate the theory (Strauss & Corbin, 1998). Nevertheless, the manner in which my data collection, coding, and analysis had progressed led me to favour the use of the paradigm model as an appropriate way of theorising around the core category of “inappropriate prescription: clinicians’ resistance to control measures”. This was because I could clearly see the flow of ideas and themes that revolved around the interaction between conditions (causal, contextual, and intervening), strategies, and consequences as they related to the phenomenon I had identified. As Strauss and Corbin (1998:129) remind us, researchers should not be dogmatic about rigidly placing codes into pre-determined boxes, such as conditions and strategies. Their advice is “to let it happen”. I was conscious of this advice when putting together the paradigm model around the phenomenon of “inappropriate prescription: clinicians’ resistance to control measures”. My objective was to try and capture the dynamic flow of the nature and type of relationships so that the explanation of the phenomenon becomes “interesting, plausible, and complete” (Strauss & Corbin, 1998:129). The paradigm model adopted in this thesis represents the end result of the extensive coding procedures detailed in this chapter. This is shown in figure 4.15 and explored in more detail in chapter 5.
Figure 4.15
Paradigm model “inappropriate prescription: clinicians’ resistance to control measures”

Context
Under conditions where the phenomenon is:
- In a hospital setting (location)
- Occurs very often (frequency)
- Concentration is high (intensity)
- On a continuous basis (duration)
- Potential for consequences is high in terms of:
  - more hospital patients becoming sicker
  - higher risk of incurring government fines

Conditions
- Attitude
- Work overload
- Burdensome nature of control measures
- Lack of resources
- Lack of knowledge & awareness
- Lack of repercussions
- Lack of responsibility

Phenomenon:
- Inappropriate prescription: clinicians’ resistance to control measures

Consequences
- Synergetic hospital culture
- Enhanced resource base
- Improved antimicrobial stewardship
- Better informed clinicians
- Incentivised work environment

Strategies
- Change to hospital culture
- Improved funding
- Antimicrobial stewardship
- Clinician education and training
- Providing incentives
4.11 Summary

This chapter has presented a detailed examination of how the data for this research was collected, coded, and analysed. The researcher has presented an account of her own personal background and placed this within an exposition of researcher bias within qualitative methodology. The data collection process proceeded through four distinct stages: scoping interviews, attendance at GUIDANCE management meetings, examination of software functionality, and major end-used interviews. The chapter has been laid out in such a manner that it provides a clear audit trail for the reader to understand how the process of data collection was conducted and how the major categories emerged. The chapter concludes with an exposition of the paradigm model and how the core category emerged from the data and was integrated into a theoretical model.

The next chapter, chapter 5, constitutes the findings section of the thesis. In this chapter the paradigm model will be explained in detail as it relates to the phenomenon of “inappropriate prescription: clinicians’ resistance to control measures”.
Chapter 5

Findings
Chapter 5
Findings: exposition of the paradigm model

5.1 Chapter overview

This chapter constitutes the findings section of the thesis. In this chapter the paradigm model will be explained in detail as it relates to the phenomenon of inappropriate prescription: clinicians’ resistance to control measures. The chapter is arranged into seven sections. Each of the major components of the paradigm model will be explained sequentially – phenomenon, context, conditions, strategies, and consequences. This structure is shown in figure 5.1.

Figure 5.1
Chapter overview

In order to provide the reader with a roadmap to guide them through the chapter, figure 5.2 shows the properties of each of the components of the paradigm model. These components and their properties are analysed sequentially in order to provide a smooth flow through the chapter.
Figure 5.2
Paradigm model

Phenomenon
- Inappropriate prescription: clinicians’ resistance to control measures

Context
Under conditions where the phenomenon is:
- In a hospital setting (location)
- Occurs very often (frequency)
- Concentration is high (intensity)
- On a continuous basis (duration)
- Potential for consequences is high in terms of:
  - more hospital patients becoming sicker,
  - higher risk of incurring government fines

Conditions
- Attitude
- Work overload
- Burdensome nature of control measures
- Lack of resources
- Lack of knowledge & awareness
- Lack of repercussions
- Lack of responsibility

Strategies
- Change to hospital culture
- Improved funding
- Antimicrobial stewardship
- Clinician education and training
- Providing incentives

Consequences
- Synergetic hospital culture
- Enhanced resource base
- Improved antimicrobial stewardship
- Better informed clinicians
- Incentivised work environment
5.2 Phenomenon

The concept of a *phenomenon* is defined in two separate ways by Strauss and Corbin:

1. “The central idea, event, happening, incident about which a set of actions or interactions are directed at managing, handling, or to which the set of actions is related” (Strauss & Corbin, 1990:96).

2. “A term that answers the question ‘what is going on here?’ Repeated patterns of happenings, events, or actions/interactions that represent what people do or say, alone or together, in response to the problems and situations in which they find themselves” (Strauss & Corbin, 1998:130).

One potentially confusing aspect of identifying the phenomenon in a grounded theory research study is that the researcher must somehow disentangle this concept from that of the *core category*. The core category is defined as:

3. “The central phenomenon around which all the other categories are integrated” (Strauss & Corbin, 1990:116).

However, Strauss and Corbin added several amendments and nuances to this definition in their second book where they referred instead to the *central category*:

4. “The central category (sometimes called the core category) represents the main theme of the research…It seems to explain what this research is all about” (Strauss & Corbin, 1998:146).

These various definitions were initially problematic for me. Definition 4 above places emphasis on the main theme of the research and attempts to explain what the research is all about. Initially, I envisaged that the main theme was *antimicrobial resistance*. This topic was what the research was all about and formed the basis of my literature review in chapter 2. However, I soon realised that this could not be the core category because it was the pre-determined professional theme with which I entered into the research study.
The real core category had to emerge from the data. With this realisation in mind I allowed the data to speak to me more directly as I transcribed, coded, and analysed the evolving interviews. In view of the fact that I started my data collection with six scoping interviews, which concentrated on the members of the Infectious Diseases team at the hospital research site, I became pre-occupied with the specific GUIDANCE system at the hospital and their particular obsession with the perception that clinicians were stubbornly refusing to adhere to the guidelines that were set out. This led me to think that perhaps the core category was ‘non-adherence to GUIDANCE” since this was the main issue of the ID team. However, as my interviews expanded, and the variety of themes and ideas expanded in concert, I came to realise that this core category was too narrow and did not sufficiently integrate all the categories that were emerging from my research. Gradually, the concept of “inappropriate prescription” began to emerge as the integrating category and I started to gather the other categories around this central theme. However, I still could not shake free of the grip of the idea that inappropriate prescription was actually performed by humans (clinicians). Yes, inappropriate prescription was a significant issue but it was occurring at the behest of those clinicians who resisted attempts by hospital authorities to control their prescribing behaviour. As shown in chapter 4, I wrote the following memo to myself at that time in my data analysis:

Antimicrobial resistance has rapidly become a major topic of world significance, principally because of the tendency of clinicians to indulge in inappropriate prescription. Inappropriate prescription is caused by a set of factors that encompass personal, organisational, and IT elements. However, hospital management has attempted to control the problem through a strategy of clinician adherence to a specially developed piece of computer software called GUIDANCE. This has been resisted by clinicians. The problem continues.

I now wrote the core category as “inappropriate prescription: clinicians’ resistance to control measures”. This seemed to capture the ideas in definitions 1, 2, 3, and 4 above in a more decisive manner, for example: ‘the central idea that a set of actions is aimed at managing’, ‘what is going on here’, ‘the central phenomenon around which all the other categories are integrated’, ‘the main theme of the research’, and ‘what this research is all about’.
As shown in chapter 4, my selective coding settled on the issue of the paradigm model as the integration framework for the different categories. Since Strauss and Corbin (1990) use the term *phenomenon* as the central integrative category of the paradigm model, I have chosen to continue using this term instead of either of the terms *core category* or *central category*.

The participants in this research study operated within a certain cultural context which paved the way to clinicians’ resistance to control measures aimed at mitigating inappropriate prescription. In this study ‘inappropriate prescription’ is referred to as any of the following circumstances:

- **Wrong dosage** - the clinician prescribes the wrong dosage or quantity of an antibiotic.
- **Long duration** - the clinician prescribes antibiotics for a longer duration than the standard required duration for a particular disease.
- **Short duration** - the clinician prescribes antibiotics for a shorter duration than the standard required duration for a particular disease.
- **Overuse/misuse** - the clinician prescribes antibiotics when these are not required for the patient.
- **Broad-spectrum antibiotic instead of narrow-spectrum** - the clinician prescribes a very potent or powerful antibiotic (also known as broad-spectrum antibiotic) when the patient could be treated with a weaker antibiotic (also known as narrow-spectrum antibiotic).

However, it was noticeable that some of the end-user prescribers found the term ‘inappropriate’ to be a confronting choice of word, in the sense that it was potentially misleading or provocative. They did not believe that it should be used. In disagreeing with the term ‘inappropriate prescription’ they offered a collection of alternative terms, such as:

“**Different choice of drugs, different ways of prescribing, prescribing that doesn’t meet the criteria, poor choices, poor decision making and imperfect prescribing**”.
For example, one end-user prescriber mildly chided me with the following comment:

Interviewee 15: “Why do you call it inappropriate prescribing? Just because theory or software says it’s inappropriate, it doesn’t make it inappropriate”.

However, other prescribers did call it ‘inappropriate prescribing’. This shows the variety of opinions amongst the different interviewees who made up the sample population of my research study. These participants generally agreed that inappropriate prescription was the main cause of antimicrobial resistance and that the issue would only become worse unless strict controls were placed on prescribing practices. In order to capture some of the richness of respondent comments, several extracts from interviews are presented below in the participants’ own words.

Interviewee 2: “I think using unnecessary antibiotics on your patients and giving them more powerful antibiotics than what are needed causes the spread of AMR”.

Interviewee 9: “Inappropriate prescription is what we have created in this world and we need to do something about it because it’s going out of our hands”.

Interviewee 16: “I think it has become a very major problem in Australia and proper care should be taken to reduce the spread of these organisms or symptoms for that matter. Incidents relating to these topics always make us think twice about the prescription and that’s why we need to prescribe antibiotics judiciously to try and reduce these incidents as they are becoming very common. Certainly awareness about this topic is very important. It’s difficult to see reduction in the spread of infections in a growing population”.

Interviewee 27: “This problem of antibacterial resistance is increasing with time. It’s definitely an issue, it’s again going to become a bigger issue and I think it’s under the control of hospital authorities on what to do with it. It definitely results in extended length of stay for the patients and should be dealt with properly. I think with respect to causes, it’s more to do with exposure like the longer the patients stay in the hospital the more is the exposure to such things”.
Interviewee 36: “*We do get to see instances of antimicrobial resistance at the hospital but maybe the problem is not as prominent as in some other hospitals. One way to reduce the spread is I guess is just prescribing fewer antibiotics. Sometimes putting patients on antibiotics that probably aren’t first line or could be first line but there could be other antibiotics that we could use has obviously posed a problem in the past which caused emergence of these resistant microbes*."

5.3 Context

Strauss and Corbin (1990:101) define context as “a specific set of properties that pertain to a phenomenon…it is also the particular set of conditions within which the action/interaction strategies are taken to manage, handle, carry out, and respond to a specific phenomenon”. Strauss and Corbin elaborate on this definition by putting the concept of *context* into their example of the broken leg. Thus they state that it is context that is being described when the statement is made “under conditions of intense pain of long duration, we take such and such a measure to control it” (Strauss & Corbin, 1990:102).

The phenomenon in this research study is “inappropriate prescription: clinicians’ resistance to control measures”. In analysing the conditions, strategies, and consequences that pertain to this phenomenon it can be observed that these are occurring within a particular context, namely:

- Location (hospital setting)
- Frequency (occurs very often)
- Intensity (concentration is high)
- Duration (continuous basis)
- Potential for consequences is high in terms of:
  - more hospital patients becoming sicker, and
  - a higher risk of incurring government fines

Thus, the context can be stated in the following terms - under conditions where clinicians’ resistance to control measures aimed at inappropriate prescription is: located in a hospital, occurs frequently, with high intensity, on a continuous basis, with high
consequences for more patients becoming sicker and the risk of government fines, then [the following strategies can be pursued]. These contextual properties can now be briefly summarised.

5.3.1 Location (hospital setting)

The phenomenon occurred within one particular hospital situated in Victoria, Australia, within which all the research was conducted and all the clinicians were employed at the time.

5.3.2 Frequency (occurs very often)

Inappropriate prescription occurred on a frequent basis but clinicians still displayed high resistance to control measures.

One of the pharmacists said:

Interviewee 29: “I see inappropriate prescription coming to the pharmacy every week, in fact I saw one today”.

Another clinician mentioned:

Interviewee 10: “Oh, we see inappropriate prescription everyday here. It happens more in other units than my unit”.

5.3.3 Intensity (concentration is high)

The intensity of the inappropriateness of prescription was high because broad-spectrum, restricted antibiotics possessed many side effects, but despite this clinicians were still reluctant to accept any mechanisms aimed at controlling prescription.
A pharmacist mentioned:

Interviewee 25: “I was on the phone today telling the doctor why he has prescribed such a high dosage which is just not necessary and not right. The consequences of that dosage could be really bad”.

A senior manager stated:

Interviewee 35: “A year ago we had to close a full ward because of antimicrobial resistance, the whole ward, it was really bad”.

5.3.4 Duration (continuous basis)

The duration of inappropriate prescription is on a continuous basis. It happens throughout the year in all the units, and despite this clinicians still continually resist any control measures.

One senior manager said:

Interviewee 39: “We have been trying to control inappropriate prescribing for the last few years now but it just seems to increase and become worse year on year”.

Another clinician stated:

Interviewee 20: “All of us here are prescribing inappropriately and we continue to do so. We are making the problem bigger for us, no one knows how to solve this”.

5.3.5 Potential for consequences is high

The consequences of clinicians’ high incidence of resistance to control measures aimed at inappropriate prescribing are very severe. One such severe consequence is an inability to cure the patient, potentially resulting in death. In addition, an increase in resistant bugs within the hospital results in other patients becoming sicker and their
length of stay within the hospital increases. This increases the demand for already scarce bed space.

A clinician mentioned:

Interviewee 12: “We could potentially enter the pre-antibiotic era where there will be no cure for infections as nothing would work on patients, and it’s a scary thought”.

A pharmacist stated:

Interviewee 33: “The prescribers are not thinking about the consequences of their actions, it can kill patients”.

Another consequence that occupied the attention particularly of senior management was the prospect of being fined by the government. Fines could be incurred if prescription rates of broad-spectrum antibiotics crossed a particular threshold suggested by the government. There could be other financial consequences as well. For example, if infections reach the stage where the hospital has to close an entire ward, or implement some other form of infection control measure, then this can impact on the reputation of the hospital, as well as jeopardising the prospect of future funding.

5.4 Conditions

Strauss and Corbin (1990:100) define causal conditions as the “events or incidents that lead to the occurrence or development of a phenomenon”. They give the simple example of the phenomenon of pain which is brought about through the incident of breaking a leg. Thus, the casual condition of pain is breaking a leg. However, they add the caution that in reality a single causal condition rarely produces a phenomenon. As a result, the researcher should be looking for multiple causal conditions within the data. In relation to this current thesis, the phenomenon of inappropriate prescription: clinicians’ resistance to control measures has been identified as the phenomenon. The causal conditions leading to the occurrence and development of this phenomenon must now be presented.
Strauss and Corbin (1990:103) define intervening conditions as “those conditions which act to either facilitate or constrain the action/interactional strategies taken within a specific context”. The authors give several specific examples: such as, time, space, culture, economic status, technological status, career, history, and individual biography.

In relation to their example of breaking a leg which causes pain, the authors identify that the following intervening conditions will also have a bearing on the strategies to be pursued – the lack of training in first aid, the absence of a warm blanket, and the long distance that has to be traversed before help can be obtained.

Strauss and Corbin (1998) change their emphasis in their second book. Causal conditions are defined as “sets of events or happenings that influence phenomena” whilst intervening conditions are defined as “those that mitigate or otherwise alter the impact of causal conditions on phenomena” (Strauss & Corbin, 1998:131). But more significant than this is the attempt by the authors to downplay attempts by researchers to separately identify and list those conditions that are labelled causal or intervening.

Instead “what the analyst should focus on is the complex interweaving of events (conditions) leading up to a problem, an issue, or a happening to which persons are responding through some form of action/interaction, with some sort of consequences” (Strauss & Corbin, 1998:132).

In accordance with these guidelines given by Strauss and Corbin (1998), this thesis will not attempt to give separate identification to conditions which may be labelled causal or intervening. Instead the focus in this chapter will be to present findings which follow the logic of ‘conditions affecting a phenomenon which leads to strategies and consequences’.

In this section, seven conditions are identified and presented as impacting on the phenomenon of *inappropriate prescription: clinicians’ resistance to control measures*. This set of conditions is shown below:
attitude
work overload
burdensome nature of control measures
lack of resources
lack of knowledge and awareness
lack of repercussions
lack of responsibility

Each of these conditions will now be presented and discussed.

5.4.1 Attitude

Hypothesis
Clinicians who display an attitude of preciousness are more likely to resist control measures aimed at inappropriate prescription.

In this section it is argued that those clinicians who display an attitude of preciousness are more likely to resist control measures aimed at inappropriate prescription. This attitude becomes stronger the higher the status of the clinician is. The higher the status of a clinician, the more likely they are to carry themselves with a swagger. I noticed this almost immediately when comparing my interview experiences with junior and senior doctors. The latter tended to exude an aura of arrogance and confidence (in some cases over-confidence). This is attributable to a number of factors such as the length of their training, their depth of knowledge and expertise, and the high levels of status and reputation they enjoy in the eyes of the general public. During interviews with some senior doctors I field noted such words as ‘superiority’ and ‘elitism’. They belong to a prestigious profession. Whilst some doctors were speaking I was also struck by some of their statements and mannerisms which gave the impression of them being somewhat ‘precious’, especially when comparing themselves with others. Ballantyne (2012) has used the term ‘preciousness’ when comparing the behaviour and attitudes of university academics with college teachers. He defines preciousness in the following manner:
“Associated with something that is highly treasured, loved, esteemed, or cherished. It carries connotations of something that is excessively elegant or refined. Accordingly, it tends to possess great value, sometimes to the extent of being beyond value. People who might be accused of acting preciously are usually assumed to be affectedly (emotionally) concerned with style, manners, or language. By paying too much attention to such details they are often perceived to be behaving in a very formal and almost unnatural way” (Ballantyne, 2012: 79).

Thus, it can be argued that people who act rather preciously about their role and worth in society will be more likely to display an attitude that is resistant to the views or directions of others. This seemed to be the case with senior doctors. They tended to believe that they knew more than anybody else in the hospital. Their professional achievements, position, knowledge, and experience led them to believe that they could overrule hospital policy and procedures. Two illustrations of this attitude are shown in the quotes below from two different senior doctors.

Interviewee 17: “I know what’s good for my patients. Just because a book tells me what’s right, it really doesn’t make it right. My experience tells me what has worked in the past and I rely on my experience, not that of the book”.

Interviewee 19: "Well, experience seems to have a greater impact on one's decision making. Experience seems to play a huge role I think. Medicine as a whole, not just antibiotics prescribing, if the matter is left to individual choice then the clinicians would back their experience. There has been no evidence of the approval systems being a more effective way of prescribing and hence the clinicians go by their experience”.

This attitude tends to give rise to the belief that senior doctors consider themselves to be near infallible. They are reluctant to admit that they make mistakes, or that they lack knowledge in a particular area of medicine. One senior doctor stated:

Interviewee 24: “We are supposed to be the most intelligent lot in the society and we know what we are doing. So we shouldn’t be treated like kids and have restrictions on antibiotics”.

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This statement gives voice to an attitude that seems to be resentful of control. It amounts to saying that senior doctors know best and should be trusted to make decisions based on their own professional judgement without being monitored or controlled. This seems to indicate a belief that external oversight of their actions amounts to being treated with disrespect. Thus, in the main, senior doctors paid little or no attention to the Infectious Diseases team. Nor did they earnestly seek antibiotic approvals or follow the software GUIDANCE system. These controls were redundant. Their experience out-stripped any direction that could be given by a piece of software, and anyway the ID team members were considered to be inferior in status. As one senior doctor stated:

Interviewee 8: “We are in the field with the patients so we know exactly what’s going on. The ID team just sit in their office looking at books and following the theory.”

This attitude also leads senior doctors to ‘play the blame game’ in the sense that if anything does go wrong within the confines of the hospital, then the blame must lie with others, such as junior doctors, administrators, or managers. In the quote below a senior doctor refuses to accept blame for inappropriate prescription and instead lays the onus on his more junior colleagues:

Interviewee 10: “Junior doctors are the ones that prescribe inappropriately as they are new and restrictions need to be for them and not us.”

This deflection of blame has implications for any remedial measures that may be introduced in an attempt to control such issues, such as training. Thus, another senior doctor argues that it is the junior doctors who need more training and to be watched more carefully.

Interviewee 24: “It’s not us, but it’s the junior doctors that need training and be watched”.

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5.4.2 Work overload

Hypothesis
Clinicians who experience work overload are more likely to resist control measures aimed at inappropriate prescription.

In this section it is argued that those clinicians who experience work overload are more likely to resist control measures aimed at inappropriate prescription. Work overload was a significant issue at the hospital under study. Clinicians often worked long hours, with shifts averaging 12 to 16 hours. It was not uncommon to cover more than one shift due to lack of government funding and a restrictive hospital budget. Under such circumstances, many clinicians suffered from lack of sleep and felt permanently fatigued. One clinician complained:

Interviewee 3: “We are always undertaking extra shifts and are really tired so how can we take time to read and research about new antibiotics?”

Clinicians also work in a busy environment. The different demands on their time are very broad. They attend to a large number of patients, each of whom are possessed of their own individual circumstances and illnesses. In addition, they also have to find room for paperwork and other administrative issues which eat into their time. Accordingly, they tend to suffer not only from work overload but also role overload. This can lead to clinicians feeling constantly harassed. Stress and tension usually accompany this. Often, they have little time to think. Because they operate within this rushed clinical context, doctors will tend to resist any additional impositions on their time, such as checking with GUIDANCE and seeking antibiotic approval. This is just an extra burden for them to carry. If they can avoid it, they will. Instead, doctors will run with what they already know. One clinician commented:

Interviewee 14: “Due to stress and lack of time, clinicians don’t have time to think. They just don’t spend enough time to think about the patient and his disease. They prescribe the first thing that comes to their mind”.

5.4.3 Burdensome nature of control measures

**Hypothesis**

Clinicians are more likely to resist control measures aimed at inappropriate prescription if those measures are inconvenient or burdensome to use.

In this section it is argued that clinicians are more likely to resist control measures aimed at inappropriate prescription if those measures are inconvenient or burdensome to use. Within the hospital it was generally recognised that information technology was in need of improvement. The strength of this argument varied according to the type of personnel. Senior managers were more likely to defend the state of IT than other levels of personnel, probably because not to do so might reflect upon their capability as senior managers. Additionally, clinicians who had worked at other hospitals were able to make a comparison and there was some agreement that compared with other hospitals the IT facilities were acceptable, although in need of improvement. Most complaints involved the lack of computers, their age, lack of user-friendliness, and poor functionality. The system was slow and full of bugs. One clinician commented:

Interviewee 7: “Have you had a look at our computers? It’s so old, looks like they bought it 20 years ago. When you try to login to check something, it freezes for several minutes. The applications are slow, the swipe card for the computers are given to us after several months. Due to this we don’t even try using the computers to learn new stuff”.

One senior manager commented that a new integrated system called BOSS was gradually being introduced to integrate the whole health information system. However, he recognised that problems existed with this system: “BOSS is notoriously unreliable, it crashes all the time, and can make retrieving information quite a tedious process”. This viewpoint found agreement in other circles. Another clinician commented:

Interviewee 23: “I think certainly there are lots of problems with the BOSS system; it doesn’t always do what you want it to do. Things are not just in the correct order and sometimes the buttons just don’t work. Often you are waiting for a long time for things to happen the way you want them to happen”.

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These deficiencies associated with using the software system only compound the resistance of clinicians to adhere to control measures aimed at inappropriate prescription, especially when clinicians are also operating in a context where they feel overworked and time-poor.

5.4.4 Lack of resources

Hypothesis
Clinicians are more likely to resist control measures aimed at inappropriate prescription when they are employed in resource-deficient environments.

In this section it is argued that clinicians are more likely to resist control measures aimed at inappropriate prescription when they are employed in resource-deficient environments. Lack of resources can result in hospital authorities cutting corners in pursuit of cost savings. This puts additional stress and pressure on clinicians. Clinicians can become disillusioned which can lead to a range of attitudes and behaviours such as increased cynicism and suspicion, the spreading of rumours and conspiracy theories, a tendency to play the blame game, an increased incidence of paradoxical messages from management (such as the tension between quality and cost-cutting), and a general increase in resistance behaviour from clinicians.

The hospital lacked a wide range of resources. In the main this lack of resources was enhanced by a perception that government funding was inadequate which directly affected the size of the hospital budget. This was a discourse that was more prevalent in the higher levels of hospital management but was rarely discussed by junior personnel. Thus, one senior manager mentioned:

Interviewee 38: “We are always struggling to get extra funding from the government”.

Any business which is under-funded will inevitably struggle to provide high quality service to its customers. Lack of funding in health care directly causes a lack of resources, lack of time, lack of monitoring, lack of reporting, and even lack of staff
rewards and punishment. Inadequate funding puts pressure on clinicians to move patients through the system at a faster pace, resulting in the prescription of broad-spectrum antibiotics to free up beds and take pressure off other hospital resources. Lack of funding means that clinicians have less time to think, often having to decide immediately what treatment is needed for a particular patient. Another result of lack of funding is that clinicians are often required to cover more than one shift per day, which makes them stressed and tired. This leads to human errors. In short, inadequate funding acts directly to induce hospital authorities and clinicians to act in a manner which is not fully compliant with their motto to do no harm. These issues are elaborated below.

A significant resource deficiency at the hospital was a lack of staff. When staff shortages are acute, clinicians often have to work longer hours and take on extra shifts. One junior doctor commented:

> Interviewee 4: “We are often doing double shifts because of lack of staff.”

Such practices lead to fatigue. Under these circumstances clinicians are often too tired to think carefully about antibiotic prescription and instead resort to habitual behaviour. This is the easy option, and represents a classic case of ‘cutting corners’ as mentioned earlier. For clinicians, researching new and perhaps more appropriate medication is a luxury that they cannot afford, whilst indulging in time-consuming behaviour to login to GUIDANCE and seek approval is inconvenient and burdensome.

The hospital was also short of beds. Clinicians were aware of this. They were also aware of the pressure put on them by hospital management not to slow down the throughput of patients through the system. The longer a patient tied up a hospital bed the more pressure this placed on limited resources. This awareness directly influenced the prescribing behaviour of clinicians.

One means of ensuring that patients did not have prolonged stays at the hospital was to prescribe a broad-spectrum antibiotic. This cures patients faster than narrow-spectrum antibiotics and so ‘frees up’ beds at a faster pace. One clinician commented:
Interviewee 21: “We don’t have enough beds here. So the management wants us to cure the patient and send them home as soon as we can. What do you think we should do then? We prescribe a broad antibiotic so that they go home and not return back to the hospital in a few days”.

This behaviour displays the conundrum in which clinicians found themselves. On the one hand they were being urged to cut back on inappropriate prescription, but on the other hand they were also urged to free up beds as fast as they could. This is an example of ‘paradoxical messages’ mentioned above which only served to increase clinician confusion and uncertainty. Within an environment such as this, counter-productive attitudes and behaviours can often be observed. Clinicians may end up trying to second-guess what the hospital authorities are trying to say. This can lead to a situation of conspiracy theories taking root. Clinicians may be suspicious of what hospital authorities are telling them and instead look for the ‘real reason’ behind official messages. Thus, one clinician commented that it was really the pursuit of cost-cutting measures that drove management policies in regard to inappropriate prescription and not a desire to reduce the incidence of AMR.

Interviewee 11: “Due to lack of funds we are forced to do a lot of things. Even restricting some antibiotics is due to the hospital trying to reduce cost”.

In addition, a wide range of hospital support services are invariably adversely impacted by inadequate funding. Information technology is a prime example of this, but this has already been discussed in an earlier section. In addition, training and education support services at the hospital were a noticeable casualty of this deficiency. Induction training was a rushed process, fitted as it was into a very limited period of time. Presenters gave quick presentations to inductees and followed each other in a procession of over-information. As a result, the junior doctors retained very little of what had been presented to them before they were shepherded out into the busy context of the hospital wards. One junior doctor recalled:

Interviewee 1: “As part of Interns’ junior training we had a discussion about antibiotics. They spoke initially about the GUIDANCE system which is something not used at the moment but were spoken about in orientation during internship”. 
A confusing aspect of this intern’s comment is that although the GUIDANCE system was “spoken about” during induction, this particular intern had never come across the system during their subsequent clinical practice. One senior manager added to this theme by commenting:

Interviewee 37: “We don’t have enough funds to spend a few days in induction and giving training to staff. They need to take some responsibility and learn by themselves”.

This comment shows one of the many instances of playing a blame game amongst different personnel within the hospital. The message given here is that although inadequate funding directly causes inadequate induction and training, then junior doctors must fill this void by themselves by taking on the extra burden of learning by themselves. Implicitly the message is: “if junior doctors do not do this, then they are complicit in not taking responsibility”.

But not only induction training suffered in this climate of funding deficiency but all types of training, including regular training and updates on issues associated with antibiotics and antimicrobial issues. One junior doctor commented:

Interviewee 4: “[The hospital] has not provided any training or education as far as I can recollect. I am sure we have spoken about hand hygiene and use of an effective hand wash and other things in our orientation but that was specific to hand hygiene and not a broader education about anti resistant organisms”.

The general conclusion appears to be that the provision of training and education activities has suffered in a climate of inadequate funding. In the words of one junior doctor “there is no learning culture here”.

Other hospital support services to be impacted by under-funding included measures aimed at monitoring and reporting inappropriate practices. For example, the ID team wanted to institute an antimicrobial stewardship team to monitor and reduce inappropriate prescription. However, budgetary restrictions prevented this. The team would comprise a project manager and other full-time team members. This team would “walk the wards” to keep an eye on antibiotic prescription. This absence frustrated the
ID and GUIDANCE members who realised that such a strategy had a good chance of success if implemented but was hampered by a lack of funds.

Interviewee 40: “Other hospitals have an antimicrobial stewardship team dedicated to keep a watch and control inappropriateness but here we don’t have funds to do that”.

5.4.5 Lack of knowledge and awareness

In this section it is argued that clinicians are more likely to resist control measures aimed at inappropriate prescription if they suffer from a lack of knowledge and awareness. People who lack knowledge and awareness in regard to certain topics generally suffer from enhanced uncertainty. Within the hospital context, those clinicians who tended to lack knowledge and awareness of hospital policies and practices in regards to antibiotics and AMR would tend not to apply control measures (or actively resist them) because their uncertainty inclined them towards habitual practice of the status quo.

Various categories of uncertainty due to lack of knowledge and awareness were discernible in the data. These included lack of knowledge about antibiotics, lack of knowledge about the side effects of antibiotics (such as AMR), lack of knowledge about the ailments of patients, and lack of knowledge about hospital policies and practices (including GUIDANCE and antibiotic policy). Lack of knowledge and awareness appears to be closely related to the level of seniority of clinical personnel. Thus, senior managers and doctors tended to be most aware, whilst junior doctors were least aware. With regards to knowledge of the side effects of antibiotic prescription (especially AMR) the discourse of senior managers revealed strong awareness of the issue. For example, one senior manager commented:
Interviewee 38: “I think it (AMR) has become a very major problem in Australia and proper care should be taken to reduce the spread of these organisms or symptoms for that matter. Incidents relating to these topics always make us think twice about the prescription and that’s why we need to prescribe antibiotics judiciously to try and reduce these incidents as they are becoming very common. Certainly awareness about this topic is very important”.

Other senior managers showed a big-picture grasp of the problem of AMR in terms of its global impact and the difficulty in developing alternative antibiotics because of the time delay and the costly nature of the process.

Interviewee 35: “It's a global problem and it's increasing unfortunately worldwide due to the use of antibiotics for the last 50 years. It is presenting a risk to the patients and it's becoming more of a challenge because the development of new antibiotics often has a timeline of 5 to 10 years and it’s a costly exercise. The bacteria have become more resistant over the years so I am very worried about that. There is also no doubt about the fact that awareness about this topic is very important”.

Other senior managers revealed a tendency to play the blame game by accusing doctors of “not thinking about it enough” and highlighting the difficulty of passing the message down from senior managers to lower levels in the clinical hierarchy.

Interviewee 36: “I think antibiotic resistance is a huge problem in all the hospitals. And doctors don’t think about it enough, unfortunately. You know it’s been my main interest for many years and I have had many conversations with the doctors to reduce the unnecessary prescription of antibiotics”.

This quote shows how difficult the communication process can be in a hierarchical organisation like a hospital and the extent to which management had been struggling “for many years” to get the message about AMR across to clinical personnel. This keen awareness of the problem at senior management level tended not to be shared at lower levels in the clinical hierarchy. One junior doctor stated:

Interviewee 6: “No, I don’t know about the rate of AMR at our hospital. I don’t even think we have a problem as no one has discussed this with us.”
The low level of awareness of the criticality of the issue in their own hospital was highlighted by a response from one intern:

Interviewee 5: “I am not sure what the resistance rate here is or how many antibiotics are being prescribed inappropriately”.

Such lack of knowledge can result in complacency. One clinician believed that AMR was not a problem in the hospital and only occurred elsewhere:

Interviewee 13: “I think we are doing good, inappropriateness happens in other hospitals”.

Amongst junior doctors not only was knowledge and awareness of AMR lacking but also knowledge of the range of different antibiotics that was available. Such lack of understanding tends to be exacerbated by inadequate communication and training. When probed during an interview why he did not prescribe other narrow-range antibiotics, a junior doctor’s answer was:

Interviewee 5: “It’s difficult to know all the antibiotics that exist. No one gives us a session or tells us about new antibiotics”.

An interesting aspect of broad-spectrum antibiotic prescription relates to the frequency with which clinicians are unable to accurately diagnose a certain ailment in a patient. Lack of diagnostic precision leads clinicians to take the easy way out by prescribing a broad-spectrum antibiotic which attacks a wide range of possible infections.

Interviewee 18: “When we don’t know the actual problem that a patient is having, then we give an antibiotic that cures a few diseases”.

The time delay that is involved in accurate diagnosis also has an effect on antibiotic prescription. One clinician mentioned:

Interviewee 22: “The results for the lab tests of the patients take a few days to reach us, so we cannot just not give a patient anything. We need to put them on some antibiotics till the time the results arrive and then we can confirm what’s wrong with the patient”.
With regard to knowledge about the hospital’s restriction policies on antibiotics it was again noticeable that senior management and pharmacists possessed the most knowledge whilst junior doctors possessed the least. Awareness of the existence of GUIDANCE and antibiotic restriction policies was very vague amongst junior doctors. One junior doctor summarised this situation as follows:

Interviewee 7: “You wouldn’t adhere to something when you don’t know about it. So educating the clinicians is very important about a policy or system”.

Other end-users were aware of a policy but had little knowledge of how it operated. One respondent claimed that his ignorance was due to others in the hospital being responsible but not himself:

Interviewee 2: “I am aware that there is a policy but have limited knowledge about the policy because everything is managed by my residents so I don’t go into the details.”

One significant aspect of clinicians’ lack of awareness (especially amongst junior doctors) relates to the fact that they are absorbed most of the time with the details pertaining to individual patients. A big-picture awareness would require practitioners to ‘lift up their heads’ and start making connections between individual practices, and the implications of these at an organisational, national, and international level. Doctors try to do the best they can for the patient they are confronted with at any given moment of time. It is sometimes difficult for them to resist the temptation to prescribe an antibiotic for a certain patient (which would almost certainly cure that patient) on the grounds that this practice is contributing to a wider spread of AMR. In other words, reconciling the micro with the macro levels can be a difficult exercise.

This scenario can (and does) present serious tensions in senior doctors, but junior doctors also exhibit further sets of constraints. Junior doctors are more ready to admit that they do not know everything. However, they are keen to learn from their mistakes. Making mistakes and learning from them is an accepted practice in many learning organisations. Within the hospital context, the lack of adequate training and education together with the low level of experience of interns and residents leads them to believe that the only way for them to learn is to make mistakes. Unfortunately, if this is taken as
the norm within a hospital environment, then learning from mistakes can significantly contribute to inappropriate prescription of antibiotics and lead junior doctors into a habit of ignoring clinical guidelines and policies.

Interviewee 4: “Yes, we might make mistakes in prescribing but we learn from them, how else do you think we can learn?”

Another intern related this practice of learning through mistakes to the “scary” nature of the hospital environment when they first arrive:

Interviewee 1: “It’s scary when we arrive here, we have no experience with patients so we need to prescribe and learn.”

In any organisation it is expected that those employees who are new and inexperienced will soon be socialised into the existing organisational culture. Organisation culture can be defined as the norms, values, understandings, beliefs, knowledge and behaviour of the employees in an organisation (Samson & Daft, 2012). New employees quickly learn how the organisation operates and how the rest of the employees think and behave. They realise that they have to fit in to “the way we do things around here” otherwise they risk being ostracised within the organisation. Of particular significance within any organisation are the opinion formers and role models. The attitudes and behaviours of such key personnel tend to be copied by new entrants. These significant members of the organisation occupy a privileged role in the organisation’s structure and culture, so it makes sense for newcomers to observe them and copy their habits.

This analysis is just as relevant to hospital culture as it is to any other organisation. Imitation of colleagues plays a vital role in the hospital culture, especially powerful and successful colleagues. Junior doctors become aware of the prescription habits of the senior doctors and take this as the norm. Initially, due to their inexperience and lack of knowledge, interns tend not to be aware that senior doctors are not following prescription policy properly. However, if and when they do acquire such awareness, it is invariably too late. Their habits have been established and they have no desire to clash with their senior colleagues or to be seen as questioning their authority and experience. Adaptation to careless prescription practices becomes the norm. One intern commented:
Interviewee 6: “This is the way everyone does it, so I learn from them”.

Another emphasised how they are led by their senior role models and how endemic the culture of not asking questions had become:

Interviewee 3: “I just follow what my seniors tell me, I don’t question them. They have more experience, so they will know the best”.

However, as analysed previously, senior doctors resist control measures for a very different reason, namely they do not want their professional judgement to be compromised by a computer software system. They are the experts, they know best, and they expect to be trusted to prescribe antibiotics according to their experience. However, this tends to involve habitual behaviour of what has worked in the past and due to their busy schedules they have very little time to read up on research about new antibiotics.

Interviewee 24: “There is no learning culture here, no one helps and asks questions. This has been happening for some time now and it’s just difficult to change it”.

Another significant aspect of the level of uncertainty amongst junior doctors relates to the practice of rotation to which these doctors are subject. Most of the junior medical staff are required to rotate every few months to different departments within the hospital and this can prove to have problematic consequences. Frequent rotation adds to the confusion and information overload to which such doctors are subject. This system means that just when they are becoming acclimatised to one department they can be moved to another. In addition, each department has its own means of prescribing medication. For example, patients in emergency or surgery tend to need more antibiotics than patients in other departments. In particular, interns complained that these differences and discrepancies between departments added to their confusion.

Interviewee 5: “There is no standardisation of antibiotics in this hospital. Every department prescribes differently, so it gets confusing at times”.

The rhetorical question posed by some respondents followed the line of:
Interviewee 9: “If some departments prescribe a lot of broad antibiotics and some do not, then how can we know what we should be doing?”

Interviewee 4: “I have been rotated to the emergency department and they prescribe broad antibiotics every day and no one cares or keeps a watch, so then we get used to it and learn from them”.

Most of the junior doctors were not only rotated between departments, but in their first two years of work they were usually rotated from one hospital to another. This caused difficulties, because each institution had its own policies, procedures, monitoring practices, and software.

Interviewee 2: “It’s strange that every hospital has a different patients’ record, they use different technology and their restrictions on antibiotics are different. When we get used to a policy or some antibiotics, then we move hospitals. What I couldn’t prescribe easily in XX hospital, I can do that here”.

Some clinicians cited this frequent displacement as one reason why they did not follow one particular hospital decision support tool. Why should they bother to learn one approach if soon they would have to adapt to another? In addition, adapting to each new hospital was made more problematic as the induction process at each institution was often very short.

Interviewee 3: “When we know in the next 3 months we are going to be shifted to another hospital, why should we take time in understanding the restriction on antibiotics?”

5.4.6 Lack of repercussions

Hypothesis

Clinicians are more likely to resist control measures aimed at inappropriate prescription if there are no repercussions for such behaviour.

In this section it is argued that clinicians are more likely to resist control measures aimed at inappropriate prescription if there are no repercussions for such behaviour.
Many industries and professions tend to possess detailed systems for performance management aimed at encouraging appropriate behaviour through relevant motivational tools and punishment implications. However, behavioural repercussions tended to be lacking at the hospital. One senior manager commented:

Interviewee 37: “There is no carrot and stick here. People need to be punished, I have been saying this to them for a long time now”.

The behaviour of human beings is, in large part, determined by the consequences of that behaviour (Skinner, 1953). Behaviour that gets rewarded tends to be repeated, whilst behaviour which receives no rewards, or which receives negative consequences tends to suffer from extinction. Clinicians are no different in this aspect. Within the hospital there existed a distinct lack of reward for doing the right thing. This tended to leave clinicians demotivated. Their opinion was expressed “why should we even try to do the right thing if we are not rewarded (or even simply acknowledged) for doing so?” However, at the same time, just as rewards are incentives for positive behaviour, there needs to be punishment for doing the wrong thing. Clinicians were generally of the opinion that no such punishment existed.

Interviewee 10: “No one is being punished for prescribing inappropriately which is wrong. Why is no one punishing these people?”

Despite what some senior managers and pharmacists related during their interviews, many end-users insisted that they were not even told they were doing the wrong thing, let alone being punished for such behaviour. This was due to a lack of monitoring and reporting.

Interviewee 23: “No one keeps a watch on what’s happening”.

It is the hospital system’s responsibility to monitor prescription habits, identify any emerging issues, and take steps to deal with inappropriate prescribing if and when it occurs. Clinicians need to be told that hospital management takes this issue seriously, and that the clinician’s prescription behaviour will be monitored on a continuous basis during their employment at the hospital. Adherence to such practices tended to be patchy.
Interviewee 39: “They need a watch dog otherwise they will not change”.

5.4.7 Lack of responsibility

**Hypothesis**
Clinicians who are reluctant to accept responsibility for their own actions are more likely to resist control measures aimed at inappropriate prescription.

In this section it is argued that clinicians who are reluctant to accept responsibility for their own actions are more likely to resist control measures aimed at inappropriate prescription. In the absence of effective monitoring and reporting systems, combined with a lack of repercussions for slating back inappropriate behaviour to certain clinicians, then it is far easier for individual personnel to indulge in a blame game of assigning responsibility to others within the hospital system for mistakes and omissions. Playing the blame game was endemic within the hospital. It was noticeable that every group of people blamed the other for inappropriate prescribing. Very few individuals or groups were ready to accept responsibility for their own actions. A junior doctor commented:

Interviewee 2: “We follow whatever our seniors tell us. We cannot question them”.

A senior clinician commented:

Interviewee 24: “It’s not us, it’s the junior clinicians who have no knowledge and prescribe whatever they like”.

A senior manager commented:

Interviewee 40: “It’s the consultants who prescribe based on their own experience and have an attitude not to change their behaviour”.

Other respondents blamed senior managers for not keeping an accurate watch. Additionally, non-end-users were accused of having no practical experience, of sitting
in their offices, and having the gall to try to lecture to experienced practitioners. Other respondents put the blame on lack of resources within the hospital, whilst others adopted a more macro blame game by pointing to the habits within developing countries relating to excessive prescription.

But clinicians are not exempt from blaming the behaviour and expectations of patients themselves for causing the problem. This is often related to cultural norms within society which help to perpetuate a power imbalance between patients and doctors. Society places clinicians on a pedestal. Patients tend not to question clinicians due to the trust, belief, and respect that society has in them. Doctors are intelligent, always right, and know better than others. Therefore, this perception of clinicians as all-knowing and infallible plays a vital role in the way both patients and clinicians behave. It does appear that as clinicians know that in most instances they will not be asked anything by the patient, they prescribe whatever they like. Despite the veracity of this argument, it is also noticeable that patients expect to be prescribed relevant medication, including antibiotics whenever they meet their physician, and put pressure on their clinician, either explicitly or implicitly. These expectations of patients are sometimes blamed for inappropriate prescription. Clinicians feel that if they do not prescribe antibiotics their patients might judge them not to be good doctors.

Interviewee 9: “The patients put a lot of pressure on us to prescribe antibiotics. If we don’t prescribe, they think we are not good doctors”.

Clinicians may prescribe antibiotics as the easy way out just to placate a patient, even if the antibiotic is not actually needed.

Interviewee 23: “I just spent over half an hour trying to convince a patient that he doesn’t need an antibiotic and it was really hard doing that. It would have made my life much easier to prescribe so that I don’t have to deal with him for that long. In most of the cases we have to give antibiotics to make the patient happy as he is expecting it”.

But an additional problem, according to clinicians, is that even if an antibiotic is prescribed, the patient often nullifies the beneficial effects by starting and stopping the course of medication according to their own whims.
Interviewee 15: “The patients start and stop their antibiotic course whenever they like and that leads to antimicrobial resistance.”

5.5 Strategies

Strategies are defined by Strauss and Corbin (1998:133) as “purposeful or deliberate acts that are taken to resolve a problem”. In this section, five strategies are identified and presented to improve the phenomenon of inappropriate prescription: clinicians’ resistance to control measures. This set of strategies is shown below:

- Change to hospital culture
- Improved funding
- Antimicrobial stewardship (AMS)
- Clinician education and training
- Providing incentives

5.5.1 Change to hospital culture

There exists a complex mixture of elements that have created an adverse culture within the hospital that encourages clinicians to display resistance to control measures. Strategies that aim to address the phenomenon of inappropriate prescription: clinicians’ resistance to control measures should show a strong tendency to reforming this adverse culture. Although the word ‘culture’ is used in this context, in reality the hospital represents a set of different sub-cultures of which the demarcation between junior doctors, senior doctors, pharmacists, and senior management is a key element. There is little evidence of a collegial professional culture operating in the hospital.

Communication between sub-cultures tends to be poor. The blame game is endemic. Accepting responsibility for one’s own actions is not immediately observable. Name-calling and buck-passing seem to be normal activities. Junior doctors are fearful and overworked. Questioning others is an activity that they quickly learn not to practice. They receive inadequate formal induction, training, or education in many aspects of their work. They tend to learn from their senior colleagues about prescription habits and
other clinical practices. However, these same senior doctors tend to exhibit an attitude of preciousness whereby they ‘know it all’ and assume a swagger in their behaviour that displays an aura of hubris and arrogance. Exhibiting superior behaviour is not generally conducive to fostering a collegial environment. At the same time these attitudinal and behavioural patterns are interpreted by senior managers and pharmacists as clinicians being ‘stubborn’. They are viewed as people who do not want to learn and who are stuck in paradigms governed by their past experiences. In turn, this tends to foster the lack of a learning culture at the hospital. This is exacerbated by a general lack of resources and funding so that the hospital is unable to afford regular and up to date education, training, and induction activities. In addition, performance management is an integral aspect of the human resource policies of many organisations, but was noticeably absent in the hospital.

Repercussions for good and poor behaviour were not observed. Incentives and punishments were, in equal measure, not part of the culture, so that ‘nobody seems to care or notice’ became a common comment. Suspicion and lack of trust are also aspects of this adverse culture. Thus, some clinicians always seem to distrust the motives of senior managers, for instance, clinicians who believe that restrictions on prescription are due to managerial cost-cutting initiatives and efforts to reduce or remove the professional autonomy over decision making possessed by clinicians, thus reducing them to the role of middle managers who robotically carry out instructions devised by managerial ‘others’ from higher up in the bureaucratic hierarchy.

This panoply of cultural deficiencies combine to create and maintain an overall clinicians’ resistance to control measures aimed at inappropriate prescription. Using the language of the corporate world, it could be reliably concluded that the hospital was in need of a business transformation aimed at cultural change. The literature is not short of cultural change theories (Dunphy & Stace, 1990; Whiteley, 1995; Bate, 1994). With specific reference to changing the culture of hospitals there has been a recent movement towards implementing lean systems within the health environment, pioneered by the Virginia Mason Medical Center in Seattle, USA (Kenney, 2011). In some respects the lean culture builds upon the past management literature in relation to quality management.
However, none of the interviewees in this research study made any mention of quality management or lean systems, which could perhaps be taken as another indication of the lack of education and training activities carried out at the hospital, as well as a deficiency in awareness of broader international trends.

5.5.2 Improved funding

In section 5.4 it was argued that clinicians are more likely to resist control measures aimed at inappropriate prescription when they are employed in resource-deficient environments. Lack of resources bears a direct correlation with lack of adequate government funding and smaller than required hospital budgets. Within the hospital there was widespread agreement that inadequate funding resulted in a shortage of staff, lack of beds, out-dated information technology, inadequate training, education, and induction, and poor monitoring and reporting practices.

Given this scenario it would be straightforward to suggest that an appropriate strategy would be to increase the funding available to the hospital. However, given the situation facing the funding providers (in this case the Victorian State Government) such a suggestion could easily be dismissed as facile given the many competing funding alternatives that are available from a limited supply of State funds. Perhaps a more acceptable alternative to the strategy of handing out the begging bowl for more Government funding would be for the hospital to directly contribute to increasing its own budget through its own individual efforts. This would require the hospital identifying other funding sources. This could be combined with increased efforts on the part of the hospital to make wiser use of the funding it does possess. This could involve a range of measures to identify and eliminate non-value-adding activities (sometimes referred to as waste) which could free up resources and funding to be used in more appropriate ways. As above, this would involve activities which fall under the umbrella term of lean management (Womack & Jones, 1996) or six-sigma methods (Arthur, 2011). Such methods are now widely advocated within the healthcare literature, together with other management and performance-improving activities (Munro, 2009; Lighter, 2010; Bisgaard, 2009), but again it is indicative that such topics were not raised during interviews at the hospital.
5.5.3 Antimicrobial stewardship (AMS)

In section 5.4 it was noted that one of the casualties of under-funding related to the institution of measures aimed at monitoring and reporting inappropriate prescription practices. For example, the Infectious Diseases team and the GUIDANCE project group wanted to institute an antimicrobial stewardship team to monitor and reduce inappropriate prescription. However, budgetary restrictions prevented this. A senior manager bluntly reported the reality as follows:

Interviewee 39: “We know that we need to have an antimicrobial stewardship team in place but we have no funding to implement it now”.

This frustrated the ID and GUIDANCE members because they realised that such a strategy had a good chance of success if implemented. As noted in chapter 1, the health systems of most countries, including ACSQHC (2011), recommend the implementation of antimicrobial stewardship teams to improve the prescribing habits of, and act as support systems for, clinicians. AMS programmes have proved to be effective in reducing antimicrobial use, inappropriate prescribing, institutional bacterial resistance rates, mortality and morbidity rates, and healthcare costs (DHAC-DAFF, 2000; Hammerum, 2007; Harbarth et al., 2001; McGowan, 1987; Monnet, 2007; Monnet et al., 2004; Webber, 2006). Based on international evidence, there is no reason to believe that an AMS team would not prove to be an effective strategy at the hospital where this study was conducted. Such a team would perform a range of duties. It could monitor all antibiotics prescribed by looking at patients’ medical charts to determine if the medication is appropriate. Incidents of inappropriate prescribing would be readily identified and action taken to prevent it reoccurring. The team could also provide assistance to clinicians as and when required, either face to face or over the phone. It could answer queries in regard to any antibiotic. This support would help clinicians make more informed prescribing decisions and also provide them with reassurance that they can draw upon the knowledge and expertise of a dedicated team should they need help.

This team would need to work full time and conduct walk-ins daily to check antibiotics’ charts themselves instead of waiting for clinicians to call them. It would also need to
report to the clinicians directly on the rates of inappropriate prescribing and antimicrobial resistance on a regular basis. Such feedback would also need to be provided to each head of department. This strategy could also enable clinicians to feel that they are achieving their goals and receiving enough support and encouragement from senior management. The concept of an AMS team walking the wards to keep an eye on antibiotic prescription is, however, a strategy that would probably meet with resistance at the hospital due to the belief that it undermines senior doctors’ clinical autonomy. Box 5.1 details some of the main advantages of an AMS program and recommendations for their implementation.
### Box 5.1
**AMS recommendations by ACSQHC**

**Key points**
- Effective antimicrobial stewardship programs have been shown to improve the appropriateness of antimicrobial use, reduce patient morbidity and mortality, and reduce institutional bacterial resistance rates and healthcare costs.
- The overall accountability for antimicrobial management control lies with the hospital administration. They should be responsible for ensuring an antimicrobial stewardship program is developed and implemented, and outcomes are evaluated.
- International literature strongly suggests that the most effective approach to antimicrobial stewardship involves multidisciplinary antimicrobial stewardship teams with the responsibility and resources for implementing a program to improve antimicrobial prescribing.
- The support and collaboration of the hospital executive is essential to the success of antimicrobial stewardship teams, and clear lines of accountability to the hospital executive should be defined.
- Successful stewardship programs include a range of interventions. Two of the most effective strategies are restrictive methods, such as requiring approval to prescribe an antimicrobial, and the proactive strategy of prospective review with direct intervention and feedback to the provider.
- Teams are more likely to be effective in leading and sustaining changes in clinical practice if they have access to, and training in, effective quality improvement methods and knowledge.

**Recommendations**
- Hospitals have an antimicrobial stewardship program that includes an antimicrobial prescribing and management policy, plan and implementation strategy that are regularly reviewed.
- Hospitals have an antimicrobial formulary and guidelines for antimicrobial treatment and prophylaxis that align with Therapeutic Guidelines: Antibiotic and are regularly reviewed.
- Hospitals establish a multidisciplinary antimicrobial stewardship team that is responsible for implementing the antimicrobial stewardship program. At a minimum, the team should include either an infectious diseases physician, clinical microbiologist or nominated clinician (lead doctor), and a pharmacist.
- The antimicrobial stewardship program resides within the hospital’s quality improvement and patient safety governance structure and is included within the hospital’s quality and safety strategic plan.
- Antimicrobial stewardship teams have clearly defined links with the drug and therapeutics committee, infection prevention and control committee, and clinical governance or patient safety and quality units.
- Team members have clearly defined roles and responsibilities. Team members should be sufficiently supported and trained to enable them to effectively and measurably optimise antimicrobial use by using interventions appropriate to local needs, resources and infrastructure.
- Antimicrobial stewardship process and outcome indicators are measured and reported to the hospital executive.

Source: ACSQHC (2011)
5.5.4 Clinician education and training

In section 5.4 it was argued that clinicians who lack knowledge and awareness are more likely to resist control measures aimed at inappropriate prescription. Lack of knowledge and awareness was noted in regard to several aspects of clinical practice including lack of knowledge about antibiotics, lack of knowledge about the side effects of antibiotics (AMR), lack of knowledge about the ailments of patients, and lack of knowledge about hospital policies and practices (including GUIDANCE and antibiotic policy).

In response to these deficiencies a strategy of increased education and training of clinicians would be required across the hospital. This should begin at induction so that new interns are made fully aware of hospital policies and decision support systems regarding the prescription of antibiotics and AMR. Since current induction activities involved ‘too much too soon’ it would be more beneficial to spread such sessions over a longer time period. One intern expressed a common viewpoint as below:

Interviewee 4: “We need more time during our induction. We cannot understand all the policies and procedures in just a few hours.”

Second, monthly or quarterly hospital-wide education sessions on inappropriate prescription and AMR at the local level could be implemented. These sessions would make clinicians aware of the rate of inappropriate prescription at their own hospital and highlight the importance and significance of this issue.

Interviewee 7: “We need training and education on a weekly or monthly basis. We have no lectures, no tutorials, nothing at this hospital”.

Third, clinicians should receive training as and when new antibiotics become available. This education would ensure that they are aware of alternative treatments and encourage them to change their prescriptive behaviour. Knowledge of other antibiotics could mean that clinicians would most often choose to prescribe the most appropriate medication, rather than the most comfortable and familiar. This training needs to be continuous so that information is not forgotten and that clinicians become aware of new antibiotics (and also new IT prescribing tools) in the ever expanding marketplace.
Interviewee 13: “This hospital has not helped me in educating me in terms of antibiotics or antimicrobial resistance. Whatever I know, it’s from my medical school.”

When clinicians operate in a context of uncertainty and confusion due to lack of knowledge and awareness they tend to be forced into learning by socialisation, as occurs at the hospital. As previously argued, this socialisation process tends to be led by senior clinicians whom junior doctors defer to in terms of prescription practices. The strategy of formalised training, however, would tend to break this reliance in the sense that clinicians would be better informed through formal activities (thus bolstering their confidence) rather than turning to informal learning through the practices of others.

However, once again, the introduction of more comprehensive training, education, and induction activities was hampered by a lack of adequate funding.

5.5.5 Providing incentives

In section 5.4 it was argued that clinicians are more likely to resist control measures aimed at inappropriate prescription if there are no repercussions for such behaviour. It was noted that there was little evidence of performance management techniques at the hospital. To alleviate this void, an appropriate strategy would be to introduce a comprehensive performance management and reward system at the hospital. Incentives, bonuses, and rewards are motivating factors for employees in most industries. Rewards can be extrinsic (bonuses, promotion) or intrinsic (praise, satisfaction). Not only does such feedback motivate clinicians to continue with this behaviour, but also provides reassurance that they are doing the right thing in their medical roles. Just as positive prescriptive behaviour should be encouraged and rewarded, so inappropriate prescriptive behaviour should be reprimanded. Clinicians who frequently prescribe antibiotics inappropriately need to be informed that their behaviour is not acceptable, and that they will be monitored to ensure that they change their prescribing behaviour.
5.6 Consequences

Strauss and Corbin (1990:106) define consequences as the outcomes of the strategies “taken in response to, or to manage, a phenomenon”. In relation to their example of pain resulting from a broken leg, one of the consequences of taking action to alleviate the pain is relief. As shown in section 5.5, five strategies were identified and presented to improve the phenomenon of inappropriate prescription: clinicians’ resistance to control measures – change to hospital culture, improved funding, antimicrobial stewardship team, clinician education and training, and providing incentives. It is argued that each of these strategies, if successful, would help to manage the phenomenon of clinicians’ resistance to control measures impacting adversely on inappropriate prescription. In this section, five overall consequences are identified and presented as outcomes from each of the separate strategies presented in section 5.5. This set of consequences is shown below:

- Synergetic hospital culture
- Enhanced resource base
- Improved antimicrobial stewardship
- Better informed clinicians
- Incentivised work environment

5.6.1 Synergetic hospital culture

In section 5.5 it was argued that a strategy of changing the hospital culture could be adopted and implemented. If successful, such a strategy could be expected to result in the following improvements to the hospital culture, thus introducing more synergism into the environment - more collegiality, better communication, reduction of the blame game, accepting responsibility, less fear, more questioning, less preciousness, less stubbornness, stronger learning culture, less suspicion, and more trust.
5.6.2 Enhanced resource base

In section 5.5 it was argued that a strategy of improved funding could be adopted and implemented. If successful, such a strategy could be expected to result in the following improvements to the resource base of the hospital – more staff, more beds, more modern information technology, enhanced training, education, and induction activities, and more effective monitoring and reporting practices.

5.6.3 Improved antimicrobial stewardship

In section 5.5 it was argued that a strategy of introducing antimicrobial stewardship could be adopted and implemented. If successful, such a strategy could be expected to result in the following improved outcomes at the hospital – reduction in antimicrobial use, inappropriate prescribing, institutional bacterial resistance rates, mortality and morbidity rates, and healthcare costs.

5.6.4 Better informed clinicians

In section 5.5 it was argued that a strategy of clinician education and training could be adopted and implemented. If successful, such a strategy could be expected to result in clinicians who are more informed about several aspects of clinical practice such as antibiotics and their side effects, patient ailments, and hospital policies and practices. In consequence, clinicians who are more informed, knowledgeable, and aware could be expected to display less confusion, more confidence, and more certainty in their clinical practices, including antibiotic prescription.

5.6.5 Incentivised work environment

In section 5.5 it was argued that a strategy of providing incentives could be adopted and implemented. If successful, such a strategy could be expected to result in a fairer work environment with more motivated staff where doing the right thing becomes a normal part of clinical practice.
5.7 Summary

This chapter has constituted the findings section of the thesis. The paradigm model has been explained in detail as it relates to the phenomenon of *inappropriate prescription: clinicians’ resistance to control measures*. Each of the major components of the paradigm model has been explained sequentially – phenomenon, context, conditions, strategies, and consequences.

The next chapter, chapter 6, focuses on those theoretical themes which have emerged from the thesis findings. In particular, the identification of the phenomenon of *inappropriate prescription: clinicians’ resistance to control measures* places emphasis on the resistance exhibited by clinicians to any attempts by hospital authorities to control their prescriptive behaviour. Resistance to change is a topic that has enjoyed significant attention and popularity in the literature. The next chapter will commence the process of comparing the findings of the thesis with the literature on resistance to change. Of particular interest in this regard is not just the general literature on resistance to change but also the literature on why change is resisted by senior professional staff such as clinicians. Of even more specific interest is the resistance to change exhibited by clinicians when that change agenda threatens to control activities which would otherwise be the prerogative of their individual professional judgement.
Chapter 6
Resistance to change
Chapter 6
Resistance to change

6.1 Chapter overview

This chapter focuses on the theoretical themes that have emerged from the thesis findings. As shown in chapter 5, the thesis has identified the phenomenon of inappropriate prescription: clinicians’ resistance to control measures. This places emphasis on the resistance exhibited by clinicians to any attempt by hospital authorities to control their prescriptive behaviour. Strauss and Corbin (1990:49-50) state that “If, after completing your study, you find that your emergent theory has some relationship to already recognized and developed theory, then you may want to use yours to extend the other” (italics added). This direction provided by Strauss and Corbin clearly states that the relationship between the researcher’s emergent theory and the nature of the extant literature should be examined after the study has been completed. Box 6.1 explains the reasons for such an approach.

Box 6.1
Literature review after the study has been completed

…there is no need to review all of the literature beforehand (as is frequently done by researchers trained in other approaches), because if we are effective in our analysis, then new categories will emerge that neither we, nor anyone else, had thought about previously. We do not want to be so steeped in the literature as to be constrained and even stifled in terms of our creative efforts by our knowledge of it! Since discovery is our purpose, we do not have beforehand knowledge of all the categories relevant to our theory. It is only after a category has emerged as pertinent that we might want to go back to the technical literature to determine if this category is there, and if so what other researchers have said about it.

Source: Strauss and Corbin (1990:50)

This approach is further re-iterated by Strauss and Corbin in their second book (1998:51-52) where they provide additional advice as to what they mean by extending
the literature: “When an investigator has finished his or her data collection and analysis and is in the writing stage, the literature can be used to confirm findings and, just the reverse, findings can be used to illustrate where the literature is incorrect, is overly simplistic, or only partially explains phenomena…[it] allows for extending, validating, and refining knowledge in the field”.

Thus, in line with this advice by Strauss and Corbin, the purpose of this chapter is to analyse the extant literature relating to resistance to change. This analysis will then be employed to extend, validate, and refine knowledge in the field, either by confirming relevant aspects of the literature or by illustrating where the literature is incorrect, overly simplistic, or partial. The structure of this chapter is shown in figure 6.1.

**Figure 6.1**

**Chapter overview**
6.2 Resistance to change

Resistance to change is defined in numerous ways in the literature. Some examples are shown below, namely:

- ‘All behaviours, events and social formations that challenge or disrupt prevailing power relations and the norms that sustain and reproduce them’ (Bordo, 1993:199).
- ‘A reactive process where agents embedded in power relations oppose initiatives by other agents’ (Jermier et al., 1994:9).
- ‘Any conduct that serves to maintain the status quo in the face of pressure to alter the status quo’ (Zaltman & Duncan, 1997:63).
- ‘Employee behaviour that seeks to challenge, disrupt or invert prevailing assumptions, discourses and power relations’ (Folger & Skarlicki, 1999:36).
- ‘Is the same as commitment to the current state’ (Armenakis, Harris, & Field, 2000:99).
- ‘Negative actions and non-action, ill will and resentment, and defensive or confrontational dispositions’ (Starr, 2011:647).

Implicit within these various definitions is the idea that resistance to change is the action of holding onto the status quo by adopting a defensive disposition within a system displaying different degrees of power. Resistance can vary from passive to aggressive (Kotter & Schlesinger, 1979), and involve acts of omission and commission (Ashforth & Mael, 1998). Some analysts regard resistance to change to be a disadvantageous aspect of organisational life, using terms such as disobedient (Piderit, 2000), obstacle (Kotter, 1995), enemy of change (Schein, 1988), willingness to deceive (Shapiro, Lewicki, & Devine, 1995), aggression and frustration (Coch & French, 1948), instabilities (Ansoff, 1988), unreadiness (Armenakis, Harris, & Mossholder, 1993), and challenge and disrupt (Bordo, 1993; Folger, & Skarlicki, 1999). Other analysts, in contrast, regard resistance to change in a more positive light. Weisbord (1987) regards resistance as a valuable asset that shows the passion of people, and managers should see possibilities in being able to channel this more constructively. In the same vein, Henry (1997:145) recognises that resistance does serve a function in organisations and “should not be feared or suppressed, but rather viewed as a normal phenomenon”.
Mariotti (1996:30) paints a gloomy picture about the general incapacity of most people to readily accept change. Quoting an anonymous source he states “the only one who likes change is a wet baby”. The literature is well-endowed with a range of reasons why employees resist change. The most common explanations are shown in box 6.2.

**Box 6.2**

**Reasons for resistance to change**

**Habit:** people derive comfort from what they know and understand. This acts as a guide to their behaviour and decision-making in the sense of ‘we’ve always done it this way’.

**Inconvenience:** change can introduce problems and troubles associated with learning new skills, adopting new behaviours, and adapting to new situations.

**Uncertainty:** people have a fear of the unknown. New ways can be strange and threatening – ‘better the devil you know’.

**Inability to change:** some people have a low tolerance, and innate dislike, of change. Their need for structure and security is high.

**Feelings of loss:** some people have a strong affinity with tradition and view the past through ‘rose-tinted-spectacles’. They tend to mourn for the way things were previously.

**Self-interest:** people often associate change as a threat to their self-interest, in that they potentially stand to lose what they already possess – jobs, skills, power, status, prestige, social relationships.

**Lack of trust:** employees sometimes do not trust the motives or statements of management. There may exist an ‘us-and-them’ attitude, often based on historical experiences.

**Control:** some people associate change with control and resent being manipulated and not in control of their own destiny.

**Misunderstanding:** some people may have misunderstood various aspects of the change due to poor communication.

**Perceptions:** different people have different perceptions of what they regard as the real need for change, as well as the methods of change and the goals to be achieved. They become aware of flaws or defects in the change program.

**Institutional inertia:** over time, organisations develop webs of understanding and commitments between people which promote regularity of social behaviour

**Sunk costs:** some organisations are less able to change because they have sunk costs in previous investments that need to be recouped.

6.3 Barriers to change

Carnall (1990) recognises the challenges that are created by change. Change has a paradoxical role in that it can bring stress and anxiety on the one hand but also opportunities on the other hand.

Effective organisation structures are more conducive to change. It is easier to implement change in a more, rather than less, effective setting. Moreover, organisational culture and management style have an important effect, by creating a climate supportive of change (Carnall, 1990:37).

Employee resistance, cultural disruption, lack of agreement, ineffective planning, poor communication, lack of appropriate skills, and pressure are some of the barriers to change for an organisation (Forsyth, 2012). Brown (2004) demarcates two types of barriers to change – organisational and individual. Organisational barriers are of three main types: unclear objectives, inappropriate structures, and poor communication.

- Unclear objectives: when people are unclear about what they need to do then they are less likely to support the change. Employees need to know what the organisation expects them to do over a given time. For an organisation to be effective the change objectives need to be specific, measurable, achievable, realistic, agreed, and regularly monitored.
- Inappropriate structures: organisations need to adapt their structure to the change. The organisation needs to ensure that the structure a) matches and supports the change objective, b) eliminates any conflicts or barriers between departments and functions, and c) contains a balanced view between the people, process, resources, and finance.
- Poor communication: employees often complain about not being told about the change process and not being kept in the loop. They can feel that the organisation does not trust them to make a contribution. This is one of the most common factors to barriers to change.

In addition, Brown (2004) states that there are four types of individual barriers to change – people’s perceptions, fear of the unknown, parochialism, and lack of trust.
People’s perceptions: over time individuals create their own perceptions based on their ideas, values, and the environment. These perceptions can create cognitive blinders. Individuals will tend to resist any change that attempts to unsettle their comfort zone.

Fear of the unknown: organisations rarely make clear and detailed announcements about change events. This vacuum can lead individuals to create their own beliefs which can easily become translated into their own reality.

Parochialism: when individuals become settled into their jobs they may engage in such behaviours as creating patterns and processes for themselves in terms of their day-to-day realities. This sense of parochialism can lead them to brand any disturbance to this pattern as a threat to their environment.

Trust: trust is built over time and requires patience. It is built on positive events and experiences over an extended period. Any anticipation of a negative effect resulting from change can be seen as a betrayal of their trust in the organisation.

6.4 Blockages to change

Carnall (1990:37) argues that there are several “blocks” which can hinder creative thinking and problem-solving during a change event and, as a result, result in resistance to change. Adams (1987) recognises five types of blocks – perceptual, emotional cultural, environmental and cognitive. Some of the more significant properties of these blocks are depicted below.
Carnall (1990) recognises that there are various types of organisational actions (mainly perpetrated by authority figures such as managers) which by their very nature are likely to discourage creativity and problem-solving and thus result in resistance to change. In contrast, a range of organisational actions can be identified that are more likely to encourage creativity and problem-solving and thus are likely to reduce resistance to change. These two types of organisational actions are shown in box 6.4.
Box 6.4
Actions which encourage and discourage creativity during change

<table>
<thead>
<tr>
<th>Actions encouraging creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay loose in thinking until rigour is needed</td>
</tr>
<tr>
<td>Protect new ideas from criticism, be optimistic, suspend disbelief</td>
</tr>
<tr>
<td>Acknowledge good ideas, listen, show approval, build on ideas</td>
</tr>
<tr>
<td>Eliminate status or rank</td>
</tr>
<tr>
<td>Support confusion, uncertainty, and learning from mistakes</td>
</tr>
<tr>
<td>Focus on the good aspects of an idea, do not evaluate too early</td>
</tr>
<tr>
<td>Share the risks</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Actions discouraging creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interrupt, criticise, mock, disagree, argue, challenge, pull rank, show anger</td>
</tr>
<tr>
<td>Be competitive, dominant, pessimistic, negative, distant, point out flaws</td>
</tr>
<tr>
<td>Inattention, not listening, using silence against people</td>
</tr>
<tr>
<td>Insist on ‘the facts’, give no feedback, act in a non-committal fashion</td>
</tr>
</tbody>
</table>

Source: Carnall (1990:42)

6.5 Psychic prisons

Morgan (1997:215) states that “human beings have a knack for getting trapped in webs of their own creation”. He refers to this through the metaphor of an organisation as a ‘psychic prison’.

“[O]rganisations are ultimately created and sustained by conscious and unconscious processes, with the notion that people can actually become imprisoned in or confined by the images, ideas, thoughts, and actions to which these processes give rise. The metaphor encourages us to understand that while organisations may be socially constructed realities, these constructions are often attributed an existence and power of their own that allow them to exercise a measure of control over their creators” (Morgan, 1997:215).
The notion of a psychic prison is important because it can illustrate how people “become trapped by constructions of reality that, at best, give an imperfect grasp on the world” (Morgan, 1997:216). In particular, people can “become trapped by favoured ways of thinking ... [that] contributes much to our understanding of why people often find it so difficult to change” (Morgan, 1997:216).

There are many concepts within the management and organisational literature that exemplify the notion of a psychic prison. The most significant of these are identified and elaborated below: allegory of the cave, childhood socialisation, circus elephant syndrome, learned helplessness, habitus, discourse, paradigms, active inertia and the Icarus paradox, dominant logic, groupthink, frames, and culture.

6.5.1 Allegory of the cave

Human beings think, act, and react largely in accord with their past and current experiences. Truth and reality are two concepts heavily caught up in the nuances of philosophical thinking. Baggott (2005), quoting Plato, states that human beings can never hope to understand the true nature of reality because we are locked in the prison of our mortal senses. We are, in effect, all prisoners in a cave. Plato (Lee, 1955: 278) asks us to imagine a number of prisoners who have always lived in a cave, shackled so that they can only look forward to where they see reflected shadows dancing on the wall in front of them caused by a fire (of which they are unaware) constantly burning behind them. Because they have always lived in the cave they know no different than the ‘realities’ of life which they see played out before them. But should one prisoner break free from his chains and turn around he would see that the shadows are merely images of the prisoners themselves projected by the fire onto the far wall. His previous beliefs are now exposed as only illusions. When the prisoner Stumbles out of the cave he will become aware of a completely different world made up of colours, dimensions, artefacts, and different types of humans and animals. He will realise that all of his previous beliefs stem solely from his situated position within the cave, unaware and unknowing. He would have a desire to return to the cave where he would enlighten the prisoners about the illusions they suffer. Such an action is foolish. The prisoners, still shackled to their positions (and beliefs) would think that the ex-prisoner had been
turned mad by his experiences. He now thinks differently to them. Accordingly, the prisoners gang up on the ex-prisoner and kill him (Robinson, 1992; Hall, 1980; Kim, 2004; Thomson, 2001; McNeill, 2003).

### 6.5.2 Childhood socialisation

Plato’s simile of the cave has many applications to organisational and extra-organisational life. The concept of humans being trapped within a set of beliefs originating from their past experiences can have profound implications for the way we behave. In particular, childhood experiences can play a significant role in moulding our worldview and how we each view the world around us. The effect of childhood socialisation on the actions and beliefs of the grown adult has been recognised by Ignatius Loyola, founder of the Jesuit Order, in his dictum “give me the child until he is seven and I will give you the man” (Ignatius Loyola, 1941-1956). Nebauer (2011) offers a simple story to illustrate the importance of the issue.

“I was talking to a man the other day who told me that he never finished projects. He would move from one project to the next without completing them. This was frustrating him and he wanted to move forward from this. It turned out that when he was young his father had asked him to do a project in the backyard. When it was completed, his father laughed at the finished project, labelling it ‘stupid’. Unconsciously, the little boy came up with a clever plan. He decided that if he never finished projects, he could avoid this judgement. This belief was incorporated into his worldview – in how life works” (Nebauer, 2011:18).

### 6.5.3 Circus elephant syndrome

The circus elephant syndrome (Elliott, 2011) also illustrates this state of adult helplessness caused by the capturing of the mind whilst young. If a baby elephant is chained to a stake, it quickly learns that it has no freedom and that attempts to escape (by continually pulling on the chain) can cause pain. Accordingly, the elephant walks round and round the stake according to learned behaviour. If, at a later stage, the chain
is replaced by a thin piece of rope from which the elephant can easily escape, it is often observed that the animal makes no attempt to do so. The elephant’s mind has been captured and controlled by the belief that no reality exists beyond the stake. A state of helplessness has been generated cognitively.

6.5.4 Learned helplessness

In like manner, the concept of ‘learned helplessness’ was first described during the 1960s and refers to the following scenario – “when experience with uncontrollable events leads to the expectation that future events will elude control, disruptions in motivation, emotion, and learning may occur” (Peterson, Maier, & Seligman, 1993:vii). It was observed that when a rat is confined in a cage from which it cannot escape, when that rat is subject to a random electric shock it will react with violent behaviour (running, climbing, etc) to try to escape the shock. The same behaviour is observed in repeated experiments when the rat is subject to a random shock. Eventually, however, the rat learns that escape is never possible. At a certain stage the rat remains passive and suffers the shock in a defeated manner without moving. If that rat is now transferred into a different cage from which escape is possible, it is observed that the rat’s state of dejection and impassivity continues in the sense that when a random shock is delivered the rat makes no attempt to escape (even though it is possible). The rat has learned that helplessness is its normal state of reality. This concept of ‘learned helplessness’ is therefore a cognitive notion in reaction to past experience. In a like manner, this concept can also be observed in humans and has been linked to the cause of ailments such as depression (Seligman, 1975). The mind has been captured and moulded to believe that no matter what one does, there is never any relief to be obtained.

6.5.5 Habitus

The importance of early childhood experiences and unconscious family socialisation in guiding future behaviour is stressed by Bourdieu (1991) through the concept of ‘habitus’. The habitus is a set of dispositions which incline people to act and react in certain ways during the course of their daily lives. The habitus provides people with a ‘feel for the game’ and a ‘practical sense’ of what is appropriate in certain
circumstances and what is not. These dispositions are ingrained and seem altogether natural. They are the site of incorporated history but also act to reproduce that history. It is important to note that such dispositions are of a pre-reflexive, involuntary, and entrenched nature, which are inculcated through numerous processes of experience, training, and learning. These dispositions tend to be durable. They endure throughout a person’s life history, invariably operating in a pre-conscious manner that often defies conscious reflection and modification. However, the habitus can be modified by ongoing experiences and encounters in the world. The habitus is generally referred to not as a principle of determination, but rather as a generative structure. It orients the actions and inclinations of an individual without strictly determining them.

6.5.6 Discourse

Discourse is referred to as “practices that systematically form the objects of which they speak” (Foucault, 1972:49). In this sense, discourse shares a basis with other concepts presented above which deal with the construction of reality through cognitive and social processes, and the creation of truth in the eyes of the beholders. Viewed in this manner, discourse reflects certain ways of thinking and behaving. It frames ideas, opinions, and concepts and, by so doing, it structures, constrains, and restricts the perceptions of people caught within the discourse. So the way in which people understand and assign meaning to the world around them is through the discourse of which they are a participant. Discourse does not reflect reality; it creates reality for its participants. In this sense, Foucault (1981:67) regards discourse as “a violence we do to things…a practice which we impose on them”.

Discourse is created by power holders. Prevailing truths merely reflect the version of events that is postulated by the current holders of power. Power struggles are continually taking place between different sections of power holders to determine whose version of reality will become dominant. The preferred version at any moment of time is referred to as the dominant discourse and is promulgated by the extant holders of power. Less preferred versions are referred to as alternative discourses. Foucault regards discourses as being in a state of permanent struggle with each other, with alternative discourses looking to overcome the extant dominant discourse and take its place in a
role of dominance. In this way, the history of society or organisations can be viewed as an endless process of discourse struggles for dominance.

Once a discourse becomes dominant, the power holders attempt to keep it in a position of dominance by silencing alternative discourses. Only preferred statements, behaviours, and attitudes are allowed to be circulated. The rest are silenced through the creation of ‘taboos’ (in modern parlance, often referred to as ‘political correctness’). People indulging in taboo behaviour are silenced by the fear of being labelled as a troublemaker or dissident. Sometimes they can be demonised as crazy, or ‘mad’. People outside the discourse can suffer various forms of punishment. At the most extreme they can be killed or incarcerated. Within an organisation they can be dismissed from their job or denied promotion. Less severe, but equally effective, punishments would involve people being ostracised by their colleagues or friends. The power holders invariably act to institutionalise the discourse by appointing only ‘experts’, that is others who engage in the same discourse, (some would say yes-people) to key positions of authority within the society, such as judges, teachers, religious leaders, managers, politicians, and so on. Through their statements and actions these ‘experts’ continually reinforce what is regarded as ‘good or true’, thus highlighting alternative actions and statements as ‘bad or evil’. At its most extreme, this approach can take on the form of ‘moral relativism’ whereby nothing is regarded as inherently good or bad, or true or evil, but merely the effect of the current discourse.

6.5.7 Paradigms

Kuhn (1970) coined the term ‘paradigm’ to refer to the set of shared beliefs or conventional wisdoms that constitute ‘normal science’ at any point in time in relation to a particular aspect of science. ‘Normal science’ means “research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice” (Kuhn, 1970:10). Normal science (the current paradigm) is normally passed on to others (such as students) in the form of textbooks which articulate the current state of the science and expound the body of accepted theory. Exponents of the current paradigm constitute the ‘experts’ who usually have a vested interest in the continuation of the
normal science, such as academic professors, journal editors and reviewers, and scientific practitioners. These experts occupy power positions within the scientific and social hierarchy. For this reason, the current paradigm is often exceptionally difficult to change. Critics of the current paradigm can suffer the same fate as people who exist outside the dominant discourse – being labelled as crazy, or suffering incarceration, ostracism, or even death. The history of science contains many such examples, such as the movement from divine creation to the Darwinian theory of evolution, or the shift from the Ptolemaic view of the universe (earth-centred) to the Copernican view of the universe (sun-centred) in astronomy. A change in paradigm is notoriously difficult to achieve when it has its roots in religious belief. The mere promulgation of different ideologies can be labelled as blasphemy in some societies, which still carries with it the death sentence.

The concept of a paradigm has also found a niche within management theory and practice. Within an organisation, a paradigm is referred to as a set of managerial core beliefs and assumptions that fashion an organisation’s view of itself and its environment (Johnson, 1992). The paradigm is essentially cultural in nature: it operates deeply and unconsciously and defines in a taken-for-granted manner how the organisation operates. The paradigm is reflected in all aspects of an organisation’s elements, such as its power structures, organisational structures, control systems, rituals and routines, stories and myths, and symbols. Once a paradigm is in place, it acts as a filter for making sense of the various and confusing signals an organisation faces. Because everything is filtered through the current paradigm, an organisation never sees the actual truth of what is going on – only the sanitised and politically correct interpretations that remain after ‘data’ has been drawn through the paradigm filter. The organisation then acts upon this ‘data’. Thus, the paradigm is both a device for interpretation and a formula for action.

6.5.8 Active inertia and the Icarus paradox

Strong organisational paradigms possess the disadvantage that managers who have succumb to the current paradigmatic way of thinking can tend to become stuck in the same modes of thinking and working that brought them success in the past. Operant conditioning (Skinner, 1953) tells us that when people get rewarded for certain
outcomes and behaviours, they will tend to repeat that behaviour in the future. Accordingly, when the business environment changes, managers can react by simply accelerating all their tried-and-true activities that brought them success in the past. They have a tendency to follow established patterns of behaviour. However, in the face of change, what was a winning formula in the past can become a recipe for failure in the future. This concept is called ‘active inertia’ (Sull, 1999). In the face of active inertia, those successful elements of the past can quickly become corrupted, for example, strategic plans can become blinders, processes can become routines, relationships can become shackles, and values can become dogmas.

A concept closely associated with active inertia is that of the ‘Icarus paradox’ (Miller, 1990) which refers to the paradox that a person’s greatest asset can easily turn into their greatest weakness in the face of rapid environmental change. Once a person experiences success this can lead to the development of hubris. Such strengths can seduce a person into excesses or cause blind spots that lead to their demise. A feeling of superiority can give rise to the abandon that can cause their downfall. This paradox owes its veracity to the tale of Icarus whose waxed wings gave him the asset of flight and a sense of superiority over his fellow mortals. However, his abandon led him to fly too high and too close to the sun, so that his waxed wings melted and he plunged to his death.

6.5.9 Dominant logic

Very few events in our day-to-day life-world are regarded as so unique that we need to deal with them through rational or scientific study. Instead, they are processed through pre-existing knowledge systems, or schemas. A schema is a belief, theory, or proposition developed over time based on an individual’s personal experiences. In effect, a schema is a mental map which allows a person to conceptualise the world and make relevant decisions. Schemas serve the purpose of permitting people to categorise an event, assess its consequences, and consider appropriate actions (including doing nothing). Dominant logics can apply to an individual, or to an organisation, or to a group of people. In the area of organisations, dominant logics are particularly important in relation to managers who are all trained to follow a company mindset or vision in cultural terms. In regard to managers, dominant logic refers to their mental
representation of how the company works in relation to its environment. It represents their worldview based on historical environments rather than current ones and results from learned problem-solving behaviour. This logic is usually stored as a shared cognitive map among the dominant coalition of managers (Prahalad & Bettis, 1986).

Prahalad and Bettis (1986) state that dominant logic evolves through four separate processes: operant conditioning, paradigms, pattern-recognition, and cognitive biases.

- **Operant conditioning** (Skinner, 1953): this refers to the concept that behaviour is a function of its consequences. Behaviour that gets rewarded gets repeated. Thus, people repeat behaviour that has been successful in the past, and for which they have been rewarded.

- **Paradigms** (Kuhn, 1970): this refers to a set of shared beliefs and conventional wisdoms that are regarded as normal, and define and manage our world as a basis for action.

- **Pattern-recognition**: this refers to basing our actions on recognising patterns in life which act as a vocabulary for making effective decisions by comparing different patterns (in the same manner that chess players recognise patterns of the pieces on the board and use these to plan their next move).

- **Cognitive biases**: this refers to the observation that people often defer to simple heuristic principles when trying to simplify a complex problem. Such an example might involve stereotyping people, such as red-haired people usually having fiery tempers.

### 6.5.10 Groupthink

Groupthink has been pioneered by Irving Janis (1972, 1982) and refers to faulty decision making within a highly cohesive group of similar minded people who do not possess sufficient diversity to ensure effective debate. What is observed within such a group is a “deterioration of mental efficiency, reality testing, and moral judgement” in the interest of maintaining group solidarity (Janis, 1972:9). There are several characteristics of groupthink (Janis, 1982):
Conformity and self-censorship: group members feel pressure to conform and adopt group norms by suppressing their own individual or differing views. No doubts or contrarian ideas are expressed against the illusion of unanimous group solidarity for fear of being labelled weak, soft, a dissident, trouble-maker, disloyal, or a non-team player.

Morality: group members adopt judgemental or superior attitudes towards other groups or institutions, labelling them as the enemy, evil, weak, unintelligent, spiteful, or stupid. Accordingly, they often ignore the consequences of their actions.

Invulnerability: group members become overly optimistic, believing that they are invincible and can overcome any challenge. This can lead them to take excessive risks and ignore possible warnings.

Mind guards: group members protect the group from information that is contradictory to their views, so that opposing or critical ideas are dismissed, ignored, or scoffed at and the holders of those ideas are ostracised or sidelined.

6.5.11 Frames

One of the adverse consequences of people being trapped within psychic prisons is that they are not in the best position to see problems in a new light. The world is a complex place with many demands upon our decision making skills. We invariably try to make sense of a complicated world by bringing our own mental models to bear on the task. Inadvertently, we do not see the external world as a true image of reality. Instead, we make the world conform to our own internal maps (schemas) as a personal interpretation based on what we expect and want our world to resemble. Bolman and Deal (1997) use the term ‘frames’ as the devices that humans use to help us to order experience and decide what to do. Frames are windows on the world. They are also the lenses that bring the world into focus. In the same vein as paradigms, frames act to filter out some things whilst allowing others to pass easily through. Thus, frames do not necessarily reveal the truth of any situation. On the contrary, they merely reflect the prejudices and blind spots of the holder. When a person’s frame is too narrow, this can lead to myopic analysis and decision making (short-sightedness) whereby a person
becomes too wedded to traditional thought processes. This can lead to a failure to meet the demands of changing environments (Hassard & Sharifi, 1989).

Bolman and Deal (1997) demarcate four different frames through which people (especially managers) view the organisational world in which they operate. The structural frame views the world through the lens of rules, roles, goals, policies, and so on. The organisation is seen as a factory or a machine. The challenge of leadership is one of social architecture by attuning structure to task, technology, and environment.

The human resource frame views the world through the lens of needs, skills, and relationships. The organisation is seen as a family. The challenge of leadership is one of empowerment by aligning organisational and human needs. The political frame views the world through the lens of power, conflict, competition, and politics. The organisation is seen as a jungle. The challenge of leadership is one of advocacy by developing an agenda and power base. Finally, the symbolic frame views the world through the lens of culture, meaning, metaphor, ritual, ceremony, stories, and heroes. The organisation is seen as a carnival, or a temple, or theatre. The challenge of leadership is one of inspiration by creating meaning, faith, and beauty.

Bolman and Deal (1997) suggest that most people (managers) view the organisation through a limited number of frames (usually only one). As a result, their view of the world is distorted and incomplete (although not necessarily wrong). Effectiveness can be improved when managers are able to ‘reframe’ that is, to see the world through multiple frames simultaneously. One adverse consequence of not being able to reframe is that when facing uncertainty or novelty people will not develop new solutions but repeat past actions and patterns of behaviour. The flexibility for divergent responses is not part of their cognitive armoury. As a result, their narrow frame ends up clouding rather than illuminating (managerial) action. Narrow frames blind people and managers to the nature of messy reality so that their world becomes one of frustration, defensiveness, and failure. In contrast, multiple frames open up more possibilities so that the world potentially becomes more exciting with wider opportunities.
6.5.12 Culture

Culture can be regarded as the shared values, understandings, beliefs, norms, behaviour, and way of thinking among the members of an organisation or society (Kilmann et al., 1986; Robin & Coulter, 2005; Haviland, 2002; Ember & Ember, 1996). However, different authors define culture in different ways, some of which are illustrated below:

- “how we do things around here” (Samson & Daft, 2012:89)
- “the collective programming of the mind that distinguishes the members of one organisation from another” (Hofstede, 2001:39)
- “learned and shared human behaviours and ideas” (Miller, 2002:388)
- “the way of life characteristics of a particular human society” (Nanda & Warms, 2002:420)

Schein (1992, 1993, 1996a, 1996b) analyses culture based on three different levels:

- Level 1 is the surface level of visible artefacts which can be seen by people from outside the organisation such as the way of dressing, manners, behaviours, physical symbols, office layout, symbols, slogans, or ceremonies.
- Level 2 is a deeper level of expressed values. These are not seen by the outside world but are the values, ideologies, and norms that members of the organisation hold at a conscious level and justify for what they do.
- Level 3 is the deepest level of underlying assumptions and beliefs. These are subconscious thoughts and feelings that provide the core elements of culture and guide the employees’ decisions and behaviours.

Further detail about the nature of the visible artefacts within organisations is provided by Samson and Daft (2012) as follows:

- Symbols: unspoken messages, objects, or events that convey meanings and values to others, such as the company logo or a mental image that employees have about an organisation.
Stories: narratives based on true stories that are repeated throughout the organisation by employees and which are rich in culture and carry meaning and identity to new employees.

Rituals: practices that are repeated continually by employees, which are usually not written down but give a clear message about the organisation’s values.

Slogans: phrases that express the organisation’s values, which are usually written down and are used to convey a meaning to their employees.

Ceremonies: activities that make up an event which usually benefit employees, such as awards night, end of year party, or quarter kick-offs.

Organisational cultures can become firmly embedded and entrenched and form powerful inertial structures which generate strong resistance to change. The assumptions underlying culture can sometimes be taken for granted and fade from consciousness, but remain powerful phenomena (Hassard & Sharifi, 1989). Managers and employees operating in a strong company culture can become personally committed to such beliefs and reproduce them many times, especially if they have been rewarded for such beliefs in the past. As previously argued, it is a natural inclination to adhere to beliefs that have been effective in the past. As a result, managers and employees can often miss the relevance of new cultural beliefs because their vision has been formed according to an exclusive set of cognitions.

6.6 Power

Wood et al. (2013:376) define power as “the ability to get someone else to do something you want done, or the ability to make things happen or get things done in the way you want”. These authors emphasise that the essence of power is control over the behaviour of others. An important issue is the manner in which power and influence are intertwined with each other.

“Power is the force that makes things happen in an intended way; influence is a behavioural response to the exercise of power – that is, influence is an outcome achieved through the use of power. Managers use power to achieve influence over other people in the work setting” (Wood et al., 2013:376).
Power can come from a variety of sources. Probably the most influential theory of power belongs to that of French and Raven (1959) who identified six sources of power: reward, coercive, legitimate, referent, expert, and informational.

- **Reward:** power based on the ability to provide tangible rewards, acceptance, or approval.
- **Coercive:** power based on the ability to provide rejection, disapproval, punishment, or threats.
- **Legitimate:** power based on one’s formal position within an organisation, such as a manager, whose authority is recognised and who is expected to be obeyed.
- **Referent:** power based on a person’s sense of identification with, and respect for, another person.
- **Expert:** power based on a person’s knowledge, skills, or experience.
- **Informational:** power based on the ability to persuade or provide information to allow someone to make a decision.

People who enjoy power, and are thus able to influence the behaviour of others, tend to occupy higher status levels in an organisation or in society than those people who are less powerful. Accordingly, change is perceived as a threat to their personal wellbeing and it is likely that they will display higher levels of resistance to change.

### 6.7 Competing commitments and big assumptions

Kegan and Lahey (2001) have suggested that a psychological dynamic called a ‘competing commitment’ may play a significant role in explaining why many people may display resistance to change. The authors suggest that even though many people in organisations might be supportive of a particular change initiative and want it to succeed, they still drag their feet in what might at first sight seem like classic resistance to change but is in fact because they are secretly harbouring another (competing) commitment towards which they are “unwittingly applying productive energy” (Kegan & Lahey, 2001:85). Therefore, the competing commitment conflicts with the drive towards the stated change initiative, thus cancelling it out. An example might be a project leader who is dragging their feet in delivering on the project in hand even
though they are enthusiastic about its success. This could be because the project leader fears that success in this project might lead to an even tougher assignment that they feel they cannot handle.

The authors give two examples of competing commitments at work. John strongly believes in open communication and close working relationships. Despite this he frequently indulged in sarcastic behaviour which resulted in his colleagues keeping their distance from him. John was frequently counselled about this, and although his behaviour did improve in the short term it always returned back to the norm. Why did John act against a principle that he believed in? It turned out that John is a person of colour who works with largely white colleagues. He felt that if he became too close to his white colleagues this would signify a lack of loyalty to his own racial group. Thus, he held a competing commitment of loyalty to his own racial group that conflicted with his belief in open communication and close working relationships. A second example relates to Helen, a valued supervisor in a manufacturing company, who reports to her manager Andrew. She is given a project to speed up delivery of a product to a valued customer. She supports the project’s aims and agrees that the company cannot afford to lose the customer. Despite this, she is tardy in her application of improvements, despite counselling. Why is Helen behaving this way? It turns out that Helen is content to remain subordinate to Andrew and fears that if she succeeds in the project then she will tend to be regarded as a peer of Andrew’s and not his subordinate. Helen would feel uncomfortable in this changed positioning of subordinate and superior. Accordingly, she acts in such a manner that undermines the company’s primary goal, despite the fact that she supports it, because she harbours a competing commitment to remain subordinate to Andrew.

Competing commitments sometimes reflect embarrassing personal issues that relate to a person’s sense of wellbeing, and which they wish generally to keep hidden as a form of self-protection.
“While primary commitments nearly always reflect noble goals that people would be happy to shout from the rooftops, competing commitments are very personal, reflecting vulnerabilities that people fear will undermine how they are regarded both by others and themselves. Little wonder people keep them hidden and hasten to cover them up” (Kegan & Lahey, 2001:88).

If competing commitments are a form of self-protection then what, ask Kegan and Lahey (2001), are people protecting themselves from? For the authors, the answer lies in the concept of the ‘big assumptions’.

“[Big assumptions] are deeply rooted beliefs about themselves and the world around them. These assumptions put an order to the world and at the same time suggest ways in which the world can go out of order. Competing commitments arise from these assumptions, driving behaviours unwittingly designed to keep the picture intact” (Kegan & Lahey, 2001:88).

Thus, in the case of John, his competing commitment (“I am committed to maintaining a distance from my white colleagues”) is underlain by his big assumption (“I assume I will sacrifice my racial identity and alienate my authentic connection to my own community if I get too integrated with the mainstream”). In the case of Helen, her competing commitment (“I am committed to not upsetting my relationship with my boss by leaving the mentee role”) is underlain by her big assumption (“I assume my boss will stop supporting me if I move towards being his peer”). Kegan and Lahey state that big assumptions are often unconscious to the person concerned and they act upon them without full realisation of what they are doing and why. Big assumptions often reflect “deep-seated fears or insecurities, highly discouraging or simplistic views of human nature, or perceptions of their own superior abilities or intellect…[they] reflect the very human manner in which we invent or shape a picture of the world and then take our inventions for reality” (Kegan & Lahey, 2001:88,91).
6.8 Personal compacts

Strebel (1996:87) defines a personal compact as an agreement between an employee and an organisation about the “reciprocal obligations and mutual commitments, both stated and implied, that defines their relationship”. A personal compact forms a solid bond between employees and organisations, the security of which often constitutes the basis for continuous and trusting relationships between the two entities. Both know what is expected of the other and their attitudes and behaviours reflect this state of certainty. However, when changes occur within the context of the workplace they can, and do, have serious impacts upon the nature and security of the personal compacts already in place:

“Corporate change initiatives, whether proactive or reactive, alter their terms. Unless managers define new terms and persuade employees to accept them, it is unrealistic for managers to expect employees fully to buy into changes that alter the status quo” (Strebel, 1996:87).

Three major dimensions are shared by compacts in all companies – formal, psychological, and social. These are shown in box 6.5.
Box 6.5
Dimensions of a personal compact

<table>
<thead>
<tr>
<th>Formal</th>
<th>Psychological</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is the most familiar aspect of the relationship between employees and employers. For an employee it captures the basic tasks and performance requirements for a job as defined by company documents such as job descriptions, employment contracts, and performance agreements. It answers such questions as: what am I supposed to do, what help will I get, how will my performance be evaluated, and what will I be paid?</td>
<td>This dimension addresses aspects of the employment relationship that are mainly implicit. It incorporates the elements of mutual expectation and reciprocal commitment that arise from feelings like trust and dependence between employee and employer. Though often unwritten, this dimension underpins an employee’s personal commitment to individual and company objectives. Management expect employees to be loyal and committed in their attitude and behaviour. Employees ask such questions as: how hard will I really have to work, what recognition will I get for my efforts, and are the rewards worth it? Individuals formulate responses to these questions largely through their relationship with their immediate boss. A manager’s sensitivity to this dimension is crucial in gaining commitment during change events.</td>
<td>This dimension reflects how employees gauge an organisation’s culture. The company’s vision, mission, values, and goals are tested against what the company actually does. Does the company practice what it preaches? How does the company really work as opposed to what the company rhetoric says about how it works? Mismatches between words and deeds are carefully noted by employees. Misalignments indicate a poor culture. This dimension tends to be undermined most during a change event when conflicts arise and communication breaks down. It is also the dimension along which management’s credibility, once lost, is most difficult to recover.</td>
</tr>
</tbody>
</table>

Source: Strebel (1996:87-88)

The main message behind this personal compact approach is that change efforts will fail unless those compacts already in place are revised. Many management teams simply expect employees to change their attitudes and behaviours once a seemingly rational argument for change has been communicated to them. However, such attitudinal and behavioural changes will not occur unless they are accompanied simultaneously by a
deliberate attempt to revise personal compacts to line them up with the requirements of
the newly changed situation.

6.9 Overcoming resistance to change

Because of the significance of resistance to change, Kotter and Schlesinger (1979) state that it is important for managers to be aware of the various strategies that could be employed to assist in efforts to overcome such resistance to change. The authors suggest six different ways in which to deal with resistance to change (Kotter & Schlesinger, 1979:109-112):

- **Education and communication**: this involves educating people about the change beforehand. Communication of ideas helps people see the need for change and the logic that lies behind it. This could involve one-on-one discussions, group presentations, or memos and reports.

- **Participation and involvement**: this is a method of involving potential resistors in some aspect of the design and implementation of the change. By such a strategy people can feel some ownership of the change effort without the belief that it is being imposed on them.

- **Facilitation and support**: this involves helping people through the change process by such methods as providing training in new skills, listening and providing emotional support through counselling, and allowing time off to address stress or anxiety.

- **Negotiation and agreement**: this involves offering incentives to active or potential resistors, such as a pay rise or early retirement benefits.

- **Manipulation and co-optation**: this involves covert measures to reduce resistance and normally involves the very selective use of information and the conscious structuring of events. Co-optation usually involves giving powerful resistors a desirable role in the design or implementation of the change, not because the company values that advice but because it wants the endorsement of that person.
Explicit and implicit coercion: this involves forcing people to accept the change either by explicitly or implicitly threatening them with adverse consequences, such as loss of their job or reduction in promotion possibilities.

It will be noticed that these strategies involve both soft (education and communication, participation and involvement, facilitation and support) and hard (negotiation and agreement, manipulation and co-optation, explicit and implicit coercion) approaches to overcoming resistance to change. Kotter and Schlesinger (1979) stress that none of these strategies is essentially superior to any of the others. Whichever strategy is chosen depends on the situation facing any particular company at any point in time. It is a common mistake of many managers to use only one approach or a limited number of them regardless of the situation. Instead, managers should learn to appraise each situation and employ that strategy (or strategies) most applicable to that unique scenario. This choice is shown in table 6.1.
## Table 6.1
Methods for overcoming resistance to change

<table>
<thead>
<tr>
<th>Method</th>
<th>Commonly used</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and communication</td>
<td>Where there is a lack of, or inaccurate, information and analysis</td>
<td>Once persuaded, people will often help with implementing the change</td>
<td>Can be very time-consuming if lots of people are involved</td>
</tr>
<tr>
<td>Participation and involvement</td>
<td>Where the company does not have all the information it needs, and where potential resistors are powerful</td>
<td>Participation often brings commitment, and people’s advice can be integrated into the plan</td>
<td>Can be very time-consuming if participators design an inappropriate change</td>
</tr>
<tr>
<td>Facilitation and support</td>
<td>Where people are resisting because of adjustment problems</td>
<td>No other approach works as well with adjustment problems</td>
<td>Can be time-consuming and expensive</td>
</tr>
<tr>
<td>Negotiation and agreement</td>
<td>Where some people would lose out and have considerable power to resist</td>
<td>Sometimes it is a relatively easy way to avoid major resistance</td>
<td>Can be too expensive if it alerts others to negotiate for compliance</td>
</tr>
<tr>
<td>Manipulation and co-optation</td>
<td>Where other tactics will not work or are too expensive</td>
<td>Can be a relatively quick and inexpensive solution to resistance</td>
<td>Can lead to future problems if people feel manipulated</td>
</tr>
<tr>
<td>Explicit and implicit coercion</td>
<td>Where speed is essential and resistors are powerful</td>
<td>Speedy and can overcome most kinds of resistance</td>
<td>Can be risky if people feel aggrieved with the initiators</td>
</tr>
</tbody>
</table>

Source: Kotter and Schlesinger (1979:111)

### 6.9.1 Re-building self-esteem

Carnall (1990) suggests that a major source of resistance to change comes from the loss of self-esteem that can afflict people when they feel that the certainty of their life-world (in which they have often invested a lot of time and effort) is under threat. Accordingly,
resistance to change can potentially be overcome by employing strategies that aim to re-build the self-esteem of affected resistors. Accordingly, Carnall (1990:119) suggests that people have four main categories of need that must be re-built during a period of change. These are the need for:

- **Intelligible information**: this involves data and information that explains the scenario in terms they can understand
- **Skills**: this involves learning new skills in both the technical (new job prospects) and emotional (coping with stress and anxiety) areas
- **Support**: this involves practical help from others about how to deal with their problems
- **Empathy**: this involves others trying to understand the situation in which resistors are placed and aligning themselves with how they construct their world

### 6.9.2 Establishing everyday trusting management styles

Kogan Page (1993) suggests that resistance to change is often related to the state of trust that has been built up between managers and employees during periods of relative calm and status quo situations. Everyday management styles can create a scenario where employees feel less necessity to resist on-going change. Consequently, managers who are trusted are less likely to encounter resistance to change during change events. Managers who are trusted often display the following characteristics:

- Know their team individually and how they influence each other
- Communicate regularly with their team
- Regularly accessible
- Create an atmosphere of trust
- Establish themselves as a manager who listens and cares
- Prepared to fight for resources
- Always supports their team

By incorporating these points into everyday management styles managers can create an atmosphere in which workgroups will more readily respond to being led through
change. Kogan Page (1993) suggests that change is easiest to achieve when all are working together with the same objectives in mind. This scenario can only be achieved under a certain set of contextual circumstances, especially when resistors:

- Understand the big picture and what it is meant to achieve
- Can visualise themselves as they will be after the change
- Feel their personal security and esteem is not in doubt
- Are involved in planning and implementing the change at an early stage
- See the change as an opportunity for self-development

### 6.9.3 Challenging competing commitments and big assumptions

In section 6.7 it was seen how Kegan and Lahey (2001) suggested that resistance to change could be ascribed to a psychological dynamic called a ‘competing commitment’. Although people may be in support of the objectives of a particular change initiative, they may unwittingly be nullifying this support by directing their productive energy towards a hidden competing commitment. Behind this competing commitment lies a ‘big assumption’ in the form of a belief held by an individual person about how the world should, and does, work. In combination, competing commitments and big assumptions result in a type of immunity to change on the part of many people. To overcome this immunity to change, Kegan and Lahey (2001) argue that effective managers should assist people to bring to the surface, and challenge, these personal limitations which inhibit their ability to change. Uncovering competing commitments can be achieved through the process of asking a series of questions directed at the people concerned, preferably within the context of a group diagnostic exercise. Ideally, “several volunteers make their own discoveries public – so people can see that others, even the company’s star performers, have competing commitments and inner contradictions of their own” (Kegan & Lahey, 2001:87). A series of four questions is recommended:

1. *What would you like to see changed at work so that your work could be more effective and satisfying?* Respondents usually reply with a complaint about an issue they care passionately about. For example, Tom, a project leader, may state
‘my subordinates keep me out of the loop about important developments in the project’.

2. *What commitments does your complaint imply?* In response, Tom may reply ‘I believe in open and candid communication’.

3. *What are you doing, or not doing, that is keeping your commitment from being more fully realised?* The response to this question usually unearths the type of undermining behaviour involved. For example, Tom may reply ‘when people bring me bad news I tend to shoot the messenger’. Tom may now admit ‘I need to stop doing this’.

4. *If you imagine doing the opposite, can you identify in yourself any discomfort, worry, or fear?* Tom may reply ‘I’m worried about hearing a problem that I can’t fix’.

Accordingly, Tom has identified his competing commitment ‘I am committed to not learning about problems that I can’t fix’. The next step to uncover the big assumption that lies behind the competing commitment is to ask Tom to complete the sentence: ‘I assume that if I did hear about problems that I can’t fix then …’. Tom may respond ‘people would discover that I’m not qualified to do my job’. Thus, what lies behind Tom’s immunity to change is a deep-seated insecurity that he has been promoted to a level that his qualities cannot sustain. Overcoming his resistance to change lies in a strategy of re-training and education whilst bolstering his self-esteem.

### 6.9.4 Revising personal compacts

In section 6.8 it was seen how the fracturing of personal compacts during a period of change can lead to resistance to change. Accordingly, Strebel (1996) argues that managers should pay close attention to a process of revising personal compacts if they wish to minimise individual and group resistance. Such revisions of personal compacts should occur in three phases:
i. Leaders draw attention to the need for change and establish the context for revising compacts.

ii. Leaders initiate a process in which employees are able to revise and buy into the new compact terms.

iii. Leaders lock in commitments with new formal and informal rules.

Each of these phases should be approached systematically by creating explicit links between employees’ commitments and the company’s change outcomes. To illustrate this process in action, Strebel (1996) uses the example of cultural change at the Dutch company Philips from 1990 onwards. The competitive landscape had changed around Philips which had been an enormously successful company for many decades but was now facing serious challenges. The personal compacts of the employees were still firmly embedded in the status quo culture which had served the company well in the past but was now in need of revision. Philips’ new CEO, Jan Timmer, started out by first getting the attention of managers and employees and then seeking to revise their personal compacts. His approach was described as ‘shock treatment’:

The company’s top 100 managers attended an off-site retreat at Philips’ training centre at De Ruwenberg:

a. It was explained that the company’s survival was in jeopardy and Timmer was launching Operation Centurion.

b. All managers were offered new personal contracts or should leave the company.

c. There was to be a 20% cut in head count, deep cuts in expenses, and resources for new initiatives had to come from within.

d. All managers had to draw up plans for reaching these objectives.

e. These plans became formal budget requirements.

f. Performance would be measured against achievement of these targets and linked to individual bonuses and career opportunities.

g. These managers went back to their business unit directors and negotiated new contracts with them in line with their Centurion contracts.

h. That group then took the initiative to the product-group and country-management teams.
i. Workshops and training programs were held at all levels explaining the changes and their consequences.

j. Timmer attended many company meetings to answer questions personally and make people feel included.

However, Strebel (1996) emphasises that ‘shock treatment’ is not the only way to revise personal compacts. This can be achieved by more participative measures. The example of a small Japanese-owned pharmaceutical company, Eisai, is used to show how personal compacts were revised to re-orient the culture of the company away from research and development and towards producing a wider range of new products and services. The new CEO, Haruo Naito, initiated the following changes:

i. Training program for 103 new ‘innovation managers’, charged with turning their insights into proposals for new products and services.

ii. These innovation managers operated outside the normal organisational structures and company culture.

iii. They drew new participants of their choice into the change initiative.

iv. This gave all employees the chance to break out of the seniority system and shape the development of the company’s new strategy.

v. Each proposal was brought before Naito and his executive team to gain corporate support and secure individual commitment to the achievement of project goals.

6.10 Clinicians’ resistance to IT systems

So far in this chapter I have examined the generic literature on resistance to change, together with measures that can be employed to overcome such resistance. In this section, the analysis is more focused on the medical profession in an attempt to examine the literature which specifically deals with resistance to change displayed by clinicians in their attitude and behaviour towards the implementation of various forms of IT in the medical context.
6.10.1 Barriers to clinicians’ acceptance of IT systems

Boonstra and Broekhuis (2010) carried out a systematic literature review of research papers from 1998 to 2009 concerning the barriers to acceptance of electronic medical records (EMRs) as perceived by physicians. EMRs are “computerized medical information systems that collect, store, and display patient information ... [they] are intended to replace existing (often paper-based) medical records... and enable instant availability of this information to all providers in the healthcare chain (Boonstra & Broekhuis, 2010:231). The authors found that despite the positive effects of EMR usage in medical practices, the adoption rate is still low and meets resistance from physicians. As a result of their literature review, the authors identified eight separate categories of barriers to acceptance, encompassing a total of 31 different sub-categories. These categories and sub-categories are shown below:

- **Financial:** high start-up costs; high on-going costs; uncertainty over return on investment; lack of financial resources;
- **Technical:** lack of computer skills; lack of technical training and support; complexity of the system; limitations of the system; lack of customizability; lack of reliability; interconnectivity and standardization; lack of computers/hardware;
- **Time:** time required to select, purchase, and implement the system; time to learn the system; time required to enter data; more time per patient; time to convert patient records;
- **Psychological:** lack of belief in EMRs; need for control;
- **Social:** uncertainty about the vendor; lack of support from external parties; interference with the doctor-patient relationship; lack of support from other colleagues; lack of support from management;
- **Legal:** privacy and security concerns;
- **Organisational:** organisational size; organisational type;
- **Change process:** lack of support from the organisational culture; lack of incentives; lack of participation; lack of leadership.

Boonstra and Broekhuis (2010) found that the first three categories (financial, technical, and time) are more often identified as barriers than the others (psychological, social, legal, organisational, and change process). They labelled the first three as ‘primary
barriers’ and the others ‘secondary barriers’. The primary barriers are most often experienced by physicians as threats in financial, technical, or time-consuming senses; whereas the secondary barriers seem to be more subconscious, lying below the surface, and are therefore not immediately mentioned. For example, psychosocial issues, such as the need for control, seem relatively peripheral.

Despite the findings of Boonstra and Broekhuis (2010), some authors do find psychosocial issues to be of significance in explaining barriers to IT adoption in clinical settings. Bhattacherjee and Hikmet (2007) carried out a study of physician resistance to information technology usage. The authors noted that IT usage is often resisted by physicians even though they are supposed to benefit from its use. They gave the example of the revolt by doctors at the Cedars-Sinai Medical Centre in Los Angeles in 2003 against the installation of a computerised physician order entry system (CPOE). The system was abandoned after doctors complained that it was too great a distraction from their medical duties. The authors pose the rhetorical question: ‘why are seemingly useful technologies sometimes resisted by potential adopters’?

The authors conducted a quantitative study at a large acute-care hospital in the southern USA using a five-construct model: perceived usefulness, behavioural intentions, perceived threat, resistance to change, and IT usage. They found physician resistance to change to be a key inhibitor of CPOE usage. This was caused by the perceived threat of loss of control over their work procedures, including how they ordered patient tests, accessed laboratory results, and made clinical decisions.

The psychosocial issue in physician resistance to IT adoption is further pursued by Walter and Lopez (2008) who bemoan the observation that too many (positivist) studies adopt generic pre-conceived models as the framework for their research. A prime example is the ‘technology acceptance model’ (Davis, 1989) which restricts its scope to two parsimonious variables – ‘perceived ease of use’ and ‘perceived usefulness’. Although subsequent extensions of this model do exist in the literature (Venkatesh et al., 2003), they suffer from the deficiency of being generic frameworks that do not apply specifically to physicians. To address this deficiency, Walter and Lopez (2008) proposed a new construct which they labelled ‘perceived threat to professional autonomy’ (PTPA) and hypothesised that this construct would be correlated with
physician acceptance of IT infrastructure. PTPA is defined as: “the degree to which a person believes that using a particular system would decrease his or her control over the conditions, processes, procedures, or content of his or her work” (Walter and Lopez, 2008: 209).

The authors conducted a mail survey of 1000 randomly selected physicians in the USA. Questions were asked in respect of two types of IT systems – electronic medical records (EMRs, which organise and retrieve information) and clinical decision support systems (CDSS, which generate diagnostic and treatment options, prescription advice, and care planning). The authors drew this distinction on the grounds that CDSS represented a greater level of ‘codified knowledge’ than EMRs, and so a priori would pose a greater threat to professional autonomy of physicians.

Walter and Lopez (2008) found that perceived threat to professional autonomy (PTPA) had a significant negative effect on perceived usefulness for both EMR data and CDSS data, which suggests that PTPA is an antecedent to perceived usefulness. However, the negative effect is greater for CDSS than for EMR. This could be because CDSS is aimed at clinical decision making, which represents a greater degree of codification of knowledge. Such knowledge is designed to impose rules, procedures, and recommendations that impact physician behaviour. In other words, CDSS provides external decision making that has traditionally solely been the preserve of physicians themselves. This is more threatening to professional autonomy and so physicians display more resistance to CDSS than they do to EMR.

6.10.2 Unhappy doctors and clinicians’ resistance

Smith (2001:1073) started a major international debate in the British Medical Journal by stating that “doctors are unhappy”. He was aware that demoralised doctors are not a good basis for an efficient and effective healthcare system but noted that “when doctors gather, their conversation turns to misery and talk of early retirement”. If doctors are as unhappy as Smith (2001) suggests, then this could be a significant factor in the explanation of why they tend to display clinicians’ resistance to change. Three aspects of this state of affairs will be examined in the following sections: emotional labour,
stress, and burnout. This discussion will then conclude with an analysis of the general state of the debate relating to ‘unhappy doctors’.

6.10.2.1 Emotional labour

Hochschild (1983) introduced the term ‘emotional labour’ into the literature in her book *The Managed Heart*. Emotional labour is experienced by people during situations involving face-to-face personal or voice interaction with customers and which involve displays of emotions which are socially acceptable. In this regard, what is perceived as socially acceptable depends on the norms of the organisation a person is working for. Exercising emotional labour involves exhibiting stereotypical behaviour during day-to-day work activities, even if a person has to deny their real feelings by suppressing them. Hochschild (2003) later introduced the term ‘emotional work’ which refers to the practice of manipulating one’s emotions so that they appear socially acceptable. Emotional work involves two types of acting: *surface acting*, which is a display of emotion without the person feeling it, and so can be regarded as fake (for example, smiling sweetly when one is really angry); and *deep acting*, where a person modifies one’s self to actually feel the particular emotion that is supposed to be felt.

Other researchers have taken up the topic of emotional labour and defined it in similar ways, for example:

- “the act of displaying the appropriate emotion” (Ashforth & Humphrey, 1993:90).
- “the plan, effort, and control of expressing an organisationally accepted emotion during an interaction” (Morris & Feldman, 1996:987).
- “the way a person manipulates and changes each emotion so that it is appropriate to his role in the organisation and to the situation which he is in” (Mumby & Putnam, 1992:472).

Accordingly, the consensus of the literature seems to revolve around the notion that emotional labour refers to a process of sufficiently controlling one’s emotions in line with organisational and social expectations. Thus, exercising emotional labour is not
necessarily an easy process. Many organisations possess written policies and codes of
behaviour that they expect employees to follow. In addition, all professions possess
their own codes of conduct which closely govern expected norms of behaviour.

In the healthcare industry, the majority of employees, especially nurses, physicians, and
clinicians, have continuous face-to-face interactions with patients in the clinical setting.
In a UK study, Ogbanna and Harris (2004) found that healthcare workers frequently
have to fake or exaggerate their emotions, leading to stress and other negative
consequences. Researchers have reported a correlation between a person’s
mental/emotional state and their physical state. The forced display of positive emotions
whilst suppressing negative emotions can induce physical illnesses such as
cardiovascular problems and lowered immune systems (Booth-Kewley & Friedman,
1987; Friedman & Dimatteo, 1989; Jamner, Schwartz, & Leigh, 1988; Cohen &
Herbert, 1996; Schaubroeck & Jones, 2000). Researchers also have reported that
emotional labour can lead to job dissatisfaction and emotional burnout (Hochschild,

6.10.2.2 Stress

An event becomes stressful when an individual appraises it as a threat to their well-
being. Sanderson (2004) defines stress as a state where a person is challenged and is
under threat by the disturbance of the normal balance of life. Stress has biological,
psychological, and behavioural reactions (Choi et al., 2013). Clinicians have to deal
with patients’ lives, injuries, suffering, deaths, and the process of death. All these
scenarios cause stress for doctors. Numerous research studies have shown that job-
related stress is extensive among clinicians (Knesebeck et al., 2010; Kim & Youn,
1987; Balch, Freischlag, & Shanafelt, 2009; Wallace, Lemaire, & Ghali, 2009;
Shanafelt, Sloan, & Habermann, 2003; Thomas, 2004; West et al., 2006; McCue, 1982;
Choi et al., 2013).

Research studies have found that a range of factors can contribute to stress amongst
clinicians, including: excessive workload schedules, overtime expectations, long shifts,
night shifts, fatigue, sleep deprivation, reduced mental health, reduced physical health,
depression, burnout, personal problems, feelings of isolation, relationships with co-workers, relationships with superiors, delayed gratifications, giving bad news, depersonalisation, work-life imbalance, malpractice lawsuits, lack of time for research, limited control, loss of autonomy, lower personal accomplishment, job insecurity, lack of training, and critical patient assignment (Knesebeck et al., 2010; Balch, Freischlag, & Shanafelt, 2009; Ahola & Hakanen, 2007; Li, Yang, & Cho, 2006; Shanafelt et al., 2002; Magnavita et al., 2008; Shanafelt et al., 2010; Buddeberg-Fischer et al., 2008; Wallace, Lemaire, & Ghali, 2009; Shanafelt, Sloan, & Habermann, 2003; Buddeberg-Fischer et al., 2005; Sexton, Thomas, & Helmreich, 2000; Choi et al., 2013). In a research study amongst Zambian doctors, Menon and Munalula (2007) identified and ranked the major sources of stress that were experienced during day-to-day activities. These were: workload (50%), insufficient resources (27.5%), inadequate rewards (7.5%), giving bad news (7.5%), long work hours (5%), and relationships with superiors (2.5%).

Research studies have also found that when doctors continue to work whilst in a state of stress, numerous consequences can follow, for example: lower energy levels, less job commitment, lower productivity, increased self-absorption, displays of anger, annoyance, conflict, and frustration, increased incidence of mistakes, accidents, and malpractice, and physical and mental illnesses (Organ & Bateman, 1998; Li, Yang, & Cho, 2005; Freidson, 1970; Buddeberg-Fischer et al., 2008; Magnavita et al., 2008; Escribà-Agüir, Martin-Banea, and Pérez-Hoyos, 2006; West et al., 2006).

6.10.2.3 Burnout

The term ‘burnout’ was introduced into the literature by Freudenberger (1974) and refers to a state of physical and mental exhaustion relating to a person’s work. The most popular measure of burnout is the Maslach Burnout Inventory (MBI) which consists of three scales: emotional exhaustion, cynicism/depersonalization, and reduced personal accomplishment (Maslach, Schaufeli, & Leiter, 2001; Maslach & Leiter, 1997; Maslach & Goldberg, 1998; Maslach, Jackson, & Leiter, 1996; Maslach, 1976, 1982a, 1982b, 1998; Maslach & Jackson, 1981, 1982; Maslach & Pines, 1977):
Emotional exhaustion: a feeling whereby a person is incapable of giving emotionally. People feel drained and ‘do not have enough energy for another day’.

Depersonalisation/cynicism: a stage of negative emotions and behaviours where a person becomes detached and distanced from their job. The person stops caring and can become de-humanised on an interpersonal level.

Reduced personal accomplishment: a stage where a person self-evaluates as worthless, incompetent, and a failure. Self-efficacy is low and depression can follow.

Burnout has been documented in many branches of medicine like surgery, intensive care, and general practice (Gundersen, 2001; Visser et al., 2003). Persaud (2004) noted that when doctors experience burnout, they lose interest in their work and stop caring about their patients. Ishak et al. (2009) conducted a literature review of 51 studies of burnout in doctors and identified that it is prevalent in up to 75% of residents, with the possibility of profound effects on their work performance and patient safety. De Valk and Oostrom (2007) conducted a literature review and meta-analysis of burnout in doctors and identified some of the main causes, for example, personality characteristics (such as perfectionism), demanding workloads, undervalued relationships, work-home conflict, and lack of self-care. Smets, Visser, and Oort (2004) argued that doctors are particularly susceptible to burnout because they spend a lot of their time with sick patients, understanding their illnesses, and helping them through significant life problems. They have to be positive and continuously develop their skills whilst at the same time they are concerned about malpractice.

The literature has identified many consequences and side effects associated with burnout. Burnout is associated with low job satisfaction and low work productivity (Visser et al., 2003), family and marital problems (Pullen et al., 1995), drug and substance abuse (Gundersen, 2001), and psychological problems like depression, decreased concentration, cynicism, irritable mood, suicide, and suicidal plans and attempts (Thomas, 2004; Lawrence, 1996; Martin et al., 1997; Dyrbye et al., 2008; Solomon, 1997). All of these issues can have carry-forward impacts in terms of decreased patient care (Thomas 2004). Other studies report on physical indicators of burnouts like headache, cold and flu, fatigue, changes in appetite, insomnia, stomach
distress, and cardiovascular diseases which again can interfere with effective functioning in the workplace (Melamed et al., 2006; Sherman, 1996; Figley, 1995; Mahoney, 1997; Toker et al., 2005).

6.10.2.4 Unhappy doctors

As mentioned in section 6.10.2, a debate started in the British Medical Journal in 2001 as a result of the article published by Smith (2001) which posed the provocative question “why are doctors so unhappy?” The most obvious cause, according to Smith (2001:1073) was that doctors “feel overworked and under-supported”. There followed a steady stream of responses in the form of articles and letters to the editor from clinical practitioners and academics. The upshot of the debate was that doctors supported the claim of being overworked and under-supported, and drew attention to many of the issues discussed above relating to emotional labour, stress, and burnout. The BMJ (2001) simultaneously published an international league table of unhappiness derived from an international survey of doctors. This table showed that the top ten countries in terms of unhappy doctors were (in rank order): UK, Spain, Belgium, India, Greece, Hong Kong, Italy, Canada, USA, and Malaysia. 66% of doctors in the UK described themselves as either unhappy or very unhappy. Australia was ranked 17th in the table with 37% of doctors describing themselves as either unhappy or very unhappy.

In terms of all respondents across all countries, the most frequently stated causes of unhappiness (in rank order) were:

1. Overworked
2. Underpaid
3. Inadequately supported
4. Falling status
5. Exhausted by change
6. Less control over their work
7. Increased accountability
8. Large gap between training and actual work
9. Left to pick up the pieces of a sick society
10. Close contact with patients disrupted
In terms of these top ten reasons it is little wonder that Smith (2001) summarised the overall reasons for doctors’ unhappiness as being ‘overworked and under-supported’. However, a closer examination of the responses to Smith’s question also indicates other causes lurking less close to the surface. These have to do with the changing status of doctors in society, their loss of professional autonomy, and their sense of being beholden to bureaucrats and managers in terms of accountability for financial acumen, medical decisions, and performance indicators. In other words, the fact that doctors feel overworked and under-supported might not carry the weight that it appears to do if doctors felt a sense of control over their work environment. These issues are discussed further in the next chapter.
6.11 Summary

This chapter has examined the extant literature in relation to the topics of resistance to change and strategies aimed at overcoming resistance to change. These topics have been examined both from a generic viewpoint and from a viewpoint more specific to that of the medical profession. Attention has been paid to the reasons stated in the literature why people tend to resist change initiatives. In particular, the idea that people often tend to become trapped in webs of their own creation (psychic prisons) is significantly related to resistance to change, especially in the case of traditional professions such as medicine. Other topics that have received attention in this chapter relate to the concepts of ‘competing commitments’ and ‘personal compacts’. The chapter concluded with an examination of barriers in clinicians’ resistance to IT systems, and paid special attention to the role of unhappy doctors in clinicians’ resistance, in particular the role played by emotional labour, stress, and burnout in contributing to the outcome of unhappy doctors and clinicians’ resistance.

The next chapter concludes the thesis. This chapter will examine the contribution of the thesis to the literature, the implications of the thesis, an evaluation of the thesis, and limitations of the thesis.
Chapter 7
Conclusion
Chapter 7
Conclusion

7.1 Chapter overview

Chapter 6 analysed some of the significant aspects of the literature related to resistance to change. The main purpose of this concluding chapter is to examine the findings of the thesis (as presented in chapter 5) and compare them with the extant literature (chapter 6) in order to analyse what contribution the thesis has made to the extant literature. The chapter also examines the implications of the thesis; criteria for evaluation of the thesis; and limitations of the thesis. The chapter is structured as shown in figure 7.1.

Figure 7.1
Chapter overview

- 7.1 Chapter overview
- 7.2 Contribution of the thesis to the literature
- 7.3 Implications of the thesis
- 7.4 Criteria for evaluation of the thesis
- 7.5 Limitations of the thesis
- 7.6 Summary
7.2 Contribution of the thesis to the literature

This thesis has noted that antimicrobial resistance has become a serious world-wide threat. To combat this threat, clinical authorities in many countries have advocate for the introduction of clinical decision support systems. However, these monitoring and control systems have been actively resisted by clinicians. Hence, this thesis has examined the research question of why clinicians have displayed such resistance to this particular change initiative. The findings of the thesis were presented in chapter 5 in terms of the paradigm model advocated by Strauss and Corbin (1990, 1998) which discovered the core category and phenomenon of inappropriate prescription: clinicians’ resistance to control measures. As shown in chapter 6, a number of research studies have investigated the reasons why clinicians display resistance to the introduction of IT systems. Although the desire to protect their professional autonomy regularly comes up in such studies, it is usually relegated to peripheral significance behind primary factors such as financial, technical, and time-based variables (Boonstra & Broekhuis, 2010). It was noted that many studies employ earlier positivist frameworks based on models such as the ‘technology acceptance model’ (Davis, 1989) which utilize pre-conceived variables such as ‘perceived ease of use’ and ‘perceived usefulness’. However, such models may not be applicable when applied uncritically to the medical profession. For example, McDaniel and McDaniel (2004) found that clinicians differ from other types of IT users with respect to IT acceptance. Specifically, variables such as ‘trust’ tend to be more important than ‘perceived ease of use’ or ‘perceived usefulness’.

Walter and Lopez (2008) bemoaned the tendency of researchers to use pre-conceived positivist models in their research, especially with respect to clinical studies. They ruminated whether “factors relevant to physicians’ priorities influence their acceptance of a new IT [system]” (Walter & Lopez, 2008:206). They identified ‘perceived threat to professional autonomy’ as a salient variable that directly affects physicians’ intention to use an IT system. Based on a mail survey sent to 1000 randomly selected physicians they found that ‘perceived threat to professional autonomy’ had a significant negative effect on perceived usefulness of a clinical decision support system and hence could be regarded as an antecedent to ‘perceived usefulness’. Despite the importance of this finding, it still leaves a number of issues outstanding. First, despite their criticism of positivist approaches to clinical studies, their research continues to promulgate this
approach in the sense that their variable of importance (perceived threat to professional autonomy) was uncovered by means of a literature search and then used as a variable in a hypothesis-testing methodology. Second, their finding (although important) tends to hide rather than reveal the richness of other relevant behavioural and attitudinal variables which may potentially play valuable explanatory roles in the overall process.

With these points in mind, it is contended that this thesis makes two specific contributions to the extant literature. First, this thesis has employed an emergent theory-building qualitative methodology, in contrast to the more popular approach employed in the literature of positivist theory-testing, via pre-conceived hypotheses. As seen in chapters 3, 4, and 5, this is a more appropriate methodology to employ when the research objective is to uncover relevant variables that may have been ignored in previous studies. Second, this thesis has added richness to the processual theorising about the topic of clinicians’ resistance to IT control measures, specifically related to the AMR debate. This richness is provided by additional insight into the attitudinal and behavioural variables that impact upon the process of clinicians’ resistance to change to IT systems.

As shown in chapter 5, this thesis has derived the core category of inappropriate prescription: clinicians’ resistance to control measures. This core category (and phenomenon) ‘emerged’ from the data of a qualitative study of clinicians employed at a major hospital just outside Melbourne, Australia (rather than being hypothesised as a variable in a quantitative study). This phenomenon reflects a rich contextual environment of attitudinal and behavioural characteristics of clinicians. These characteristics encompass a range of elements such as psychic prisons, competing commitments, big assumptions, personal compacts, and feelings of loss (as presented in chapter 6). How these characteristics contribute to the richness of the model presented in this thesis, and its contribution to the extant literature, will now be further elaborated in the following analysis.
7.2.1 The medical profession as a psychic prison

Doctors are members of an eminent profession – the medical profession. As professionals they belong to “occupations with special power and privilege…[based on] special competence in esoteric bodies of knowledge linked to central needs and values of the social system” (Larson, 1977:x). Membership of a profession brings with it professional autonomy, defined as “having control over the conditions, processes, procedures, or content of their work according to their own collective and, ultimately, individual judgement in the application of their profession’s body of knowledge and expertise” (Walter & Lopez, 2008:207). Because professionals possess special knowledge, people outside the profession are not in a position to evaluate the work of professionals. Accordingly, they are trusted to work without supervision, but within professional guidelines, and are given the power to self-regulate, primarily through peer review. Peer review is often subjective in nature, basically because the work of professionals is so complex and nuanced that objective measures cannot adequately capture the full contextual nature of all their work. According to Walter and Lopez (2008:207) “peer review is one of the main indicators of professional autonomy because being reviewed by individuals outside the profession would invalidate the claim of exclusive possession of esoteric knowledge – the basis of professional autonomy”. Walter and Lopez (2008) further argue that professional autonomy brings with it two major privileges: first, professionals have greater access to critical resources to conduct their work (such as equipment and staff), and second, professionals have control over the tasks performed by non-professionals and para-professionals whose activities help rather than replace the work domain of professionals.

Within the context of the medical profession in the UK, Ham and Alberti (2002:838) state that the model of collegial self-regulation “began in the 16th century with the foundation of the Royal College of Physicians”. This college acted both to set standards and also operated as a closed shop. This was added to by the Medical Act of 1858 which established the General Medical Council. This ushered in a ‘social contract’ between the state, public, and the profession (Dixon-Woods, Yeung, & Bosk, 2011). The Act granted the medical profession self-regulatory powers which “enabled and obliged the medical profession to set the standards governing the work of its members, establish mechanisms to ensure compliance with those standards, and take action
against defaulters” (Dixon-Woods et al., 2011:1453). Accordingly, the state placed
enormous trust and responsibility in the hands of the profession to guard against
misconduct and ensure that patients’ interests were always uppermost. Implicit within
this trust-based relationship was the belief that “physicians were assumed to be
especially virtuous and trustworthy because of the values expressed in their codes of
conduct” (Dixon-Woods et al., 2011:1453). Thus, the profession was able to avoid the
imposition of externally-imposed regulatory policies and procedures. Such formal
measures aimed at engendering confidence in work standards were not necessary.
Measures aimed at controlling, monitoring, and enforcing performance standards could
safely be left to the self-regulatory internal collegial model of the profession.

This scenario has been passed down to the Australian medical system and has been
reflected in the same model of collegial self-regulation and professional autonomy. In
turn, this model has generated a certain set of attitudes and behaviours within the
medical profession. It was seen in chapter 5 how the clinicians in our research site
displayed elements of preciousness and superiority in relation to their role. They were
well aware of the high status position they occupied, even to the extent of describing
themselves as the most intelligent people in society. Such paradigm thinking
commences at very early stages, for example, only the very brightest academic school
leavers are admitted to medical school. Once in medical school, the nature of the
curriculum continues to emphasis the element of elitism and competition. Mossop et al.
(2013) analysed the hidden curriculum of medical school and reported that medical
students referred to themselves as having a superior identity, and that this could
eourage these students to feel superior to their patients, nurses, managers, and support
staff once they entered the medical workplace. Lempp and Seale (2004:770) define
hidden curriculum as “the set of influences at the level of organisational structure and
culture including, for example, implicit rules to survive the institution such as customs,
rituals, and taken-for-granted aspects”. In their research study of the perception of
students at medical schools, Lempp and Seale (2004) found two important themes were
the ‘importance of hierarchy’ and ‘getting ahead by being competitive’. Fifty percent of
students reported that competition rather than cooperation is the defining characteristic
of medicine. The importance of hierarchy and professional rivalry are observed by
medical students very early in their career. Teaching through humiliation, disrespect,
and bullying is common (Hicks, 2003). So is verbal abuse by senior staff towards lower
status workers, together with serious relationship breakdowns due to vilification between different individuals and departments (Murakami et al., 2009). Loss of empathy has been reported by some researchers (Coulehan & Williams, 2011a, 2011b). As students move through their education, some researchers have also noticed a change in the attitudes and behaviours of students:

“Students move from being open-minded to being closed-minded; from being intellectually curious to narrowly focusing on facts; from empathy to emotional detachment; from idealism to cynicism; and often from civility and caring to arrogance and irritability” (Mahood, 2011:983).

Lempp and Seale (2004) summarised six learning processes emanating from the hidden curriculum of medical education: loss of idealism, emotional neutralisation, acceptance of hierarchy, less ethical integrity, adoption of a ritualised professional identity, and adopting less formal aspects of ‘good doctoring’. All these elements become inculcated into medical students early in their career and are further developed in the rough and tumble of the hospital context.

All these elements analysed above (professional status, self-regulation, autonomy, superiority, and so on) combine to create a scenario where doctors are perceived to exercise considerable power in the medical context. Within the framework of the French and Raven (1959) model of power, Bartos et al. (2008) have shown how doctors can exercise power across the entire range of the separate power bases.
Table 7.1
Medical clinicians as exercisers of power

<table>
<thead>
<tr>
<th>Six Power Bases</th>
<th>Definition of the Power Bases</th>
<th>Power Relationship in Healthcare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reward</td>
<td>Power based on the ability to provide acceptance, approval or tangible rewards</td>
<td>Clinicians as benefactors of respect and positive recognition</td>
</tr>
<tr>
<td>Coercive</td>
<td>Power based on the ability to provide rejection, disapproval or threats</td>
<td>Clinicians as detractors to co-workers, or impediments to ideas or practice</td>
</tr>
<tr>
<td>Legitimate</td>
<td>Power based on one’s formal position within an organisation, reciprocity for favours performed, equity for suffering incurred, or dependence on someone else for help</td>
<td>Clinicians with legal authority to order and plan care, but not with organisational authority over other healthcare providers</td>
</tr>
<tr>
<td>Referent</td>
<td>Power based on people’s sense of identification or desire for identification with the influencing person</td>
<td>Clinicians as mentors, exemplars and confidants</td>
</tr>
<tr>
<td>Expert</td>
<td>Power based on one’s knowledge and/or experience</td>
<td>Clinicians as holders of specialized knowledge and experience regardless of position</td>
</tr>
<tr>
<td>Informational</td>
<td>Power based on the ability to persuade or provide information to allow someone to make a decision</td>
<td>Clinicians as the source of information for patient care and patient-made decisions</td>
</tr>
</tbody>
</table>

Source: Bartos et al. (2008:13)

During my research trips to the hospital site I jotted down many of my observations which related to the manner in which doctors created and maintained their superior and ‘distant’ attitude towards patients, nurses, and support staff. The most obvious is the white coat and stethoscope worn around the neck, which together symbolise a person of unique ability, quite different to other people within the hospital. Added to this is the title of ‘doctor’ displayed on their door and to which they are referred by others. An added element of superior behaviour, which may appear paradoxical at first glance but in fact adds to the symbolism of elitism, is that of inverse snobbery, whereby senior consultants and surgeons abandon the ritualistic symbolism of white coats,
stethoscopes, and the title ‘doctor’, instead being referred to as ‘Mr’ and wearing ordinary lounge suits and ties.

During interviews I noticed that doctors often treated me, as a student researcher, with the same disrespect and arrogance they often showed towards nurses, managers, and non-professional staff. Their superior attitude was always on display. In chapter 5 I described this as ‘carrying themselves with a swagger’, ‘oozing self-importance’ and ‘regarding themselves as above suspicion’. Within their surgery room, other people were invariably at their beck and call, waiting for instructions to perform their duties. Patients appeared to be treated in the same manner, waiting patiently to be called in to be attended to. Patients are always needy, weak, and vulnerable in front of the doctor, deferring to their superior knowledge and desperately hoping the doctor can help them or cure their ailment. Patients believe what the doctor tells them. They rarely question their decisions regarding diagnosis, medication, or action plans. The power imbalance is obvious.

In terms of the theories of resistance presented in chapter 6, this traditional model of medical self-regulation and professional autonomy could be described as a ‘psychic prison’ in the sense that clinicians have “become trapped by constructions of reality that, at best, give an imperfect grasp on the world” (Morgan, 1997:216). Favoured ways of thinking take on the essence of resembling a trap. The difference between illusion and reality can become blurred and confused. The concept of a psychic prison was examined in chapter 6 through a number of related concepts: allegory of the cave, socialisation, circus elephant syndrome, learned helplessness, habitus, discourse, paradigms, active inertia, Icarus paradox, dominant logic, groupthink, frames, and culture. These concepts act in such a way as to filter and distort external ‘reality’. Such entrapments make it extremely difficult for people to think outside the box or to readily accept new ideas without considerable resistance. Hence, within the context of the medical profession, any perceived threat to the model of collegial self-regulation and professional autonomy could be guaranteed to engender considerable clinicians’ resistance. As seen in chapters 4 and 5, managers in this research study tend to describe the clinicians working within their hospital as being trapped in the past and not moving with the times. They are described as ‘stubborn’, ‘driven by habit, experience, and what
has worked in the past’, ‘not prepared to listen to advice’, ‘believe themselves to be more qualified’, ‘always knowing what is best’, and ‘not prepared to change’.

This model of collegial self-regulation and professional autonomy started to break down during the latter years of the 20th century. Dixon-Woods et al. (2011) point to the numerous scandals occurring within the medical profession in the UK and the failure of the collegial model to properly monitor and enforce acceptable standards, especially in the cases of a few notorious ‘bad apples’. The profession began to lose the trust of the general public at the same time as the government started to become extremely concerned by issues relating to waste, lack of financial acumen, and the necessity to control costs within the healthcare system. External controls and standards began to creep into the system and the model of internal collegial self-regulation started to break down under the weight of numerous outside contingencies. Professional autonomy started to come under attack. One aspect of this movement is the issue that has been the topic of this thesis – the implementation of clinical decision support systems to control the spread of antimicrobial resistance.

Power and resistance usually go hand in hand and healthcare is a prime example of this (Ash et al., 2007; Faulkner, 2001; Lindholm, Uden, & Rastam, 1999; Forsberg, Axelsson, & Arnetz, 2001; Lapointe & Rivard, 2006). In chapter 5 it was hypothesised that ‘clinicians who display an attitude of preciousness are more likely to resist control measures aimed at inappropriate prescription’. IT systems, especially clinical decision support systems, codify expert knowledge (the preserve of doctors) and potentially distribute it to lower status positions, such as managers and para-professionals. Thus, exclusive possession of a knowledge bank is threatened by this process of outside access to knowledge. This would allow outsiders to make decisions that potentially intrude within the traditional domain of doctors. It would also threaten the process of subjective peer review by allowing outsiders to formulate objective measures by which to assess doctors’ performance and control the manner in which they carry out their work procedures and decision making. Such systems threaten both knowledge claims and occupational boundaries, hence encroaching on professional autonomy (McLaughlin & Webster, 1998). In other words, once “the door to the secret garden starts to open up”, then “gentle administration” could give way to “hard-nosed management” (Ham & Alberti, 2002:839).
Figure 7.2 shows the processual sequence of how the introduction of clinical decision support systems can, in the presence of the psychic prison of collegial self-regulation and professional autonomy, be perceived as a threat to professional autonomy and hence engender resistance to change.

**Figure 7.2**
Clinical psychic prison and resistance to change

### 7.2.2 Competing commitments, big assumptions, and resistance to change

Also analysed in chapter 6 were the associated concepts of ‘competing commitments’ and ‘big assumptions’. In terms of the attitudes of interns, residents, and registrars towards antimicrobial resistance, it has been seen in chapters 4 and 5, that the senior doctors (registrars) strongly influence the habits of more junior doctors (interns and residents). The latter are invariably in a situation of lack of knowledge and awareness, and generally do not question the actions of their superiors. The senior doctors tend to be those who most strongly defend the status quo of professional autonomy and pass this culture down the line to their junior colleagues. Such senior doctors are invariably aware of the severe consequences of AMR but, as analysed previously, tend to deflect the blame elsewhere and deny the need to be controlled by clinical decision support systems.
When this behaviour is analysed in terms of the concept of ‘competing commitments’ (Kegan & Lahey, 2001) it could that argued that although clinicians would generally support measures aimed at reducing the incidence of AMR they are secretly harbouring another competing commitment towards which they are “unwittingly applying productive energy” (Kegan & Lahey, 2001). In this thesis, clinicians have offered significant clues as to what this competing commitment might be, namely, the fear that success in tackling AMR through clinical decision support systems could come at the expense of losing their professional autonomy, towards which they hold a strong commitment. It has been seen that clinicians tend to harbour precious attitudes about their status and importance. Since a competing commitment is usually kept well hidden, any analysis of what this might be would only be speculative, but could be along the lines of ‘I like to be regarded by others as superior’. But what is the ‘big assumption’ that lies behind this competing commitment? Kegan and Lahey (2001:88) state that big assumptions are “deeply rooted beliefs about themselves and the world around them. These assumptions put an order to the world…[and] often reflect deep-seated fears or insecurities, highly discouraging or simplistic views of human nature, or perceptions of their own superior abilities or intellect”. Accordingly, the big assumption could be something along the lines of ‘I assume I could never feel deeply satisfied unless others regard me as superior’. Although this analysis is only speculative, there are clues within the interviews that would tend to suggest that the attitudes and behaviours of clinicians stem from their belief that personal satisfaction (for them) is related to the amount of deference that they receive from others within the clinical setting and within society in general. During interviews, clinicians referred to their belief in their natural elitism stemming from their intelligence, and the role they occupy in society as members of an eminent profession. In their eyes they are superior, and others occupy positions of inferiority around them. It could be argued that they assume they are entitled to professional autonomy and that ‘the world as we know it’ could not function effectively if clinicians ceased to occupy the top rung of the medical hierarchy. This assumption may reflect a sense of superiority but equally it could be argued that it reflects a deep-seated fear or insecurity that their self-esteem is closely bound up with others’ identification of their elite role in society.

Figure 7.3 builds upon that already presented in figure 7.2. It shows the processual sequence of how the concepts of a competing commitment and a big assumption can
interact with the clinical psychic prison of collegial self-regulation and professional autonomy in such a manner that the introduction of clinical decision support systems can be perceived as a threat to professional autonomy, and hence engender resistance to change. This processual sequence forms a closed feedback loop so that, in the absence of further disturbances to the system, a vicious cycle is created between the big assumption, competing commitment, psychic prison, and on-going resistance to change.

Figure 7.3
Vicious cycle of resistance to change

7.2.3 Personal compacts (fractured and revised) and resistance to change

Clinicians have been so highly regarded for so many centuries that they consider themselves entwined within a ‘personal compact’ (Strebel, 1996) with society. Any threat to this personal compact (as for example by the introduction of clinical decision support systems) would be met with severe resistance unless a new and revised personal compact could be re-negotiated. Of particular significance in this scenario would be the perception by clinicians that both the psychological and social dimensions of their
personal compact would be fractured by any development that threatens their collegial self-regulation and professional autonomy. Unless these fractures are repaired within the context of a revised personal compact, then resistance to change would undoubtedly continue. Accordingly, with regard to figure 7.3, it would be possible to ascribe the cause of resistance to change (in terms of a perceived threat to professional autonomy) as the belief by clinicians that their extant personal compact has been ‘fractured’. Such resistance would continue until a mutually acceptable revised compact could be negotiated. As seen in chapter 6, Strebel (1996) suggests a three-step process for revising personal compacts:

1. Leaders draw attention to the need for change and establish the context for revising compacts.
2. Leaders initiate a process in which employees are able to revise and buy into the new compact terms.
3. Leaders lock in commitments with new formal and informal rules.

Edwards, Kornacki, and Silversin (2002) have championed the cause of devising a new compact which brings together the interests and responsibilities of the medical profession, managers, patients, and the government. Box 7.1 presents some of their views.
Box 7.1
Revised clinical compact

A new compact might ask doctors to work within guidelines, be accountable for key objectives and improving quality, actively support and contribute to achieving the goals of the organisation, work within resource constraints, and engage in teams and collaborative working.

Doctors should also have the opportunity to shape the goals of the organisation, participate in resource allocation, and have the resources to do the job expected. They will also need training and technical support to do this, including time to step off the hamster wheel to engage in improvement activities, high quality data, and a supportive culture that uses information for learning rather than judgement.

A new compact would also require organisations to take a highly participative approach with high quality appraisal, personal development, and other modern human resource management techniques.

The relationship with government also needs to change…in a new deal doctors might agree to follow nationally-agreed standards and guidelines, work to improve quality, and account for their work. In return, doctors should expect to be instrumental in developing the standards. The targets they are asked to account for should be realistic and there needs to be a manageable number. Government has a right to ask the profession to continue to improve but should not expect to micromanage it in detail.

Source: Edwards et al. (2002:836)

The essential aspect of such a new compact would appear to be based on win-win principles across the major sets of stakeholders. This, of necessity, would involve a non-destructive dialectical process which finds a synthesis between the extremes of the traditional model of collegial self-regulation on the one hand, and hard-nosed management on the other. Ham and Alberti (2002) add to this debate by codifying a new and explicit compact in terms of seven dimensions: patients’ rights, public responsibilities, greater accountability, enough resources, partnerships, effective care, and stewardship. Such a compact could, however, only be achieved through the development of “greater trust”, “better communication”, and an “honest understanding” of the respective positions of the major stakeholders (Ham & Alberti, 2002:841).
It could be argued that the impact of an acceptable revised personal compact within the clinical setting would act to repair the ‘fractured’ compact which clinicians perceive in terms of a threat to their professional autonomy. This new scenario could be labelled a ‘dialectical synthesis’ of compacts offering a type of halfway house between the two extremes of ‘collegial self-regulation / professional autonomy’ on the one hand and ‘hard-nosed management’ on the other. This compromise would potentially create a synthesis between self-regulation and other-regulation which could be labelled the ‘accommodation compact’. In turn, this could be expected to impact positively on the ‘vicious’ processual sequence depicted in figure 7.3, by initially influencing the ‘big assumption’ within which clinicians derive their sense of satisfaction within the system. This sequence is shown in figure 7.4.

**Figure 7.4**

**Impact of revised clinical personal compact**

7.2.4 Aligned system of clinical non-resistance

The mindset that underlies figure 7.4 is that clinicians will have to amend their ‘big assumption’ before any meaningful lowering of resistance to change can occur, and that the primary influence for this altered mindset should come from an acceptable and negotiated revision to the existing clinical personal compact. The content of this revised
compact would, presumably, contain many of the elements promulgated by Edwards et al. (2002) and Ham and Alberti (2002) whilst the sequence of steps required to obtain such mutual agreement would accord with those presented by Strebel (1996). However, as admitted by Kegan and Lahey (2001) the revision of big assumptions is not an easy task and requires careful facilitation by other managers. Big assumptions, first, have to be brought to the surface by a sequence of careful questioning (see section 6.9.3) and then systematically challenged, so that the personal limitations that inhibit the ability to change can be revealed, analysed, and questioned. In the case of clinicians, this might involve questioning why they like to be regarded by others as superior and why this gives them a sense of satisfaction. Is this the only metric that could work for them? Perhaps they could learn that the satisfaction of working with others in a less hierarchical and more egalitarian manner could bring them an equal level of personal satisfaction. In other words, satisfaction can also be achieved through an ‘accommodating’ mindset rather than a ‘superior’ mindset. Correspondingly, the new ‘big assumption’ might be revised to ‘I assume I could never feel deeply satisfied unless working as an equal partner in an effective team environment’. It will be observed that once resistance to change has been overcome, then the concept of a ‘competing commitment’ no longer applies. It is to be replaced by what could be called an ‘accommodating commitment’. In this case, the accommodating commitment of clinicians may be something along the lines of ‘I like to be regarded by others as an effective team player’.

In terms of this analysis, therefore, the challenge of overcoming clinicians’ resistance to the introduction of clinical decision support systems lies within the creation of an aligned system between big assumptions, accommodating commitments, psychic prisons, and personal compacts. Accordingly, the introduction of clinical decision support systems should, ideally, not be met with the distorting effect of a contradictory clinical psychic prison but rather one which accommodates the thrust of the IT intervention. This concept of ‘accommodating’ is one which should run through the complete sequence of compositional elements which form the essence of a no-threat, no-resistance cyclical process. This is depicted in figure 7.5.
7.2.5 Analysis of loss: emotions and behaviours

It was earlier suggested that clinicians fear that once “the door to the secret garden starts to open up”, then “gentle administration” could give way to “hard-nosed management” (Ham & Alberti, 2002:839). A practicing physician put the argument in the following words in the form of a letter to the *British Medical Journal*: “doctors have lost the joy that comes from working as a professional, replacing independence and professionalism with the headaches and discontents of being a middle manager” (Workman, 2001:1361). This statement that doctors have “lost the joy” possesses evocative overtones. Loss of power, status, control, and autonomy are fears that are recognised in the literature as potentially causing resistance to change. Understanding the way in which loss impacts upon emotions and behaviours is crucial in any analysis of resistance to change. There
are four areas in which people can typically experience loss following change: (Neimeyer, 2001; Bowlby, 1969, 1980, 1982, 2008)

- **Loss of attachments** (the feeling that occurs when change ends existing relationships); this can elicit emotions of isolation and feeling that your friends have left you behind.
- **Loss of structure** (the feeling that occurs when change brings an end to physical surroundings or personal structures such as procedures and routines); this can elicit emotions of feeling disoriented, incompetent, uncomfortable, and exasperated.
- **Loss of influence** (the feeling that occurs when change ends areas of responsibility or spheres of influence); this can elicit emotions of feeling less important, devalued, wanting revenge, and anger at those who have taken away the power.
- **Loss of meaning** (the feeling that occurs when change ends one’s belief in what the organisation stands for and the plans one has made in regard to those beliefs); this can elicit emotions of feeling disbelief, disillusionment, betrayal, and being taken advantage of.

All of these elements of loss are potentially at play when the implementation of IT systems threatens to intrude into the traditional domain of doctors’ autonomy. Of particular significance are ‘loss of influence’ (in the sense of feeling less important and devalued in status) and ‘loss of meaning’ (in the sense of feeling disillusioned and betrayed). These emotions are easily translated into behavioural and attitudinal outcomes and consequences, such as anger, apathy, withdrawal, low commitment, wanting revenge, being sensitive and over-protective, cynicism, and bad-mouthing others. Such negative reactions, when prolonged, can translate into adverse psychological health such as stress and emotional burnout (Lazarus & Folkman, 1984).

It has been seen in chapters 4 and 5 how these attitudinal and behavioural outcomes and consequences play themselves out in the sense of clinicians feeling hemmed in and consequently lashing out at others in an on-going blame-game. During this ‘blaming’ process, patients, management, and the government are often targets. Patients are
criticised for putting pressure on doctors, junior doctors are criticised for inexperience during prescription, government is criticised for reduced funding, and managers are criticised for cutting costs and taking away automatic trust in doctors to always act in the best interests of their patients. Managers come in for severe criticism from clinicians for ‘treating us like kids’ by attempting to introduce clinical decision support systems in order to control inappropriate prescription. This accusation of paternalism is backed up by other arguments which suggest that managers are a kind of inferior species, not possessing the education or experience to tell clinicians what to do. Clinicians think of themselves as ‘the most intelligent people in society’ and hence it is quite normal for such attitudes to be expressed in terms of preciousness: ‘we are in the field with the patients so we know exactly what’s going on...the ID team just sit in their office looking at books and following the theory’. In regard to the UK, Edwards (2003:21) notes how consultants reject new work practices on the grounds that they give too much power to managers and “the medical press carries a surprising amount of quite vitriolic attacks on the integrity, motives, and education of managers”. Edwards (2003:23) quotes one clinician:

“Many managers are there by default. They do not have the intellectual ability to genuinely see the differences between hospitals and supermarkets or doctors and check-out cashiers. They are the pass GCSE students. Remember them at school?”

It was suggested above that such negative reactions on the part of clinicians, when prolonged, can translate into adverse psychological health, such as stress and emotional burnout (Lazarus & Folkman, 1984). The threat of losing their traditional paradigm, involving the security of professional autonomy, can be reacted to by either of two specific types of coping – problem-focused or emotion-focused coping strategies. The former are active in nature in the sense that they are oriented towards confronting the problem by attempting to modify the source of the stress. The latter are avoidance in nature in the sense that they are oriented towards reducing tension by avoiding dealing with the problem and instead attempting to modify the symptoms of the stress (Lazarus & Folkman, 1984). Problem-focused coping can have a positive effect on well-being in the sense that the individual actively confronts the problem. In contrast, emotion-focused coping can lead to poor levels of psychological adjustment and a loss of touch
with reality. The context in which people operate can influence the type of coping strategy adopted. Thus problem-focused coping is more likely to be observed in a context of participative management, where information is freely available, and there is a clear vision. Accordingly, people appraise a situation as changeable, where they are empowered to take control of change. In contrast, emotion-focused coping is more likely to be observed in a context of directive or coercive management, where meaningful information is not provided, and there is no clear vision. Accordingly, people feel that nothing can be done to modify harmful, threatening, or challenging conditions. They feel powerless and out of control (Lazarus & Folkman, 1984). Figure 7.6 depicts these linkages in the case of emotion-focused coping.

**Figure 7.6**

*Emotion-focused coping: causes and consequences*

<table>
<thead>
<tr>
<th>Context</th>
<th>Coping strategy</th>
<th>Psychological health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive management</td>
<td>Emotion-focused coping</td>
<td>Poor psychological well-being</td>
</tr>
</tbody>
</table>

Within the context of clinicians who fear loss of control and autonomy through the introduction of clinical decision support systems it could be argued that the clinicians would feel themselves trapped within a directive (hard-nosed management) rather than a participative environment. Accordingly, their ability to take control of the situation in an empowered manner is diminished, leaving them to feel out of control and powerless. Their coping strategy is therefore more likely to be emotion-focused than problem-focused, resulting in a deterioration of their psychological health. With regard to the earlier discussion of ‘unhappy doctors’, introduced in chapter 6, it could be argued that this psychological scenario of ‘unhappiness’ is not so much the result of factors such as overwork, underpay and so on. Rather, it results from the playing-out of emotion-focused coping strategies within a context of helplessness and disempowerment, engendered through feelings of loss of influence and loss of meaning due to the intrusion of managerial-style decision support systems into their previously autonomous work environment. With reference to the research findings of this thesis presented in
chapter 5, it will be noticed that several ‘conditions’ were identified (in terms of the paradigm model). These conditions included, amongst others: ‘attitude’, ‘work overload’, ‘burdensome nature of control measures’, and ‘lack of resources’. However, in terms of the argument as it is now evolving, it is possible to suggest that the crucial variable to be emphasised is that of ‘attitude’. This encompasses elements of preciousness, superiority, and higher intelligence, all of which combine to create strong resistance to change against the introduction of clinical decision support systems. Any suggestion that the door to the secret garden was about to be opened a little further would engender feelings of loss amongst clinicians leading to emotions of helplessness and being out of control. The resultant reliance on emotion-focused coping, as suggested above, could have adverse consequences for the maintenance of psychological health. In this processual sequence, it could be argued that variables such as ‘work overload’, ‘burdensome nature of control measures’ and ‘lack of resources’ (as analysed in chapter 5), merely play the role of moderating influences, which make a bad situation even worse. On the other hand, if clinicians had embarked on a strategy of problem-solving coping, the simultaneous presence of variables such as work overload, lack of resources, and so on, could have been compensated for and ameliorated within the general context of feeling empowered and in control of events, thus not leading to poor psychological adjustment. This sequence of linkages for emotion-focused coping is depicted in figure 7.7.
In the light of this analysis, a significant question is raised, namely, how can clinicians be induced into engaging in problem-focused coping? As discussed earlier, problem-focused coping is more likely to be observed in participative work environments. Problem-focused coping also tends to result in more positive psychological adjustment and well-being (Lazarus & Folkman, 1984). With the previous analysis in section 7.5 in mind, it is argued that a potential solution lies within the concept of an ‘aligned system of clinical non-resistance’. This has been represented diagrammatically in figure 7.5.

To recap, such an aligned system depends upon the alignment of four elements: big assumption, accommodating commitment, psychic prison, and personal compact. Such an alignment is induced in the first instance through the negotiated introduction of a revised clinical personal compact. This revised compact has been labelled an ‘accommodation compact’ and would result from a dialectical synthesis between the two competing compacts of ‘collegial self-regulation / professional autonomy’ on the one hand, and ‘hard-nosed management’ on the other. It could therefore be hypothesised that if clinicians could be induced to perceive themselves as operating within a context of accommodation and participation, then the introduction of clinical decision support
systems into the clinical environment would tend to bring forward emotions of feeling ‘in control’. This would encourage the adoption of problem-focused coping strategies. This processual scenario is shown in figure 7.8.

### Figure 7.8
Problem-focused coping in the clinical context

7.2.6 Bringing together the contributions of the thesis

Section 7.2 has presented the arguments which make the case for this thesis’s contribution to the literature. Sub-sections 7.2.1 – 7.2.5, together with figures 7.2 – 7.8, tell the following story:

- The medical profession acts as a psychic prison which reinforces the perception that clinicians represent a superior breed of intellectuals within society, who are entitled to exercise their roles within a context of collegial self-regulation and professional autonomy.
- Although clinicians would generally support the principle of reducing the incidence of AMR, they secretly harbour a competing commitment towards
professional autonomy which negates any potential support for the introduction of clinical decision support systems.

The big assumption that lies behind this competing commitment may reflect a deep-seated fear or insecurity that their self-esteem is closely bound up with the manner in which others identify the elite role of clinicians in society, namely the assumption that they could never feel deeply satisfied unless others regard them as superior.

Resistance to change exercised by clinicians towards the introduction of clinical decision support systems, is governed by the perception that their existing personal compact has been (or is in danger of being) ‘fractured’ by the intrusion of IT systems into their traditional domain.

Overcoming this resistance to change could be achieved through the negotiated introduction of a revised compact (which represents a dialectical synthesis between old and new compacts - the ‘accommodation compact’) thus engendering a subsequent revision in the big assumption harbour ed by clinicians, along the lines of questioning and challenging the metric on which they have traditionally based their sense of satisfaction (namely, being regarded by others as superior), in favour of a new metric (namely, by working with others as equal partners in an effective team environment).

Therefore, overcoming clinicians’ resistance to change to the introduction of clinical decision support systems depends upon the creation of an aligned system between big assumptions, competing (and accommodating) commitments, psychic prison, and personal compacts.

Clinicians could be expected to feel loss of influence and loss of meaning resulting from a fractured personal compact, thus leading them into emotion-focused coping strategies and poor psychological health over the longer term.

Problem-focused coping strategies would represent a better psychological adjustment for clinicians and these are more likely to be engendered within a participative work environment emanating from the negotiation of a revised personal compact for clinicians which reflects ‘accommodating’ principles rather than ‘superior’ principles which presently form the basis of the extant clinical compact.
7.3 Implications of the thesis

The theoretical implications of the thesis have mainly been covered in section 7.2. Accordingly, this section will concentrate on the practical implications of the thesis. It was noted in chapter 2 that antimicrobial resistance presents a world-wide threat and that one particular strategy that is strongly touted as presenting a possible solution to the problem (the introduction of clinical decision support systems) is widely resisted within the medical profession. There are a range of possible reasons advanced within the literature to try to explain this resistance – financial, technical, time, psychological, social, legal, organisational, and change process. However, this thesis, by adopting an emergent qualitative methodology within a large case study hospital setting, has emphasised the significance played by the process of inappropriate prescription in perpetuating the issue, and that behind this problem lies a strong clinicians’ resistance to accepting IT-based control measures on the grounds that they potentially threaten the paradigm of collegial self-regulation and professional autonomy.

Accordingly (and stemming from the theoretical analysis in section 7.2) this thesis highlights the implication that any attempt to eliminate the potency of clinicians’ resistance to change must be based on simultaneous attempts to negotiate a new and revised personal compact for clinicians. Chapter 5 noted that a range of conditions could be identified as impacting on the phenomenon of inappropriate prescription: clinicians’ resistance to control measures namely – attitude, work overload, burdensome nature of control measures, lack of resources, lack of knowledge and awareness, lack of repercussions, and lack of responsibility. However, as previously analysed in this chapter, these variables could mainly be regarded as moderating variables, and the thesis suggests that the primary emphasis should be placed on psycho-social variables entwined within the scenario of clinicians’ resistance to change in relation to the perception of a fractured personal compact.

The primary implication of such an emphasis is that the reduction of antimicrobial resistance (the main outcome) rests strongly on the ability of societal stakeholders (government, medical profession, general public, patient organisations, and so on) to satisfactorily negotiate a new and revised compact that satisfies the ‘big assumption’ of clinicians. In other words, although variables such as ‘perceived ease of use’, and
‘perceived usefulness’, in combination with factors such as ‘work overload’ and ‘lack of resources’, are undoubtedly important in the change equation, this thesis suggests that a greater chance of success lies within attempts to understand and appreciate the psycho-social context within which clinicians operate.

The successful introduction of a revised personal compact depends not upon an approach of directive top-down imposition but rather on facilitative implementation that takes into account the interests of all major stakeholders. The concept of an ‘accommodation’ compact relies upon mutual understanding, empathy, respect, and trust. These elements have not been commonly observed in healthcare systems over recent decades as opposition and cynicism have become the order of the day (Edwards, 2003). It was noted in chapter 6 that Strebel (1996) has advanced a three-step model for the introduction of revised personal compacts, namely:

1. Draw attention to the need for change and establish the relevant context.
2. Ensure employees buy into the new compact terms.
3. Lock in commitments with new formal and informal rules.

Although valuable, such an approach bears too close a resemblance to the simplistic model of unfreezing, movement, and refreezing (Lewin, 1951) which has dominated popular change models for many decades. The implication of introducing revised personal compacts requires a more nuanced approach than this, and one that places increased emphasis on the requirements of dialectical thinking. Different systems tend to fall under the influence of different ‘attractors’ and inevitably move towards a position of relevant stability. Personal compacts are of this nature. Hence, any attempt to induce a revision of personal compacts would involve the creation of new contexts that break the hold of the dominant attractors in favour of new ones (Morgan, 1997). If we argue that the extant clinical personal compact based on professional autonomy is sustaining an undesirable state, then the challenge is to introduce a measure of instability in order to break the dominant attractor and allow a new one to emerge. In one sense, this instability has gradually emerged over recent times as challenges to professional autonomy have put pressure on the extant compact. Morgan (1997) argues that managers can never fully control the change process in a precise form. The best they can do is to “nudge and push” towards a new scenario where stakeholders are more
inclined to reconsider the viability of the present system (Morgan, 1997:269). In other words, the change process contains not linear precision but rather the ability to shift the balance so that the attractor finds its own form. This involves two elements – ‘new understandings’ (exposing the system to new information and encouraging double-loop learning) and also ‘new actions’ (such as experiments, prototypes, pilot studies, changes in rewards, new personnel, and so on). For this reason, this thesis has argued for the introduction of dialectical thinking into the clinical reform process, whereby the revised compact (‘accommodating’) represents a synthesis between two opposing entities – ‘professional autonomy’ on the one hand and ‘hard-nosed management’ on the other. Such a process is not destructive of either entity. It preserves the two opposing concepts within one single complex thought.

Wrapped up in this dialectical process is the concept of changing the ‘big assumption’ that clinicians have traditionally harboured and which lies behind the strength of the extant personal compact. As seen in chapter 6, Kegan and Lahey (2001) have promulgated a sequence of four questions designed to uncover the big assumption of organisational players and thus lay themselves open to challenging the veracity of their existing mindset. This thesis has argued that the big assumption of clinicians needs to be revised from one of ‘superiority’ to one based on teamwork, partnership, and accommodating competing interests in pursuit of a common goal. Accordingly, the process of dialectical thinking involved in the revision of personal compacts must be juxtaposed with an associated process of uncovering and challenging clinical big assumptions. The implication of these requirements is to call for a far more sophisticated attitude of facilitative management, involving understanding and empathising with the relevant psycho-social variables, than has traditionally been experienced within the wider healthcare system.
7.4 Criteria for evaluation of the thesis

Strauss and Corbin (1998:266) adopt the conventional stance that the usual canons by which quantitative research studies are judged (such as generalizability, reproducibility, consistency, precision, and verification) are “quite inappropriate” for judging the merit of theory-building qualitative studies. Instead, they believe that the quality of theory-building research should lie in “judgements about some of the components of the research process” (Strauss and Corbin, 1998:268). They stress that reviewers must be able to accurately judge how the analysis was carried out. In other words, the research process must be adequate. In order to judge this, Strauss and Corbin (1998: 269) lay out the following seven criteria for evaluating the quality of the research:

1. How was the original sample selected, and on what grounds?
2. What major categories emerged?
3. What were some of the events, incidents, or actions (indicators) that pointed to some of these major categories?
4. On the basis of what categories did theoretical sampling proceed? That is, how did theoretical formulations guide some of the data collection?
5. What were some of the hypotheses pertaining to conceptual relations (i.e. among categories) and on what grounds were they formulated and validated?
6. Were there instances in which hypotheses did not explain what was happening in the data? How were these discrepancies accounted for? Were hypotheses modified?
7. How and why was the core category selected? Was this sudden or gradual, and was it difficult or easy?

It will be observed that chapter 4 of this thesis (‘data collection and analysis’) contains a detailed exposition that carefully addresses each of the seven criteria above. The aim of chapter 4 was to present a comprehensive audit trail so that the reader is able to understand how the data was collected, how the interviews were conducted, how theoretical sampling was employed to progress the theoretical analysis, how the various categories and properties emerged, and how the paradigm model was put together around the core category and phenomenon of inappropriate prescription: clinicians’ resistance to control measures. Without wishing to repeat the arguments already
presented earlier in the thesis, specific responses to each of the seven criteria above will now be presented.

**Selection of the original sample.** Section 4.2 explains how the original sample was selected and on what grounds. It was a purposive sample of six scoping interviews. The six participants were selected because of their in-depth knowledge about the research topic. The interviewees were: the head of Infectious Diseases (ID), the GUIDANCE project manager, the ID consultant, the ID pharmacist, the head of Pharmacy, and a prescribing clinician.

**Emergence of major categories.** The major categories and themes to emerge from each of the six scoping interviews are shown in tables 4.2 to 4.7. These were amalgamated into a combined set of categories and sub-categories, as shown in table 4.8. These are: clinician behaviour (plus eight sub-categories), GUIDANCE program (plus five sub-categories), management factors (plus four sub-categories), and antibiotic prescription (plus three sub-categories).

**Main indicators.** Sections 4.5.1 to 4.5.7 present a detailed exposition of each of the six interviews and an analysis of the main indicators (events, incidents, and actions) which pointed to the major categories. Some of these indicators include: clinician non-adherence to hospital policies; world-wide problem of AMR; GUIDANCE issues; clinician reliance on habit and experience; stubborn behaviour of clinicians; busy clinicians; lack of knowledge; clinicians over-ride pharmacists by stating patients are at risk; senior clinicians role model inappropriate behaviour to junior doctors; medical school training; lack of hospital induction and training; lack of monitoring; and inconsistent hospital policies.

**Theoretical sampling.** Theoretical sampling proceeded immediately after the data from the six scoping interviews had been collected, coded, and analysed. Section 4.6 explains how problems with using the GUIDANCE tool led to my attendance at a series of eight management meetings in relation to the operation of the GUIDANCE tool, during which I also collected and analysed a wide variety of documentation. Table 4.11 shows the codes that emerged from the analysis of these eight meetings and associated documentation. Section 4.7 also presents an example of theoretical sampling which
arose from the incidents of clinicians’ resistance to use GUIDANCE on the grounds of issues associated with ease of use and poor functionality. Table 4.12 shows the codes that emerged from this analysis.

As a combined result of the analysis from the six scoping interviews, eight GUIDANCE meetings, and examination of the usage and functionality of GUIDANCE, figure 4.9 was created. This revealed a total of three separate categories (personal factors, organisation factors, and IT factors) divided into 23 sub-categories). This gave rise to a further round of theoretical sampling which concentrated on the emergent themes of ‘inappropriate prescription’ and ‘clinicians’ resistance to hospital policies and guidelines’. Accordingly, 40 interviews were conducted with clinical end-users in order to pursue this category.

**Hypotheses and conceptual relations.** By this stage, the main hypothesis under exploration (in terms of building, not testing) was concerned with ‘inappropriate prescription’, how this occurred, and the role played by clinician behaviour (especially resistance).Sections 4.9.1 to 4.9.5 present the analysis of interviews conducted with interns, residents, registrars, pharmacists, and senior managers. Figures 4.10 to 4.14 present the conditions for each of these categories which lead to inappropriate prescription. Some of the main examples include: ‘rotation of medical staff’ and ‘lack of knowledge’ (interns), ‘lack of time’ and ‘experience versus theory’ (residents), ‘blame game’ and ‘lack of funds’ (registrars), ‘egos’ and ‘none awareness of outcomes’ (pharmacists), and ‘over-confidence’ and ‘no-big-picture thinking’ (senior management).

**Non-significant hypotheses.** The occurrence of hypotheses (in terms of building, not testing) failing to explain what was happening in the data was not of prime significance in the analysis. It must be remembered that interns, residents, registrars, pharmacists, and senior managers occupy different roles in the medical context and hence their perspectives are primarily influenced by their relative perspectives as conditioned by their role location. As in all grounded theory analysis, the researcher’s mind must follow the line of asking ‘what is really going on here’ and this implies trying to uncover the core category (phenomenon) which ties together in an overall storyline all the competing perspectives. The main hypotheses of the thesis are presented in sections
5.4.1 to 5.4.7. However, in relation to these separate hypotheses (and as argued earlier in chapter 7), it is suggested that the most significant variable relates to ‘attitude’, whilst the other variables identified in chapter 5 (such as work overload, lack of resources and so on) are hypothesised to occupy moderating influences within the overall model.

**Core category.** Section 4.10 explains how the core category was selected. The main storyline of ‘inappropriate prescription’ had emerged fairly early in the analysis but the reason why this was occurring remained hazy until later in the study when the concept of ‘clinicians’ resistance to control measures’ became more established. Accordingly, the core category of *inappropriate prescription: clinicians’ resistance to control measures* was identified by the end of chapter 4. The paradigm model, with this core category at its heart, was then explored in detail in chapter 5, through an exposition of the prime components – phenomenon, context, conditions, strategies, and consequences. After conducting a literature review on ‘resistance to change’ in chapter 6, this current chapter has then completed the analysis by weaving in the contributions of the thesis to the literature in terms of the roles played the concepts of psychic prisons, competing commitments, big assumptions, personal compacts, and analysis of loss within a model of ‘an aligned system of clinical non-resistance’ (figure 7.5).

### 7.5 Limitations of the thesis

Data for this thesis was collected from only one research site – a major hospital situated two hours’ drive from Melbourne. As such, the study has been conducted within the confines of a specific site and so the findings cannot readily be generalised to particular contexts outside this boundary. However, the one-site context of the thesis is not, in itself, necessarily a limitation of the study. The main advantage is that I was able to obtain in-depth understanding of the operation and culture of the hospital. In addition, I was able to conduct forty in-depth interviews, as well as attend management meetings and collect relevant hospital documentation. However, it could be argued that a multi-site study would have added more breadth to the data and more density to the findings. Although true, it must be remembered that considerable limitations are placed on the ability of PhD students to conduct the type of studies they would otherwise wish to undertake. These limitations include both time availability and the strictures imposed by
restricted funding. In similar vein, the chosen research site reflects the nature of its location, namely, an Australian hospital (which reflects the nature of the country’s healthcare system) situated within the state of Victoria (which reflects the funding practices and other policies of this particular state). Although, data collection from hospitals in other states (and/or countries) would have been beneficial, this again runs up against the limitations of time and resources previously mentioned.

Future researchers would be encouraged to extend the study to a multi-site context in order to add any required extra density to the findings of this thesis. It must be remembered that a grounded theory study, if performed correctly, could never be classified as ‘wrong’, but merely ‘incomplete’ (Glaser, 1978). Extant grounded theory studies could be regarded as ‘modifiable’ until such time as they are added to, or otherwise modified, through the incorporation of extra data. Accordingly, the core category of inappropriate prescription: clinicians’ resistance to control measures can be regarded as complete only as far as it goes, and that it remains open to subsequent densification as more data is collected, analysed, and incorporated into the study
7.6 Summary

This is the concluding chapter of the thesis. It has been structured into four main sections: the contribution of the thesis to the literature; implications of the thesis; criteria for evaluating the thesis; and limitations of the thesis. First, the thesis has contributed to the theoretical literature in relation to the nature of resistance to clinical decision support systems. Emphasis has been placed on the psycho-social variables that constitute the essence of the resistance process and these have been elaborated through the separate concepts of psychic prisons, competing commitments, big assumptions, personal compacts, and analysis of loss. The thesis has presented a framework of an aligned system of clinical non-resistance and has advocated that such a system could avoid the deleterious effects of psychological mal-adjustment that may otherwise be encountered within the context of clinicians’ resistance to control measures. Second, the thesis has emphasised a major implication that the reduction of AMR rests strongly on the ability of societal stakeholders to satisfactorily negotiate a new and revised compact that satisfies the ‘big assumption’ of clinicians. This calls for the introduction of a more facilitative form of management involving dialectical analysis, than has traditionally been observed within the healthcare system. Third, the thesis has been evaluated in terms of the criteria advanced by Strauss and Corbin (1998) and has been found to hold up well against these criteria. Fourth, some limitations of the study have been presented with suggestions as to how researchers could conduct further studies to address these limitations.
References


Australian Associated Press Pty Ltd (AAP), (April 12, 2007 4:45 PM). Malpractice suits pay out over $150m. Sydney Morning Herald.


Pirmohamed, M., James, S., Meakin, S., Green, C., Scott, A. K., Walley, T. J., ... & Breckenridge, A. M. (2004). Adverse drug reactions as cause of admission to hospital:


Appendices

Appendix 1: Ethics Approval

To: Prof Robert Jones; FBE
Ms Farinoush Farhadieh

Re: SUHREC Project No 2009/227 Clinician's adherence to antibiotic approval system (Stage 1) [BH Project 09/76]. Approved Duration: 04/10/2009 to 04/10/2011

I refer to your application for Swinburne ethics clearance for the above project protocol involving

Relevant documentation pertaining to your application was given expedited ethical review on behalf of Swinburne's Human Research Ethics Committee (SUHREC) by a delegated member of SUHREC, significantly on the basis of what was given clearance by Barwon Health.

In light of further clarification and minor revision to consent instruments requested and considered by the SUHREC delegate, I am pleased to advise that Swinburne ethics clearance has now been given for Stage 1 of the project to proceed in line with standard on-going ethics clearance conditions here outlined (as applicable). (Nb Barwon Health may need to be apprised of the Swinburne ethical review/clearance including with respect to revised consent instruments now to be used as per your email of 29 September 2009.)

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.
- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project. (A copy of any progress, annual or final report submitted to Barwon Health also being submitted to my office should meet these requirements, all things being equal; similarly with any request to modify approved protocols.)

- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact me if you have any queries about Swinburne on-going ethics clearance and if you require a signed Swinburne ethics clearance certificate additional to this clearance email. You should cite the SUHREC project number in communication. Copies of clearance emails should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely
Keith Wilkins
Secretary, SUHREC

*****************************************************************************
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Appendix 2: Sample Coding

Below is an example of open coding taken from a sample interview. Only a few paragraphs have been taken from this interview to ensure broad-based confidentiality.

<table>
<thead>
<tr>
<th>TEXT</th>
<th>CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibacterial resistance is a <strong>huge problem</strong> in all the hospitals. And doctors <strong>don’t think about it enough</strong> unfortunately. Awareness about MRO’s are important. Yes, <strong>crucially important</strong>. I really think it’s very important. It’s been my main interest for many years that now and I have had many talks to junior doctors about <strong>minimizing unnecessary AB use</strong> and soon. <strong>Multi Resistance Organisms are caused due to antibiotics and their prescription.</strong> If you use an AB, you will eventually have multi-resistance organisms. So you are basically <strong>contaminating your environment with drugs</strong> which Bugs are evolutionary, are designed to eventually overcome with natural selections, so it just happens, that’s the way it is.</td>
<td><strong>Antimicrobial Resistance:</strong> <strong>Huge Problem</strong> Clinicians don’t think it through <strong>Crucially important</strong> <strong>AB causes AMR</strong> Contaminates the environment Spreads the bugs</td>
</tr>
<tr>
<td>Antibiotic prescribing practices in this hospital are <strong>necessarily bad</strong> in general, in particular for chest infections. And in general people tend to treat their fear rather than the infections. So they are often <strong>fear form of unknown</strong> that comes so they use unnecessarily broad AB’s.</td>
<td><strong>AB practices are bad</strong> Clinicians treat their fears <strong>Lack of knowledge</strong> <strong>Lack of patients condition</strong> <strong>Fear of the unknown</strong></td>
</tr>
<tr>
<td>AB are being <strong>prescribed inappropriately constantly</strong>. I see it happening <strong>every day, every time</strong>. I see a need for <strong>standardizing antibiotic prescribing</strong> practices. Yes, that’s the one, that’s the</td>
<td><strong>Inappropriate prescription occurs:</strong></td>
</tr>
</tbody>
</table>
best way of doing anything, so **everything should be standardized.** The **doctors traditionally haven’t done that**, doctors have been trained to follow the appropriate prescribing and standardized methods but they sort of see themselves as **hardly trained** to think as **individuals** and they always do their own thing and **question everything** and never do anything anybody else does just because they say to do it. They have got a few **psychological conflicts.** It’s difficult to change their **attitude.**

| Constantly | Everyday | Every time |
| Clinicians disagree about training |
| Clinicians attitude |
| Standardization is necessary |
| Resistance to change |
| Resistance to policies |
| Psychological conflict |
| Clinicians attitude |

I believe that every clinician **has the knowledge and awareness of MRO.** No, I don’t think its because they are not aware of MRO’s. I think a significant proportion of the doctors working in the hospital would have **forgotten about the system.** And some of them might go yeah, that’s right, I never use it. I have **forgotten about it.** It’s the fact that people are **lazy** and they **don’t have time to think.** It’s a very sort of **cultural thing** I think you have to get the doctors start getting into the **habit of actually clicking in and logging on** and using it is **difficult.**

| Forgotten the system |
| Clinicians are lazy |
| Overworked |
| Hospital culture |
| Habit |
| Difficult to make clinicians get into the habit |

Main reasons contributing to clinicians not adhering to AB restriction/approval system is **out of mind and out of sight.** There is **no punishment** for not using it. There is **no incentive,** really, to use it and that’s the main reason. If you don’t **keep a watch** and **penalize** people here, then no one will do anything or **follow any rule.**

| Out of mind |
| Out of sight |
| Lack of monitoring |
| Lack of incentive |
| Compliance |
| Strict policies |

You need to get **too strict** with these staff. I would make the DSS
or any policy part of electronic prescribing so it’s impossible to bypass. But having said that, the advantage of electronic prescribing is going to create some whole lot of other problems. So this would be a check point for bypassing approval systems for AB’s. People bringing in their problem will create a whole lot of other problems. So this would be a check point for bypassing approval systems for AB’s. People bringing in their problem will create a whole lot of other problems, people not going through a list of drugs in general, prescribing all sorts of other things, might just continue prescribing inappropriately.

Yes, everybody needs incentive basically to follow anything at the hospital. And they would do anything if there is a reason, so whatever, whether it’s a carrot or a stick as they say, but there needs to be an incentive. And I think having that culture where people know they are being watched, could probably change things around. And as a junior doctor myself I wouldn’t have modified my practice but I would have really been just taken aback and sort of seen my practice here is being watched, I need to make sure I am doing the right thing and not just gonna unnecessarily prescribe AB’s because that’s what everybody else does.

I have seen and used the current DSS. The user interface is not too bad; it’s quite reasonable, but not very good. The things that I don’t like about it – it invariably has bugs in it. At times you have to go somewhere else to use it and available in front of the patient and at times like the fact that its not linked into AB’s prescribing. Because if it was linked to AB prescribing, then you wouldn’t know how to bypass but at the moment I think overall it just creates a little bit more work for most doctors. In fact most people in general, if it’s not beneficial immediately and requires a little bit of extra work, then they just won’t do it. Also it’s a little bit out of mind out of sight because it’s another icon if you don’t click on it, no harm comes to you, and the world doesn’t end. Also, antibiotic approval systems must have an interface necessary

Resistance will continue

Monitoring and reporting is necessary
*compatible with iphone, seamless, effortless and intuitive & beautiful* to look at, that’s the main thing. *Not be slow and not be prone to bugs* constantly. If you want people to use an approval policy or software, then you need to make sure it has all the necessary features and the one at our hospital doesn’t have any of these. DSS can play a role in *improving the use of antibiotics* but speaking from the point of view of being a kind of an expert in AB use anyway, so it really doesn’t help me. But, yeah, it can for other junior doctors provided the *process is effective and efficient*.

To have this *DSS connected to the BOSS* would be good so that I don’t have to go to another system, obviously that would be very useful. Having *genuinely useful information* in it that people actually want to seek out but to some extent it is duplication of AB guidelines and everybody will realize the use of AB guidelines. But never-the-less, it’s the same information available in different place, but it’s the same information and most people find it *easy most of the time to get a book*, but actually go through the system to find information about the antibiotic.

**Steps need to be taken in educating staff** about antibiotics and their usage. More education will be better for *sure, specially for interns*. Senior staffs know it all but have been used to prescribing *whatever has worked with them in the past* and they will continue to do so even after education.

I think *antibiotic restrictions are useful*. I don’t think it’s been very effective here but it can be effective and it’s not a barrier for the patient at all. In fact you just need to look at the overall

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Lack of education

Education to be provided

Interns need more education

Senior doctors will not change their habit

Restriction policies are useful

Could benefit
picture. On the one hand may be it might briefly cause an issue for a few minutes at worst for an individual patient getting an AB, but probably at the benefit of overall of that patient, hundreds of thousands of other patients being less at risk of getting resistant bugs in like a hospital environment. So I don’t think it’s a barrier to good care at all.