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FACULTY OF SOCIAL AND HUMAN SCIENCES

ACADEMIC UNIT OF PSYCHOLOGY

Changing the prescribing behaviour of general practitioners: Understanding the acceptability and feasibility of interventions to promote prudent antibiotic use across Europe

by

Sarah Tonkin-Crine

Thesis submitted for the degree of Doctor of Philosophy in Health Psychology Research and Professional Practice

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ABSTRACT

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CHANGING THE PRESCRIBING BEHAVIOUR OF GENERAL PRACTITIONERS: UNDERSTANDING THE ACCEPTABILITY AND FEASIBILITY OF INTERVENTIONS TO PROMOTE PRUDENT ANTIBIOTIC USE ACROSS EUROPE

By Sarah Tonkin-Crine

Antibiotic resistance is recognised as an international health concern due to its potential to increase morbidity and mortality from illnesses that are currently treatable. Antibiotic prescribing by GPs in primary care has been shown to directly contribute to rates of antibiotic resistance. Many interventions have been introduced across European countries in an attempt to promote prudent use of antibiotics for respiratory tract infections in primary care. Exploring GPs' views and experiences of interventions to promote prudent antibiotic use can help to understand what is viewed as acceptable by GPs and what may encourage behaviour change. In addition, investigating these views across countries can highlight any similarities and differences between contexts and examine whether interventions which are acceptable, feasible and potentially effective in one context may be appropriate for implementation in others.

The main aim of this research was to explore GPs' and experts' views and experiences of antibiotic prescribing and interventions to promote prudent antibiotic use in the management of RTIs. If professionals hold different views there is a need to develop interventions for each country, whereas if professionals hold similar views then an intervention which is acceptable in one country can be implemented in others.

Two qualitative studies were carried out to explore GPs' and experts' views of antibiotic prescribing and interventions to promote prudent use across five European countries. The results of both studies revealed consistent views despite differences in context, indicating that both GPs and experts who develop interventions held similar beliefs about the acceptability and feasibility of different types of interventions.

Secondly, a systematic review was undertaken which synthesised all qualitative work which had explored GPs' views on antibiotic prescribing or interventions to promote prudent use. The review incorporated studies from several countries and produced a model highlighting seven factors which influence GPs' prescribing decisions and aspects of interventions which could address these factors.

The findings of this thesis reveal the barriers experienced by GPs in prudent antibiotic prescribing and suggest that it is suitable to develop an intervention to promote prudent antibiotic use for implementation at an international level.

List of Contents

List of Tables

List of Figures

Declaration of Authorship

I, Sarah Tonkin-Crine, declare that the thesis entitled "Changing the prescribing behaviour of general practitioners: Understanding the acceptability and feasibility of interventions to promote prudent antibiotic use across Europe" and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

Parts of this work have been published as:

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Signed: ……..

Date: …….

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Abbreviations

AMR: Antimicrobial resistance
BAPCOC: Belgian antibiotic policy coordination committee
CHAMP: Changing the behaviour of healthcare professionals and the general public towards a more prudent use of antimicrobials.
CRP: C-reactive protein
EAAD: European antibiotic awareness day
ECDC: European Centre for Disease Prevention and Control
ESAC: European surveillance antimicrobial consumption
GP: General practitioner
GRACE: Genomes to combat resistance against antibiotics in community-acquired LRTI in Europe.
HAPPY AUDIT: Health alliance for prudent prescribing, yield and use of anti-microbial drugs in the treatment of respiratory tract infections.
NICE: National Institute for Clinical Excellence
LRTI: Lower respiratory tract infection
QoF: Quality of outcomes framework
PCT: Primary care trust
POCT: Point of care test
PRIME: Process modelling in implementation research
RTI: Respiratory tract infection
STRAMA: Swedish strategic programme against antibiotic resistance.
URTI: Upper respiratory tract infection
WHO: World Health Organisation

CHAPTER 1: Antimicrobial resistance and GP prescribing behaviour in Europe.

1.1 Introduction

This chapter introduces the problem of antibiotic resistance and its relation to primary care practice and respiratory tract infections. It discusses the concept of unnecessary antibiotic prescribing and the various types of interventions which health organisations have designed and implemented in order to reduce unnecessary antibiotic prescribing across Europe. This chapter concludes with the rationale for the research project reported within the thesis and a description of the context in which this work was carried out.

1.2 Antimicrobial resistance: the problem

The World Health Organisation (WHO) defines antimicrobial resistance (AMR) as the "resistance of a microorganism to an antimicrobial medicine to which it was previously sensitive" (WHO, 2012a). Here, a microorganism usually refers to a bacterium or a virus. There are various types of antimicrobial medicine, such as anti-fungal or anti-viral medications; however, the most commonly used are antibiotics, which will be the focus of this thesis.

Resistance to an antibiotic develops over time. A person who takes an antibiotic for the first time introduces this new medicine to their body. Microorganisms present in the body which are vulnerable to this medicine will die off; however, there will always be some microorganisms which have a natural resistance to the medication and which will not be killed. These microorganisms will stay in the body and will reproduce, passing on their resistance as they multiply (WHO 2012b). When a person takes the same antibiotic in the future, a smaller number of the microorganisms will die compared to the previous time

and a greater number of microorganisms, which are resistant, will remain. This cycle continues until something else causes the microorganisms to die; for example, a different, more aggressive type of antibiotic, which may then start its own cycle of resistance. The potential risk of treatment like this is that a patient's body can eventually produce microorganisms which are resistant to multiple types of antibiotic. It can then be possible for an infection, which was once treatable by use of an antibiotic to last for a much longer period creating more morbidity and increasing risk of transmission, or eventually to become untreatable because of multiple resistances.

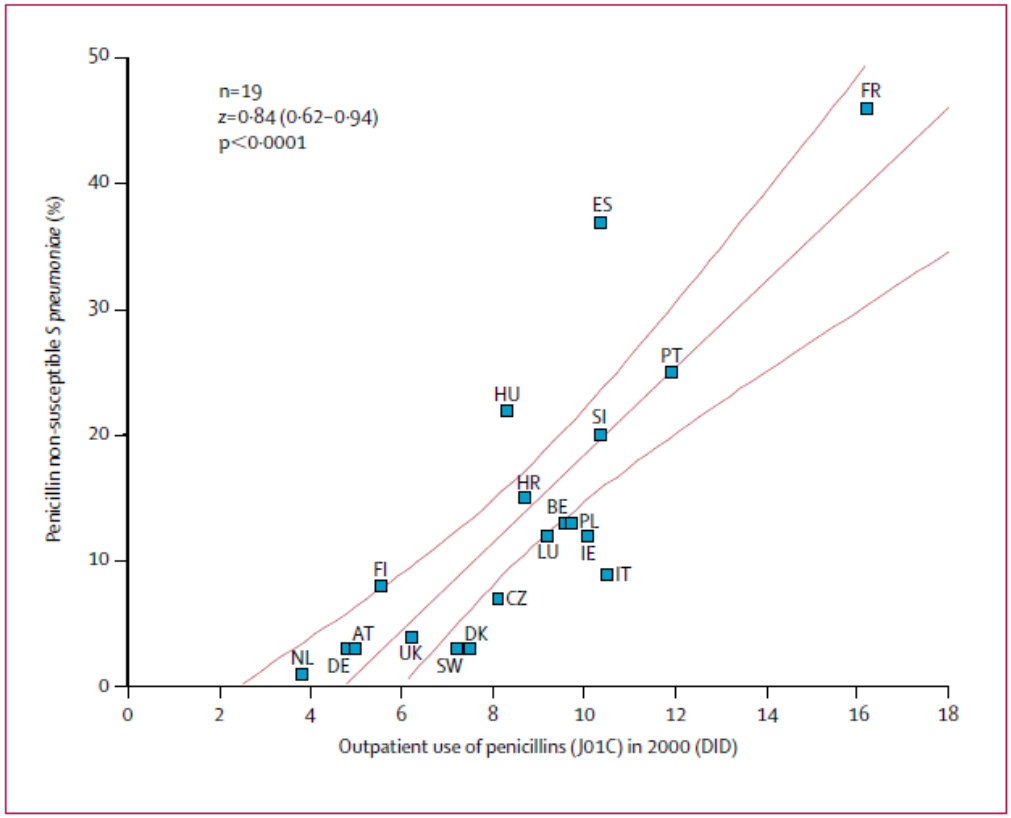
Antimicrobial resistance can result from the overuse, underuse and misuse of antibiotics (WHO, 2012b). Overuse occurs when people take antibiotics which are not needed for the illness from which they are suffering. In this situation a person will develop partial resistance to a medication which offered them no benefit. Underuse occurs when people do not take antibiotics which are necessary for the illness they have, either not taking an antibiotic at all, or taking an antibiotic which is not strong enough. Underuse can lead to a lengthening of the illness, increased symptoms and greater risk of transmission to other people and it may also lead to death. Lastly, misuse of antibiotics refers to patients who do not take their medication as prescribed by healthcare practitioners; for example, not finishing a full course of antibiotics because they feel recovered from their illness before they have finished all the medication prescribed. In this situation, all microorganisms causing the illness may not have been killed off and can multiply quickly, sometimes having developed to become resistant to the current antibiotic. Once bacteria in a person's body have developed resistance to a particular type of drug this resistance can remain in their system for several months. This means it is preferable for a patient not to take several doses of antibiotics within a 12 month period (Costelloe, Metcalfe, Lovering, Mant and Hay, 2010).

As mentioned above, the biggest threat of AMR is increased mortality from illnesses which were previously treatable. The WHO identify several other negative consequences of AMR including increased health care costs through increased morbidity and the need for the use of more expensive medications, a lack of control over the spread of infectious diseases and the risk of returning to a "pre-antibiotic era" if infectious diseases become uncontrollable (WHO, 2012a).

1.3 The relation between antibiotic resistance, primary care and respiratory tract infections

Primary care is the source of the majority of prescriptions for antibiotics and therefore the majority of these prescriptions are being dispensed by general practitioners (GPs) (Goossens, Ferech, Stichele & Elseviers, 2005). Research has investigated the prevalence of different types of resistance across multiple countries in relation to primary care antibiotic prescribing data, and there is strong evidence that countries with higher antibiotic prescribing rates in primary care have higher rates of antibiotic resistance (Goossens et al., 2005). One European project, the European Surveillance of Antimicrobial Consumption (ESAC), gathered data from 34 countries, including the 27 EU states, to investigate the amount and type of antibiotics being prescribed within and between countries. Using measures of resistance and prescribing in each country, the research team were able to assess the correlation between prescribing in primary care and levels of resistance in the general population. Figure 1 shows the data for this in terms of prescribing for all types of penicillin (for example, Amoxicillin and Penicillin V) and the prevalence of penicillin-resistant streptococcus pneumoniae bacteria. It indicates that, as primary care prescribing of a specific antibiotic increases, the resistance to that antibiotic in the community is also likely to increase.

Figure 1 states that the x axis in this graph represents outpatient *use* of penicillins; however, this better represents the amount of antibiotics *prescribed* in primary care, rather than the amount of antibiotics consumed by primary care patients, which would be more difficult to estimate. Penicillin use was worked out using the defined daily dosage (DDD) measurement as recommended by the WHO, which represents the "assumed average maintenance dose per day for the drug's main indication in adults" (Goossens et al., 2005, p.584). In order to control for the size of the population in each country this was expressed as "DDD per 1000 inhabitants daily" or DID in short.



AT, Austria; BE, Belgium; HR, Croatia; CZ, Czech Republic; DK, Denmark; FI, Finland; FR, France; DE, Germany; HU, Hungary; IE, Ireland; IT, Italy; LU, Luxembourg; NL, The Netherlands; PL, Poland; PT, Portugal; SI, Slovenia; SW, Sweden; ES, Spain; UK, England only.

Figure 1. The correlation between use of penicillin antibiotics in primary care in 19 European countries and the prevalence of penicillin-resistant streptococcus pneumoniae bacteria in the general population. Graph taken from Goossens et al. (2005, p. 584).

Whilst some research has looked at the amount of antibiotics being prescribed across countries, other research has focused on the illnesses for which doctors are prescribing these drugs. In a study of UK general practice between the years of 1998 and 2001, researchers explored the general practice research database in order to see for which indications GPs were prescribing antibiotics and which type of antibiotics were being prescribed (Petersen & Hayward, 2007). The study identified the ten most common indications for prescribing antibiotics, six of which were upper or lower respiratory tract infections. Supporting research also suggests that antibiotic prescribing for respiratory infections are thought to account for up to 75% of all antibiotic prescribing in general practice (Goossens et al., 2005; Welschen, Kuyvenhoven, Hoes & Verheij, 2004).

Petersen and Hayward (2007) also identified the percentage of cases of each condition that were prescribed antibiotics. They found GPs were prescribing for over 80% of cases of lower respiratory tract infections (LRTI), 65% of cases of sore throat, 62% of cases of otitis media and 44% of cases of upper respiratory tract infections (URTIs) (Petersen & Hayward, 2007). These results supported previous research, from countries other than the UK, which showed high levels of antibiotic prescribing for upper respiratory tract infections, which remained consistent across several years (Kuyvenhoven, van Essen, Schellevis & Verheij, 2006).

Such results indicate that antibiotics are commonly prescribed for the majority of respiratory tract infections (RTIs) in general practice. Whilst some of these prescriptions are likely to be necessary for patients who may be at risk of complications, the percentage of infections being treated with antibiotics appears to be very high when compared with recommendations from evidence-based guidelines for these conditions. The most recent guideline from the National Institute for Health and Clinical Excellence (NICE) recommends not prescribing antibiotics for

acute otitis media, acute sore throat, acute rhinosinusitis, acute bronchitis or the common cold (NICE, 2008). The only situations where antibiotics are recommended is when the patient presents with specific symptoms; bilateral otitis media in children under two years, otitis media with otorrhea (ear discharge) and sore throat where a patient presents with three or more Centor criteria (NICE, 2008). The Centor criteria are associated with the diagnosis of Strep A sore throat (bacterial infection with group A beta streptococcus) and include four criteria; tonsillar exudates, swollen tender anterior cervical nodes, lack of a cough, and history of fever (Centor, Witherspoon, Dalton, Brody & Link, 1981). Guidelines from other European countries contain similar recommendations and advise on limited prescribing of antibiotics for acute respiratory tract infections; examples include national guidelines from Belgium, the Netherlands, Finland and regional guidelines from Sweden, alongside others (STRAMA, 2000; BAPCOC, 2008; Zwart, Dagnelie, Van Staaij, Balder, Boukes & Starreveld, 2007; Blomgren et al., 2005).

Guidelines are based on research evidence which has investigated the benefit of taking antibiotics for patients with acute infections. Research has identified that many of these types of infections are self-limiting and that antibiotics offer either no, or very little, benefit in terms of duration or severity of symptoms when provided to patients with acute RTIs (Little et al., 2005). Two Cochrane reviews, focused on sore throat and bronchitis, investigated all randomised controlled trials looking at the use of antibiotics to treat either condition (Spinks, Glasziou & Del Mar, 2006; Smith, Fahey, Smucny & Becker, 2004). Both reviews found that antibiotics only reduced the duration of illness by a day on average and highlighted that this minimal benefit had to be weighed up with the risks of side effects from antibiotics (which can include nausea, vomiting and diarrhoea) as well as the number needed to treat in order to obtain benefit. Spinks et al. (2011) also specified that healthcare professionals needed to consider the problem of medicalisation of illnesses which are

self-limiting and the likelihood of patients returning to general practice unnecessarily for future acute illnesses (Little et al., 2005).

The research above indicates that guidelines support the management of RTIs without the use of antibiotics, as well as showing that antibiotics are being prescribed for the majority of patients presenting with RTIs in primary care. This literature, when referring to RTIs, implies that the infection is acute and that an infection has not lasted an unusual amount of time. The remainder of this thesis will continue to refer to RTIs, inferring that RTIs are acute and following a usual course and will use RTIs to cover both lower and upper respiratory tract infections (LRTI and URTI).

Prescribing which does not fit with guidelines mentioned above can be referred to by several names including irrational prescribing, inappropriate prescribing and unnecessary prescribing. The remainder of this thesis will use the latter name as it does not infer that GPs are acting irrationally or inappropriately towards their patients. It should be noted that "unnecessary" is used here to reflect the *clinical* necessity for an antibiotic prescription for a patient.

1.4 Interventions to reduce unnecessary prescribing

1.4.1 Types of intervention

To reduce unnecessary antibiotic prescribing many countries have used a variety of interventions to try to change GP prescribing behaviour for the management of RTIs. The content of interventions can range from simple such as providing education to GPs, to complex such as providing multi-component interventions using education, skills training and feedback. Providing education on prudent antibiotic prescribing, encouraging the reduction of unnecessary prescribing, to GPs is often the basis for the majority of interventions. Providing materials or

guidelines about what is considered best practice ensures that GPs have access to the relevant information and evidence behind recommendations. Organisations in the UK who produce such recommendations include NICE, the Scottish Intercollegiate Guideline Network (SIGN), NHS Clinical Knowledge Summaries and the Public Health Agency in Northern Ireland.

Whilst clinical practice guidelines are designed to improve the standard and consistency of healthcare, their effectiveness is dependent on their quality and successful implementation (Carlsen, Glenton & Pope, 2007). Even when quality is high and implementation is good, interventions which purely educate GPs are likely to have only a limited effect on behaviour and, alone, are often not enough to initiate significant change (NICE, 2007). As a result, other interventions have been designed to complement national or local guidelines or to help with their implementation.

In UK primary care it is common for GPs to be invited to attend educational meetings, also called academic detailing, often as part of their continual professional development. Whilst these are another educational intervention, meetings also enable GPs to discuss practice with their peers in order to hear how others are practicing. Educational meetings occur outside of surgeries and may be offered to a local, regional or national group of GPs, varying in size depending on scope. An alternative to these types of meetings are outreach visits where experts on a subject are invited into a GP's own practice in order to present and discuss a specific subject. These experts may be trained GPs themselves or may be other healthcare professionals from primary or secondary care. This option has an advantage as it means GPs are required to commit less time in order to attend meetings; however, it is more resource heavy for the healthcare organisation and also means GPs may not have the opportunity to communicate with peers outside of their own practice. Research has shown that interventions containing

educational meetings can be effective at helping to change clinician prescribing behaviour (Coenen, Van Royen, Michiels & Denekens, 2004; Gonzales, Steiner, Lum, & Barrett, 1999; Ilett et al. 2000; Molstad, Ekedahl, Hovelius & Thimansson, 1994; Welschen et al., 2004; van der Velden, Pijpers, Kuyvenhoven, Tonkin-Crine, Little & Verheij, 2012).

Another type of intervention is audit and feedback. This involves monitoring primary care practice for a certain amount of time and then reporting back to the GP surgery, or individual GP, about the results. In terms of prescribing, an example of an audit would be to record all antibiotic prescriptions given for a certain diagnosis across six months and then report back to individual GPs to say how many prescriptions they gave in terms of the relevant population they saw and compared to their practice colleagues or, perhaps, other local colleagues. A Cochrane review assessing the effects of audit and feedback on the practice of healthcare professionals found small to moderate effects, which suggested this type of intervention could be helpful in changing GP behaviour; however, the largest effects were seen when baseline behaviour was not in line with recommendations (Jamtvedt, Young, Kristoffersen, Thomson, O'Brien & Oxman, 2003). Other studies have also shown that interventions including audit and feedback can help to decrease unnecessary antibiotic prescribing for RTIs and increase prescribing in line with clinical guidelines (Zwar, Wolk, Gordon, Sanson-Fisher & Kehoe, 1999; Munck, Gahrn-Hansen, Sogaard & Sogaard, 1999). However, one study found no differences between the change in behaviour of clinicians who receive guidelines and feedback and those who receive guidelines alone, suggesting that audit and feedback may not add anything in terms of changing behaviour compared with providing information alone (Søndergaard, Andersen, Stovring & Kragstrup, 2003).

Interventions may also involve the use of reminders for GPs, often incorporated into computers used within consultations. When making a

diagnosis, computer reminders may inform GPs about an appropriate treatment strategy or may inform about the risk factors for certain patients for different management options. For example, for antibiotic prescribing, a computer reminder may recommend not prescribing antibiotics for acute sore throat or present information about the minimal benefit patients with a sore throat may get from taking antibiotics. Reminders can be helpful as they can interrupt habitual behaviours as they occur in the consultation and can make a GP reconsider or double check what treatment they have decided upon. One study has shown that interventions containing reminders can improve antibiotic prescribing for RTIs in general practice, either through reducing the amount of prescriptions given or reducing the duration of antibiotic treatment given (Christakis, Zimmerman, Wright, Garrison, Rivara & Davis, 2001).

Interventions may also be designed to help GPs learn a specific new skill or extend their existing skills. Two types of skill have been taught in interventions aimed at changing antibiotic prescribing by GPs. The first is training in the use of near patient tests to aid the diagnosis of acute infections, and the second is the extension of communication skills in order to address specific patient expectations about treatment. The use of near patient tests for the diagnosis of RTIs varies across Europe, depending on the availability and reimbursement of these tests by governments. A commonly used test in some countries is a C-Reactive Protein (CRP) test; CRP is a protein produced by the liver which can be measured from a blood sample. The levels of CRP rise in response to inflammation when the body is infected and therefore higher levels of CRP indicate that the body is suffering from a greater level of inflammation. In this way, CRP tests can help identify patients who are suffering from higher levels of inflammation and who therefore may benefit from taking an antibiotic. CRP tests are widely used in Nordic countries such as Denmark and Sweden; however, they are not regularly used in other European countries, mainly because costs are not

reimbursed by the national health organisation (Dahler-Eriksen, Lassen, Lund, Lauritzen & Brandslund, 1997; André, Schwan & Odenholt, 2004; Cals, Chappin, Hopstaken, van Leeuwen, Hood, Butler & Dinant, 2010). Studies using a CRP test as an intervention to decrease unnecessary prescribing in primary care have become more common and several have found results suggesting that the use of tests help to decrease antibiotic prescriptions for RTIs (Cals, Butler, Hopstaken, Hood & Dinant, 2009; Cals, Schot, de Jong, Dinant & Hopstaken, 2010; Bjerrum, Cots, Llor, Molist & Munck, 2006). Other studies, however, have found that, although the use of CRP tests may reduce antibiotic prescriptions, this may not help a patient's symptom resolution. Diederichsen et al. (2000) found that patients who had a CRP blood test as part of their examination experienced longer duration of illness compared to a control group. This suggests either that the test is not always recognising patients with more severe symptoms or that clinicians are basing prescribing decisions on test results over the physical examination, both of which have consequences for the implementation of such an intervention.

Some interventions have also focused on teaching communication skills to GPs. Research has identified that often patients can present to primary care without informing the GP of all of their concerns (Barry, Bradley, Britten, Stevenson & Barber, 2000). In terms of antibiotic prescribing, much research has identified that GPs may prescribe antibiotics because they feel the patients wants them (Cockburn & Pit, 1997; Butler, Rollnick, Pill, Maggs-Rapport & Stott, 1998); however, this is not always the case and therefore it is important for GPs to be able to specifically ask about patient expectations and have examples of how to do this (Butler, Rollnick, Kinnersley, Jones & Stott, 1998). Other research has also presented models which GPs can use in their discussions with patients to establish what patients are concerned about; and then respond appropriately (Rollnick, Mason & Butler, 1999; Butler, Kinnersley, Prout, Rollnick, Edwards & Elwyn, 2001). Again, there have

been studies which indicate that interventions which contain communication skills training for clinicians can be effective in reducing the number of antibiotic prescriptions for the treatment of RTIs (Cals et al., 2009b; Butler et al., 2012; Altiner, Brockmann, Sielk, Wilm, Wegscheider & Abholz; 2007).

Other types of intervention can involve incentives for the GP practice. Financial incentives have been widely used in UK general practice as part of the introduction of the Quality and Outcomes Framework (QoF) in 2004. In terms of antibiotic prescribing within this framework, GPs are able to receive money for their practice by showing a decrease in antibiotic prescribing within a certain timeframe by a certain percentage. Whilst this scheme can be popular, GPs have a choice in which targets they wish to try and meet, meaning that some can be ignored if a practice feels they are too hard to achieve. One study which used financial incentives as part of a larger intervention alongside education and audit and feedback, found that the combination led to clinicians prescribing fewer antibiotics on average than a control group for acute sinusitis (Greene et al., 2004). Another study, however, found that improvements in prescribing by clinicians receiving a financial incentive wore off over time and only had a limited effect (Martens, Werkhoven, Severens & Winkens, 2006).

Lastly, offering GPs the option of providing patients with a delayed antibiotic prescription can be a type of intervention as it may provide the GP with an alternative behaviour other than “immediate prescribing” (where a patient can cash the prescription on the same day and start taking the antibiotic immediately) (NICE, 2008). In this situation, a GP may provide a patient with a prescription and instruct them that it should not be cashed until a minimum time period has elapsed. Alternatively, the GP may provide access to a prescription after a certain time has elapsed (for example, a prescription being left at a GP reception for a patient to pick up in three days’ time, if needed, without

seeing the GP again). A review of five studies which explored the effectiveness of delayed prescribing or reducing antibiotic use (measured as the collection of a prescription or self-reported consumption of the antibiotic) concluded that it was an effective intervention for reducing use by general practice patients with RTIs (Arroll, Kenealy & Kerse, 2002b).

As well as individual interventions aimed at GPs, national campaigns may also be developed by a healthcare organisation, which focus on antibiotic prescribing in primary care and which are aimed at GPs as well as patients or the public. In England, national campaigns educating the public about the prudent use of antibiotics have been running regularly since the first "Andybiotic" campaign in 1999 (Figure 2, Woodhead & Finch, 2007). During these campaigns, GPs have also been targeted and given patient materials to help to remind them about prudent prescribing and to offer the opportunity to educate their patients about appropriate use. In an evaluation of UK campaigns, Lambert, Masters and Brent (2007) found that there were significant differences in antibiotic prescribing volumes between primary care trusts (PCTs) in the intervention areas and PCTs in the control areas in the north of England. Other studies of evaluations of campaigns in other countries have also suggested that they may help to reduce antibiotic prescribing, although these studies emphasise that benefits are likely to be seen in countries which are considered high prescribing countries and only if campaigns use specific behavioural and social marketing techniques to target specific populations (Huttner, Goossens, Verheij, & Harbarth, 2010; Goossens et al., 2006).

Figure 2. Two examples of posters from national English antibiotic campaigns; one from the "Andybiotic" campaign in 2002 and one from the European Antibiotic Awareness Day (EAAD) campaign in 2009 informing people that antibiotics do not help for certain illnesses.

Overall, research has shown that some interventions may be helpful in overcoming barriers to implementing guideline recommendations; however, there is either limited or mixed evidence for each type of intervention. Reviews of this work suggest that interactive educational interventions for clinicians may be helpful but there is more evidence for this type of intervention than for others, so this may reflect bias in the amount of evidence available (Ranji, Steinman, Shojania & Gonzales, 2008; Ostini et al., 2009). Other reviews suggest that interventions which target RTIs as a whole, rather than a single condition, and are multi-faceted rather than single interventions, could also be helpful in changing clinician prescribing behaviour; however, they also suggest that further studies should be carried out with appropriate process evaluations (Arnold & Straus, 2005; Ranji et al., 2008). In summary, there is more work to be done to establish what type of interventions may be most effective.

1.4.2 GPs' views on interventions

It is clear that quantitative research which can explore the effectiveness of interventions can be helpful when trying to determine methods to achieve desired behaviour change by GPs. Qualitative research is also able to make a contribution to explaining how and why behaviour change may occur.

Previous qualitative work has explored GPs' adherence to practice guidelines and has specifically focused on GPs' perceptions of guidelines in order to identify any barriers or facilitators GPs report in following recommendations. Research has indicated that GPs want guidelines to be transparent in their development so that the basis of recommendations is clear and traceable (Carlsen & Norheim, 2008; Rashidian, Eccles & Russell, 2008). Research has also highlighted specific concerns GPs hold about guidelines including worries about the influence of cost-saving policies on recommendations, the frequent changes seen in recommendations and the relevance of the evidence base to their own general practice (Carlsen & Norheim, 2008; Rashidian et al., 2008).

A meta-synthesis of 17 qualitative studies looking at GPs' attitudes to guidelines found that GPs appeared to receive, and implement, guidelines differently depending on whether they felt they were prescriptive or proscriptive (Carlsen et al., 2007). The authors described prescriptive guidelines as ones which encouraged the use of specific interventions or encouraged specific behaviours; proscriptive guidelines were ones which discouraged certain behaviours or interventions (Carlsen et al., 2007). Carlsen et al. (2007) concluded that prescriptive guidelines may be better received by GPs as they present methods of overcoming barriers in everyday practice, whereas proscriptive guidelines may conflict with GPs' ideas of delivering patient-focused

practice by promoting rationing of medication or denial of patient requests.

Alongside studies on GPs' views of guidelines in general, qualitative studies exploring GPs' views of guidance on the management of RTIs, and the prescription of antibiotics for these infections, has become more common. Several studies have explored GPs' views on the prescription of antibiotics for RTIs and suggest that GPs have concerns about reducing antibiotic prescribing which may influence how they follow guidelines. Examples of such concerns include the effects on the doctor-patient relationship and concerns about clinical complications when antibiotics are not prescribed (Butler, Simpson & Wood, 2008; Kumar, Little & Britten, 2003). Research has also identified that GPs report that they are more likely to prescribe unnecessarily in specific situations in practice; for example, when short of time in the consultation or when they perceive patient pressure for an antibiotic (Kumar et al., 2003; Bjornsdottir & Hansen, 2002; Petursson, 2005).

Whilst this research is able to provide an insight into general practice and can help to explain why antibiotics continue to be prescribed for RTIs, there are still areas which have not yet been covered. Although several qualitative studies have been carried out, the majority of these have involved GPs working within the UK and the remainder include GPs from Northern European countries such as the Netherlands, Belgium or Nordic countries. Future research which can explore GPs' views in other countries, in Eastern or Southern Europe or further afield, would be able to provide additional insight into primary care practice and explore whether there are additional factors which influence GPs' prescribing decisions.

1.4.3 Other healthcare professionals' views on interventions

Whilst it is preferable to explore the views and experiences of GPs to directly explore the decisions being made in primary care practice, it can also be beneficial to investigate the views of other professionals who develop and implement recommendations for primary care.

There have been a limited number of studies which have investigated views on guideline development, guideline implementation and the development of interventions to aid guideline implementation in groups other than GPs. Two qualitative studies exploring the views of "experts" who develop guidelines have suggested that guideline quality may be improved by following more systematic development processes (Thomson, McElroy & Sudlow, 1998) and offering guidance on how to minimise subjectivity in guideline development groups (Calderon, Rotaeche, Etxebarria, Marzo, Rico, & Barandiaran, 2006). These studies did not, however, examine views on guideline implementation. Only one study has investigated views on guideline implementation in primary care in groups other than GPs, asking administrators, nurses and project leads (Ploeg, Davies, Edwards, Gifford, & Miller, 2007). The results suggest that interventions should address barriers related to the clinician, the social and organisational context, and should be tailored to different groups of professionals.

As yet, no qualitative studies have asked the professionals or "experts" who develop and implement interventions for their views on different primary care interventions and how they compare or how they feel interventions are received by clinicians. Examining the views of experts who develop and implement interventions may help to explain which factors make interventions more successful. Compared to research on GPs' views, experts can provide a new perspective, based on their different experience, on whether interventions are feasible to carry out

in practice, and may also provide a useful “outsider” view of how GPs respond to, and follow, interventions in practice.

1.5 Working towards the consistent management of acute RTIs in general practice across Europe

As seen previously, the problem of antibiotic resistance is a worldwide issue and is therefore relevant to all European countries. As well as data on resistance, the ESAC have also collected data on the amounts of antibiotics and types of antibiotics prescribed in each country taking part in the project, shown in Figure 3 (Goossens et al., 2005; Muller, Coenen, Monnet & Goossens, 2007).

From these data it is apparent that there is huge variation in the total amount of antibiotics prescribed across Europe, per country. These data are supported by other work, undertaken as part of a European project exploring the variation in antibiotic prescribing for acute cough between 13 countries (Butler et al., 2009). In that project, researchers found that total antibiotic prescribing for acute cough between primary care networks, in the 13 countries, ranged from 20% to 90% with an overall average of 53% (Figure 4, Butler et al., 2009). Researchers also explored additional variables and patient characteristics and found that variation in antibiotic prescriptions between networks remained, even when data were adjusted for illness severity, co-morbidities, age and duration of illness before the consultation (Butler et al., 2009). In addition, when looking at recovery, they found rates were similar between patients who had received antibiotics and those who had not. The authors concluded that the variation patterns found between countries were not associated with clinical differences in illness presentation or duration.

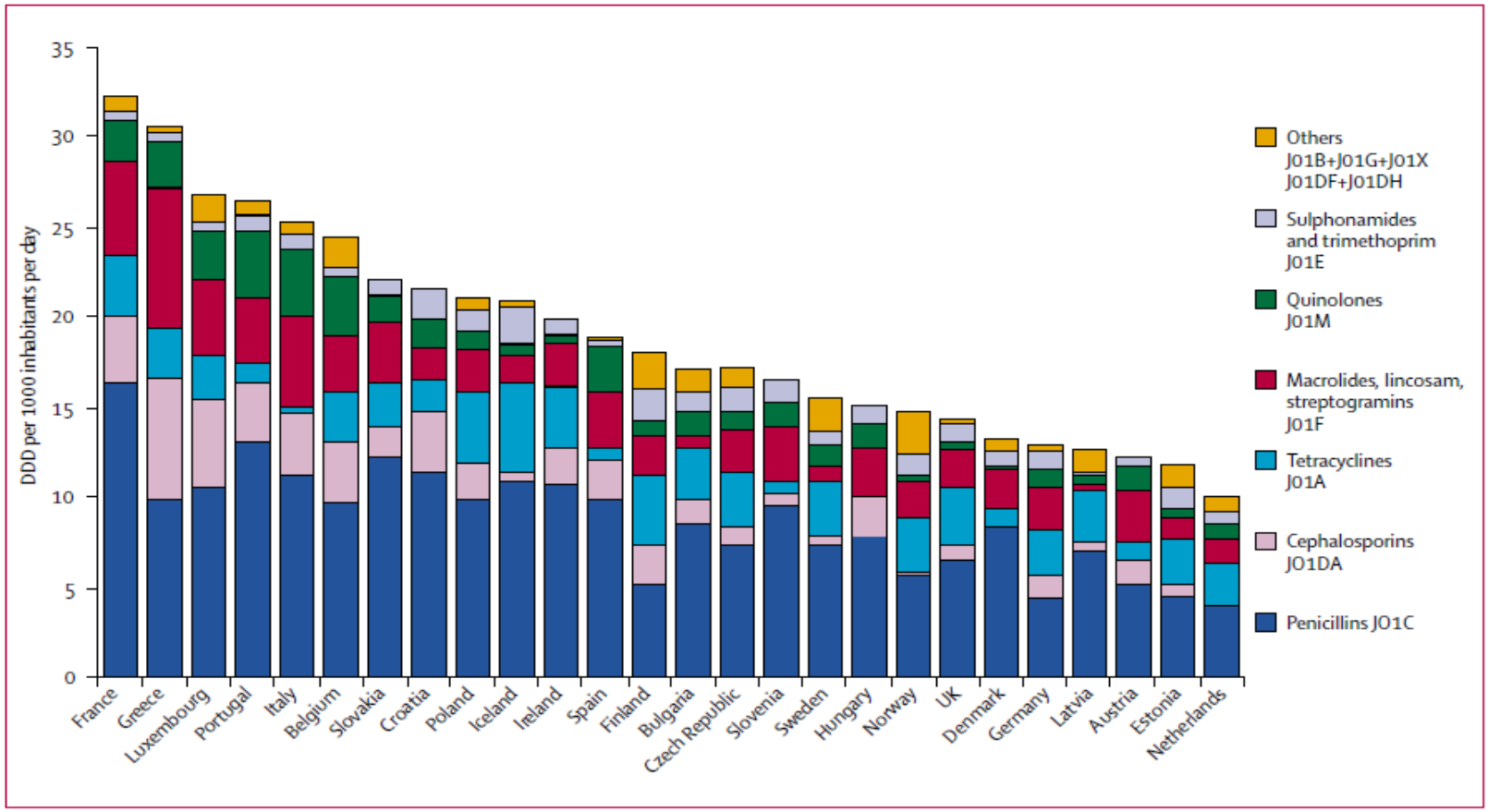


Figure 3. Variation in total antibiotic prescriptions in primary care across 26 European countries in 2002. Data are shown for all antibiotics falling under J01 in the WHO Anatomical Therapeutic Chemical classification system, which covers antibacterials for systemic use (WHO Collaborating Centre for Drug Statistics Methodology, 2011). Graph taken from Goossens et al. (2005, p. 581).

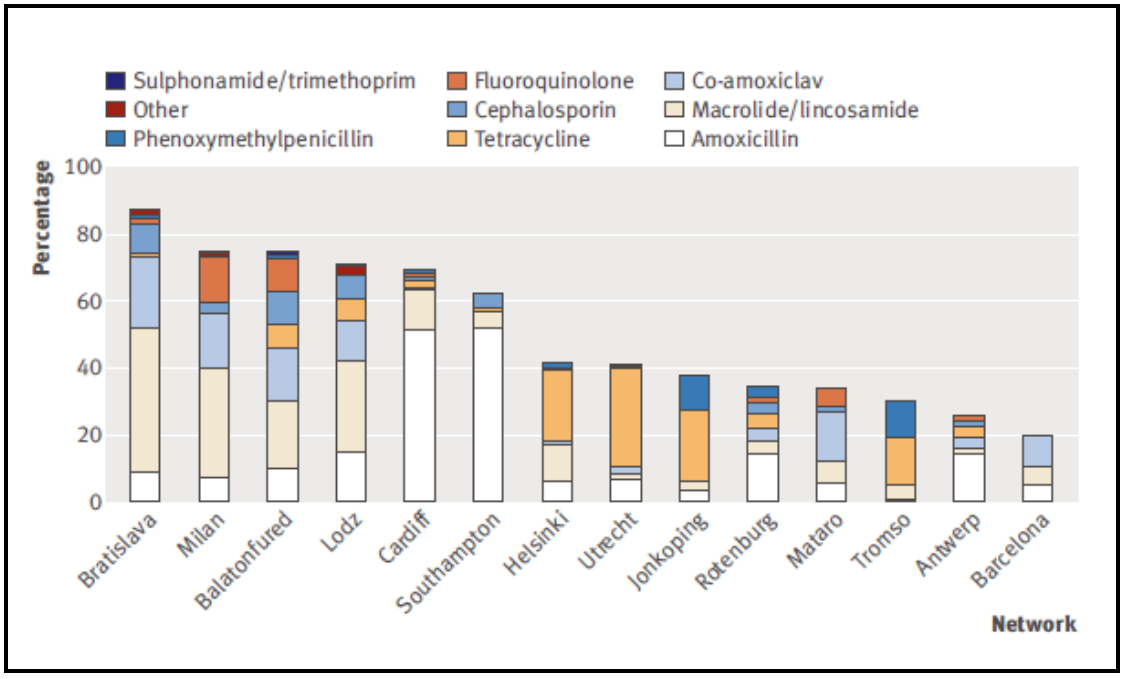


Figure 4. Variation in total antibiotic prescribing and type of antibiotic prescribed for acute cough between 13 European primary care networks, representing 13 countries. Graph taken from Butler et al., 2009.

The presentation of data such as these highlights the fact that antibiotics are likely to be being prescribed unnecessarily in at least some countries. There is no evidence to suggest that in lower prescribing countries patients are having a greater number of illness complications and there is nothing to suggest that in higher prescribing countries GPs are seeing different types of patients to lower prescribing countries, either in terms of clinical factors or demographics. For those countries which are seen to be lower prescribers, such as the Netherlands, it is more difficult to determine whether the number of prescriptions is necessary or not. The results of other research, however, suggest that overprescribing, or prescribing which is not in line with national guidelines, is common for RTIs even in these countries (Akkerman, Kuyvenhoven, van der Wouden & Verheij, 2005). Such results indicate that it is likely that all primary care practice in Europe

could be improved because clinicians are prescribing antibiotics for RTIs unnecessarily, in terms of clinical factors, in at least some cases.

Whilst individual countries can have clear guidelines and recommendations which define "unnecessary" prescribing, it is not necessarily the case that guidelines between European countries are similar. Previous research has reviewed international, national and local guidelines for RTIs across 10 European countries (Tonkin-Crine, Pijpers, Verheij & Little, *unpublished manuscript a*). The review identified high consistency between guideline recommendations for the diagnosis and management of otitis media, sinusitis, sore throat and lower RTIs in primary care practice across countries. Authors found that guidelines were very similar in specifying when antibiotics should be used; however, differences between guidelines usually emerged in the type of first line antibiotic which was recommended (Tonkin-Crine et al., *unpublished manuscript a*). Such results may help to explain the variation, seen above, in the type of antibiotics prescribed between countries but do not, however, help to explain the variation in the amount of antibiotics prescribed.

It is clear from the above data that differences in the amount of antibiotic prescribing between countries cannot be explained by the prevalence of disease, the types of patients presenting to primary care or the national recommendations available to primary care clinicians. Given data, it is reasonable to assume that clinicians across Europe are facing similar situations in their consultations, at least in terms of clinical factors. This has led some health organisations and researchers to consider a European approach to changing clinician prescribing behaviour. An example of such a campaign is the European Antibiotic Awareness Day (EAAD, 2012), set up in 2008 by the European Centre for Disease Prevention and Control (ECDC) in association with the WHO. This is an event, which occurs annually on November 18th, designed to advertise and promote the prudent use of antibiotics to primary and

secondary health care professionals, patients and the general public (Earnshaw, Monnet, Duncan, O'Toole, Ekdahl, & Goossens, 2009). As a result of this programme, campaigns to promote prudent antibiotic use have become more common in European countries and countries, which had no national campaigns previously have been able to use EAAD materials to help inform and educate health professionals and the public (Huttner et al., 2010).

Whilst European organisations have sought to make use of resources across countries to promote prudent antibiotic use, researchers have started to explore the possibility of creating interventions aimed at changing clinician behaviour to be used internationally. The majority of research, as seen in examples above, has focused on changing clinician behaviour in one country or context. Whilst assessments can be made on whether an intervention is effective within a particular country, they can also be useful to explore how an intervention may work across countries. Following the results of Arnold and Straus (2005) evidence suggests that multi-faceted interventions rather than single interventions may be more effective, and some European research projects have started looking at exploring the effectiveness of such an intervention across countries (GRACE, 2012; HAPPY AUDIT, 2012). Bjerrum et al. (2010) explored the effectiveness of a multi-faceted intervention at reducing antibiotic prescribing for RTIs in primary care across six countries; Denmark, Sweden, Lithuania, Russia, Spain and Argentina. The intervention included educational outreach visits and the provision of evidence-based guidelines, written by the research team, on prudent antibiotic use, posters and brochures for patients for use in the surgery and the provision of, and training in the use of, two point-of-care tests (POCTs), Strep. A (Group A streptococcal infection) and CRP. The authors found that the prescribing rate before and after the intervention decreased significantly in four of the countries, but did not change significantly for GPs in Denmark and Sweden. Prescriptions for LRTIs were seen to change more than prescriptions for URTIs, with

prescriptions falling by 42% in Lithuania, 25% in Russia, 25% in Spain and 9% in Argentina. The authors concluded that this variation seen between countries may be a result of the availability of POCTs in each country. POCTs are common in general practice in Denmark and Sweden but not in the other four countries; therefore, the introduction of these tests may explain the significant change in prescribing. Despite this, the authors could not explain why, in the four countries where the intervention seemed to have an effect, the extent of change in prescribing was so different (42% compared to 9%). The results suggest that there are other factors associated with primary care practice in each country which can influence the effectiveness of interventions. This is in line with additional research suggesting socioeconomic factors may account for some of these influences (Masiero, Filippini, Ferech & Goossens, 2010). These include higher levels of antibiotic use per capita being seen to be associated with a greater proportion of older adults in a population or the presence of a fee-for-service remuneration scheme.

In terms of qualitative research, prior to 2011 there appear to be only two studies which have looked at healthcare professionals' views of guidelines and interventions across two or more European countries. One study examined the views of guideline developers across four European countries- Germany, the Netherlands, Norway and Belgium on the development of a guideline for the management of cystitis in primary care, to see whether cultural aspects influenced the content of recommendations (Christiaens, De Backer, Burgers & Baerheim, 2004). The authors found that, although guideline developers reported following systematic processes to produce high quality recommendations and used the same evidence, the content of recommendations differed substantially. In one example, Christiaens et al. (2004) found that Norwegian guideline developers were happy to recommend making a diagnosis of cystitis via a telephone consultation; however, guideline developers from Germany and Belgium recommended diagnostic tests to be carried out by the GP before

diagnosis and, in addition, Belgian guideline developers felt it was suitable for GPs to carry out home visits to make a diagnosis. All recommendations reflected what was considered usual practice in each country and acceptable to both clinicians and patients.

Examples such as this highlight how varied recommendations can be despite being based on the same scientific evidence. If guidelines can reflect such cultural differences it is likely that the design and implementation of interventions will also reflect cultural differences between countries, perhaps more so, which may influence their effectiveness. It may be possible that, despite evidence indicating that an intervention is effective in one country, it may not be effective in another because of cultural or contextual differences in how it fits with usual general practice.

A second qualitative study, in Norway and Denmark, looked at GPs' perceptions of national guidelines for use in primary care (Carlsen & Kjellberg, 2010). The authors found that, although GPs had similar positive views on guidelines being evidenced based and useful for their practice, there were differences in views on guidelines which considered the cost of care. Guidelines which considered cost were seen as acceptable by Danish GPs but not by Norwegian GPs, who felt that clinical considerations were the only relevant factor. Again, this example highlights cultural differences in how GPs perceive the same information and reflects that the dissemination of certain information most likely needs to be tailored to the specific audience.

In summary, both the quantitative and qualitative examples above suggest that there is variation between countries in the effectiveness of interventions at changing prescribing behaviour as well as in GPs' views on the acceptability of different interventions; however, there has been limited research in this field to date. If European organisations are going to continue addressing the issue of antibiotic prescribing internationally,

it is important to explore whether there is significant variation between European countries in what features of interventions GPs view as acceptable. If there are, there is a need to develop implementation strategies for each country. If not, then an implementation strategy that proves effective in one country can be applied in others.

1.6 Outline of thesis

This thesis describes the current literature focused on promoting more prudent GP antibiotic prescribing for RTIs in order to explore whether it may be feasible to develop an intervention aimed at GPs for use in multiple European countries. The empirical studies reported within this thesis have been conducted with a view to exploring healthcare professionals' views of guidelines and interventions to promote more prudent antibiotic prescribing. Chapter 2 explores how psychological theory has been considered in the literature on changing GP antibiotic prescribing behaviour. Chapter 3 discusses the methodological techniques used throughout this thesis and the reasons why these were chosen. Chapter 4 and 5 present two large qualitative studies investigating the views of GPs, and experts who design and deliver interventions to GPs, on interventions to promote prudent antibiotic use across five European countries. Chapter 6 presents a systematic review which synthesises the current qualitative literature on GPs' views of antibiotic prescribing and interventions to promote prudent antibiotic use. Finally, Chapter 7 contains the discussion and conclusions of this thesis.

1.7 Context of the research programme

The empirical work (Chapters 4 and 5) contained in this thesis was carried out as part of a large European project, CHAMP (Changing the behaviour of health care practitioners and the general public towards a more prudent use of antimicrobials, www.champ-antibiotics.org). The

CHAMP project sought to determine the feasibility of developing an international intervention aimed at decreasing unnecessary antibiotic prescriptions by GPs in the management of RTIs. My role on the project involved managing and carrying out two qualitative studies, which are presented in this thesis. Within these studies I was responsible for carrying out interviews with UK participants and overseeing data collection and translation in other countries. I was responsible for analysing the whole data set collected in each study. The CHAMP project also included work on a review of current European guidelines on the diagnosis and treatment of acute RTIs, which is not presented here. The remaining chapters included in this thesis were not part of the CHAMP project and were carried out independently.

CHAPTER 2: Psychological theories of behaviour change in relation to GP prescribing behaviour.

2.1 Introduction

The task of encouraging change in health care professionals' behaviour, or indeed any behaviour, is a complex one. Although previous research studies are able to show positive effects of interventions aimed at changing GP behaviour, it is not enough to know that a single intervention works at a single time, in a single context. Without trying to understand *how* an intervention has led to a significant effect there is no possibility of learning from, or expanding on, previous successful interventions to replicate their positive effects.

Research which has investigated GP antibiotic prescribing for RTIs has focused on identifying specific characteristics of interventions which appear to be effective at promoting more prudent prescribing behaviour (Arnold & Straus, 2005; van der Velden et al., 2012). This has involved examining the design of an intervention, for example whether an intervention is delivered in a single or multi-faceted format, and the content of an intervention, identifying the components within the intervention by which researchers expect GP behaviour to be modified. In the area of antibiotic prescribing, examples of such components could be providing education for GPs thorough the provision of primary care guidelines or algorithms, providing equipment for GPs such as point of care tests (POCTs) or providing patient information for GPs to pass on to patients in their consultations.

Whilst it is important for researchers to know which intervention design and components appear to be more effective, it is also important to know the reasons *why* interventions are working. If one knows that

POCTS can help to reduce unnecessary antibiotic prescribing then one could recommend POCTS to be provided to all GPs, across multiple contexts. This may result in all GP prescribing improving, in which case behaviour change has been successful. However, there are reasons why this might not be appropriate. Firstly, there is no guarantee that what works for some GPs will work for all, especially if those GPs work in different contexts. Secondly, whilst an intervention component may be shown to be effective, it may not be available or feasible to implement in all primary care contexts. Identifying *how* a specific intervention component works to influence behaviour means that an alternative approach, which addresses the same mechanism(s) of change, could be used as a substitution in some contexts and have equally effective results. In this sense it may be possible to tailor a behaviour change intervention in order to "match" the context in which it is being applied. Thirdly, whilst the example of a POCT could potentially be applied for use in other conditions, such as those where inflammation is measured (for example urinary tract infections), it is not clear whether other intervention components could be used for encouraging behaviour change in connection to other illnesses or situations. If this is not explored there is the potential for primary care practice to miss out on further benefit.

By studying GPs' antibiotic prescription behaviour in terms of behaviour change theory it may be possible to identify relevant theoretical constructs and therefore specific mechanisms which lead to a GP perceiving and/or responding to an RTI consultation in a different way, thus reducing the likelihood of an unnecessary prescription. Identifying these mechanisms goes beyond pure description of intervention components and instead breaks these components down to the means by which they are working, enabling researchers to describe how behaviour is being influenced, and through which pathway(s).

The ability to identify mechanisms of behaviour change can be particularly useful when exploring the behaviour change of GPs who work in different contexts. It may be the case that, for antibiotic prescribing decisions, different mechanisms are relevant for GPs working in different contexts. For example, a GP who works in a practice with five other GPs may be largely influenced by the prescribing practices of his or her peers; in this case, perceived subjective norms may be an important mechanism which influences behaviour change. Alternatively, GPs who work in a single-handed practice may have concerns about "losing" patients to other doctors if they don't prescribe an antibiotic when one is expected and therefore perceived outcome expectancies may be an important mechanism to target. In this situation, it would be appropriate to use different intervention components to target the different mechanisms relevant for each context. Alternatively, it may be the case that the mechanism(s) which influence GPs in one context are also the same for GPs working in other contexts. For example, regardless of which context they work in, all GPs may have concerns about whether an illness is a viral infection or a bacterial infection; in this case, self-efficacy may be relevant as behaviour could change if GPs have more confidence in their ability either to distinguish between viral or bacterial illness or to make prescribing decisions based on other factors. In this case, it may be appropriate to include the same intervention components, targeting the same mechanism(s) for all contexts.

Lastly, it is also important to consider that, whilst mechanisms could be individual and distinct for each intervention component, the more likely case is that some intervention components may have multiple mechanisms through which they influence behaviour; therefore, different intervention components may be targeting the same thing. Intervention components which share the same working mechanism may then have the potential to be interchangeable in an intervention, thereby creating choice, either in terms of the researcher or health organisation

designing and implementing the intervention or in terms of the GP in following the intervention. In summary, it may be the case that whilst effective intervention components may not be common across contexts, mechanisms of behaviour change could be and therefore tailoring one intervention to fit different contexts would be necessary.

This chapter will focus on the existing research which has investigated interventions to promote more prudent antibiotic prescribing for RTIs and will explore the psychological theories of behaviour change which have been considered useful in explaining GP behaviour. The aim is to explore whether there is one theory (or theories) which appears to stand out when explaining GP antibiotic prescribing behaviour and whether this can identify the mechanisms by which GPs are making their decisions. If a suitable theory can be identified, there is potential to explore the relevance of its constructs in difference contexts; if no theory stands out, it may be more appropriate to explore GP behaviour across contexts through a more exploratory approach. Each relevant theory is explained below and its reference in existing research discussed in order to establish how they can help to inform efforts to change GP prescribing behaviour for RTIs.

2.2 Psychological theories of behaviour

This section presents six psychological theories which may be relevant for changing the antibiotic prescribing behaviour of GPs. Although it is usual in health psychology for theories to explain how a person may choose to carry out healthy or non-healthy behaviours or to explain a patient's behaviour in relation to an illness, some models can equally apply to other types of behaviour and may therefore be relevant for trying to understand GP behaviour.

2.2.1 Social Cognitive Theory

Social Cognitive Theory (SCT, Bandura, 1986) stems from earlier work on Social Learning Theory (SLT, Miller & Dollard, 1941; Bandura, 1977) which states that behaviour is learned through the observation of others' behaviour. In SCT, Bandura (1986, 1998) proposes that behaviour is neither a result of a person's environment nor a person's cognitions but instead behaviour is influenced by, and itself influences, both factors. Bandura used the phrase "reciprocal determinism" to represent how these three determinants- cognitions, environment and behaviour interact with one another in various ways to produce different outcomes (Figure 5).

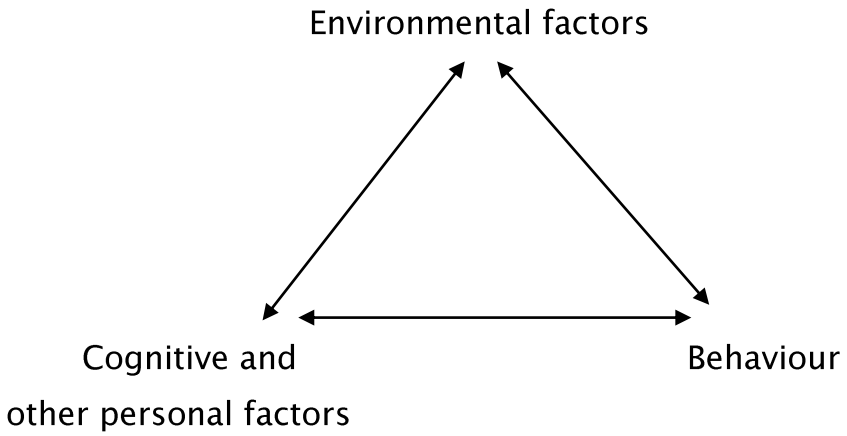


Figure 5. Diagram indicating the reciprocal relationship between the three determinants explained in Social Cognitive Theory, taken from Bandura (1986).

Social Cognitive Theory assumes that people have a certain amount of control over these three determinants and that people are capable of self-reflection. This control enables people to assess and manage their environment, thoughts and behaviours to decide which outcomes they want to achieve and, subsequently, act to achieve them. Individuals are

seen to carry out a specific behaviour, evaluate it, adjust it and re-evaluate it. This continuous loop is referred to as self-regulation. Self-regulation is affected by an individual's personal goals, as well as being influenced by the behaviours of significant others and their reactions to the individual's behaviour.

Bandura (1986) identified a number of determinants which influence behaviour which can be split into four categories; self-efficacy, outcome expectancies, sociostructural factors and goals. These are represented in Figure 6.

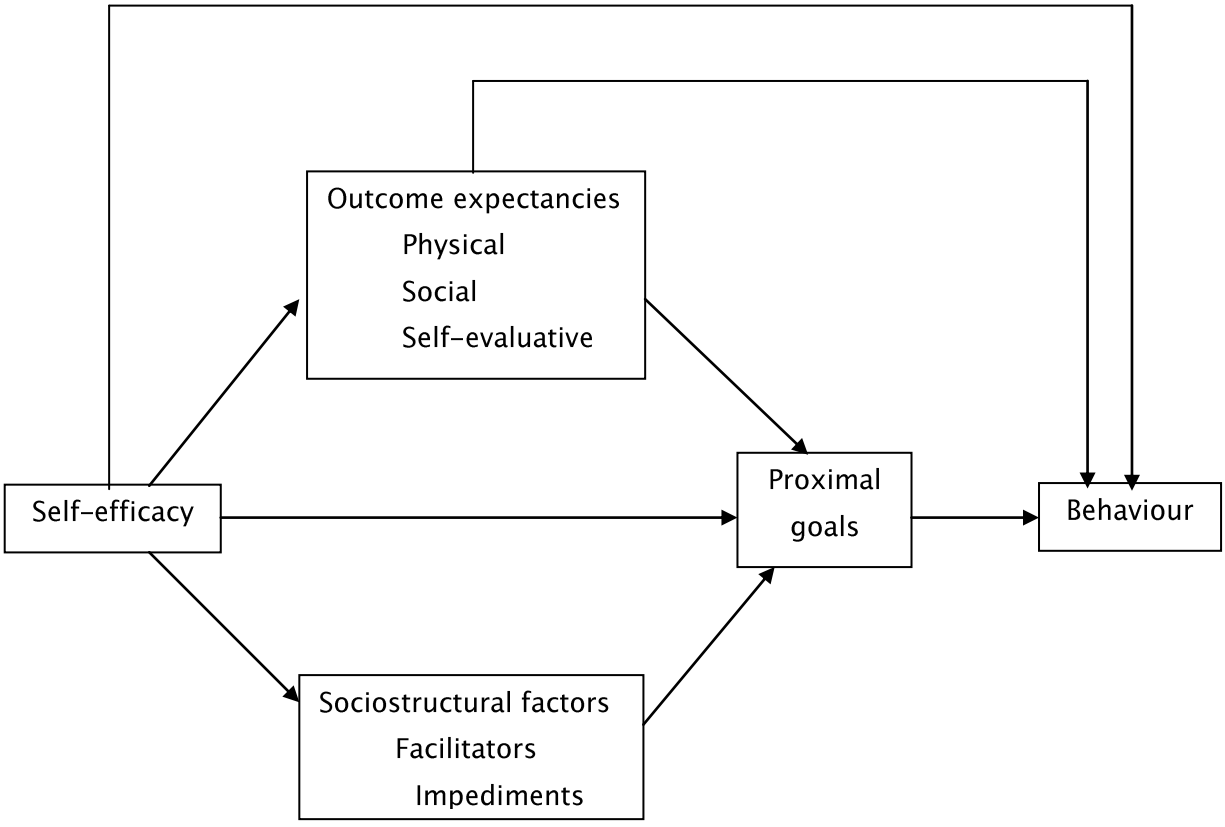


Figure 6. Diagram displaying the relationships between the psychosocial determinants within Social Cognitive Theory, taken from Luszczynska and Schwarzer (2005).

Self-efficacy is a major focus of Social Cognitive Theory and is crucial in helping people to work towards their goals. Self-efficacy represents a person's cognitions and judgement regarding their capability to carry out a specific task. Bandura (1986) hypothesised that individuals who had high self-efficacy when presented with a given task, would believe that they had the capabilities required to complete the task, and thus were more likely to succeed. Alternatively, individuals with low self-efficacy would not believe they held the required skills and therefore would view the task as more difficult and likely be less successful. In summary, whether or not an individual believes they can accomplish a task is often a strong predictor of whether or not they actually accomplish it (Bandura, 2000).

Alongside expectations about efficacy, individuals also hold expectations about the outcomes of their behaviour. Bandura (2000) identified three types of outcome expectancy- physical, referring to a positive or negative sensory experience, for example, pain, social, referring to perceptions of social norms, and self-evaluative, referring to an individual's self-sanction of their behaviours. Outcome expectancies can be a result of personal experience or can be learned vicariously. Individuals may experience positive outcomes from a previous behaviour which leads them to continue with the behaviour or otherwise may perceive potential benefits from observing others' behaviour. These benefits act as incentives to continue performing certain behaviour or as motivation to change a behaviour towards something which will give greater rewards. Alternatively, if an individual has experienced punishment or negative outcomes from a behaviour, or observed another experiencing negative outcomes, they will cease or avoid performing the behaviour.

Aside from these two central cognitive constructs, goals were a third determinant identified by Bandura (2000). He described two types, proximal and distal. Distal goals serve to offer an orienting effect for

behaviour whereas proximal goals can influence action to be taken in the here and now. Lastly, Bandura (2000) identified barriers and facilitators to carrying out behaviours. He stated that this could be a) personal or situational or b) linked to the health system or resources available to an individual. Personal and situational factors are linked to the individual themselves and can be part of the self-efficacy assessment. The health system or environment in which the individual is in, however, refers to how services are structured socially and economically and are beyond the immediate control of the individual.

Each of the constructs identified in social cognitive theory may help to explain GP prescribing behaviour, specifically prescribing an antibiotic for a self-limiting illness. A GP may lack self-efficacy and feel they are unable to say no when a patient wants an antibiotic; alternatively, they may be worried that a patient may go to another doctor if they say no resulting in a negative outcome for themselves. The decision may also be based on the GP's proximal goals- for example, pleasing the patient in the current consultation- rather than distal goals- for example, educating the patient about appropriate antibiotic use. Lastly, although the GP's non-prescribing decision may be supported by national guidelines, they may know that their practice colleagues do not follow guidelines and therefore the patient would get antibiotics from another GP in the practice anyway. This highlights environmental factors which may be beyond their control.

2.2.2 The Theory of Reasoned Action and the Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) led from the Theory of Reasoned Action developed by Ajzen and Fishbein (1980, Figure 7). The Theory of Reasoned Action (TRA) aims to explain the determinants of volitional behaviours carried out by individuals. TRA states that the proximal determinant of behaviour is an individual's intention to carry out that

behaviour. Individuals who have a strong intention to carry out a behaviour are more likely to do so than individuals who have weak intentions. TRA identifies two determinants which influence an individual's intention to carry out a behaviour- attitude and subjective norm. Attitude refers to how an individual feels about the behaviour, what they expect the outcomes of the behaviour to be and whether they value these outcomes. Individuals who feel positive about carrying out the behaviour and who perceive positive outcomes from the behaviour will have higher intentions to carry out the behaviour and therefore are more likely to carry out the behaviour. Subjective norms refer to individual's perceptions about what other people think about their behaviour. This usually refers to other people who are important to the individual but can also be an interpretation of how the individual perceives society in general to feel about the behaviour. Again if an individual thinks that other people who are important to them value the behaviour it is likely to increase their intention and thus their likelihood of carrying out the behaviour. In this respect intention mediates the relationship between attitudes and behaviour and subjective norm and behaviour.

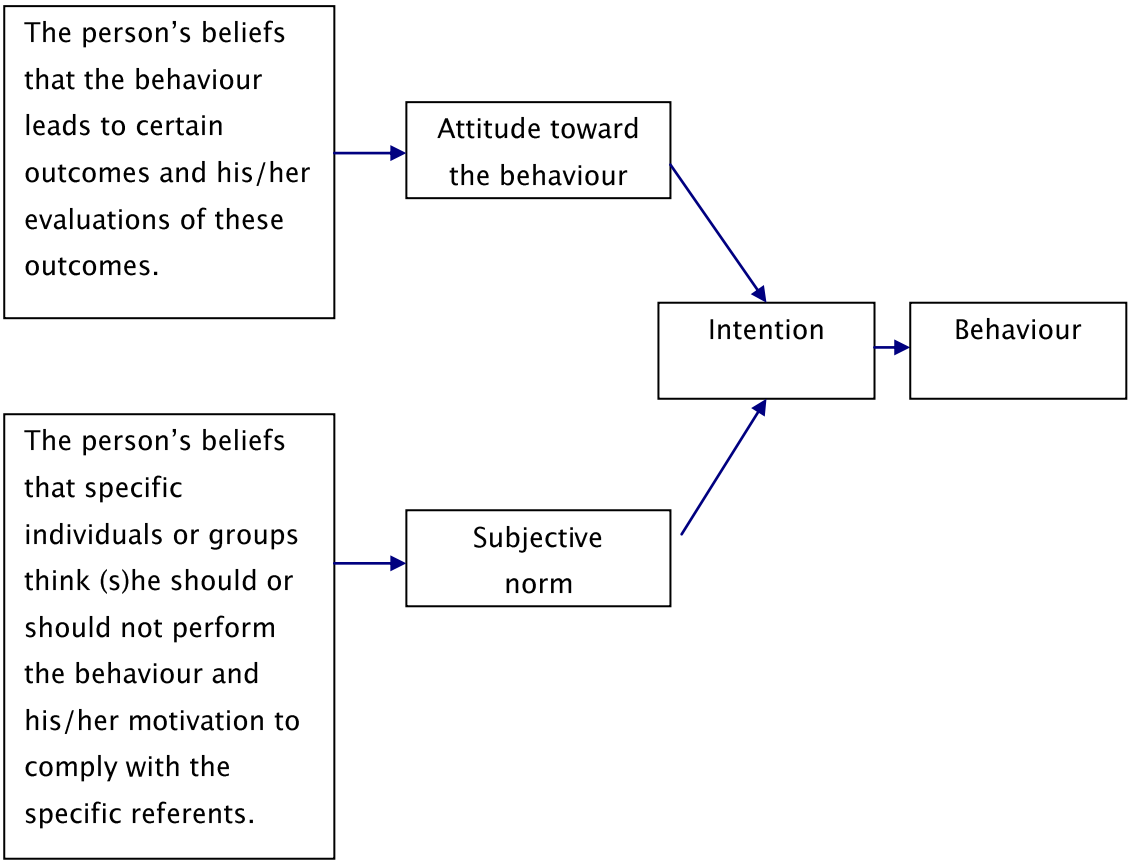


Figure 7. The theory of reasoned action taken from Ajzen and Fishbein (1980).

Following the TRA, Ajzen (1985, 1991) extended the model to create the Theory of Planned Behaviour (Figure 8). This was done by adding an additional determinant of intention, perceived behavioural control (PBC). This allowed the model to account for whether an individual felt that a behaviour was under his or her volitional control. PBC involves an assessment of how easy or not the behaviour is to carry out. Ajzen (1985) proposed that if an individual felt that they had control over their ability to carry out their behaviour they would have higher intentions and would be more likely to carry out the behaviour. PBC includes beliefs about internal control- for example, whether the individual thinks they have perseverance to be able to give up smoking- as well as external control factors- for example, whether the individual thinks they have access to smoking cessation support groups.

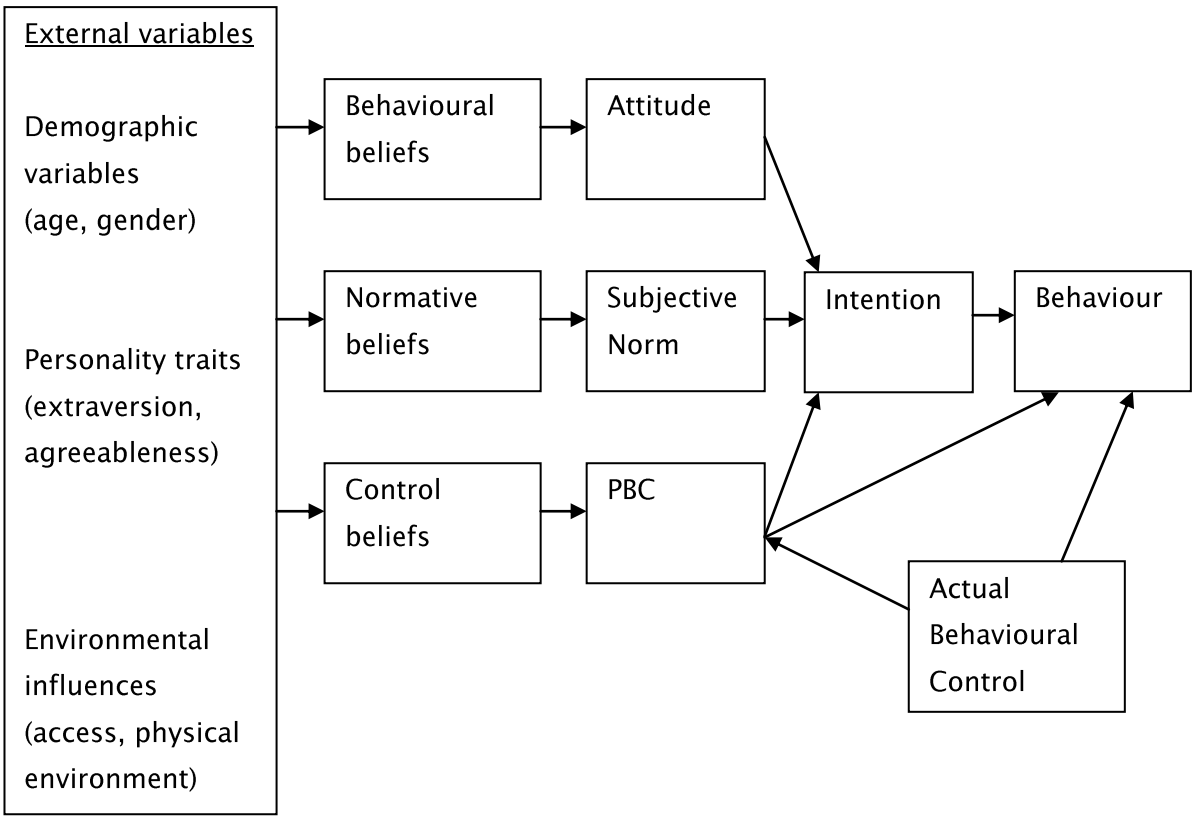


Figure 8. The theory of planned behaviour taken from Conner and Sparks (2005).

As well as having an influence on an individual's intention to carry out a specific behaviour, PBC is also seen as being a direct determinant of behaviour itself. Ajzen (1985) suggested that PBC could influence behaviour by reflecting an individual's confidence that they would be able to carry out their intentions to perform a behaviour. Lastly, the model considers the actual behavioural control an individual has in a given situation which can influence both PBC and behaviour.

In the situation of a GP prescribing an antibiotic for a self-limiting illness, the TPB can explain this behaviour in terms of the three constructs which determine the intention to prescribe an antibiotic. In terms of attitudes, a GP may believe that it is more important to protect the individual patient from the current infection rather than concentrate on their, or the public's, resistance to antibiotics. For subjective norms, GPs may be influenced by their high prescribing colleagues or may be

eager to make sure their patient is satisfied with their consultation. Lastly, for PBC a GP may believe that they do not have much control over whether a patient takes antibiotics or not as patients can always go to a different doctor.

2.2.3 Self-determination theory

Self-determination theory (SDT, Deci & Ryan, 1985) suggests that behaviour is a result of an individual's motivation to carry out the behaviour which itself is a result of psychological needs. SDT separates motivation into two types- controlled, that which is dictated and encouraged by others, and autonomous, that which is self-determined. SDT assumes that humans have "evolved to be inherently active, intrinsically motivated and oriented toward developing naturally through integrative processes" (Deci & Ryan, 2012, p. 417) and therefore that behaviour which is motivated intrinsically will meet these needs and will be more likely to be carried out. Deci and Ryan (1985) specified three types of psychological needs- competence, autonomy and relatedness- which they suggest drive individuals' motivation to carry out specific behaviours. SDT sees humans as wanting to carry out behaviours which they feel competent in, which they feel they have free choice to carry out and which are supported and encouraged by their environment.

SDT focuses particularly on how the social environment can influence an individual's motivation to carry out a behaviour. SDT identified multiple types of motivation which fall along a continuum; these include amotivation, external regulation, introjected regulation, identification, integration and intrinsic motivation (Levesque, Williams, Elliot, Pickering, Bodenhamer & Finley, 2007). Intrinsic motivation represents behaviour which is carried out for its own sake because it is pleasurable or of interest (Levesque et al., 2007). The last three types of motivation on this continuum are types of autonomous regulation because they are self-determined. Identification is whether behaviour is positively

endorsed and valued by an individual and integration is where the behaviour is viewed as part of the larger self and seen to connect with an individual's broader values (Levesque et al., 2007). These types of autonomous regulation are seen to make a behaviour more likely to occur.

Deci and Ryan (2012) state that the environment either undermines autonomous regulation or enhances it and, as a result, influences the likelihood of the behaviour being carried out. Examples of environmental cues which can enhance autonomous regulation are positive feedback and having choice in carrying out a behaviour. Examples of cues which undermine autonomous regulation and are examples of controlled regulation are monetary reward, threats if a behaviour is not carried out and competition.

SDT differentiates from other theories in the way that it distinguishes between behaviours which are a result of autonomous versus controlled regulation. In this respect, it can identify why two individuals may carry out the same behaviour but for different reasons; for example, a GP not prescribing an antibiotic because it is important to them versus a GP not prescribing in order to meet a QoF (Quality and Outcomes Framework) target. Here, SDT would predict that in the former situation the behaviour of not prescribing would be more likely to be carried out, and more often, than in the latter situation because the GP is acting autonomously. In situations such as this, SDT can be helpful in explaining why people may not respond to interventions which offer rewards or incentives.

2.2.4 Operant learning theory

Operant learning theory (OLT, Blackman 1974) states that individuals hold beliefs about what consequences will occur as a result of their behaviour. The theory names these "perceived anticipated

consequences" and explains how they affect decisions about behaviour. Operant learning theory states that behaviours are carried out when they are paired with positive anticipated consequences. Behaviours which are viewed as having positive outcomes are more likely to be carried out than behaviours which are viewed as having negative outcomes. Therefore, when carrying out a behaviour, an individual must believe they will receive positive outcomes as a result of that behaviour, or at least avoid negative outcomes. In addition to this, the theory suggests that behaviour which is performed more frequently is more likely to become habitual and therefore will be performed consistently.

When prescribing an antibiotic for a self-limiting illness a GP may see positive outcomes such as the patient being satisfied and believe they are avoiding negative outcomes, such as potential illness complications if the illness becomes more serious.

2.2.5 Self-regulation theory

Self-regulation theory (SRT, Diefenbach & Leventhal, 1996; Leventhal, Leventhal & Contrada, 1998) is another social cognitive model which considers how people think about their own health condition. The model considers people's representations about an illness, how people cope with an illness, their appraisal of their coping technique which then finally feeds back into how they view the illness (Figure 9). In this way the model is concerned with illness representations, coping and appraisal. Illness representations can be seen as any belief or expectation a person holds about an illness. SRT identifies two types of illness representations which are responses to illness stimuli, either external or internal, which make people assess how they are going to cope with the illness. Emotional illness representations are the feelings associated with the illness stimuli; for example, a person being fearful about a symptom which makes them think of cancer. Cognitive illness representations are the thoughts people have about the illness stimuli.

These are separated into five types and are listed below, using an example of a person who is experiencing cold symptoms.

Illness stimuli: Sneezing, runny nose, tiredness.

Cause – thinking you have caught an illness as a result of having contact with other people.
Consequences – thinking you will have to take a day off work.
Control/cure – thinking that you will be able to treat the illness yourself.
Identity – thinking that you have a common, winter cold.
Timeline – thinking the illness will not last longer than a week.

There are two potential ways in which SRT may be applicable to a primary care situation involving antibiotic prescribing, either by explaining a patient's illness representations, or by explaining a GP's illness representations. As shown in the example above, SRT can explain how a patient may perceive an acute illness. If a patient has a previous bad experience with a cold, perceives their illness as serious, out of their control and/or is worried or anxious, they may feel antibiotics are the only way they can better, which may then influence the GP's prescribing decision. If a GP gives them antibiotics then their thoughts about their illness are confirmed. If they do not receive antibiotics then they may appraise their initial coping strategy (taking antibiotics) as inadequate and may also view their illness differently, e.g. as less serious.

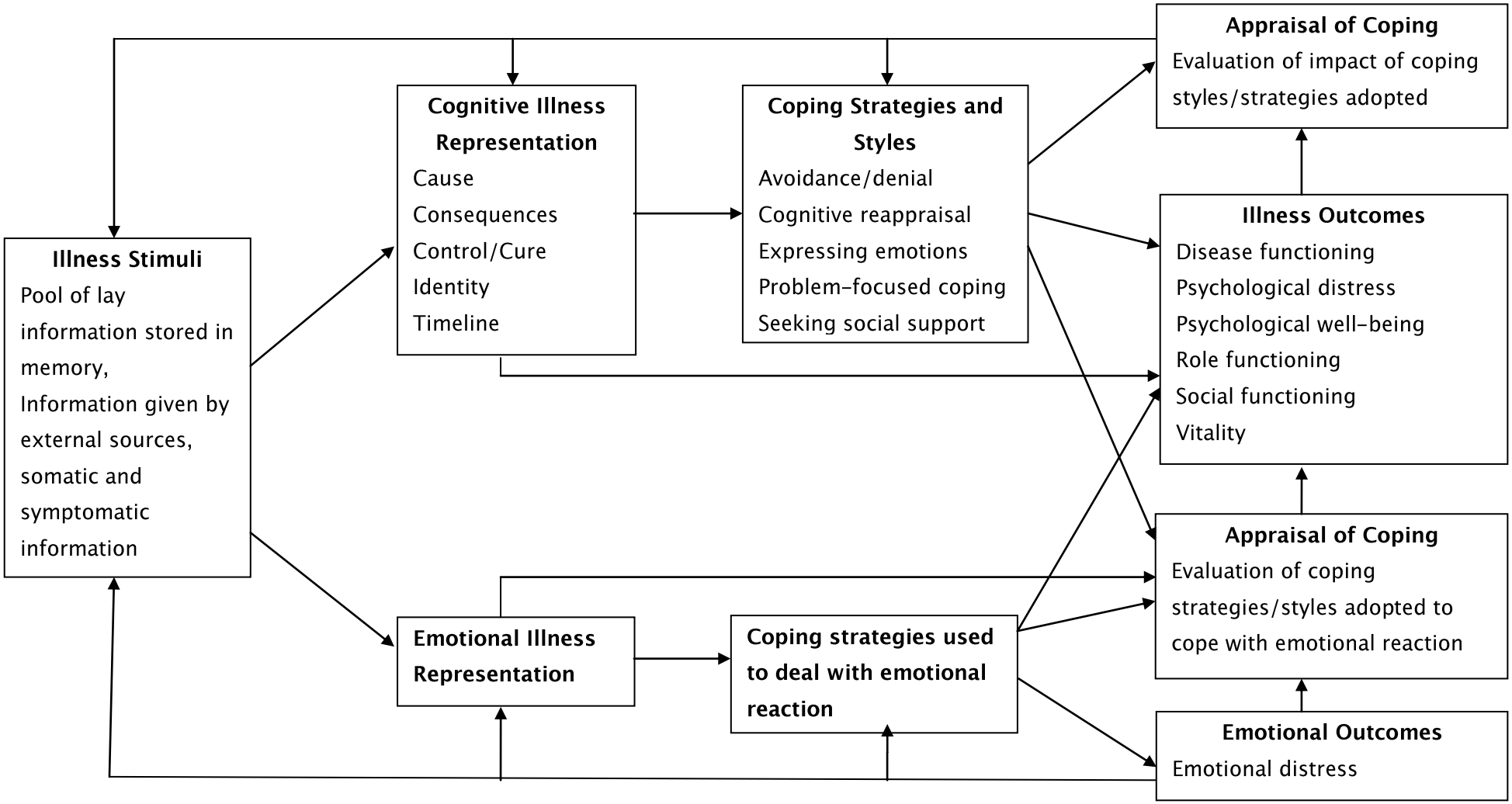
Alternatively, SRT may explain how GPs perceive an illness in general, how they assess it in terms of seriousness for their patients and therefore their treatment decisions. A GP who views a three week cough as a common, non-threatening complaint in primary care practice is unlikely to give an antibiotic to a patient; however, a GP who feels that a

three week cough could easily develop into pneumonia, based on past experience, is likely to prescribe an antibiotic as a preventative measure.

2.3 Exploring how psychological theory can explain health care professionals' intentions and behaviours.

Much research has identified the gap between actual clinical practice and recommendations for evidence-based practice. In the last decade, several studies have begun to explore explanations for this gap in terms of behaviour change theories. Reviews of such work can provide a useful summary of the research which has been accomplished so far. Godin, Belanger-Gravel, Eccles & Grimshaw (2008) completed a systematic review of all studies which "aimed to predict healthcare professionals' intentions and behaviours with a clear specification of relying on social cognitive theory". The review included publications which focused on clinicians and nurses as well as other healthcare professionals, for example, pharmacists and psychologists. Papers also covered GPs' intentions and behaviours to perform various tasks ranging from prescribing antibiotics to intentions to care for patients with HIV. Godin et al. (2008) found that the theory of planned behaviour explained more variance in health care professionals' behaviour and stated that it was an appropriate theory by which to explore this area further.

Figure 9. A representation of Leventhal's common sense model of illness representations taken from Hagger and Orbell (2003).



Walker, Grimshaw and Armstrong (2001) also explored the theory of planned behaviour in predicting GPs' intentions, in regard to prescribing an antibiotic for an uncomplicated sore throat. Walker et al. (2001) found that a model, based on GPs' agreement with TPB constructs, was able to predict 48% of the variance in their intention to prescribe an antibiotic. This was increased further to 63% by adding a measure of past behaviour. In addition, Walker et al. (2001) looked specifically at the difference in beliefs between those GPs who intended to prescribe for at least some sore throat versus GPs who did not intend to prescribe for any. The authors identified that GPs were more likely to intend to prescribe antibiotics if they believed antibiotics reduced the risk of illness complications, antibiotics reduced the length of illness and antibiotics were cost-effective, and also if their patient was of lower socio-economic status, if their patient asked for an antibiotic, to avoid missing a more serious illness and if they believed their patient would finish the whole course of antibiotics.

Whilst supporting the theory of planned behaviour in general, Godin et al. (2008) identified two points of interest in their findings; theories differed in how well they could explain behaviour in different types of healthcare professional (e.g. nurse vs. clinicians) and in how well they could explain different "behaviour categories". The behaviour categories looked at were clinical practice (e.g. prescribing, performing an examination), compliance with guidelines (e.g. hand washing or wearing gloves) and counselling. Godin et al. (2008) suggested that this finding may reflect the importance of context in explaining behaviour and that clinician behaviour may differ because of the variety of situations which clinicians deal with compared to other healthcare professionals. With this in mind it may not be the case that one theoretical model would be the best fit for all healthcare professionals' behaviour. This idea fits with the work of Kortteisto, Kaila, Komulainen, Mantyranta & Rissanen (2010) who explored the TPB in helping to explain healthcare practitioners'

intention to use clinical guidelines. Whilst they found the theory relevant to both nurses and clinicians, perceived behavioural control was the strongest factor associated with clinicians' intention to follow guidelines and social norms were the strongest factor associated with nurses' intention to follow guidelines. The authors concluded that whilst one theory may be helpful in promoting guideline use in clinical practice, different strategies may need to be used when targeting different professional groups (Kortteisto et al., 2010).

Finally, a study by Presseau, Francis, Campbell & Sniehotta (2011) looked at the TPB in relation to GPs giving advice on physical activity to patients in consultations. The authors were interested in identifying additional constructs which were amenable to change, which could complement the original theory. These authors identified goal conflict and goal facilitation as two potential constructs which would help to increase the amount of variance in clinician behaviour if added to the TPB. Goal conflict represented factors which GPs felt made it harder for them to give advice on physical activity in their consultations. Goal facilitation represented factors which GPs felt made it easier to give advice on physical activity to patients. Presseau et al. (2001) found that constructs from TPB were able to explain 47% of variance in the self-reported behaviour (giving advice to an appropriate population across a two week period). The addition of goal conflict led to an additional 6% of variance explained and the addition of goal facilitation led to a further 8% of variance explained. Presseau et al. (2011), when discussing their results, suggested that the TPB, which focuses on a single goal directed behaviour, could thus be complemented by constructs which consider other goal directed behaviours, relevant to the context, which may help or hinder GPs to carry out the desired behaviour. In this respect, the addition of constructs such as these can add context specific factors which may be missed by the TPB.

Aside from publications which have investigated the relevance of the TPB to healthcare professionals' behaviour, a few studies have also considered other theories when trying to explain behaviour. Williams, Levesque, Zeldman, Wright & Deci (2003) explored the relevance of self-determination theory (SDT) in explaining health care practitioners' motivation to provide counselling to patients about quitting smoking. The authors explored clinicians' agreement with scales on perceived autonomy, perceived competence and "autonomy support from insurers" (people who encourage practitioners to counsel their patients who smoke). Following work from Jaen, Strange & Nutting (1994) which considered the relevance of the Health Belief Model (Becker, 1974) they also looked at two barriers which had been identified as influencing behaviour, "time constraints" and "non-reimbursement". Behaviour was measured by self-report with practitioners indicating when they had given smoking cessation counselling and for how long. After controlling for demographics and measures of barriers, the three constructs from SDT explained 15% of variance in behaviour, carrying out counselling with patients and 7% of variance in the time spent on counselling patients. These results support the model of SDT in helping to explain clinician behaviour and authors highlighted the importance of providing "autonomy-supportive interventions for health care practitioners" in order to promote behaviour change (Williams et al., 2003, p.549).

Bonetti et al. (2010) is another example of research which has considered different theories when trying to explain the behaviour of health care professionals. These authors explored how well different theories could explain variance in dental practitioners' behaviour. They looked at two things- how well each theory could explain variation in behaviour and how well each theoretical construct within the theories could explain behaviour when entered individually. When explaining behavioural simulation, the authors found that the theory of planned behaviour (TPB), social cognitive theory (SCT), implementation intentions (II) and operant learning theory (OLT) could explain between 7-31% of

the variance and, when all theoretical constructs were entered, 38% of variance was explained. For behavioural intention, TPB, SCT, OLT and CS-SRM (Common sense self-regulation model) explained between 24-58% of variance and all constructs together explained 68% of variance. Bonneti et al. (2010) concluded that psychological models can be useful when looking at clinician behaviours, and that these may apply to different population of healthcare professionals as well as to different clinical behaviours.

Whilst the majority of research has explored those theories mentioned above in section 2.2, other research has tried to develop new theories specifically based on explaining clinician behaviour. One of these is the knowledge-attitude-behaviour framework, presented by Cabana et al. (1999, Figure 10). The authors presented this framework as a result of completing a review of publications which identified a number of barriers to clinician guideline adherence. Firstly, they identify two barriers to clinicians having the required knowledge to adhere to guidelines- a lack of familiarity and a lack of awareness. Secondly, they identify five barriers which influence clinicians' attitude to adhering to guidelines- lack of agreement with specific guidelines, lack of agreement with guidelines in general, lack of outcome expectancy, lack of self-efficacy and lack of motivation. Lastly, they identify three barriers to carrying out the behaviour recommended by guidelines- external barriers, guideline factors and environmental factors. This model benefits from offering a broad explanation of clinician adherence to guidelines as it does not focus on one desired clinical behaviour or outcome. The model appears to identify useful barriers which may be helpful to consider when attempting to change clinician behaviour, and there is obvious cross-over with other models (for example, the inclusion of self-efficacy) which suggest that this fits logically with other literature.

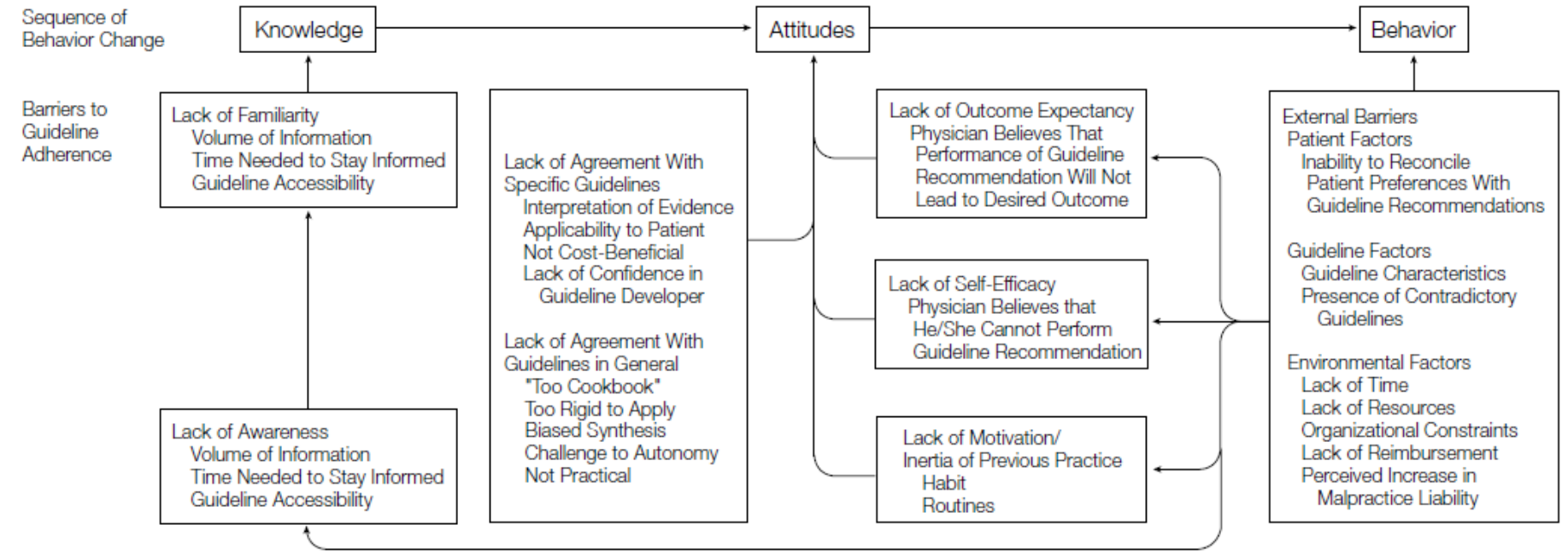


Figure 10. The knowledge-attitude-behaviour framework from Cabana et al. (1999) identifying several barriers experienced by clinicians in adhering to practice guidelines.

Whilst Godin et al. (2008) suggested, through the results of their review, that the TPB was an appropriate model to explain clinician behaviour, they also proposed that a separate model, the Theory of Interpersonal Behaviour (TIB) by Triandis (1980), was appropriate for explaining clinicians' intentions to carry out a behaviour. With these findings, Godin et al. (2008) presented a framework incorporating the variables in both of the models which they felt was able to account for the majority of their findings. This method of fitting different models together and comparing how theoretical constructs may complement one another between theories may be another helpful step to exploring the relevance of theory to clinician behaviour.

2.4 Using psychological theory to inform interventions aimed at changing GP antibiotic prescribing for RTIs

Although many studies have developed interventions to promote prudent antibiotic prescribing by healthcare professionals, only a minority have referred to theories of behaviour change in their intervention design and/or reporting of intervention content. By concentrating on this research it is possible to identify which theories other researchers have thought may be relevant to this specific area and subsequently which may prove useful when trying to design an effective intervention. This section focuses on three projects which have used different techniques in exploring the relevance of psychological theory in the design of interventions to promote more prudent antibiotic prescribing by GPs.

2.4.1 The STAR Intervention

Simpson et al. (2009) presented one study, STAR (Stemming the Tide of Antibiotic Resistance), which used the constructs identified in Social Cognitive Theory (SCT) and the Theory of Planned Behaviour (TPB) to design intervention components to promote prudent prescribing in

healthcare professionals. The authors aimed to target outcome expectancies and beliefs about the consequences of not prescribing by informing GPs about the positive outcomes or consequences of more prudent prescribing. The aim of this was to encourage self-reflection and the formation of intentions to not prescribe antibiotics which would then motivate behaviour change. The authors also focused on self-efficacy and beliefs about perceived behavioural control, stating that in order to change their behaviour successfully GPs should have confidence and belief in their own ability to not prescribe an antibiotic for an acute RTI.

The STAR intervention addressed the outcome expectancies and beliefs about consequences held by GPs by presenting evidence about the importance of change in primary care prescribing and by giving GPs feedback on the amount of antibiotics they prescribed as a practice and the subsequent effects on resistance rates. The authors indicated that providing this information to GPs supported previous qualitative research which indicated that GPs did not acknowledge the link between their prescribing behaviour and public health (Wood, Simpson & Butler, 2007; Simpson, Wood & Butler, 2007).

The task of addressing self-efficacy and perceived behavioural control was also informed by previous qualitative work with GPs. Previous studies suggest that GPs find it difficult to communicate with patients in consultations with limited time periods without it affecting patient satisfaction (Barry et al., 2000). Meanwhile, patients report that they feel misunderstood in consultations, receive unwanted prescriptions and subsequently have lower satisfaction and/or adherence to medication or self-care advice (Barry et al., 2000). The STAR intervention aimed to address these issues by providing online training in communication skills, to help increase GPs' confidence in discussing treatment options with patients and to acknowledge patients' concerns and needs. To do this, the intervention provided example video clips of consultations to

allow vicarious learning from appropriate models. In addition, information on the implications of prescribing data was also delivered to GPs as a practice seminar for discussion with peers, again giving an opportunity for vicarious learning, following social cognitive theory, as GPs could hear about, and discuss, alternative prescribing behaviours being carried out by their colleagues.

Following completion of the trial, the STAR intervention was shown to be effective at reducing clinically unnecessary antibiotic prescribing in primary care (Butler et al., 2012). As intervention components were designed with regard to constructs from SCT and TPB the intervention components and the theoretical constructs on which they were based may help to explain the behaviour change of the GPs. Unfortunately, the STAR study did not measure GP self-efficacy, PBC, outcome expectancies or beliefs about consequences throughout the trial and therefore it is not possible to say whether these constructs changed in any way as a result of the intervention. As a consequence it is not possible to say whether or not these constructs mediated the pathway to behaviour change. Finally, it is also not possible to say whether the intervention components themselves were suitable means by which to influence any of the theoretical constructs.

Providing examples to GPs about how to discuss treatment decisions may improve their confidence or sense of control about being able to do this themselves; however, we cannot be certain this is the effect of the intervention component unless it is measured. It is also interesting to note that, in this study, communication skills were taught to help improve self-efficacy regarding discussions with patients; however, if this did lead to higher self-efficacy it is not clear whether this would have affected other areas where clinicians may have been unconfident, for example, diagnosing between viral and bacterial illnesses. It may be that certain intervention components could be designed to address one aspect of self-efficacy, but not all relevant aspects, and therefore

behaviour change may still be prevented by a lack of confidence in another area. For example, a GP may feel unconfident in making a viral versus bacterial diagnosis in their RTI consultation, so increased self-efficacy may only be achieved by informing the GP about decision making rather than the communication skills used in this study. In this study, it was assumed that GPs would only have low confidence in discussing decisions with patients.

2.4.2 The PRIME project

Other research has used alternative approaches to explore the relevance of psychological theory in encouraging more prudent prescription of antibiotics by GPs. This was named the PRIME project (Process modelling in implementation research). Eccles, Grimshaw, Johnston et al. (2007) aimed to identify which theoretical constructs were relevant when explaining GPs' prescribing behaviour for URTIs. Rather than selecting an initial theory, Eccles et al. (2007) decided to explore several potential theories and see whether the constructs, looked at within their original theory or individually, helped to explain 1) variance in intention to carry out the behaviour, 2) variance in carrying out a simulated behaviour and/or 3) variance in carrying out the actual behaviour of not prescribing an antibiotic for a URTI.

Eccles et al. (2007) measured theoretical constructs by operationalising each one and forming appropriate statements to be delivered to GPs via a questionnaire. GPs then reported how relevant or important the statements were to them on likert scales. The authors were interested in three outcomes- intention to not prescribe, simulated behaviour and actual prescription behaviour. GPs intention not to prescribe an antibiotic for a URTI was also measured by agreement with the statements. Simulated behaviour was measured by presenting patient case descriptions to GPs and asking whether they would prescribe an antibiotic or not. Lastly, actual prescription behaviour was looked at

through the number of prescriptions written by GPs for the relevant illnesses.

Eccles et al. (2007) explored associations between the measures using multiple regression, first entering constructs as grouped by their original theories and, secondly, entering all constructs individually. Four theories and one strategy, and their component constructs, were studied, Social Cognitive Theory (SCT), Theory of Planned Behaviour (TPB), Common sense Self-regulation Model (CS-SRM), Implementation Intentions (II) and Operant Learning Theory (OLT).

When predicting actual prescribing behaviour the authors found that only OLT, specifically 'evidence of habitual behaviour', was able to predict any variance. This occurred both when constructs were entered into the regression separately and as part of their original theories. This indicated that GPs were more likely to not prescribe an antibiotic if they reported that not prescribing was a habitual behaviour for them.

When predicting behavioural simulation, the authors found that when constructs were entered as part of their original theory, four theories contributed to explaining variance; TPB (31%), SCT (26%), II (6%) and OLT (24%). When constructs were entered separately, four were able to explain 36% of the variance in behavioural simulation; TPB "PBC Power", OLT "evidence of habitual behaviour", CS-SRM "Cause chance/bad luck" and TPB "Intention".

When predicting behavioural intention, the authors found again that four theories helped to predict variance, TPB (30%), SCT (29%), OLT (43%) and CS-SRM (27%). When constructs were entered individually, six constructs helped explain 49% of the variance in behavioural intention. From TPB "attitudes direct" and "PBC power", "risk perception" from SCT, "evidence of habitual behaviour" from OLT and from CS-SRM "control doctor" and "control treatment".

"PBC Power" was identified as distinct from "PBC direct" in this study, with "PBC direct" appearing to represent how much actual control GPs had over prescribing and "PBC power" representing how much control GPs felt they had. "Attitudes direct" was also shown by authors to be distinct from "attitudes indirect" with "attitudes direct" representing beliefs about the direct effects of prescribing on the illness (rather than patient satisfaction). Eccles et al. (2007) stated that the construct of "cause chance/bad luck", represented a measure from the Illness Perceptions Questionnaire-Revised (IPQ-R, Moss-Morris, Weinman, Petrie, Horne, Cameron & Buick, 2002) although did not explain the relation between this questionnaire and Leventhal et al.'s (1996) theory of self-regulation. Here GPs would agree with a sentence such as "Getting a URTI is determined by chance/bad luck." The authors also stated that "control doctor" and "control treatment" also represented measures from the IPQ-R representing how much control GPs' had, as doctors, and the treatment (antibiotics) had in determining whether the patient got better. If doctors believe that they have low control over whether or not their patient gets better quickly then they are unlikely to provide a treatment. Lastly, "risk perception", representing a construct from SCT, was reported by GPs agreeing with statement such as "It is highly likely that patients with an URTI will be worse off if I do not prescribe an antibiotic".

Eccles et al. (2007) concluded that their results provided evidence that theoretical constructs were helpful in understanding and explaining GP antibiotic prescribing behaviour and that interventions which target the relevant elements "should have the greatest likelihood of success in influencing the implementation of evidence-based practice" (p. 10).

Following this initial work by Eccles et al. (2007), Hrisos et al. (2008a) identified three models (SCT, TPB and OLT) which they felt were useful in helping to explain clinicians' prescribing behaviour in the management

of URTIs. From the work of Eccles et al. (2007) and other data analysis the authors identified three theoretical constructs which had been shown to influence actual behaviour and which were suitable to be targeted within an intervention (Hrisos et al., 2008a). Under SCT, the authors identified "risk perception" and "self-efficacy" and, under OLT, "anticipated consequences". Two interventions were designed to help target these constructs and were selected by referring to previous work by Michie, Johnston, Abraham, Lawton, Parker & Walker (2005) who identified construct domains and associated behaviour change techniques.

Intervention 1 was a graded task, designed to influence self-efficacy. GPs were required to consider increasingly difficult descriptions of patient situations and asked whether they would prescribe an antibiotic or not. They were then asked to select a situation which they found least difficult from those where they indicated they would give antibiotics, think of potential alternative management techniques and then develop a plan to do this in the future.

Intervention 2 was a persuasive communication intervention, designed to influence risk perception (from SCT) and anticipated consequences (from OLT). GPs were presented with two sequences of five pictures, one with Dr A who prescribed antibiotics and one with Dr B who did not prescribe. The pictures showed consequences of the decision in different situations. GPs then had to indicate how much they try to be like Dr A or B and how much they are actually like Dr A and B.

In their next study, Hrisos et al. (2008b) investigated the effects of their interventions in order to see whether each influenced GP beliefs and intended or simulated behaviour. GPs were sent a questionnaire pre and post-trial and received both, one or neither of the interventions.

The authors were interested in a) whether the interventions influenced intention or behavioural simulation and b) whether the interventions changed the constructs which they were designed to influence.

The authors found there was no significant interaction effect between the two interventions. There was no significant effect of the graded task on GPs' intention or simulated behaviour; however, the persuasive communication intervention led to higher intention to not prescribe an antibiotic and fewer indications that GPs would prescribe in the behaviour simulation scenarios. Secondary results indicated that the interventions did target the constructs they were aimed at. GPs who received the graded task targeting self-efficacy reported stronger beliefs in their capabilities to manage patient without antibiotics. They also reported a stronger sense of perceived behavioural control, relevant to the Theory of Planned Behaviour. GPs who received the persuasive communication also reported a significant change in anticipated consequences. However, in addition, the persuasive communication was also seen to influence measures of a number of other constructs. Lastly, mediational analysis showed that the effects of persuasive communication on behaviour simulation and intention was mediated by anticipated consequences (the target construct) as well as attitude (direct) taken from TPB and self-efficacy from SCT.

Overall the work by these authors (Eccles et al., 2007; Hrisos et al., 2008a; Hrisos et al., 2008b) provided a systematic approach for examining the relevance of theoretical constructs and exploring their influence on GPs' beliefs, intention and simulated behaviour. Constructs from SCT, TPB and OLT seem to be relevant and important to target when considering interventions to influence antibiotic prescribing and the use of mediation analysis can identify these constructs as the mechanisms by which interventions are producing significant behaviour change.

2.4.3 The eCRT project

A third study which considered psychological theory when designing an intervention to influence GP prescribing for RTIs was by McDermott, Yardley, Little, Ashworth & Gulliford (2010). These authors aimed to develop a computer delivered, theory based intervention to "promote adherence to guidelines by presenting GPs with prompts during the consultation" (McDermott et al., 2010, p.2). SCT was selected as a relevant and appropriate theory based on the previous findings of Eccles et al. (2007) and Hrisos et al. (2008b). McDermott et al. (2010) proposed that, following SCT constructs, an intervention which "creates a controllable and supportive environment, increases self-efficacy, promotes positive outcome expectancies and reduces negative outcome expectancies might support better adherence to guidelines" (p. 2) and therefore promote more prudent prescription of antibiotics for RTIs.

McDermott et al. (2010) used SCT to inform the initial development of their intervention, targeting environment, outcome expectancies and self-efficacy. The environment was targeted by producing prompts for the GP within their consultation which the GP could control; for example, in terms of how much information appeared on their screen. Outcome expectancies were targeted by providing evidence to show that antibiotics provide no additional help to patients with acute infection and evidence showing that patients who do not receive antibiotics may be less likely to re-consult. Self-efficacy was targeted by using verbal persuasion and modelling within prompts, which included describing management options available to the GP and giving positive encouragement.

In their results, McDermott et al. (2010) report on how GPs' views helped to refine and adapt the original intervention to make it more acceptable to GPs and more feasible in practice. They found that "perception of the role of prompts" was very important to GPs. If

prompts were seen to be enforced by an outside body GPs were less inclined to follow them. If the GPs felt they had control over the prompt, and subsequently their environment, they viewed it more positively. This fits with the ideas from Social Cognitive Theory (SCT) that individuals are more likely to change their behaviour or consider changing their behaviour when the feel they have control over their environment. It also fits with Self-determination theory (SDT) and suggests that if GPs are self-motivated to follow the intervention they are more likely to keep up this behaviour and subsequently change their prescribing.

Secondly, GPs reported they were more likely to use the prompts with certain patients. Some felt they would use the prompts more often when a patient's clinical condition indicated they did not need antibiotics or when a patient may need persuading about the evidence behind a no antibiotic decision. This theme suggested that GPs were considering the positive and negative outcomes of using the prompts in different situations and seeing positive ways prompts could be used to support non-prescription decisions.

Overall, McDermott et al. (2010) were able to give another example of a dual development process of an intervention focused on theoretical constructs and research evidence found through qualitative methods. The results of the effectiveness of this intervention are not yet available.

2.5 Exploring how psychological theory is discussed in literature on GP behaviour

Whilst it is important to consider which models of behaviour change other authors have identified as relevant for the area of GP antibiotic prescribing, it can also be interesting to explore how theory has been discussed by authors. There can be major differences in how much detail is given in publications about the relevance of theoretical components, how theoretical constructs are described in publications

and how people discuss multiple theories of interest. This section looks at existing papers which investigate the relevance of psychological theory and considers points which raise further questions.

2.5.1 Identifying and describing theoretical constructs

Simpson et al. (2009), mentioned above, discuss the relevance of theoretical models to GP behaviour change by addressing the concept: that "behaviour change will be more likely if an intervention addresses both the '*why*' and the '*how of change*'" (Simpson et al., 2009, p. 2). A second paper by McNulty and Francis (2010) also uses the same vocabulary, talking about the 'why and how of change' (p.2278). McNulty and Francis (2010) reference a study by Rollnick et al. (1999) who, in their work on health behaviour change, present a model to describe patients' readiness to change in relation to a specific health behaviour (Figure 11).

The model is based on their previous work in which they explored ways to assist GPs in helping patients to consider their smoking during consultations (Rollnick et al., 1997). The idea behind this was for GPs to help encourage and support smoking cessation or reduction in the consultation. The work links to the Stages of Change theory (Prochaska & DiClemente, 1983) which describes people as being on a path towards behaviour change, passing through different stages depending on how ready they are to make a change and maintain that change. In their study, Rollnick et al. (1997) found that smokers, when talking about their "readiness" to change, focused on how <u>important</u> the change was to them and whether they were <u>confident</u> in their ability to make a change. They chose to focus on these two factors in their model. The words used by Rollnick et al. (1999) when presenting their model are very much influenced by the population the model aims to describe, patients who are contemplating a behaviour change to improve their own health. The model is presented to describe this population and is

presented for use by healthcare professionals to discuss issues with patients in their consultations.

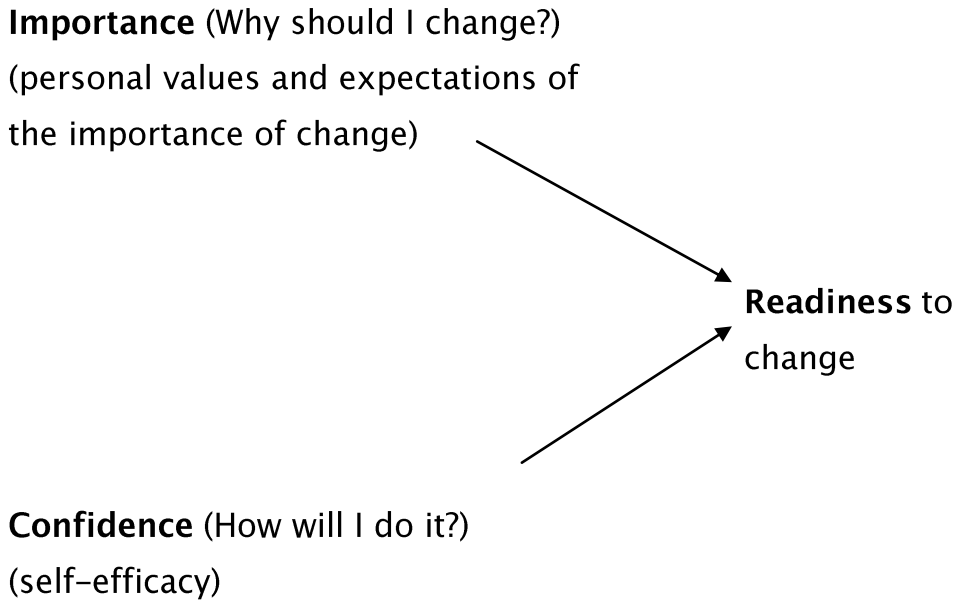


Figure 11. A model indicating the relationship between importance, confidence and readiness to change when a patient considers changing a behaviour to improve their health taken from Rollnick et al (1999).

Whilst this model is very useful in helping GPs to communicate with patients in consultations about their own health behaviours, it has had a strong influence on how certain papers have discussed behaviour change theory in regard to designing interventions to promote more prudent prescribing by GPs. As mentioned above, McNulty and Francis (2010) specifically reference the work by Rollnick et al. (1999) and other papers have also used the same terminology (Simpson et al., 2009; Francis, Wood, Simpson, Hood & Butler, 2008). Each of these papers has focused on the questions used in the model above, taking "Why should I change?" and "How will I do it?" to describe the "why" and "how" of behaviour change (Francis et al., 2008; Simpson et al., 2009; McNulty & Francis, 2010). It is clear that the simplicity of Rollnick et al.'s (1999) model is very useful when describing behaviour change, but authors need to be cautious when using labels in the model which were not the

original construct names. Using the labels of “why” and “how” can be confusing for readers as the links to theoretical constructs are not explained. Social Cognitive Theory is discussed by Simpson et al. (2009) and Francis et al. (2008) in relation to these two words, with “why” being linked to outcome expectations and “how” being linked to self-efficacy; however, these words are not used within Social Cognitive Theory itself and linking constructs in this way may be oversimplifying the capability of theories in general to help answer these types of questions (Bandura, 1998).

This problem is repeated when papers report what to consider in terms of “why” and “how”. Whilst linking the “how” of behaviour change to self-efficacy and the confidence of the GP in their ability to change, Simpson et al. (2009) explain that, in order to deliver “the how of change”, interventions need to be time efficient, acceptable to clinicians, feasible in practice and contain communication strategies. These appear to be very sensible and logical solutions to the question “how to change behaviour”; however, the link between these and the construct of self-efficacy is not explicit. It may be the case that providing training in communication strategies increases a GP’s self-efficacy in explaining decisions to patients, but this is not stated by the authors and one could argue that other theoretical constructs may also be relevant to using communication strategies. For example, a GP may only consider a communication strategy useful for patients who they perceive will have a positive response; in this case, outcome expectancies may be equally relevant and therefore, using Simpson et al.’s (2009) definition, the “why of behaviour” is also covered.

Although the authors above have addressed the work carefully and have provided well designed interventions aimed at changing GP behaviour, there is a certain danger when reporting the theoretical basis of interventions, described in terms of questions such as “why” and “how”, without providing an explicit link to theoretical constructs. If one is

going to talk about the "how of behaviour change" it is not appropriate to refer *only* to confidence or self-efficacy, when other theoretical constructs may also be relevant. Presenting questions such as this may also be unhelpful because a reader may interpret the answer of "how do you change behaviour?" as "increase a person's confidence" which in this context tells you nothing about what the content of an intervention needs to contain, it only specifies another thing it must achieve.

A second example of theoretical constructs not being fully explained appears in the study by Eccles et al. (2007). The authors refer to "risk perception" as a construct of Social Cognitive Theory; however, this wording is not used by Bandura (1986) in descriptions of the theory itself (Eccles et al., 2007). Although the authors give more detail on the theories incorporated in an earlier paper (Walker, Grimshaw, Johnston, Pitts, Steen & Eccles, 2003), again "risk perception" and its relation to the other constructs in SCT is never clarified. Whilst it may be the case that authors have a good reason for measuring "risk perception", the lack of explanation in their paper about this inclusion can be unhelpful for readers in understanding exactly what was being measured. In the same paper, Eccles et al. (2007) also separate many constructs; for example, measuring two types of perceived behavioural control ("direct" and "power") and two types of attitude ("direct" and "indirect") in the Theory of Planned Behaviour. Whilst these measures appear to be distinct the authors do not explain their reasons for choosing this approach and why this may be preferable to one measure for each construct.

These examples highlight how the description of theoretical constructs can be limited in papers and indicate how hard it can be to explore explicit links between theories and behaviours.

2.5.2 Overlap between psychological theories

Eccles et al. (2007) provide some example statements, taken from their questionnaire given to GPs, which were used to measure the theoretical constructs in which they were interested. From the examples they present it is apparent that the authors used the same statements to measure "Attitudes indirect" from the Theory of Planned Behaviour as for measuring "outcome expectancies (behaviour)" in Social Cognitive Theory (Eccles et al., 2007). Here the authors appear to be assuming that these constructs represent the same thoughts; however, the reason for this is not explained. In their discussion, the authors state that, whilst theories were able to explain variation in behavioural simulation and intention, "the analysis suggested that they were measuring similar phenomenon within their own individual structures" (Eccles et al., 2007, p. 9). This suggests that the authors feel there is overlap between the theories. To complement this idea, there is existing literature which highlights the redundancy in having multiple models which describe the same construct under different names (Ajzen, 1998; Abraham, Sheeran & Johnston, 1998; Noar & Zimmerman, 2005). The argument from these works suggests that it may not be the case that one theory is better than others at explaining behaviour because of the cross-over in constructs which are similar. Instead it may be more appropriate to identify which constructs are relevant to the behaviour of interest. Eccles et al. (2007) help to explore this idea in their second multiple regression by entering constructs independently, regardless of their original theory.

In relation to this, Hrisos et al. (2008) identified SCT and OLT as potentially helpful theories in explaining GP behaviour and designed interventions based on constructs from these theories. However, whilst they identified three relevant constructs, they designed only two interventions one to cover both "SCT outcome expectancies" and "OLT anticipated consequences". This is another example of how constructs

may be seen as overlapping between theories and why identifying the construct, rather than the theory, may be more helpful in explaining GP behaviour.

In developing their interventions Hrisos et al. (2008b) describe how they matched theoretical constructs to appropriate intervention components following work from Michie et al. (2005). In their results however the authors found that, although the graded tasks and persuasive communication targeted the constructs of interest, they also targeted other constructs which was not originally intended. Some of these could be seen as similar- for example self-efficacy and perceived behavioural control- although some were quite different- for example, anticipated consequences and habit (Hrisos et al., 2008b). In this respect, operationalising constructs still appears to have some unintended effects. It may be the case that it is not possible to create an intervention component which is only related to one theoretical construct. Alternatively, methods of operationalising constructs may still need work in order to help refine this process.

2.5.3 Selecting psychological theories

Eccles et al. (2007) state that some theories or strategies they studied, specifically OLT, II and CS-SRM, had not been operationalised before. It is therefore interesting to note how the authors have viewed the CS-SRM in terms of GP prescribing behaviour. Some psychological models can be seen as "content-free" and therefore can potentially be applied to any type of human behaviour which is motivated; others however are specific to health behaviours (Bandura, 1998, p.736). Leventhal's self-regulation model could be seen as being more relevant to the latter. Eccles et al. (2007) state that they used the model to "measure a clinician's perception of the condition in general" (p. 10). However the model was created with the intention of describing individuals' cognitions and emotions regarding their own health behaviours and the

extension of this model to a GP's representation of their patient's health seems to be extending the model to a context for which it was not designed. Talking about a GP's perception of the condition "in general" also seems to be limited as individual GPs can display a wide variety of treatment strategies for the same illness. Indeed, in terms of antibiotic prescribing, a GP could give an antibiotic to one patient with an acute cough but not to another patient with a similar cough. Exploring the GPs "general" perception of the illness would not help to describe such different behaviours. This idea may help to explain the findings of Eccles et al. (2007) which indicate that CS-SRM can help to explain variance in behavioural intention and simulation but not in actual behaviour. For the former two, GPs have to make decisions about what they would do in a general situation; however, for the latter, GPs have to make decisions based on an individual patient. It is in these situations where factors other than the GP's representation of the illness may become more important in the decision process. With this is mind, it may not be helpful to look at certain psychological models of behaviour, like the common sense model, for the context of GP prescribing behaviour.

In summary, there are instances in the current literature where more detailed explanation could be helpful in looking at the link between theory and behaviour. Authors need to be careful to describe theories as was intended by the original authors and explain any reported differences clearly within their own papers. Authors should also describe their choices in selecting theories or measuring constructs so readers are aware of the reasons behind these decisions and how they have been determined. Finally, it is interesting that several aspects of the research point to an overlap in theories and the likely situation that some theories are measuring constructs which have different names but which are very similar. This research suggests that it may be better to consider theoretical constructs independently, rather than within in a theory, to explore their influence on behaviour.

2.6 Conclusion

The aim of this chapter was to explore whether there is any evidence to suggest which psychological theories, if any, may be helpful when explaining GP antibiotic prescribing behaviour. Six theories were identified which were discussed in the relevant literature. These had been considered either in research looking at GP adherence to guidelines on any sort of condition or specifically in research looking at GP antibiotic prescribing for acute infections.

Although research suggested that these six theories may be helpful in supporting GP behaviour change, no one theory, or theoretical construct, stood out as being more helpful than the others and studies which had considered psychological theory in relation to GP antibiotic prescribing were very limited in number. It was interesting that research which had explored the relationship between GP prescribing behaviour and theory had investigated this in different ways; however, the research also highlighted how difficult a topic this can be to explore.

Overall, there is little literature on this topic and, within the papers which exist, there is limited agreement on which theories may be relevant. Due to this lack of agreement, and due to the fact that this thesis examines behaviour across contexts which none of the literature has explored directly, it seems appropriate to take an exploratory approach to investigating this area. Following a qualitative approach will permit exploration of the similarities and differences between GPs' views across contexts (or countries) and make an initial start in determining whether behaviours, and potential influences on behaviour, may be similar across contexts.

CHAPTER 3: Qualitative Research Methods

3.1 Introduction

This chapter discusses qualitative methods used within psychological research. First, this chapter identifies the various epistemological positions that researchers take when exploring specific research questions and examines the assessment of quality in qualitative research. Next, qualitative methods are discussed, mentioning both techniques for primary data analysis as well as secondary data analysis. This section concludes with the rationale for the methods chosen for both empirical chapters in this thesis, chapters 4 and 5, and the method for the systematic review in chapter 6.

3.2 Epistemology and theoretical assumptions in research

All researchers, when undertaking a research study, must start with some theoretical assumptions about what they are investigating. Whilst these may not always be explicit, they are necessary and determine the question(s) being asked and often also the method and analysis being used to answer that question. A researcher's perspective on ontology, what reality is, and epistemology, how knowledge can be obtained, are central to understanding why a particular research question is being asked (Yardley and Marks, 2004). Different perspectives about what each of these concepts represent have been proposed and debated for many decades. As an outcome of such debates, many different perspectives have emerged, all of which fall on a continuum, with realism at one extreme and idealism at the other (Figure 12).

Idealism ⟷				**Realism**
Subjective Idealism Constructivism Relativism	Objective Idealism	Critical Realism/ Subtle Realism	Scientific Realism	Naïve Realism Positivism Absolutism

Figure 12. An example of the continuum of certain perspectives in epistemology.

Those who take a realist perspective believe that there is one true reality, independent of human thought and experience, and that by undertaking rigorous research studies scientists can uncover that true reality. Researchers supporting this view believe that research studies should try to minimise bias as much as possible in order to make objective observations about the physical world (Yardley and Marks, 2004). Critics of this perspective argue that humans are unable to view the world objectively and that our interpretation of the physical world will always be influenced by our understandings and interpretations. Those who support this idea fall at the idealism end of the continuum, also called constructivism. Constructivism represents the idea that humans "construct" the world around them and interpret their interactions with their physical environment in a way which fits in with their existing knowledge (Yardley and Marks, 2004). Taking an extreme idealistic view, researchers may believe that each individual has constructed their own reality of the world so that there is no one true reality but instead multiple realities, all of which are equally valid. Those who take an objective idealist approach may believe that there are multiple realities which overlap and which individuals share. Lastly, falling half way along the continuum, are those who support a critical

realist approach. Here researchers support the idea that there is a true objective reality but accept that our ability to understand this is limited. These researchers support the critical examination of study findings in order to achieve the best understanding of this objective reality (Cohen and Crabtree, 2006). Subtle realism, whilst also falling in the centre of the continuum, differs slightly as here, researchers believe that reality can only ever be viewed through human experience and understanding and therefore we may be limited in understanding any objective reality fully (Cohen and Crabtree, 2006). Overall, the perspectives researchers hold about reality and knowledge can mould their research questions and the methods and analysis used to answer those questions. These are discussed further below.

3.3 When to follow a qualitative methodology

Historically, as the science of psychology was emerging in the mid-19th century, research imitated that carried out in the base sciences, such as physics, in order to follow what was seen as a rigorous scientific method (Eisner, 2003). As a result, much research was experimental and quantitative in order to try and eliminate bias from research and to obtain objective results, following a realist approach. This continued through the early 20th century onward until the 1960s and 70s when qualitative research began to be considered by researchers who could see the benefits of being closer to the reality of people's lives rather than trying to replicate it in lab experiments (Eisner, 2003). Researchers began to see the advantages of exploring the ideas people had and the judgements people made about different topics to understand how they behaved.

By exploring individuals' understandings of the world, for example, the understanding of a particular health condition, qualitative research can appear to be naturally more driven by a relativist perspective. Asking about patients' understanding of their disease, and accepting that

patients may have different perspectives on this, points to the idea that there can be multiple realities about living with a chronic condition, for example. However, it is important to realise that qualitative and quantitative research is not always undertaken by researchers who hold different epistemological beliefs. It is possible for a researcher who supports the realist perspective of obtaining knowledge to carry out a qualitative study; however, they may use different methods and ask different research questions. Yardley and Marks (2004) give the example of a realist and a constructivist carrying out a grounded theory analysis. The realist may want to "uncover [a patient's] rationale for accepting or rejecting a particular treatment" whereas the constructivist may want to "explore how the treatment was perceived and depicted by the patients" (Yardley and Marks, 2004, p. 5).

Indeed, Eisner (2003) argues that in one sense all research is qualitative because "all experience is in some way qualitative; qualities are the sources our senses pick up as we have intercourse with the environment" (p. 20). Eisner (2003) argues that both qualitative and quantitative research report on qualities which are experienced by humans but that these approaches differ in how they report these qualities. He states that quantitative research uses quantification which "describes with respect of magnitude" and qualitative research uses qualification which "describes through the use of descriptive language and the meanings associated with such language" (p. 20). In this sense, there may be a situation where quantitative research and qualitative research can be used to explore that same thing. For example, if assessing quality of life in someone who has a progressive chronic illness, a quantitative approach may consider how many times a person is limited in their daily activities across a period of time; however, a qualitative approach may describe the narrative of how the person's condition has developed over time and prevented them from carrying out activities.

Considering this, a researcher should then think clearly about what they are investigating and what they want to find out as it will determine which methods they choose to use. Qualitative research aims to explain individuals' experiences using language in order to provide a detailed, descriptive account of situations. This can be beneficial in studies where a new area is being explored and/or where little is previously known about individuals' behaviours, thoughts or experiences. In this respect, qualitative methods can help to explore a particular experience and present results which can be very broad or all-encompassing to allow researchers to identify multiple factors which may be relevant. This can be more limited in quantitative research where researchers try to measure factors and are constricted by the numbers of measures they can use and control. Research using qualitative methods also often tries to retain the context in which results were obtained in order to help explain data. This can be beneficial when exploring a population which may differ in factors which can influence results. For example, in patients who have different cultural and ethnic backgrounds a "good" quality of life may be viewed very differently but this may not be apparent if using a purely quantitative measure of quality of life which do not consider culture and ethnicity. Using qualitative methods may allow researchers to identify factors which may influence the behaviour of interest and explore these in relation to the contexts in which they appear. This then allows for the possibilities of finding "multiple truths" which may represent multiple realities or offer perspectives on a true reality depending on the researchers' epistemological perspectives.

3.4 Quality in qualitative research

Critics of qualitative research often argue that it does not meet the same standards as quantitative research, which has well-established criteria for determining quality by, for example, assessing sample sizes and using appropriate statistics (Yardley, 2007). These critiques can often come from a misunderstanding of qualitative research and the diverse

methods and approaches which are used within qualitative studies. Some who compare qualitative research to quantitative believe that all qualitative studies should have set criteria to follow to ensure quality. One example of this is a set of criteria proposed by Hamburg, Johansson, Lindgren and Westman (1994). These authors suggested alternative criteria for qualitative research which substitute criteria usually used to assess quality in quantitative research (Figure 13).

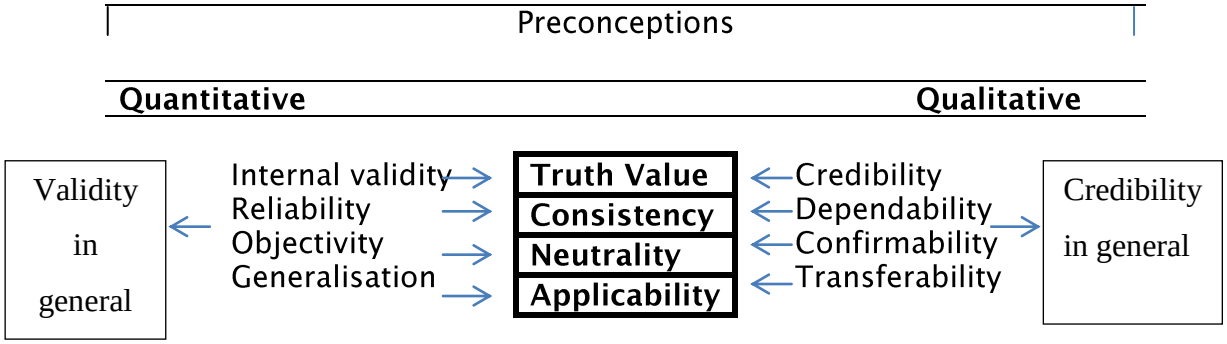


Figure 13. Quality indicators in qualitative and qualitative research and their relation to one another. Figure taken from Hamburg, et al. (1994, p. 178).

In this diagram, the authors indicate how qualitative research can achieve similar standards to quantitative research by addressing similar aspects of quality. Hamburg et al. (1994) talk about qualitative research having credibility, rather than internal validity, in order for it to reflect truth. To achieve this they suggest asking open ended questions to participants, letting participants talk freely without interruptions, obtaining participant validation of interview transcripts, developing a close participant-interviewer relationship where both parties are equal and following an analysis technique in which codes and themes are entrenched within the original data.

Rather than reliability, as assessed in quantitative research, Hamburg et al. (1994) talk about dependability in qualitative research to represent how research can be consistent. Whereas in qualitative research,

researchers may strive to achieve stable and controllable conditions, qualitative research must be more flexible and reactive to the context and data which are collected. Rather than deciding on a pre-determined sample size to assess power in qualitative research, qualitative researchers can estimate an initial number of interviews; however, this may change based on the variation in data which emerge from interviews. Additional interviews may be needed if a particular theme needs to be explored more or if there are contrasting views between certain members of a group. Alternatively, fewer interviews may need to be achieved if views and opinions appear to be very similar throughout all interviews from the beginning. Assessing the point of saturation, where no new insights appear to be emerging from analysis, despite additional interviews, can represent a suitable stopping point for data collection.

Hamburg et al. (1994) discuss confirmability in qualitative research as a parallel to objectivity in quantitative research. In both cases, researchers want to ensure that their research and data represent the 'reality' they are searching for, however they define that themselves. In this respect, researchers do not want to impose their own ideas and interpretations of the data, but remain neutral to process. Just as in quantitative research, qualitative researchers need to ensure that data analysis is systematic and thorough and that the steps taken are replicable, if not the exact interpretation. In order to assess the interpretations of the data, some may have two independent coders to analyse data who can question each other's understanding and establish consensus on areas of disagreement. Researchers may also want to actively search for negative cases, data which do not fit their initial themes, in order to justify their interpretations and check how exceptions fit with these.

Lastly, Hamburg et al. (2004) discuss transferability, which is compared to generalisability discussed in quantitative research. Although qualitative research can never argue that findings from one sample will

be relevant for another sample, Hamburg et al. (2004) argue that by describing the context in as much detail as possible, as well as reporting participant characteristics, research findings can then be viewed by others who can evaluate whether findings may be relevant to other situations.

Providing example criteria such as the above enables readers to assess the quality of a qualitative piece of work; however, the criteria suggested, in trying to emulate that proposed for quantitative work, can be seen as rigid and some maintain that criteria such as this may not be applicable for all qualitative work. Yardley (2007) argues that the variety within qualitative studies can be as diverse as the variety between quantitative and qualitative and, therefore, that insisting that all qualitative approaches should be grouped together and have some common form of assessment is inadvisable. As alternatives to the criteria discussed above, Yardley (2007) outlines four essential qualities that good qualitative research should have- sensitivity to context, commitment and rigour, transparency and coherence and impact and importance (Table 1).

In discussing sensitivity to context, Yardley (2007) highlights the emphasis qualitative research puts on understanding the context in which research is carried out. This includes the socio-cultural setting of the research but also includes the relationship between the researcher and the participant and the theoretical and evidence base of the research study, the justification for exploring the topic to begin with. She argues that it is the researchers understanding of these contextual elements, and the way the research is set up to acknowledge and explore each of these, that portray quality in a qualitative study. Researchers who understand the socio-cultural setting of their participants are likely to have a greater understanding of why topics may be discussed in a certain way. For example, the work of Wilkinson and Kitzinger (2000) uses a discursive approach to explore cancer patients'

comments on thinking positive. Rather than representing actual thought processes or the psychological states of participants, Wilkinson and Kitzinger (2000) suggest that cancer patients feel they have a moral obligation to think positive and this is reflected in the terms they use to describe thinking positively, that "you just have to think positive" or "you've got to think positive" (p.806). Here Wilkinson and Kitzinger (2000) challenge the existing literature which, assuming that patients' speech represents their actual psychological state, suggests that people who think positively cope better with a cancer diagnosis.

Table 1: Four essential qualities of good qualitative research, with examples of the form each can take. Table taken from Yardley (2007, p. 219).

Sensitivity to context
Theoretical; relevant literature; empirical data; sociocultural setting; participants' perspectives; ethical issues.
Commitment and rigour
In-depth engagement with topic, methodological competence/skill; thorough data collection; depth/breadth of analysis.
Transparency and coherence
Clarity and power of description/argument; transparent methods and data presentation; fit between theory and method; reflexivity
Impact and importance
Theoretical (enriching understanding); socio-cultural; practical (for community, policy makers, health workers).

This focus on the exact words used by participants is also reflective of the focus which Yardley (2007) suggests is common of qualitative research. Here Yardley (2007) states that "most qualitative approaches take speech not as a revelation of internal feelings, beliefs or opinions, but as an act of communication intended to have specific meanings for

and effects on particular listeners" (p.221). Without this focus on context, qualitative researchers may miss interesting findings which can offer alternative perspectives on reality and which represent the "truth" as understood by their participants.

Yardley (2007) also talks about how qualitative research should have commitment and rigour. She suggests that commitment requires appropriate handling of data and proficiency in carrying out the qualitative approach chosen. Here, researchers should immerse themselves both in their data but also in the relevant literature to ensure they are aware of all potential relevant issues. Rigour represents appropriate data collection and analysis, that enough data have been collected in order to meet the needs of the research question and the type of analysis selected. Rigour is also used to represent the idea that researchers achieve "completeness of the interpretation", that all aspects of the data are explored and reported in the analysis. This may involve looking back over the data after completing an initial level of analysis to see whether there are other underlying issues or broader themes which offer another interpretation of value. As discussed by Hamburg et al. (2004) under their description of confirmability, researchers may also represent rigour in their work by using triangulation. Here, research may search for views from a number of connected groups in order to build up a more complete picture of a situation. One example of this could be including the views of patients, carers and health professionals in order to understand the experience of being hospitalised for an acute health condition. Whilst some researchers may see alternative views as beneficial in order to help understand the "reality" of what actually happens in such a situation, others may concentrate on understanding only the patients' perspectives and argue that the views of others do not contribute to understanding these independent perspectives.

In discussing transparency and coherence, Yardley (2007) talks about how persuasive the research, and the story which it tells, are for a

reader. In order for a study to be transparent, researchers should ensure that they give details of all steps taken to carry out the research, both in terms of data collection and analysis. Whilst providing such detail, it can also be common for qualitative researchers to reflect on how the decisions they have made regarding how to carry out research may have affected the results of the study; for example, with a decision only to select participants of a certain age, contemplating and questioning the assumption(s) that are being made about age, which may influence the interpretation of results. In talking about coherence, Yardley (2007) discusses the "fit" between all aspects of the study from the research question being asked, to the methods used, to the philosophical perspective of the researchers. Here, research can only be plausible if these aspects are clearly aligned with the same aim.

Lastly, Yardley (2007) discusses impact and importance, stressing the need for the outputs of research to have influence with a specific population, be it large or small. Impact can vary from providing new, practical solutions for specific situations to providing a new theoretical insight into a certain area and either can be equally valuable. Most importantly, Yardley (2007) emphasises that the value of research "can only be assessed in relation to the objectives of the analysis, the applications it was intended for, and the community for whom the findings were deemed relevant" (p. 223).

Overall, it may be prudent for those who wish to assess the quality of qualitative work to use guidance such as that suggested above. For some qualitative work, it may be possible to assess quality based on criteria which are similar to quantitative assessments of quality, as suggested by Hamburg et al. (2004). However, for other qualitative work, these criteria may still not be relevant. Therefore rather than suggesting the work is of lower quality, researchers may want to look at broader criteria, as suggested by Yardley (2007), to see how researchers have tried to consider the sociocultural setting, carried out a broad, in

depth analysis, used transparent methods and discussed results in relation to theory to enrich understanding.

3.5 Qualitative analysis methods

Numerous methods exist to analyse qualitative data which each represent distinct approaches. Often the terminology used to describe a type of qualitative analysis represents a certain approach rather than specific steps taken in the analysis, which can differ depending on how researchers choose to apply the method. Some methods can also be flexible in their application to allow researchers undertaking analysis from different epistemological perspectives to carry out the same analytic method. Some types of qualitative analysis are discussed below and these methods present the ones which were considered for use within this thesis.

3.5.1 Thematic and content analysis

Thematic and content analysis are common types of qualitative analysis which provide a systematic way of handling large sets of raw data (Joffe & Yardley, 2004). Thematic analysis shares some similarities with content analysis and sometimes researchers will report following "thematic content analysis" in their work. Content analysis focuses on the frequency of occurrences of topics, words or phrases in a piece of text and often involves reporting numbers in the results in order to identify topics which have been mentioned most often. In this respect, content analysis has aspects of quantitative analysis incorporated within it and researchers may choose to run statistical tests on the numerical data they collect in order to assess differences between frequencies. Critiques of content analysis often argue that the method does not represent the context of the original text. Knowing that one topic is mentioned more than another topic does not necessarily make it any more important or relevant to what is being discussed in the whole

conversation, and by using a measure of frequency, researchers run the risk of missing important insights into a topic purely because they are not mentioned often in a discussion.

Rather than assess the frequency of comments in a text, thematic analysis instead uses descriptions to help group similar pieces of text together. Thematic analysis involves coding a piece of text to identify important issues which are being discussed. Each section of text which talks about something of relevance to the research question is labelled or coded by the analyst in order to identify issues of importance. This process can be carried out inductively, with code labels staying closely linked to the raw data, or deductively where an existing framework or theory is applied to the data. Initial codes are then applied to later sections of the data, if appropriate, until all data are coded. Codes can either be carried out at a “manifest level”, using code names to reflect what participants say directly, or at a “latent level” where researchers make inferences about what participants are saying in the data and label codes based on those inferences (Joffe & Yardley, 2004). Once codes are identified they can then be compared for similarities and differences in order to develop broader categories and eventually a coding manual which defines what type of data is applicable for inclusion in each category. Producing a coding manual can aid inter-rater reliability if more than one researcher analyses data by producing a set of “rules” about how data can be segregated. As for content analysis, thematic analysis can also be critiqued for organising data according to how the researcher views it rather than representing an individual participant’s story and some researchers feel using more constructivist methods of analysis may be more appropriate in certain situations. Papers describing thematic analysis can also often be critiqued because of the lack of a transparent approach in both analysis and reporting of research studies, and researchers should strive to make their work as transparent as possible, as discussed above. One advantage of thematic analysis is that themes are often directly related to practice or policy and

therefore can be used to help address and answer questions in these areas without the need for policy makers to undertake further interpretation. Other advantages include thematic analysis being one of the more accessible methods of qualitative analysis. It can be less "constructivist" than other methods and therefore can be more easily understandable to both qualitative and quantitative researchers alike (Howitt, 2010). Although the construction of themes in thematic analysis can seem straightforward, researchers should be wary of producing superficial themes over more conceptual ideas, and ensure as many levels of analysis are undertaken as necessary to represent all the data available.

3.5.2 Grounded theory

Grounded theory analysis was first developed by Glaser and Strauss (1967) and offered a systematic approach to carrying out qualitative research. Grounded theory analysis focuses on developing theoretical ideas from raw data. Researchers following grounded theory analysis often collect and analyse data and then further data collection is carried out, followed by further analysis; in this way, the grounded theory approach is an iterative process for analysing qualitative data. Techniques used in grounded theory involve line by line coding of data in order to closely inspect each segment of text and constant comparison which involves a researcher constantly checking between the raw data and the codes to ensure that the analysis is entrenched in the original data. Following line by line coding, codes are grouped into categories which then begin to form relationships and initial theoretical ideas. A second round of data collection is often carried out in order to test these ideas. This can involve researchers collecting data from other sources for example, younger/older participants, participants from different backgrounds to see whether the ideas fit to a broader population or context. Some researchers critique grounded theory when researchers ignore existing theories which already exist in the same

area and suggest that findings may just end up identifying ideas which are already known. Another critique of grounded theory is when researchers do not complete a second stage of data collection. This can limit findings as authors do not search for other examples of participants or contexts where their theories may also apply.

3.5.3 Framework analysis

Framework analysis was introduced by Ritchie and Spencer (1993) as a qualitative analysis approach which provided a systematic way of handling a large data set. Framework analysis is often used in health services research where research studies are carried out to answer specific questions to inform policy and/or practice. Ritchie and Spencer (1993) proposed five stages of analysis- familiarisation, identifying a thematic framework, indexing, charting, and mapping and identification. Familiarisation involves reading and re-reading transcripts in order to understanding the data set as a whole and the topics initially emerging from the data. Identifying a thematic framework can be carried out either inductively or deductively depending on the aims of the researcher. Deductive approaches are common when using framework analysis because of the need to answer questions related to practice. In this instance, a researcher usually starts with a pre-existing framework based on existing knowledge in an area and the research question. Instead, an inductive approach would allow a researcher to build a thematic framework through the process of familiarisation of the data. Once a suitable framework has been identified, data are then indexed according to the categories they represent, with each instance in a data source being assigned to a suitable category. Indexing ensures that each data source- for example, each interview- is analysed and indexed according to the thematic framework to ensure that data analysis is comprehensive and covers all the relevant data available. Charting the data involves keeping a record of which sections of data apply to which category in the thematic framework. If the data contain several

interviews, it can be helpful for a researcher to chart each interview, compared to each category in the framework. This then allows all the data from individual sources to be organised in one place. The last stage, mapping and interpretation, then involves examining the data to look at the patterns and relationships emerging between categories and data sources. Researchers may define specific key concepts which are emerging from the data as most important, they may look at the range of comments on one topic- for example, looking at positive and negative views on the same event- and they may try to find associations between individual's views and characteristics which may help to explain the data. Finally, it may be possible to develop strategies from the data which can be implemented in practice. An example of this may be to identify reasons why people may not want to attend a health screening programme and then designing material to help overcome barriers to attendance.

3.6 Qualitative meta-synthesis methods

Systematic reviews are crucial within research in order to synthesise large amounts of data from individual studies investigating the same phenomena and to explore similarities and differences between studies. Systematic reviews can synthesise studies which are purely quantitative, purely qualitative or can include studies which use either or both methods. Reviews which synthesise quantitative studies are the most common. Often these utilise statistical techniques to integrate data between studies; this is termed a meta-analysis, first coined by Gene Glass (Glass & Smith, 1979). Reviews which contain a meta-analysis are considered the gold standard because they integrate data from high-quality RCTs and are able to establish effect sizes which can give information on the effectiveness of a specific practice or intervention.

This section will focus on systematic reviews which collate qualitative studies. These are often called qualitative meta-syntheses, although

other names are also used, such as qualitative meta-analysis, qualitative meta-data analysis and meta-ethnography (Sandelowski, 2004). There can be confusion in the literature about what each of these terms means. The term "meta-analysis" is usually used to describe the statistical techniques undertaken in a systematic review, as supported by the Cochrane Collaboration, and therefore it can seem contradictory to name a qualitative review as a "qualitative meta-analysis" (Cochrane Collaboration, n.d.). "Meta-ethnography" is also another term which is seen to be used in different ways. Sandelowski (2004) states that "meta-ethnography" is also another exchangeable term for a qualitative meta-synthesis and the use of these terms as synonyms can also be seen in research studies (Gask, Macdonald & Bower, 2011). Other research, however, presents the term "meta-ethnography" as one type of qualitative meta-synthesis; in other words, a specific method for carrying out a qualitative meta-synthesis (Barnett-Page & Thomas, 2009; Ring, Ritchie, Mandava & Jepson, 2010, Garip & Yardley, 2011). The term meta-ethnography was coined by Noblit and Hare (1988) when they produced the first publication that explained the steps involved in carrying out a qualitative meta-synthesis. Since 1988, other authors have published alternative techniques for completing a qualitative meta-synthesis including grounded theory synthesis (Eaves, 2001), thematic synthesis (Thomas & Harden, 2008) and critical interpretive synthesis (Dixon-Woods et al. 2006). In this case, although Noblit and Hare (1988) were the first to describe one set of steps involved in undertaking a qualitative meta-synthesis it is apparent that a meta-ethnography is just one method used to integrate data from qualitative studies. This point, however, is often overlooked in the literature and it is apparent in several studies that researchers often cite Noblit and Hare (1988) whilst only ever referring to a meta-synthesis, rather than a meta-ethnography, and it is often not clear which techniques authors have used to analyse their data (Dowrick et al., 2009; Anderson, Jason, Hlavaty, Porter & Cudia, 2012; Waibel, Henao, Aller, Vargas & Vazquez, 2012). The cause of this may be that some authors do not realise

different methods for meta-synthesis have been introduced since the work of Noblit and Hare (1988) and therefore, whilst meta-ethnography and meta-synthesis could have been synonymous in 1988, that is no longer the case. The remainder of this section will use the term "meta-synthesis" to refer to systematic reviews which solely synthesise qualitative data across studies on the same topic. Meta-ethnography will be used to describe one type of meta-synthesis as described by Noblit and Hare (1988).

3.6.1 Types of meta-synthesis

Various summaries and reviews of the literature have outlined the different methods available for synthesising qualitative data, however these summaries do not always agree on the number of methods available (Pope, Mays & Popay, 2007; Barnett-Page & Thomas, 2009; Ring et al., 2010).

Meta-ethnography

Perhaps because of Noblit and Hare's (1988) early publication and clear description of their method, meta-ethnography is one of the most common types of meta-synthesis reported in the literature. Noblit and Hare (1998) outline seven steps to be carried out as part of a meta-ethnography. These steps are usually carried out iteratively with researchers returning to earlier steps in the process to recheck the data or refine their analysis. The steps include choosing a research question, searching for appropriate studies, reading the studies, examining the relationships between studies, "translating" the studies into one another, synthesizing the translations and then expressing the synthesis. Noblit and Hare (1988) termed the word "translation" to represent the main technique used in meta-ethnography. In order to synthesis studies together key concepts from each study need to be "translated" in order to form a name under which they can all fit. The relationship between studies is examined in order to determine how the

studies can be translated and synthesised. Noblit and Hare (1988) presented three types of synthesis- reciprocal translation, when studies are similar and key concepts can be translated across studies, refutational synthesis, where studies present opposite results and can be compared based on their differences and a line of argument synthesis, where key concepts between studies are compared and then comparisons are framed within an additional interpretation of the data which represents all the studies; here researchers are looking to present "a 'whole' among a set of parts" (Noblit & Hare, 1988, p. 63). The third type here, whilst providing a synthesis of the studies, as do the other two, additionally allows the research team to explore the categories that have merged from the synthesis and extend them by adding another level of interpretation; this then becomes an interpretation which could not have been obtained by looking at the individual studies alone. Noblit and Hare (1988) developed meta-ethnography to use with ethnographic research which they carried out in the field of education. In this respect, the method was developed by researchers who worked from more of a relativist viewpoint and therefore the authors emphasised preserving the context from which data were collected in order to help understand and explain data.

Two papers in particular have examined the method more closely since Noblit and Hare's (1988) publication (Britten, Campbell, Pope, Donovan, Morgan & Pill, 2002; Campbell et al., 2003). Britten et al. (2002) explored four qualitative studies looking at patients' perceptions of their illness and how this related to taking medication. They followed a line of argument synthesis and identified two distinct forms of taking medication; one related to following medication instructions and one related to self-regulation. The authors went on to explore the same topic but across a larger number of 37 studies (Pound et al., 2005). Due to the broad topic and variation in the qualitative studies that met the inclusion criteria of their review, Pound et al. (2005) added an additional stage and amended the original seven stages proposed by Noblit and

Hare (1988, Table 2). They organised the 37 studies into smaller groups, each with similarities in the type of medicine being looked at, and then translated studies within the smaller groups before going on to look at relationships between groups. In this way the authors were able to develop "maps" to represent each of the smaller groups and then develop these to create a final model of medicine-taking in general. Later meta-syntheses have also followed this approach when using meta-ethnography and have used the technique of dividing selected papers into groups within the initial stages of analysis (Malpass et al., 2009; Smithson, Britten, Paterson, Lewith & Evans, 2012).

Campbell et al. (2003) followed the meta-ethnographic method in order to explore whether it could be helpful in synthesising studies with fewer commonalities. Campbell et al. (2003) explored patients' perspectives of diabetes and included studies on both types of diabetes as well as studies looking at perspectives on management, aetiology and the differences in perspectives between patients and practitioners. Following the additional step used by Britten et al. (2002), the authors divided the seven studies included in the review into smaller groups, based on similarity and then followed steps as recommended by Noblit and Hare (1988). Campbell et al. (2003) concluded that the technique of meta-ethnography was advantageous in synthesising studies and being able to inform the existing literature with an interpretation which extended the findings of the individual studies.

Table 2: The eight stages followed in a meta-ethnography of medicine-taking, extended from Noblit and Hare's (1988) original seven stages. Box taken from Pound, et al. (2005, p. 140).

Stages of the synthesis

1. Topic Selection
2. Searching for studies
3. Reading and appraising the studies, including initial extraction of main findings/concepts
4. Organising studies into medicine groups
5. Translating studies into each other *within* medicine groups; produces a raw textual synthesis for each medicine group (reciprocal translations)
6. Determining how findings relate to each other *within* medicine groups; produces medicine maps
7. Determining how studies are related *across* the medicine groups; produces overall model of medicine taking.
8. Synthesising translations *across* the medicine groups; produces an overall textual synthesis of medicine taking ('lines of argument' synthesis) and enables further conceptual development.

Grounded theory synthesis

Grounded theory synthesis is another method used to synthesise qualitative studies, although it is seen less often in the literature than meta-ethnography. Several authors have adapted grounded theory as an analytic method for primary data to make it applicable for synthesising qualitative studies. One example was Eaves (2001), who developed the technique as a way to extend the results of individual grounded theory studies and create a higher level grounded theory. Eaves (2001) used the techniques contained within grounded theory, as established by Glaser and Strauss (1967), in order to develop a method for grouping

data from multiple studies. In this way, grounded theory synthesis is seen as a comparative approach, as opposed to a translation-based approach such as meta-ethnography, as it uses the same constant comparative technique seen in primary qualitative grounded theory studies (Pope, Mays & Popay, 2007; Glaser & Strauss, 1967).

In the process of a grounded theory synthesis, individual studies are examined in order to identify key concepts. Similar concepts between studies are grouped into categories, with the researcher re-examining the data to search for any new instances of concepts and to amend and refine categories where necessary. Once all categories have been refined and are thought to represent the group of studies, one central category of interest is selected which represents all the data, and the data are re-examined again to help amend and refine this category. In this respect, the research is constantly comparing data between studies and refining the categories which highlight their similarities and differences (Eaves, 2001).

Barnett-Page and Thomas (2009) emphasised the difference between grounded theory synthesis and other types of synthesis by stating that the former seeks to compare “like with like”, whereas other types of synthesis allow the comparison of qualitative studies which have followed different methods. This could be viewed as meaning that all studies entered into a grounded theory synthesis should use grounded theory methods; however, other authors have not followed this in their own interpretation of a grounded theory synthesis. Both Kearney (2001) and Finfgeld (1999) carried out a grounded theory synthesis of studies which had used grounded theory, thematic content analysis and phenomenology methods. Whilst these methods are different, however, they represent techniques which tend more towards a relativist approach to research, rather than a realist approach. Overall, grounded theory synthesis may be a useful method for synthesising studies where researchers hold similar constructivist epistemological viewpoints;

however, this method may not be applicable for studies where authors hold a more realist stance and which use alternative qualitative methods.

Thematic synthesis

Thematic synthesis is a third type of qualitative meta-synthesis, developed by Thomas and Harden (2008). As with grounded theory, this was developed by researchers taking techniques from thematic analysis used to analyse primary qualitative data and adapting these to fit with the synthesis of qualitative studies. Whilst grounded theory synthesis uses specific techniques taken only from grounded theory, thematic synthesis utilises techniques from various types of qualitative analysis used to analyse primary data.

Thomas and Harden (2008) identify three stages in a thematic synthesis (Table 3). The first of these involves "line by line" coding of the data, mirroring the technique used in thematic analysis when analysing primary qualitative data. Line by line coding involves searching all of the data systematically and applying codes to distinct sections to represent their content and meaning. In primary data analysis, the names of codes can use words used by the participant or can be in the author's own words. In the same way, a thematic synthesis can use the words of the author of the original paper or can use the words of the researcher carrying out the synthesis. Thomas and Harden (2008) specify that the data to be coded are anything which falls under the results or findings section of a paper, although they also state that findings may also appear in the abstract of a paper and be rephrased in a different way. Interestingly, the authors do not suggest coding sections of the discussion of a paper which may also be relevant. The second stage of synthesis involves the development of descriptive themes from the codes named in stage one. Codes are compared and then grouped according to their similarities and differences, with new codes being named to represent the similarities within each group. Eventually, all

codes are grouped with others, which are similar to them to create a set of descriptive themes representing the content and meaning of the whole data set. Stage 3 extends on stages 1 and 2 by "going beyond" the data set and trying to identify analytical themes which could represent the data. Thomas and Harden (2008), in their example, describe referring back to their research question- which was to identify the barriers and facilitators to children eating healthily- and reassessing the data based on this question. The authors described how the research team independently looked at the data and inferred potential barriers and facilitators from the descriptive themes that had been found. In this way, the authors were applying their own understanding of the data set, going beyond what the original authors of each study had presented.

Table 3: The three stages in a thematic synthesis as described by Thomas and Harden (2008, p. 4).

Stages of a thematic synthesis:
1. Coding of text "line by line" 2. Development of "descriptive themes" from initial codes 3. Generation of "analytic themes"

Unlike meta-ethnography and grounded theory, thematic synthesis focuses less on retaining the context in which the original research was carried out. When completing line by line coding of the results of a qualitative study, researchers can chose whether to code in agreement with the original authors' interpretations or whether they choose to name codes in terms of their own interpretations. This may be beneficial if researchers are dealing with qualitative studies which asked slightly different research questions from that of the meta-synthesis, or when exploring themes across qualitative studies which ask slightly different research questions from one another. The introduction of thematic

synthesis by Thomas and Harden (2008) also differs from other methods by focusing on the idea of using computer software to help analyse data for a meta-synthesis, imitating programs which are used for the analysis of primary qualitative data.

The above sections detail three common types of meta-synthesis; however, there are several more which are also discussed in the literature. Critical interpretive synthesis, introduced by Dixon-Woods et al. (2006) borrows techniques from meta-ethnography and grounded theory synthesis but instead focuses on the synthesis of both qualitative and quantitative methods. Framework synthesis, used by authors such as Oliver et al. (2008) borrows techniques from framework analysis and follows a deductive approach to data synthesis using an a priori framework. Lastly, textual narrative synthesis aims to compare studies whilst retaining the context and characteristics of each study, like meta-ethnography, but without searching for an additional interpretation of the results (Lucas, Baird, Arai, Law & Roberts, 2007).

3.6.2 Meta-synthesis and epistemology

Barnett-Page and Thomas (2009), in describing different types of meta-synthesis, suggest that the reason for the number of approaches available reflects the epistemological positions of researchers. The authors suggest that some meta-synthesis methods have been developed in line with idealist or realist positions and describe how components of a meta-synthesis approach can reflect such positions (Table 4).

Barnett-Page and Thomas (2009) identify six components of meta-synthesis methods which can reflect epistemological positions. They argue that, compared to a realist approach to synthesis, idealist approaches are more likely to contain iterative searches for relevant studies, will assess the quality of studies based on content rather than

method and will contain greater heterogeneity between studies. The authors discuss “problematizing the literature”, which they describe as being more common in idealist approaches, as a process by which researchers critique the literature which they are synthesising; for example, by identifying and questioning the assumptions on which research has been carried out or in the way the existing literature has constructed a particular situation, issue or event of interest. In table 4, the term ‘question’ represents the idea that syntheses which are realist tend to synthesise findings and then provide a summary of the results. Alternatively, more idealist approaches question the synthesis findings and, on occasion, add another level of interpretation (as in meta-ethnography and thematic synthesis) where new ideas emerging from the data can be explored. Finally, the authors discuss the product of the synthesis and argue that realist approaches to synthesis are more directed at producing clear recommendations for practice or policy, whereas idealist approaches produce more complex ideas, which

Table 4: How components of a meta-synthesis can differ in their execution and purpose when perceived from two opposite epistemological positions. Table taken from Barnett-Page and Thomas (2009, p. 9).

	Idealist	**Realist**
Searching	Iterative	Linear
Quality assessment	Less clear, less a priori; quality of content rather than method	Clear and a priori
Problematizing the literature	Yes	No
Question	Explore	Answer
Heterogeneity	Lots	Little
Synthetic product	Complex	Clear for policy makers and practitioners

themselves may be new constructions which then have to be assessed again in order to see how the results could be applied in practice.

Barnett-Page and Thomas (2009), using a similar epistemological continuum as that above, suggest that critical interpretive synthesis is a subjective idealist approach, meta-ethnography is an objective idealist approach and thematic, framework and textual narrative syntheses follow a critical realist approach. This argument is logical and certainly has strength; however, a researcher runs the risk of closing themselves off to certain approaches if they feel that a method can only be applied following one type of epistemological position. As discussed above in relation to qualitative analysis techniques, there is no reason why someone taking a realist approach to research cannot undertake a grounded theory analysis and the same applies to meta-synthesis methods. Grounded theory synthesis may have emerged out of research which followed an objective idealist approach; however, it is possible for researchers with other epistemological positions to carry out a grounded theory synthesis. Rather than categorise meta-synthesis methods, it may be more appropriate for researchers to explore the full range of methods available and select the most appropriate for their research question, as well as taking account of their epistemological position.

3.6.3 Critique of meta-synthesis

While there has been a collection of literature focusing on the different types of meta-synthesis, there has been accompanying literature questioning whether synthesis of qualitative studies should take place at all. Downe (2008) highlights the debate in this area and the range in views from researchers who believe that meta-synthesis is crucial in progressing knowledge based on qualitative evidence, to those who believe it is impossible to synthesise knowledge which is specific to different contexts.

Those who critique meta-synthesis feel that it defies the “very nature and purposes” of qualitative research and that the summation of several qualitative studies loses the “uniqueness of individual projects” (Sandelowski, Docherty and Emden, 1997, p. 366). Qualitative research methodology stems from a relativist, rather than realist perspective, and as such does not seek to find one reality but rather present one construction of reality (Downe, 2008). The accumulation of qualitative studies in order to identify a collective truth is not then seen, by some, as worthwhile since the original contexts of the individual studies will have been lost in the act of summation.

Researchers supportive of meta-synthesis methods argue for their use in order to “provide middle range theories to advance knowledge and practice” (Downe, 2008, p. 5). Small qualitative studies may have little impact in terms of informing policy and practice because they are not generalizable. The use of meta-synthesis to turn findings from individual qualitative studies into a summary of several studies which may be able to produce a new general theory, works towards “enhancing the generalizability of qualitative research” (Sandelowski et al., 1997, p. 367). In producing such general theories meta-synthesis can aid the transferability of research findings to practice and/or policy (Downe, 2008).

The majority of authors appear to agree on the goal of meta-synthesis, to produce a whole which is greater than the sum of the parts and there is general consensus that this can provide useful, new information. However there is greater debate about how meta-synthesis should be carried out. As detailed above there have been multiple approaches presented as ways to carry out a meta-synthesis and authors argue about which are more appropriate techniques to include. The use of quality assessment measures is one major area of debate (Barbour, 2001). Whilst there is an array of measures, from different authors, to assess the quality of qualitative studies (Walsh and Downe, 2006) others

argue that such checklists represent “externally imposed rules of acceptability” which are more relevant to research carried out from a realist perspective (Downe, 2008, p.6). Some researchers have found a middle ground in this debate by taking a pragmatic approach to the use of quality assessment. Here, researchers have chosen to include studies in a meta-synthesis when they reach a minimum level of quality as assessed by a specific measure (Downe, Simpson and Trafford, 2007). Other researchers have instead used quality assessments, not as an inclusion criterion for a synthesis, but instead to focus on the “design features” of each study in detail to inform the synthesis (Sandelowski et al., 1997).

Whilst there can be variation in how a meta-synthesis is carried out, researchers agree that the decisions made by researchers as to what process they follow need careful thought. Making a decision about whether or not to use a quality assessment instrument needs consideration in terms of the researcher’s own epistemological stance as well as thoughts about the consequences of such a decision (Downe, 2008). As for any qualitative study, researchers need to be aware of the assumptions they are making and how these assumptions can influence the answers that are found in the data. Only with this insight can researchers ensure that they are asking the right questions of their data.

In summary, many researchers believe that meta-synthesis is worth carrying out and that this type of research provides an important avenue for qualitative work to develop and provide answers more applicable to practice. There remains debate about how meta-synthesis should be carried out, particularly in terms of the analytic methods used in order to synthesise data. Whilst there may not be one correct answer to this authors stress that researchers should complete analyses in sufficient detail and consider the assumptions behind each of their decisions and how these influence the subsequent interpretations of findings (Downe, 2008; Sandelowski et al., 1997).

Overall, authors who have explored the literature on meta-synthesis and those who have used one of the techniques available to synthesise studies have found it helpful in being able to inform a particular area of research. As with quantitative reviews, meta-synthesis is able to produce a summary of similar studies which can help identify findings which appear across different contexts or within different types of people. Having the option of various techniques available for carrying out a meta-synthesis allows authors to select a technique which they feel fits best for their data. As more examples of these techniques appear in the literature, other authors are likely to realise the advantages of the techniques and other ways of carrying out meta-syntheses may be established.

3.7 Qualitative methods in this thesis

Overall, this chapter explores the different approaches followed in qualitative research and the methods used to collect and analyse data. The following chapters in this thesis present the empirical work carried out, with chapters 4 and 5 presenting two large qualitative studies. Both of these studies used techniques taken from thematic and framework analysis in order to analyse data. Thematic analysis was chosen because it allowed an inductive, systematic approach to analysis but did not aim to build theory, and because it was suitable for the research questions being asked and was aligned with the researchers' epistemological position. Framework analysis was followed once an initial framework had emerged from the thematic analysis and helped to organise the large data set, adding to the rigour and transparency of the research.

Chapter 6 of this thesis presents a systematic review and meta-synthesis. This meta-synthesis follows the method of meta-ethnography proposed by Noblit and Hare (1988) and adapted by Britten et al. (2002). Meta-ethnography was chosen because it is an established

approach in the literature, with good working examples of how to undertake the steps involved. Due to the focus of this thesis on international research, meta-ethnography is a technique which helps to retain the emphasis on the context in which original research was carried out, which can be helpful when comparing research undertaken in different contexts. It also allows a choice of analysis depending on whether or not the studies to be synthesised are in agreement (reciprocal translation) or indicate opposite findings (refutational synthesis).

Overall, this thesis uses inductive qualitative approaches to explore a previously untouched topic. The work presented in the following chapters has been carried out from a critical realist perspective, with the belief that participants' views and reports of their experiences are able to help us understand the reality of European primary care practice, but which recognises that these views, and the researcher's own interpretations of these views, are limited in gaining a full understanding of reality because of our various understandings of the world and our place in it. Further details about the research approaches undertaken in this thesis appear in the relevant chapters.

CHAPTER 4: GPs' views and experiences of antibiotic prescribing and strategies to promote prudent prescribing in five countries.

4.1 Introduction

Chapter 1 discusses the problems of unnecessary antibiotic prescribing in primary care and the various types of strategies (interventions and guidelines) which have been developed to try and influence GP prescribing behaviour. To assess why a strategy may be effective in practice it is necessary to explore GPs' views and experiences of guidelines and interventions as well as exploring their attitudes to antibiotic prescribing for RTIs in general. Although previous qualitative research has explored GPs' views of antibiotic prescribing and/or individual interventions to promote prudent prescribing, the literature review in chapter 1 indicated that only one study has examined these views in more than one context (Carlsen & Kjellberg, 2010). In addition, only one study has examined the views of GPs on more than one type of strategy to promote more prudent antibiotic prescribing (Cals, Butler & Dinant, 2009).

This study elicited the views of GPs from five countries regarding strategies to promote prudent antibiotic prescribing. The aim was to determine whether there were common features of strategies (guidelines and interventions) which GPs working in very different contexts found desirable and necessary. It was also of interest to investigate whether there were important contextual differences in GPs' views of strategies. If GPs' views across countries appeared to be similar there would be scope for producing recommendations for developing guidelines and

interventions that would be sufficiently broad and flexible to be relevant to a wide range of contexts. If GPs' views across countries appeared to be very different, there would be scope for identifying these differences and producing recommendations tailored to the individual contexts.

4.2 Method

4.2.1. Country selection

The study required participants to be selected from several European countries. The UK was automatically included since the research group was based in England and remaining countries were selected based on their differences to the UK in order to attempt to collect a diverse European sample. Countries were selected based on three aspects- their national prescribing rate, their location in Europe and the existence of current or previous national campaigns to reduce antibiotic prescribing.

As the UK was shown to be a fairly low prescribing country within Europe (Goossens et al., 2005), high prescribing countries were of particular interest for inclusion as a contrast. The inclusion of high prescribing countries was also more likely to produce a sample of health professionals who were either unaware, more opposed to, or had difficulty following antibiotic guidelines and therefore had the potential to give more information about how to tackle such barriers. In addition, the location of a country within Europe was noted in order to include participants from different regions of Europe and to cover a broader geographical area. Lastly, some countries were included if they had had national campaigns to reduce the prescription of antibiotics. This was of interest as GPs in a country with a campaign would likely have experienced more types of interventions aimed to reduce unnecessary prescribing, and would therefore have more experience on which to base their comments, than those in a country without a campaign.

Countries which had primary care researchers working in the area of prescribing for RTIs were considered for inclusion. These countries included those which were involved in the CHAMP project. After discussion amongst the study team five countries were selected; Belgium, France, Spain, Poland and the UK. France and Belgium were chosen as they were countries with high prescribing rates in comparison to the rest of Europe as well as both having had national campaigns for several years previously (Huttner et al., 2010; Muller et al., 2007). Spain and Poland were selected as they were countries with average prescribing rates compared to the rest of Europe, but higher than rates for the UK. They were also chosen based on their locations in Southern and Eastern Europe. Spain had had previous national antibiotic campaigns. Poland had had no previous antibiotic campaigns but some areas had had some involvement in the European Antibiotic Awareness Day in November, 2008.

4.2.2. Participants

The Southampton and South West Hampshire Local Research Ethics Committee granted ethical approval for the study for participants from the UK (Ref: 08/H0502/118). Ethical approval was not necessary for other participating countries since participants were not patients and, instead, the research study was approved by the participating institution in each country (Nice University Hospital, University of Antwerp, Medical University of Lodz and Hospital Clinic Barcelona).

Participants were defined as those currently working as a qualified GP in primary care. The intention was to recruit a sample of GPs from each country with a diverse range of prescribing behaviours, so as to include both high and low prescribers in comparison to the country average. An initial target number of 10 GPs was set for each country, with the intention of increasing the number of interviews in each country depending on when data saturation was indicated.

Actual prescribing rates could only be obtained prior to interviews in the UK and Spain. In the UK, GPs were selected from surgeries which were identified as having a prescription rate which was either very low or very high when compared to the local country average. It was not possible to get prescribing data for individual GPs in the UK. In Spain, GPs were sampled based on their individual prescribing data obtained through a clinic connected to the research site; high and low prescribers were identified when compared to the clinic's average prescribing rate. Although the GPs sampled from Spain and the UK were from limited locations, the aim of sampling was not to get a representative sample for the whole country; instead both samples contained high and low prescribers thereby providing a with a range of prescribing behaviour. For the remaining countries, prescribing data were not available. Instead, GPs were selected from different regions or areas within each country, aiming to sample GPs who worked in diverse locations and who had diverse patient populations. Appropriate participants were identified by a study coordinator in each country who was familiar with the health system and was fluent in the required language(s). Most often this person carried out the interviews with GPs, except in Belgium and France where a second researcher interviewed the GPs.

All participants were recruited by an invitation from the study coordinator in each country and were sent a participant information sheet (Appendix A). Participants were contacted either via post, email or phone and were given information about the study in the official language of their country. Belgian participants were sent information in Dutch. Participants wishing to take part in the study completed a consent form prior to the interview taking place either at the time of interview or prior to interviews carried out by phone (Appendix B).

Several GPs had to be contacted in each country in order to conduct an appropriate number of interviews. It was not practical to keep a record

of this or to assess whether there were significant differences between respondents and non-respondents due to the varied information available in each country about individual GPs. In each country, money was available to reimburse GPs for their time taken to participate in the study if needed. The only country which offered GPs reimbursement was the UK where GPs were reimbursed a set amount of £70 for an interview which was estimated to take 1 hour.

4.2.3. Materials and Procedures

All participants took part in a semi-structured interview which was carried out by a trained interviewer, either in person or over the telephone. Interviews were carried out in the official language of each country (in Dutch for Belgian participants), in which the interviewer and participant were both fluent. Interviews followed a semi-structured interview schedule which was translated, if necessary, into the required language and back-translated by a different individual. Any discrepancies were resolved though discussion between the translator(s) and the project coordinator in each country, who was fluent in both languages.

An interview schedule was written for all interviewers to follow. This was necessary to ensure that the same core questions were asked to all participants, across all countries. The interview schedule (Appendix C) was designed with open-ended questions in order to identify participants' own views and experiences on current strategies aimed at reducing GPs' unnecessary antibiotic prescribing for RTIs. Questions were based on the Theory of Planned Behaviour (Ajzen, 1991).

Whilst the interview schedule did not need to be linked to theory, referring to theory provided a structure by which to develop questions. Examining specific theoretical constructs allowed the researcher to consider general determinants of behaviour, rather than specific factors

related to antibiotic prescribing. This allowed questions to be as broad as possible to allow GPs to discuss whatever they felt was relevant. It also ensured that the interview schedule contained questions relating to all the general determinants of behaviour, so that a specific area, for example perceptions of important others (subjective norms), was not overlooked.

The TPB (Ajzen, 1991) was selected because it is a broad model of behaviour. As described in chapter 2 it is a model which is "context-free", in that it can be applied to many different behaviours, in different contexts (Bandura, 1998, p.736). In this respect, the TPB is more relevant to GP behaviour than a more specific health theory, for example Self-Regulation Theory (Leventhal, Leventhal & Contrada, 1998). Social Cognitive Theory shares many of the positives of the TPB and could have been equally useful in this context (Bandura, 1998). The TPB was selected over SCT purely due to the researcher's own preference.

Questions were written to address each element of the model (behaviour of interest, attitudes, subjective norm and perceived behavioural control). Attitudes were identified by asking GPs what they thought about guidelines on antibiotic prescribing or interventions designed to reduce unnecessary prescribing (instrumental attitude) and how they felt about putting them into practice (affective attitude). Subjective norms were covered by asking GPs about their views of the feelings of their peers on guidelines and interventions and how they thought patients would feel about them following guidelines. Lastly perceived behavioural control was explored by asking about situations where strategies were helpful or unhelpful and asking how guidelines or interventions could be made easier to follow.

Additional questions were also added at the beginning and end of interviews. Initial questions asked about GPs' views on antibiotic prescribing in general and their views on providing guidelines for

antibiotic prescribing. Enquiring about broad topics allowed GPs to interpret the questions as they wished and discuss any aspect they felt was relevant. The interview was completed by asking how the guideline could be improved, plus a set of closed questions about participant demographics and medical experience (e.g. age, gender and years in practice).

As well as asking about a participant's own experience of strategies, specific examples of strategies were also introduced in interviews. These were national guidelines, educational meetings for GPs, financial incentives and patient education materials. Short descriptions of each were added to the interview guide as prompts for interviewers to use in situations where GPs had no personal experience of them (Appendix C).

4.2.4. Analysis

Each interview was transcribed verbatim in the original language and translated into English where appropriate. Translations were checked by the original interviewer before analysis and all transcripts were made anonymous. Interview data were examined using an approach which took aspects from both thematic analysis (Braun & Clarke, 2006) and framework analysis (Ritchie & Spencer, 1993). As no previous research had used a semi-structured interview approach to explore GPs' views of strategies across different countries, an inductive approach was taken.

Analysis followed the five main steps of framework analysis as proposed by Ritchie and Spencer (1993): familiarisation, identifying a thematic framework, indexing, charting, and mapping and identification. To facilitate familiarity with the data, the researcher read through interviews repeatedly. For those interviews which had been translated into English and there were queries, the original interviewer was contacted for clarification. In order to develop a thematic framework, the researcher employed techniques from thematic analysis (Braun & Clarke,

2006). Once familiar with the data, the researcher coded thirty-two interviews (covering interviews from three of the five countries) on a line by line basis, assigning labels to identify common sections of text. This produced a number of low level codes which were reviewed and combined to produce themes emerging from the data. Following a thematic analysis approach, themes were continuously revised and refined moving back and forth between transcripts as analysis progressed over the remaining interviews. Agreement on themes and sub themes was sought by members of the research team and inconsistencies were discussed and resolved. Using this grounded line by line approach to initial coding to develop a thematic framework for the data enabled the researcher to follow an inductive approach to data analysis, and avoided trying to fit data into a pre-existing framework based either on previous research or the researcher's own preconceptions.

The final thematic framework was then used to "index" data from all interviews to the emergent themes. This involved labelling all data according to the thematic framework and adjusting the framework for any instances of data which presented new concepts. The data were "charted", using Excel, to indicate what data each interview contained that was relevant to each theme and sub-theme. Charting the data allowed easy comparisons across interviews within and between different countries. Interpretation and mapping of the data involved assessing the similarities and differences across themes between countries. Results were discussed within the research team in face to face meetings, as well as teleconferences and emails, to determine the most salient findings in terms of providing explanations for GPs' behaviour across the five countries.

4.3 Results

4.3.1. Participant demographics

In total, 52 GPs participated in the study, with10 or 11 participants from each country. Interviews lengths ranged from 11 to 69 minutes. Participant demographics were similar across the five countries although GPs from Spain were slightly younger on average and there was variation in whether more male or female GPs took part across countries (Table 5).

Table 5: The demographics of fifty-two GPs interviewed across the five countries.

	Belgium (n = 10)	**France** (n = 11)	**Poland** (n=10)	**Spain** (n=10)	**UK** (n=11)
Mean age (years)	45.3	49.7	42.9	38	44.5
Age range (years)	29–62	33–58	36–53	29–53	33–56
Male	7	7	6	3	5
Female	3	4	4	7	6

GPs varied slightly in terms of their professional characteristics (Table 6). Participants generally reported similar years in practice apart from GPs from Spain who reported having fewer years of experience. GPs from France and Belgium had fewer colleagues working in their surgery compared to those from the UK or Poland, which was felt to reflect the general context of GPs in the four countries. The Spanish sample came from a very large city health centre with many GPs; this was felt to reflect GPs working in larger urban centres but the sample did not incorporate those who worked in smaller rural surgeries. The GPs interviewed in each country were mainly based in urban locations with populations of over 10,000 people, except for French participants who more often worked in rural areas. Most GPs were involved in training

more junior colleagues, except in France and Spain, which may have reflected the solo practice of GPs working in France and GPs working in Spain having fewer years of experience.

Table 6: The characteristics of fifty-two GPs interviewed across the five countries.

	Belgium (n=10)	**France** (n=11)	**Poland** (n=10)	**Spain** (n=10)	**UK** (n=11)
Years in Practice:					
Mean	17.5	18.8	17.4	10.4	14.8
Range	2–33	5–30	11–28	2–26	3–30
Years in current surgery:					
Mean	6.3	16.5	8.3	5.2	12.3
Range	1–33	5–30	3–15	1–8	2–24
GPs in current surgery:					
Mean	2.4	1.4	4.6	40*	7
Range	2–5	1–4	2–10	N/A*	2–10
Surgery location:					
Urban	5	4	8	10	6
Rural	5	7	2	0	5
GP Trainer:					
Yes	4**	3	7	2	9
No	2**	8	3	8	2

**All participants sampled in Spain were from the same city health centre which employed 40 GPs. This type of health centre reflected common city centre clinics in Spain but was not comparable to individual GP practices in the other countries.*

***Data about whether GPs were involved in training were incomplete for Belgium participants.*

4.3.2. Qualitative Results

Seven themes were identified from the interview data, each with subthemes. These are shown in Figure 14. Themes were purposively phrased as recommendations for future strategies. Table 7 shows how quotes from the GP transcripts led to the creation of initial themes which were then rephrased as recommendations for practice.

Table 7: An example of how GPs' quotes were used to form initial themes which were later renamed as recommendations for practice.

Example quote	**Initial theme name**	**Recommendation (Final themes)**
"First of all, it is necessary that the professional has the guideline at reach to start with. Since I started working here I haven't seen any of these guidelines." (Spain, GP 3).	Advice and guidelines are not delivered effectively to GPs.	Deliver the message and promote guidelines to GPs.
"I know bronchitis is viral. Still, most of the time I see in the usual clinical practice that giving antibiotics shortens the duration of bronchitis partly or to a large extent, which makes me doubt whether in the viral process of bronchitis there is also some bacteria involved." (Spain, GP 7).	GPs are sceptical of guideline content.	Increase trust in recommendations.
"I mean you have to approach every patient individually, because it is not always possible to follow these guidelines precisely. It is our reality that works a little bit differently than the guidelines." (Poland, GP 9).	GPs feel that they cannot always follow guidelines.	Address barriers to following recommendations.

Table 7: Continued. An example of how GPs' quotes were used to form initial themes which were later renamed as recommendations for practice.

Example quote	**Initial theme name**	**Recommendation (Final themes)**
"I think that [the test] gives reassurance, to both the doctor and the parent... So, I think that it's a tool…me, in any case, it is useful for me." (France, GP 10)	Additional resources support GPs in following guidelines.	Offer practical support in reducing unnecessary prescribing.
"We had a campaign about five to ten years ago didn't we? The same sort of thing, a lot of it on television and it made it easier because patients said 'oh yes I've heard of that'. It works, or it did work. It made it easier in the consultations. I think it made it easier not to give antibiotics." (UK, GP 4).	Patients need education about the use of antibiotics as well as GPs.	Support patient education.
"We talk a lot about prescribing antibiotics [in meetings]. And it is influential because we have some critical people… and you feel that they discuss prescribing correctly, very critically. And [other] people they listen and think that they may have to change their ideas about it. So there is, in the [meeting], more possibility to change your prescription behaviour." (Belgium, GP 4).	Better communication between GPs will lead to more consistent practice.	Encourage a united practice amongst GPs.
"I think that doctors who work in hospitals should participate in this training. Unfortunately, specialists very often don't choose the right antibiotic and they don't always know that there are such guidelines." (Poland, GP 7).	Other healthcare professionals are also responsible for prudent prescribing.	Educate other health professionals and increase responsibility for prescribing.

Figure 14. Seven themes identified from the analysis of GPs' views and experiences of guidelines and interventions aimed to reduce antibiotic prescribing for RTIs.

A – Deliver the message and promote guidelines to GPs

- Deliver recommendations to GPs effectively
- Have an easily accessible and useable format
- Keep content concise and memorable
- Highlight how recommendations are useful for GPs

B – Increase trust in recommendations

- Highlight the clinical rationale behind antibiotic recommendations
- Address concerns about recommendations based on cost
- Explain evidence behind recommendations
- Provide recommendations tailored to local areas
- Increase collaboration between development groups
- Remain independent from drug industry

C – Address barriers to following recommendations

- Specify how guidelines are/are not being met
- Recognise GPs' concerns about following guidelines
- Address clinical and non-clinical aspects which make reduced prescribing difficult
- Acknowledge the importance of clinical judgment
- Monitor GPs' prescribing

D – Offer practical support in reducing unnecessary prescribing

- Provide tools to assist the GP
- Assist practices to encourage participation in educational meetings
- Encourage guideline adherence by offering financial benefits
- Incorporate recommendations into computer programmes

E – Support patient education

- Address the degree of patient demand
- Encourage detailed explanation to patients to help them to understand a decision
- Encourage the use of patient education as an extra aid for GPs
- Provide public campaigns for support

Figure 14. Continued. Seven themes identified from the analysis of GPs' views and experiences of guidelines and interventions aimed to reduce antibiotic prescribing for RTIs.

F - Encourage a united practice amongst GPs

- Encourage discussion and information exchange between GPs to share opinions and experiences
- Provide opportunities to discuss queries about guidelines
- Encourage consistent decision making within a practice
- Give feedback to allow peer comparison

G - Educate other health professionals and increase responsibility for prescribing

- Improve communication with secondary care
- Use European/international guidelines to spread education

Deliver the message and promote guidelines to GPs

The majority of GPs were happy with the advice that they received, although GPs from Spain and Poland felt that the delivery of advice could be improved, stating that on occasions they were unaware of some recommendations. In Poland, this may have reflected the fact that there had been no previous national campaign to promote prudent antibiotic use. GPs from other countries felt that, although guideline delivery was good, they could be overloaded with information which affected how well they could read and remember advice and therefore the influence on their practice.

> If [GPs] know [guidelines] exist and they're easy to use then they'd be alright… I mean there's all sorts of guidelines and sometimes we despair a bit because, I mean even for the same condition, you get loads of different sets. (UK, GP 9).

All GPs wanted advice sent to them in an easily accessible and usable format and for advice to be straightforward. The majority of GPs from each country were very happy about advice that they had received, stressing that it had been useful to their practice in helping them to make prescribing decisions, keeping them up to date on recent evidence and helping them to explain prescribing decisions to patients.

> No, no, I tell [patients] that that's the way I do it and in addition, when they are a little insistent, I tell them "there are French recommendations which are called that, that and that…", and I show them on the internet, you know, I show them, like that, they read them, they see them, and like that, they understand very well. (France, GP 11).

One particular point stressed by GPs from Belgium, Poland and Spain was that they often reported feeling safer in their prescribing decisions when they knew that the decision corresponded to recommendations.

> Interviewer: And how do you feel applying the advice given in these meeting?
> Participant: Well, in general I feel much safer. It may be that you have the feeling that you are carrying on daily life with a much more scientific basis behind it. You feel that apart from your own clinical experience, it is supported by true information. (Spain, GP 3).

Increase trust in recommendations

The majority of GPs interviewed were aware of the clinical benefit behind recommendations concerning antibiotics, both for individuals and society. All reported that they supported efforts to reduce unnecessary prescriptions. However, a small minority of GPs from Spain, France and Poland reported that they had some reservations. These GPs stated that

they were unsure about the effectiveness of treatments that were recommended by their health authority and that they would prefer to choose alternative treatments based on their clinical experience.

> I know bronchitis is viral. Still, most of the time I see, in the usual clinical practice, that giving antibiotics shortens the duration of bronchitis partly or to a large extent, which makes me doubt whether in the viral process of bronchitis there is also some bacteria involved. (Spain, GP 7).

Some of the GPs from Spain and the UK reported that they were biased against guidelines in general as they felt that often recommendations were concerned with saving money rather than providing benefit for the patient. Despite this general belief, some stated that they felt this wasn't the case for guidelines related to antibiotics. This indicated that the promotion of prudent antibiotic use may be a more acceptable concept for some GPs than other primary care practice recommendations.

> Well, MBO[1] sometimes does not have a clinical basis but an economic basis. So sometimes you find pointless and ridiculous objectives that don't make sense at all, as they have an economic basis. (Spain, GP 10).

> I've been in on meetings, being an ex-prescribing lead, where it's so heavily biased in the financial direction that I wondered if clinical judgement and clinical practice were being thought about at all. (UK, GP 7).

GPs from Belgium, the UK and particularly Spain also mentioned that contradictory guidelines were sometimes a problem for them in practice

[1] MBO – "Management by Objectives". Spanish incentive scheme, to reward primary care practitioners for achieving set targets as determined by the government. (DPO – Dirección por objetivos).

and that they had received conflicting messages in the past which made advice difficult to understand. They suggested that fewer guidelines, produced from a collaboration of guideline developers, would help with this in the future.

> Well, some things are well done, and some others are much too strict. But well especially with the guides from the [Catalan Institute of Health] what happens is that they do not coincide with the guides published by the Spanish Society of Pneumology and these kinds of contradictions might cause problems. (Spain, GP 10).

The biggest concern of GPs from Belgium, Poland and Spain was the potential bias in recommendations influenced by the drug industry. Several felt this was very common in their countries, particularly GPs from Poland. Participants stressed that they wanted to receive independent advice and that this needed to be stated in guidelines.

> I don't think that you can find 100% objective information…because those pharmaceutical companies will always be involved in the funding at some level. (Belgium, GP 9).

> It is also important to make clear the separation between the drug industry and knowledge that is being given, because this can sometimes remain diluted and sometimes it is clear that you are having a meeting with a [pharmaceutical company] behind it so a very good image of the product is provided. But sometimes you don't know and so you have to stick to the studies. (Spain, GP 7).

The most important point which helped GPs to trust guideline advice, which was stressed by nearly all GPs from every country, was the explanation of the evidence base behind recommendations. Where evidence was provided, GPs reported feeling more satisfied about the

effectiveness and safety of treatment options for patients and this overrode other doubts about the source of recommendations.

Address barriers to following recommendations

The majority of GPs felt that their current practice was in line with their national guideline(s), either because they had changed their practice since receiving recommendations or because they had already been doing as recommended. Some felt that giving further advice was unnecessary because it was obvious.

> Participant: Yeah those [recommendations] are all the ones we would do anyway so I don't know if I read those guidelines or not but that's standard practice isn't it? If you ask me, that's being a bit patronising because that's what we do anyway.
> Interviewer: Sure, so it doesn't really apply to your practice…
> Participant: No I don't think it applies to anybody does it? Apart from old school, which I've already mentioned, I find that quite patronising to think that that's what NICE, I suppose NICE write the guidelines so I suppose they have to write it to be specific but that's what we do anyway. (UK, GP 10).

In stating how they followed guidelines, a few GPs made reference to changing the type of antibiotic prescribed rather than reducing the number of antibiotic prescriptions. This suggested that this was the only way they felt their prescribing could be, or had, improved and possibly meant that they had not realised that reducing the amount of drugs prescribed was also important.

> I mean that's the bottom line really to get the prescribing away from sort of second line [broad spectrum antibiotic] prescribing. (UK, GP 1).

GPs from France, Spain and the UK also admitted that the subject of antibiotics was not of interest to them and that they did not usually seek out advice on the subject. This meant they were less likely to pay attention to advice received, or offered, on the topic.

> Interviewer: And would you be interested in going to a meeting on respiratory infections and antibiotic prescribing?
> Participant: I don't think it would be one I'd rush to at the moment but bearing in mind that it's an area I'm reasonable familiar with and there are lots of other areas to get education in (UK, GP 7).

Despite feeling that they followed guidelines, almost all GPs also mentioned what they reported to be exceptional cases where guidelines could not be followed and stated that decisions had to be based on individual patients.

> I mean you have to approach every patient individually, because it is not always possible to follow these guidelines precisely. It is our reality that works a little bit differently than the guidelines. (Poland, GP 9).

Many GPs said that it was not always easy to follow guidelines and that sometimes they had concerns about potential negative clinical consequences for patients. Some GPs spoke about times when they had not followed guidelines because of this.

> I mean sometimes although an infection… seems to be simple, a patient is feeling terrible or he has a high temperature, so one thinks that a stronger antibiotic should be used even though the guideline says something different. And then I don't feel quite comfortable with it, because I can imagine that he will come back after two or three days and he won't feel better at all. (Poland, GP 3).

> Well when we've got a lot of co-morbidity, um, you feel you want to get the infection down in one hit um, that's the time you think well maybe I'd just like to use Clarithromycin now rather than wait for Amoxicillin to try it out and you know. (UK, GP 1).

GPs from Belgium, France, Poland and the UK also mentioned several situations where they gave antibiotics to patients when it was not clinically necessary. These were most often when a GP felt it was difficult to deal with a patient's disappointment when not receiving an antibiotic or when a patient was not able to return for a consultation in the next few days (e.g. the patient was going on holiday, the weekend was approaching with fewer health services available).

> [Patients] with that kind of argument like "this [other] doctor gives it and we cannot consult her now", "I feel abandoned" and some emotional arguments that make me [prescribe]. (Belgium, GP 5).

> Well, there are times when it's harder to negotiate because we really feel the person's [expectations], either they tell you straightaway, or they are disappointed when it is not part of the prescription. (France, GP 6).

> You know when you go home from these [educational] meetings and you think, you know "I'm going to be good, I'm not going to do this, I'm not going to do that" and um it's getting easier with time but, you know, sometimes last patient on a Friday night, you know. (UK, GP 11).

The majority of GPs stressed that "guidelines are guidelines" and stated that clinical judgment was needed in order to implement them appropriately. GPs often said that their decisions were based on their own experience (and sometimes habit) and that they felt they knew what

was best for their patients. This sometimes resulted in not following guidelines, however they felt this was in the patient's best interest.

> On the other hand I think a guideline is always literally a guideline for correct implementation and by consequence subject to interpretation and adaptation to the context. (Belgium, GP 3).

Lastly, a few GPs from each country made reference to feeling monitored either by their health authority or another agent which put more pressure on them and their practice. Some felt that this was important to improve the prescribing of some GPs, although others felt their work was being interfered with and were more reluctant to pay attention to advice or implement it.

> Well in theory, next year they're proposing, if you didn't follow guidelines in your practice, you know, you're going to be spot-checked and penalised if you don't follow guidelines. I suppose it's to bring people into line but what they're going to bring people into line about I don't know. (UK, GP 3).

Offer practical support in reducing unnecessary prescribing

Many GPs felt it would be useful to have more support to help them follow recommendations. GPs from France and Poland thought that point of care tests (POCTs), which could give immediate results to aid diagnosis, would be useful to help them make prescribing decisions. Some also felt that tests would reassure those GPs who prescribed more than average, when prescribing fewer antibiotics.

> When there was a mother with her child who had a high temperature and whose tonsils looked suspicious, I took a smear in order to do a test and when the result was positive I applied an

> antibiotic and when it was negative I did not apply it. In this way these tests helped me. (Poland, GP 8).

> I think that [the test] gives reassurance, to both the doctor and the parent, even if the children don't really appreciate it, but well… I don't use it with adults, except when I have doubts… I know that some never use it or use the strep test very little and go only on their clinical sense and others use it a lot. So, I think that it's a tool… me, in any case, it is useful for me. Subsequently, everyone uses the resources as they feel, as they like and as they can. And it's not a waste of time at all, much to the contrary. (France, GP 10).

Although POCTs were not commonly used in Poland some GPs interviewed had had experience of them through participation in previous research studies. The use of POCTs in France was more common as the cost of tests was reimbursed.

GPs from all countries generally liked attending educational meetings to help gain advice on their practice and to keep them up to date and many felt they were more influential than guidelines alone. Several GPs stated that it was often very difficult for them to attend meetings and felt that they could be given more help by their surgery or their health authority, either to attend meetings or to bring speakers to their own surgeries.

> We always highlight the problem of time. I mean, it is difficult to release a doctor of their daily activity so many update meetings have to be made outside of your schedule or you cannot attend, so surely we should adjust these meetings to fall within the appropriate time. (Spain, GP 8).

Several GPs from Spain and the UK mentioned financial benefits that were in place in their country to encourage GPs to follow guidelines. GPs in the UK were generally positive about incentives and felt they were

effective. However Spanish GPs were more divided, with many GPs querying the evidence base of incentives.

> Most of the people are satisfied [with the incentive scheme] because they see an economic reward behind it. The only problem is the basis on which MBOs are built, most of the people think it is an evil system and that it does not help them to prescribe better. And, from what I have heard, my colleagues think that way too. They are not based on evidence or… well they have not explained MBOs to us very well and we don't really understand them. (Spain, GP 3).

> Well, the new contract says what financial incentives does, they didn't think general practice would change, they thought no one would achieve the targets and when there was money on the table, the whole organisation, across the country, changed dramatically, almost overnight, from a very reactive sort of service to a very proactive service and people changed massively. (UK, GP 4).

> I think it's probably good actually because GPs are having to look at income streams all the time and I think it's probably a good idea to make them focus on what they're doing I think it does become an agenda then for them to discuss. (UK, GP 6).

A large proportion of GPs from Belgium, Poland and the UK also stated that they preferred recommendations and advice when it was based on local information; for example, the resistance levels in a local area. They suggested that this would be more relevant to their practice and therefore of more interest to them.

> I must admit I personally I prefer the local [meetings] because I think sometimes you can go to things say in London , which are interesting but then you think "would this apply to us?", you know,

> it's all very well having national guidelines but if your local hospital isn't following them then it clashes. (UK, GP 9).

Lastly, a few GPs from Spain and Belgium also stated that they felt it would be useful if guidelines were built into their existing computer systems to help them make prescribing decisions more easily at the time of the consultation.

Support patient education

The majority of GPs reported that they had a minority of patients who always demanded antibiotics. This meant that GPs had to address patient expectations about antibiotics and treatment which they felt made their job more difficult. GPs from Belgium and Poland reported concerns that trying to address patient expectations, instead of prescribing an antibiotic, may lead to patients going to another GP.

> This knowledge should be directed more at patients, because sometimes they force doctors to prescribe antibiotics for them. (Poland, GP 10).

> People from the AFSSAPS[2] and the HAS[3], are not confronted with this aggressiveness from patients. There you are, they give good advice, actually they are right, but sometimes we do not heed it, because to be objective, when there is someone who is hassling you a lot, you put them on antibiotics even though it serves no purpose. And we are not happy about that but we still do it. (France, GP 11).

[2] AFSSAPS – Agence française de sécurité sanitaire des produits de santé. French health products safety agency.

[3] HAS – Haute autorité de santé. French national authority for health.

> Well, sometimes you give up and you end up giving them an antibiotic, even when the patient does not need it… and you know it and you have been told but… well, partially you do it for your own survival in the office… the patient gets more and more stubborn and you tell them, "well, at least if you have a high temperature, in that case yes, take it" and you try bargaining the way you can… it is not easy even when you give them thousands of explanations, not even if you give them thousands of materials." (Spain, GP 4).

Encouragingly, GPs commonly reported that patient demand had improved over recent years.

> There's been quite a lot of NHS advertising hasn't there about it and I think that's been quite powerful actually and I think people are starting to notice, you know people are realizing that they don't necessarily need [antibiotics]. (UK, GP 2).

Despite some high demand from patients, the majority of GPs in France, Belgium, Spain and the UK said that they felt confident in dealing with patient expectations for antibiotics and that they managed this by giving a simple explanation of their decision.

> [Patients are] told "oh this is probably viral and antibiotics are to treat bacterial things" and in explaining it to them, you know they're not too keen on whether this is a good thing or not, but you know most of the time I make this big effort and I stick to my guns and they have to put up with it…it takes more time, but I'm working on the premise that hopefully over time particularly the parents of younger children, that they take this on board and stop coming back for recurrent things for their children, and any other children that they may have. (UK, GP 10).

Some GPs stressed that the patient's acceptance of the doctor's decision was often dependent on the doctor-patient relationship and that they perceived it to be much easier for patients to accept decisions when they trusted their GP.

> I think that if my patients are satisfied with me, they would continue being satisfied whether I used these guidelines or not… I think they rely very much on our prescription, they trust the professional, not the guideline. (Spain, GP 3).

> I think in general patients trust their doctor, perhaps not implicitly but have great trust and great faith in their doctor. (UK, GP 3).

Some GPs, however, reported that they did not always take the time to explain their decisions to patients as prescribing a drug was quicker and they felt that the patient was satisfied either way.

> It seems that the days where there are lots of patients, I prescribe a lot more... because it's easier, you get rid of the person quickly by giving them the medicine and then they go. If you spend a quarter of an hour talking to the patient, and well, you can't see fifty in a day, it's not possible. (France, GP 7).

> I try to negotiate with the patient… but it's not so easy. So many times I give up the undertaking because you don't have time enough to discuss or confront anyone. (Spain, GP 2).

In order to help manage patient expectations, the majority of GPs in each country felt that patient materials, giving information on common

infections and antibiotics, would be useful to give in a consultation either for themselves or for other GPs.

> I recommend it. Because usually you don't have enough time in the surgery to explain all you'd like to explain to the patient. So you give him just the main guidelines and then you give him a document to be read at home and tell him to follow the recommendations. (Spain, GP 10).

> It's on our computer systems and it's incredibly easy to download an information sheet or direct the patient where to go to find an information sheet to read, so we use them enormously, we're great fans. (UK, GP 5).

Some, however, felt that materials were not necessary and that their explanation was enough for patients, especially as they felt that patients may not read leaflets and/or take in the information.

> If people already take so much trouble to get to here, I also want to reward them with my own words and my own explanation. And then I don't think I'm allowed to fob them off with a little leaflet. (Belgium, GP 8).

> There are a lot of posters and leaflets everywhere, people have got used to seeing them, and they don't read them anymore; they are simply unresponsive to them. (Poland, GP 8).

To help with managing patient expectations, many GPs felt information also needed to be available outside of the surgery. Many GPs in Belgium and France were particularly enthusiastic about campaigns which had happened in their own country and some GPs from Spain, Poland and the UK who mentioned campaigns were also supportive of them.

> A media campaign for the population, um, for me personally is, or I often seize it gratefully, in order to convince people. Because if it's in the newspaper it's correct and if the doctor says it, it's not certain eh? (Belgium, GP 8).

> Well, um, we had a campaign about five to ten years ago didn't we? The same sort of thing, a lot of it on television and it made it easier because patients said "oh yes I've heard of that". It works, or it did work. It made it easier in the consultations. I think it made it easier not to give antibiotics. (UK, GP 4).

When talking about campaigns some GPs stressed that it was important to have constant, regular messages for patients rather than a one off message to give consistent reminders.

> I'm sure, it's like all these things isn't it, it's not a stand on its own thing, um if you want to change the public's perceptions of something you need to feed them information regularly not just once a year. (UK, GP 5).

Encourage a united practice amongst GPs

The majority of GPs felt that discussion with peers was helpful as it made them think about alternative ways of carrying out recommendations and also made them aware of how similar, or not, their practice was compared to others. Opportunities for discussion were mainly mentioned in reference to educational meetings. These were often meetings of a large number of GPs (over 30); however, some did refer to smaller peer group meetings which may have contained fewer GPs (under 10); smaller group meetings were often preferred because of the greater opportunity for interaction.

> We had an opportunity to listen to the information that was presented to us by the professor and we also had an opportunity to exchange the information we possessed. I think that there was a psychological aspect in this training too, because when one heard that his or her colleague was trying not to apply antibiotics and everything was all right, there were not many complications and so on, then one might think that it could be good not to apply antibiotics too. (Poland, GP 10).

GPs also mentioned that meetings were useful to answer queries they had about guidelines and to help keep recommendations relevant to their own practice.

> [The meeting] is a presentation and then discussion afterwards, where you can get a good fifteen minutes of discussion, it's like open the floor to "What do you do? When? And why do you do that?" and you're always encouraged, if you have questions to ask at the time. They're very useful, because it's usually about what you do in practice, what you do yourself in practice and a lot of... everybody asks different questions but they're always questions where you think "oh yes, I do that as well, now why do I do that?" they're always things which are absolutely 100% relevant to your day to day work. (UK, GP 3).

> I think it's, I think a lot of us probably benefitted from it because we know [the presenter] and he, you know sort of trust a friendly face, and he could give examples and you could ask questions about, well about such and such, and yeah I think it's changed our practice, yeah, because we had the opportunity to ask any queries, he could answer them. (UK, GP 9).

GPs in the UK reported that there was often not consistent practice within their own surgeries and GPs from Belgium and Poland also felt

there were inconsistencies amongst GPs in general, particularly between older and younger generations of GPs. GPs from all countries felt guidelines had the potential to increase consistent prescribing decisions amongst GPs.

> We don't have a lot of in house training, certainly towards what we do, we're very much individual in that we go, if we want to learn something that we see, we'll pick and choose ourselves…whatever it may be, so that would really be where we do our own learning, and certainly not as a practice but as individuals. (UK, GP 3).

Some GPs from Belgium and France reported that prescribing feedback was very useful for them, as it helped to inform them about how they were doing compared to others. Some GPs from Spain and the UK added to this stating that they felt that peer comparison was very influential in affecting how much a GP prescribed.

> I believe it can be very enlightening that every colleague can get an idea of their prescription behaviour. I think it can only make such a discussion more interesting. (Belgium, GP 2).

> We are seen regularly…we get a check-up on prescriptions from Social Security. There you are, that's a resource that helps me...the inspector told me that I wasn't prescribing as much as that, but I still had the impression I was prescribing too much…I really want to be told how I am prescribing, it's always interesting. (France, GP 7).

> I think ranking against other practices is very powerful, you know if you were to list influences on GPs, probably below money would come peer-group comparison. (UK, GP 5).

Educate other health professionals and increase responsibility for prescribing

In terms of having consistent prescribing practice across Europe, GPs from Belgium, Poland, Spain and the UK felt that having international European recommendations may be useful. GPs felt international recommendations may help to support or direct countries' national recommendations. However, some GPs felt that recommendations would still be too distant from their own practice to be particularly useful to them; for example, recommendations would be too general and not apply to their own patient population.

On a local level, GPs from the same four countries felt that other health professionals, in addition to GPs, should be involved in changing their prescribing behaviours. Most GPs reported that other health professionals did not have to follow the same recommendations as primary care, which had a subsequent effect on patient understanding regarding antibiotics and made it harder for GPs to keep to guidelines.

> [A&E doctors] do tend to hand out antibiotics like Smarties and then it makes our job a lot more difficult in the surgery to explain to somebody that it's probably viral and then hear "but last time doctor they gave me penicillin at the hospital and it sorted it all out because I was much better within the week" and you know they might have been much better within the week without treatment anyway. But having to explain to people who have already experienced something so different, someone who's very inexperienced but who [the patients] think must know more than the GP who's got tons of experience. (UK, GP 10).

GPs in Poland and Spain particularly stressed the problem of patients coming to the GP surgery when they had already been given a drug by a pharmacist, which they felt was a major flaw in their health systems.

> We make trainees conscious of the fact that patients sometimes take antibiotics on their own and when they finally come to the doctor's an antibiotic has already been taken for two or three days. They come to the doctor's, because it does not work and it does not work, because it is a viral infection. (Poland, UK 6).

> The only thing MBO[4]s do is make you argue with patients coming from other doctors and asking you for a prescription that they have already paid for at the chemist's, and that is not being a doctor, but a policeman. (Spain, GP 7).

4.4 Discussion

4.4.1 Main findings

The analysis of interviews produced seven themes which were translated into specific recommendations for future strategies aimed at promoting a more prudent use of antibiotics. It was surprising to see, across all themes, that GPs had similar views about many aspects of prescribing, regardless of the country in which they worked. GPs were judged as having similar views when the majority of GPs from each country reported the same views as the majority of GPs in the other countries. This finding suggests it may be feasible to develop an implementation strategy that will be widely applicable. Where differences in views arose, they were a result of differences in either GPs' personal experience of type of strategies, or the availability of antibiotics in different countries, which are explained further below.

[4] MBO – "Management by Objectives". Spanish incentive scheme, to reward primary care practitioners for achieving set targets as determined by the government. (DPO – Dirección por objetivos).

The findings of this study indicate what elements a strategy aimed at promoting prudent prescribing should include in order to maximise acceptability with GPs. GPs put great value on information they could gather from their peers, stating a preference for interventions which offered opportunities for discussion and comparison between colleagues. Such interaction was thought to be helpful in moving towards a more consistent practice between GPs and offered support in helping to change behaviours.

GPs recognised that antibiotics were prescribed too often for respiratory infections and felt that guidance on prescribing was helpful for them, with some reporting that they felt "safer" if they had guidelines they could follow. Although positive about the general aim to reduce resistance, GPs had concerns about the basis of guidelines, occasionally feeling they did not represent clinical benefits for patients and were either inaccurate or influenced by biased sources. GPs stressed that any guidance needed to be backed by a strong, clear evidence base.

Lastly, GPs indicated that they felt targeted as a population and emphasised the importance of using strategies to educate other health professionals as well as themselves. GPs felt that as well as supporting a change in healthcare professional behaviour this would also give consistent messages to patients and increase understanding about appropriate antibiotic use.

Whilst there was overall similarity in views, GPs from different countries did have differences in opinion about how strategies could be designed or delivered in relation to their own context or experience. Three main differences were noted. Firstly, participants had varying experience of receiving guidelines and advice on antibiotic prescribing, which affected their enthusiasm for receiving further advice. The desire for guidance was greatest among those who had received little advice before and, in this study, this appeared to apply to GPs from Spain and Poland in

particular. Secondly, GPs reported experiencing different barriers within their health system in changing their prescribing behaviour. GPs from Spain and Poland reported that patients could access antibiotics prior to a consultation because dispensing laws were not enforced. Thirdly, GPs differed in their opinion on how to provide practical support for non-prescribing decisions. Here, GPs from France and Poland supported the idea of providing POCTs (e.g. a CRP blood test, a rapid streptococcal antigen throat swab) to use in a consultation, whereas GPs from other countries suggested financial incentives or support from within a GPs surgery (e.g. consistent practice between partners). In such instances, differences were likely to be based on what participants had previously experienced in their own country and what they had already found helpful themselves (e.g. Polish GPs only mentioned quick tests being helpful when they had previously used them themselves).

When assessing the differences noted between GPs' views, there was a very clear divide between countries. Differences were highlighted when the majority of GPs in one country reported something which GPs in other countries did not report at all. In one example, nearly all GPs from Spain and Poland talked about patients who obtained antibiotic over the counter illegally; however, no GP in any of the other three countries mentioned this because it was a law which appeared to be well enforced in those countries.

Such differences may represent differences in experiences of intervention types between countries and therefore may not necessarily mean that similar approaches cannot apply to all contexts. If, however, differences do represent aspects which may not be possible in some contexts, results offer ideas of how strategies could be specifically tailored to match different settings whilst still meeting the main recommended criteria for a strategy. In the above instance, interventions could be tailored to provide additional support for GPs, either by offering the use of a POCT, offering a financial incentive upon reaching

a target or encouraging consistent practice within a surgery of several doctors.

Overall, the similarities between participants from each country suggest that, by incorporating participants' suggestions presented here as recommendations, future strategies have the potential to be implemented successfully throughout multiple European countries. In addition, the differences between views of participants from each country indicate how strategies could be specifically tailored to fit a chosen context.

4.4.2. Comparison to previous research

Because of the consistency identified between comments of GPs from different countries, it was not surprising that emerging themes had clear similarities to previous qualitative work carried out in the UK (Butler et al. 1998b; Kumar et al., 2003; Simpson et al., 2007; Wood et al., 2007) as well as other European countries (Coenen, Van Royen, Vermeire, Hermann & Denekens, 2000; Frich, Hoye, Lindbaek & Straand, 2010). Similar themes included GPs accepting that antibiotic resistance was an important issue (Simpson, et al. 2007), GPs favouring their own experience or knowledge of their patient over guidelines (Coenen et al., 2000; Kumar et al., 2003), GPs being concerned about the clinical consequences of not prescribing (Kumar et al., 2003; Simpson et al., 2007) and GPs finding it difficult to balance the treatment of the individual patients with guideline advice (Butler et al. 1998b; Simpson et al. 2007; Wood et al., 2007).

Results also indicated that some GPs found it difficult to trust guidelines, in line with previous research (Butler et al. 1998b; Wood et al., 2007). However, other GPs reported that they liked having evidence based guidance and were happy with the information they had received. Results indicated differences between countries in relation to this, with

GPs who distrusted guidelines being more likely to come from Spain or Poland. The findings from this study contradict previous research carried out in the UK, as UK GPs seemed happy with the advice they received. However, distrust in guidelines may be relevant to other countries, possibly those where guidelines are not as common or where guideline quality is not as high.

Lastly, results indicated that some GPs reported difficulties handling perceived patient expectations for antibiotics, matching previous work (Butler et al. 1998b); however, others were not as troubled by this and felt that patient trust in their GP was a key aspect in whether patients accepted a no antibiotic decision. In this case, GPs did not differ between countries but within countries, indicating that it was more likely an issue which dealt with a GP's experience or time in practice than with their specific geographic location or socio-cultural context.

4.4.3. Future strategies

The themes identified in the data offer specific recommendations which could inform future strategies aimed at reducing antibiotic prescribing in primary care. The consistency between the views of GPs from different countries provided recommendations which represented the majority of participants and which were relevant to all five countries.

Although participants suggested specific recommendations for future strategies, ideas need to be considered in terms of their feasibility. The recommendations presented here could be implemented on several different levels. In terms of human resources, strategies could be carried out at an individual level, by the GP, such as using patient education materials in a consultation, or be implemented at a local, national or even international level, for example by providing education for the general public via media campaigns. In terms of context, the recommendations presented are flexible. For example, a strategy could

offer information to aid peer comparison by comparing prescribing rates within a surgery, within a local area or within a country. This flexibility of recommendations, enabling them to be implemented in different ways, is very useful for those planning interventions, and means that interventions can again be tailored to their context depending on the resources available. The implementation of interventions may differ between, and perhaps within, countries because of access to such resources.

The implementation of interventions should also consider the existing alternative strategies present in a country or region and how a new approach may fit with these. One clear example where problems may occur is in the consistency of messages given in strategies designed for a similar purpose and was one of the points raised by GPs in interviews. Any new intervention should clarify how it relates to existing or past strategies and explain any differences which could cause potential confusion. The potential for clashes in strategies could be viewed as being more likely in those countries where different intervention types are more common and where multiple strategies are present at any one time, but may also be viewed as being more likely in countries where evidence based strategies have been lacking and messages based on alternative sources (such as information from drug companies) are prevalent instead. Overall, the context of the strategy remains vitally important to ensure that the messages received by the target audience are as intended.

4.4.4. Study strengths and limitations

While the study managed successfully to interview a large number of participants, covering each of the five countries, it is not possible to say whether the interviews carried out reflected the views of the population of GPs for that country. Participants may have volunteered to take part in the study because of their strong views on the subject of antibiotic

prescribing, either positive or negative, and therefore may represent a biased sample. The sampling of high prescribers was an initial aim of the research which could not be achieved in all of the study countries and therefore again the sample may not have represented those GPs with prescribing behaviours which were most dissimilar from recommendations.

Although interviews were designed in order to allow GPs to speak freely, socially desirable responses were always likely. Interviewers used in the study presented themselves as independent researchers, who were not a qualified GP or expert in this area, so that participants did not feel they were being tested or judged in any way. Interview data showed that many participants were confident in presenting negative views on the topic of prescribing or on recommendations, indicating that they were comfortably speaking freely.

The interview guide used in the study asked GPs about four strategy types in addition to their own experience. There were usually positive reactions to these examples, which may suggest that participants felt that any strategy may be helpful and therefore, if alternative strategies had been presented, these may also have been favoured. It was reassuring that when discussing the examples provided, the majority of GPs were aware of what the strategy involved and could explain specific reasons for rating it highly. In addition, there were a minority of participants who were happy to point out negative aspects of one example, financial incentives, indicating that strategies introduced by the interviewer were not always valued.

Lastly, due to the number of languages used across interviews in this study, there were a number of transcripts that could not be read or analysed by the main analyst immediately and there was a substantial delay in receiving transcripts in some cases. Due to this delay and the number of languages involved it was not possible to amend the

interview guide a great deal during the study. In addition, it was difficult for the research team to give feedback to interviewers about their interview style or questioning. In this instance, interviewers were experienced and had undertaken training prior to starting the study and therefore major changes to the interviewing style were not necessary. These aspects are important points to consider when carrying out qualitative work involving multiple languages.

4.4.5. Conclusion

This study demonstrates that the views and preferences held between GPs from five different European countries in relation to strategies aimed to promote prudent antibiotic use are very similar despite differences in experience with strategies and differences in the social and cultural context. This consistency in views suggests there is potential to develop a single strategy which could induce desired behaviour change in GPs from different European countries. The results offer additional information about how the design of such a strategy could be tailored to specific contexts where necessary. In the following chapter, a qualitative study carried out with “experts”, those who have designed and delivered strategies to promote prudent prescribing in primary care, is described. This expert study adds the views of an additional stakeholder group on the same topic and expands upon the views obtained from GPs within the current study.

CHAPTER 5: Exploring the views and experiences of experts who develop strategies to promote prudent antibiotic use across five countries.

5.1 Introduction

Chapter 4 explored the views of GPs on antibiotic prescribing for RTIs and strategies to promote prudent use of antibiotics. Exploring the views of another stakeholder group has the potential to generate more ideas about the feasibility and acceptability of strategies in primary care contexts across countries.

Chapter 1 indicated that there have been a limited number of studies which have explored the views of people, other than GPs, on the development and implementation of strategies aimed at changing GP behaviour. Two qualitative studies, concentrating on how guidelines could be better developed, have stated that following a more systematic development processes and offering guidance to minimise subjectivity may help to improve the quality of guideline content (Thomson et al., 1998; Calderon et al., 2006). Looking at the implementation of guidelines, Ploeg et al. (2007) stated that the implementation of recommendations could be improved by addressing barriers related to the clinician, considering the social and organisational context and tailoring guidance to different groups of professionals (e.g. separate advice being written for GPs and pharmacists).

This study concentrates on those professionals who design, develop and implement strategies to promote prudent antibiotic prescribing for RTIs and explores their views and experiences of encouraging GP behaviour change. The aim was to determine whether there were common features

of guidelines and interventions that experts working in different contexts considered useful based on their experience in encouraging change in health professionals' behaviour. In addition, it was also of interest to investigate whether there were important contextual differences in experts' views of the development of guidelines and interventions.

5.2 Method

5.2.1 Country selection

This study ran alongside the study carried out in chapter 4 and therefore involved the same countries. Participants were sampled from Belgium, France, Poland, Spain and the UK.

5.2.2 Participants

As for the study in chapter 4, the Southampton and South West Hampshire Local Research Ethics Committee granted ethical approval for the current study for participants from the UK (Ref: 08/H0502/118). Ethical approval was not necessary for the other participating countries, but was approved by the participating institution in each country.

Participants were defined as those who had had previous experience of developing, disseminating and/or implementing recommendations to general practitioners on either the management of RTIs or the prudent use of antibiotics in primary care practice. Since this definition covered several types of professionals across the five countries it was decided by the research team to refer to the group as "experts". This indicated that participants had an appropriate level of knowledge and experience to be informing GPs and avoided dividing individuals by their profession or training.

Potential participants were identified by a study coordinator in each country who was familiar with the local health systems and was fluent in the required language(s). Experts were recruited through a mixture of purposeful and snowball sampling. The majority of experts in each country were identified through their involvement, either in the development or implementation of a national or regional primary care guideline on the management of respiratory tract infections. Other experts were identified through local and national health services in order to identify those who worked more directly in delivering education to GPs. Initial interviews led to experts suggesting other individuals who may be suitable for the study.

5.2.3 Materials and Procedure

All participants were recruited by an invitation from the study coordinator in each country and a participant information sheet (Appendix D). Participants were contacted either via post, email or phone and were given information about the study in the official language of their country, with Belgian participants being sent information in Dutch. Participants wishing to take part in the study completed a consent form prior to the interview taking place (Appendix E). Several potential participants had to be contacted in each country in order to conduct the required number of interviews; however, as for the GP study in chapter 4, it was not practical to keep a record of this. The majority of participants took part in the study on a voluntary basis; however, participants recruited in Belgium and France were offered reimbursement of a €20 voucher for their time to take part in interviews.

Six primary care researchers interviewed participants. Each interviewer completed all the interviews in one country except in

France where two interviewers carried out interviews. Telephone or face to face interviews were carried out and both methods were used across all countries except in the UK and Belgium where only telephone interviews took place. Recruitment continued until researchers were satisfied that no new themes were emerging from the data.

All participants took part in a semi-structured interview, carried out in the official language of each country, in which both the interviewer and participant were fluent (Belgium interviews were all carried out in Dutch). The interview schedule used for the study (Appendix F) mirrored that used for the GP study in the previous chapter. Where GPs had been asked their opinions on following recommendations, experts were asked their opinions on developing, disseminating and/or implementing strategies for GPs. Experts were also asked about their perceptions of GPs' views of strategies as well as patients' views.

Interviews were translated into English by translators in the country in which they took place except for French interviews which were translated in the UK. English translations were checked by the original interviewer(s) in each country.

5.2.4 Analysis

Data analysis followed the same procedure as for interviews with GPs in the previous study (see chapter 4 for details). Data were transcribed verbatim, translated into English where necessary and analysis used techniques from thematic and framework analysis, following an inductive approach (Braun & Clarke, 2006; Ritchie & Spencer, 1993).

5.3 Results

5.3.1 Participant demographics

In total, 51 experts participated in the study taking part in 50 interviews (one interview with 2 experts was carried out in France). Ten interviews were carried out in each country. Interview lengths ranged from 13 to 81 minutes, with a mean of 38 minutes. Participant demographics were similar across the five countries (Table 8).

Table 8: The demographics of fifty-one experts interviewed across five countries.

	Belgium (n=10)	**France (n=11)**	**Poland (n=10)**	**Spain (n=10)**	**UK (n=10)**
Age (yrs):					
Mean	46.9	51.9	48.7	44.7	51.4
Range	37-61	35-64	44-62	34-51	39-67
Gender:					
Male	6	9	8	6	3
Female	4	2	2	4	7
Training:					
Qualified GP	9	6	3	7	1
Not a GP	1	5	7	3	9

Experts had a broad range of occupations, medical and non-medical, including ear, nose and throat (ENT) surgeons, microbiologists, pharmacists, paediatricians, academics and managers of specialist health care units (e.g. infectious disease). Half of the experts interviewed (51%) reported that they were a qualified GP; of these some were currently working as a GP, some were retired and some were involved in other activities. The proportion of participants who were a

qualified GP varied across countries. More experts were also qualified GPs in Belgium, Spain and France than in the UK and Poland.

Experts varied in the experience they had of providing information to GPs, patients and the public (Table 9). Just over half of the experts interviewed (54%) had been involved in two or more types of strategy either aimed at reducing antibiotic prescribing or managing RTIs. The majority of experts had taken part in developing a national or local guideline on the management of RTIs in primary care (71%). Experts were also likely to have been involved in either educational meetings or outreach visits for GPs, either on reducing the prescription of antibiotics or promoting a new RTI guideline (61%). 20% of experts had been involved in a national campaign and 12% had been involved in other interventions comprising financial incentives and prescribing feedback. Differences in experts' experiences of strategies between the five countries were likely to have been influenced by the presence and variety of interventions in each country, as all countries had guidelines, as well as the way the participant sample was recruited.

As well as talking about their own personal experience of strategies, experts also referred to other interventions of which they were aware. These comments also led to POCTs (most commonly CRP tests) and computer reminders being discussed by experts as alternative types of intervention aimed at changing GP prescribing behaviour.

Table 9: The number of experts who report having had experience in developing or implementing five types of strategy across the five countries.

	Belgium	France	Poland	Spain	UK	Total
Guideline development	7	8	6	10	5	36 (71%)*
Educational meetings	7	6	9	3	6	31 (61%)
Public Campaigns	2	2	6	0	0	10 (20%)
Financial incentives	0	0	1	2	0	3 (6%0
Prescribing feedback	3	0	0	0	0	3 (6%)

**Groups are not exclusive as some experts report having had experience in more than one type of strategy.*

5.3.2 Qualitative Results

Qualitative analysis produced six themes emerging from the interview data, each with subthemes (Figure 15). Themes were purposively phrased as recommendations for future strategies. Table 10 shows how quotes from the expert transcripts led to the creation of initial themes which were then rephrased as recommendations for practice.

Table 10: An example of how expert quotes were used to form initial themes which were later rephrased as recommendations for practice.

Example quote	**Initial theme name**	**Recommendation (Final themes)**
"In the end we realised, in these work groups, that it was really about the pathologies that were only cared for in primary care… And therefore, in the end, practical experience was essential and came uniquely from the general practitioners." (France, expert 6).	Guideline development would benefit from involvement of GPs.	Guidelines should be developed appropriately to be relevant for GPs.
"It easily takes a few hours to read [the whole guideline]. I think that a card, a card with a summary, is indispensable." (Belgium, expert 7).	Guideline format can have a large impact on whether they are used by GPs.	Guideline content and delivery should be appropriate for easy use by GPs.
"The general attitude to all of these things is, well that's fine we already do that, but of course they don't, but that's what they say." (UK, expert 4).	GPs do not see the necessity for changing their practice.	Explain the need for guidelines and interventions.
"I know that generally these doctors have started to equip themselves with tests… I personally and precisely pointed out that it was worth investing in these tests." (Poland, expert 10).	Interventions can provide additional support to GPs in following guidelines.	Design interventions to help GPs follow recommendations in practice.

Table 10: Continued. An example of how expert quotes were used to form initial themes which were later rephrased as recommendations for practice.

Example quote	**Initial theme name**	**Recommendation (Final themes)**
"I think that they don't like having things imposed upon them so actually going out and meeting them face-to-face, talking about why we're doing it, has been a very positive thing." (UK, expert 5).	GPs will not engage with interventions unless they are of benefit to them.	Provide interventions which are appealing to GPs.
"It's ridiculous that in Spain antibiotics are still [illegally] prescribed in the pharmacy. That's why we have that pressure in the surgery, and it's an insulting pressure, patients tell us to prescribe them an antibiotic they have already taken. This is unacceptable and this is happening now." (Spain, expert 4).	Interventions should also target patients and other health professionals.	Provide education for patients and other health professionals.

Figure 15. The six themes representing experts' views and experiences of developing guidelines and interventions aimed to reduce antibiotic prescribing for RTIs.

A – Guidelines should be developed appropriately to be relevant for GPs

- Guideline process needs to produce high quality content
- Established process can help support group and development
- Involve appropriate and diverse range of expertise
- Involve GPs in guideline development

B – Guideline content and delivery should be appropriate for easy use by GPs

- Provide good access to guidelines
- Provide consistent, clear and concise message
- Evidence base should be clear and current
- Promote guidelines to raise awareness
- Development of recommendations should consider implementation

C – Explain the need for guidelines and interventions

- State clear motivations behind recommendations
- Interventions should specify how/when practice does not match guidelines
- Interventions should acknowledge the importance of clinical judgment

D – Design interventions to help GPs follow recommendations in daily practice

- Health authorities need to work to prioritise GP education
- Recommendations should be flexible to work on a local level
- Design interventions to fit with surgery

Figure 15. Continued. The six themes representing experts' views and experiences of developing guidelines and interventions aimed to reduce antibiotic prescribing for RTIs.

E – Provide interventions which are appealing to GPs

- Emphasise benefits for everyday practice
- Deliver face to face advice
- Provide opportunities to answer queries and compare practice
- Provide incentives to encourage participation

F – Provide education for patients and other health professionals

- Support GPs by educating other health professionals
- Educate patients to support GPs prescribing
- Encourage GPs to educate patients

Guidelines should be developed appropriately to be relevant for GPs

The majority of experts who had taken part in guideline development felt it was very worthwhile and that having an established process helped to produce content of high quality. Some experts felt that this should be emphasised to GPs to reaffirm that advice given to them was the result of a systematic process and from an independent source.

> I think it's important that [company name] does not receive any funding, then I think because of that credibility, the guideline is always linked to being independent, we don't have any sponsor, we make it clear [to GPs that] the pharmaceutical sector is not the one leading the content. (Spain, expert 2).

Experts from Poland reported that established processes were not in place for the development of guidelines and some reported that guidelines were still influenced by drug companies (e.g. guidelines containing adverts for specific drugs).

Experts from all countries felt that involving appropriate expertise in guideline development was crucial and that it was important to involve GPs in the process. This was unsurprising since many of the experts were GPs themselves but was also something valued by those experts who were not GPs, including experts from the UK who were more likely to be from a secondary care setting. Experts from France specifically emphasised that GPs were able to add their practical knowledge from primary care to guidelines, which would be likely to improve their implementation.

> The recommendation is an answer to clinical questions about which [GPs] have doubts, it's not an answer to clinical questions about which specialists have doubts. So they are really written for general practitioners, and that's what we want to know when we're in practice. (Belgium, expert 7).

> In reality, in the end, we realised in these work groups that it was really about the pathologies that were only cared for in primary care and that ENT did not treat throat infections, etc. as the first line treatment. And therefore, in the end, practical experience was essential and came uniquely from the general practitioners. (France, expert 6).

Guideline content and delivery should be appropriate for easy use by GPs

Experts from all countries stressed the importance of delivering advice to GPs in a way that was quick and easy for them to comprehend. Experts felt it was important that GPs knew where to access information and that this was as simple as possible for them with many suggesting an increased use of technology and the internet to achieve this.

> At the moment the resources are very paper-based, I think that we need to work on a web-based resource or in any case, something which is on the computer or some kind of software which would allow practitioners to look for things very quickly…because I think that practitioners use the internet and IT more and more. (France, expert 1).

Experts were also conscious of the form of advice, mentioning that content should be clear and concise and that GPs should not be overloaded with several types of advice on the same topic.

> For many guidelines that they make there are many problems, there are guidelines and guidelines, there is chaos. For example, in COPD everything is very clear now that we have a goal, but there are other pathologies, where there are stacks of guidelines that are similar, and that creates chaos. We have asthma where we have a recommendation and then we have a guideline and they are not in agreement. (Spain, expert 5).

> It easily takes a few hours to read [the whole guideline]. I think that a card, a card with a summary, is indispensable. It's an indispensable tool to make a quick check possible, to have some "decision tools", that's indispensable. (Belgium, expert 7).

Several experts also felt that GPs needed continuous messages to remind them of recommendations.

> Doctors cannot change the way they think in two or three days, it is necessary to give information to them continuously so that they are calm about prescribing antibiotics in that pathology, then they don't prescribe any antibiotics and they really believe in what they are doing, until then, they won't apply it. (Spain, expert 1).

Experts from all countries stated that evidence was crucial in convincing GPs to follow recommendations. In this respect experts reported that it was important to ensure that recommendations kept up to date with new evidence.

> We ask questions, then we consult the literature and then we respond, we try, we try as far as possible to formulate the guidelines with strong evidence. (France, expert 7).

> I think that's the point where the guidelines become quite valuable, because [GPs] want to do something that's evidence based. (UK, expert 6).

Experts also felt that guidelines should be promoted to GPs to make them aware of what was available and that there should be a greater focus on supporting the implementation of recommendations. Polish GPs, although in agreement, felt implementation would be difficult due to the lack of independent funding available.

> I don't think this guideline is going to be followed, I don't think many people use it because to be honest what I think is that we do know how to write guidelines but we don't know how to disseminate them. And if you don't disseminate a guideline, the guideline is absolutely useless. And I think guidelines don't reach anyone because they aren't promoted. (Spain, expert 4).

Explain the need for guidelines and interventions

Experts from all countries had some reservations about how well guidelines were accepted by GPs. Several felt that GPs were worried about cost motivations and that GPs suspected that recommendations had only been designed to save money. Many experts wanted to correct this view and emphasise the clinical benefits of advice.

> It's not economic, it's about public health, and it's about telling practitioners that the main message is abstention. We do not treat. And then actually, as a consequence, when antibiotics are justified, it's about trying to choose the cheapest. That's why we provide notes on costs. (France, expert 3).

Other experts felt that GPs responded to advice negatively because of a general lack of trust either in the government or health authority and when feeling that they were being monitored in their practice.

> I think that there are practitioners who we have had trouble convincing, informing, because they are a little bit negative towards us, and broadcast this. So it's true that there are doctors we will have difficulty reaching, if, from the start, there is a slightly negative or dismissive attitude, well, we will have difficulty in helping this type of practitioner. (France, expert 1).

Positively, some experts did feel that advice on antibiotic prescribing was valued by GPs since the issue of antibiotic resistance was accepted in general by the medical community.

> I think that in the politics of antibiotics everyone is in agreement. (Spain, expert 9).

In contrast to this, however, experts commented that GPs may be less likely to read guidelines on antibiotic prescribing for RTIs because they felt they already knew how to act and because it involved conditions which were very common in primary care.

> The general attitude to all of these things is, "well that's fine we already do that" but of course they don't. (UK, expert 4).

> I think the GPs who end up going to the talks, the conferences, are the ones who are completely interested and they are the same people who are already looking for guidance, information, etc. The problem is people who ignore professional guidelines, they prefer to use their own experience and that's it. They are not very open to new evidence or changes [in recommendations]. (Spain, expert 8).

In response to this type of belief, experts felt it was important, not only for advice to state what was recommended, but also to have interventions which would highlight where this was, and was not, being followed by individual GPs or GPs within the same surgery.

Experts recognised that GPs could not follow guidelines in all situations and valued a GP's clinical judgment when making a decision based on an individual patient.

> I think a guideline is a guideline and you have to use your judgment. (UK, expert 3).

Despite this, however, experts felt that GPs worried unnecessarily about negative consequences for patients who were not given an antibiotic and often chose to prescribe an antibiotic when it wasn't clinically needed to end a consultation quickly or to avoid a second consultation for the same illness.

> If [the GP] has all the data showing him that it would be all right not to apply [an antibiotic], he lacks the feeling of security, so we need to enhance his feeling of security. He does not feel safe because of many reasons; he receives no consequences if he prescribes an antibiotic without any reason. However, he is going to have terrible consequences if he does not prescribe it and an ill patient dies within a few hours because of sepsis. This is the first risk. (Poland, expert 4).

> I don't know how it is in small health centres. I have heard that a patient has to come to a family doctor there and in order not to come again he is prescribed [an antibiotic] in order [for the patient] not to come for a second time. (Poland, expert 2).

Design interventions to help GPs follow recommendations in daily practice

A majority of experts interviewed across all countries had taken part in some sort of intervention to try to help GPs to follow guidelines, most often educational meetings. Despite current efforts to educate GPs in this way, many experts felt that health authorities in their country could do more to help GPs change their practice; this was particularly relevant for experts from Poland who indicated that their GPs currently had less education compared to others. Most often, experts suggested that more resources needed to be put towards education on prescribing.

> Improving this continuing education? I must tell you, the problem, is always financial… We are sponsored by the pharmaceutical industry, but less and less. That is to say that ten years ago, we had lots of money, we had lots more money than today. Today, we have a lot less of it. (France, expert 7).

> It became a little more difficult, because, unfortunately, the [Ministry of Health] did nothing to support this initiative [providing educational meetings for GPs]. Unfortunately, neither the previous nor the present Ministry of Health did and does nothing to support this project. (Poland, expert 10).

As a specific form of support, experts from France and Poland felt that their health authorities should reimburse POCTs (e.g. CRP test, rapid strep test) to help GPs in their diagnosis of RTIs. This practice was

currently active in France and had been in place for a few years. In Poland POCTs were not common and were not reimbursed by the government although some practices received tests through their participation in research projects.

> I know that generally these doctors have started to equip themselves with [point of care] tests, because they considered them as a very good argument for parents [of young children] and they could support their decisions when they had any doubts about whether to apply an antibiotic or not. In a way it was a success, I personally and precisely pointed out that it was worth investing in these tests. The reduction in the amount of reimbursed costs of prescribed antibiotics is much higher than the number of tests used by doctors. (Poland, expert 10).

As well as increasing resources to invest in education, experts also commented on how interventions should be approached. One of the most important points raised, by experts from Spain and the UK, was the flexibility of an intervention in order to fit well with different local areas.

> Another thing about the incentive scheme is that there's a target to aim for but they don't have to achieve the target to get it, if they achieve a 10% movement on where they were then they receive the incentive, because if you didn't have something like that your outliers, your really bad ones, would have such a mountain to climb, that they would avoid that and they're the people we really want to join in. (UK, expert 10).

Experts from France and Belgium also commented that advice should be given within the local context so it was more practical for GPs to follow.

> Sometime you find differences between primary care… and hospital practice, then later on guidelines [written for hospitals] have to be adjusted for use at a local [primary care] level in order to be put into practice. (France, expert 7).

As well as needing to fit within different locations, experts also stressed that interventions should be adaptable to the surgery or specifically the consultation. The most commonly cited examples of this were offering patient education materials which could be handed out easily in a consultation, giving a summary sheet of advice that could be referred to quickly in a consultation or building existing guidelines into a GP computer programme to act either as a quick reference source or a reminder of prescribing guidelines when making a treatment decision.

> Now that records are computerised, I mean incorporating these aide-mémoires, what we call "reminders" in English, into our software… the introduction of reminders, the aide-mémoire in the medical software, in the medical records, is a resource that has proved its effectiveness at modifying behaviour and improving practice. (France, expert 6).

Provide interventions which are appealing to GPs

Experts felt that it was important to make education and training on antibiotics appealing for a GP. Some felt that doctors did not realise the benefits they could gain from using guidelines or attending training and that these should be emphasised.

> These [educational] groups are mandatory for GPs and so they have to go there to keep their ratings or credits. So they come, just sitting there until it is through, and you hope you can transfer something, but you can easily see the passivity... people who arrive

> a whole lot too late and are just present, they won't get involved in the matter at hand. (Belgium, expert 9).

Experts felt that once this was achieved and GPs could see the relevance to their own practice voluntary participation in training would improve.

Experts from Poland and Spain felt that GPs who currently used guidelines and advice did so because it made them more comfortable in their prescribing or more confident about their decisions and felt that this was one benefit which could help convince those GPs who did not pay attention to advice.

> I think it's also important if you tell professionals that if the look is purulent mucus and it involves bacterial infection and they have this information, I think they also feel more comfortable with what they prescribe in this case, well I think guidelines have a counselling, practical objective and an educational one too. (Spain, expert 2).

Several experts, from all countries, felt that training for GPs was more attractive to them when it involved an interactive component where they could discuss their own practice and ask any questions about recommendations. Educational meetings were often discussed in relation to this and many of the experts had led one of these themselves.

> [Interactive educational meetings], I think it's a good method, if only because the doctors are talking about it and are busy with it and are thinking about it together…rather than them just sitting in a room somewhere and listening to the explanation ex cathedra. I think it's better if they are busy with it themselves. (Belgium, expert 8).

> The really good technique to use, because a lot of GPs say “I don’t use nitroflurantoin” for instance, because of side effects, you say, “well look who uses nitroflurantoin in the room?” and there will be people who use it. So you say “well what about the side effects” because some people say they wouldn’t give it to their dog, and they say “well no I don’t have any problems”, and I say “OK could you just say that a bit louder” so the people who don’t use it do hear it you know. So they are very influenced by peers, so you use peer knowledge rather than your own to change them. (UK, expert 2).

In addition to discussion with their peers, experts also felt that GPs liked to compare themselves with their peers and specifically how well their prescribing rate fared in comparison to the average GP. Experts from France, Belgium and the UK specifically talked about giving individual GPs a report of their prescribing feedback and comparing it to the average for their area. Experts from Poland and Spain also felt that this would be attractive to GPs; however, it was not something that was commonly done in their countries.

> The other thing we do is pull out prescribing data, as a comparative thing across the county. So we have been providing GPs a sort of, you know, comparison, “Here’s where you are in comparison with your colleagues in the county”, you know, “You’re the top quinolone prescriber” or “You have more antibiotics than anyone else.” (UK, expert 5).

> [Prescribing feedback] it’s certainly a useful measure. To be able to position myself in relation to other GPs, to find out what products I prescribe too much of. I think that’s an eye-opener. (Belgium, expert 7).

> I mean the professional needs to have his results in order to compare himself to the community where he works. And this is another thing that is not being done, sometimes it's done but in general it isn't (Spain, expert 4).

Only experts from Spain and the UK talked about giving incentives to GPs or surgeries in the form of money. They felt that financial incentives could have a large impact on how some GPs practiced and sometimes stated that this was the most effective way to change GPs prescribing. Some experts did recognise that such a scheme was not always fair to GPs and that variations in clinical populations were not always taken into account making it harder for some practices to achieve set targets.

> The real world isn't like that, there are people who are more motivated than others [to change]. Then if you give economic incentives there are people that are going to work with a person with hypertension or diabetes better than if you don't, it shouldn't be like that but it works. (Spain, expert 5).

Provide education for patients and other health professionals

Nearly all experts commented on patient demand for antibiotics and the pressure it put on GPs to prescribe antibiotics, although most stated that demand was often very variable. All felt that patient education was very important and helped patients to have realistic expectations about treatments for common infections. Several experts, especially those from France, were particularly keen to talk about the national campaigns present in their countries and how they felt these had improved the knowledge of the general public as a whole and generally reduced demand over recent years.

> I think there is still quite a lot of unnecessary prescribing of antibiotics in those areas [RTIs] and I think part of that comes from patient pressure to have antibiotics. (UK, expert 7).

> The [national] campaign was very well received because "antibiotics, they're not automatic" was brought into peoples' morals, it's truly a phrase that had an impact on people's minds, which made it possible to develop people's knowledge in France for the first time. (France, expert 1).

Along with educating the public in general, experts from France and the UK felt that patient education materials were also very useful for a GP to have access to in consultations to support their decisions.

> It's quite nice for patients to leave the surgery with a piece of paper in their hand and rather than it being a prescription it's quite nice to be able to give them a leaflet about antibiotics… I find it quite interesting in the psychology of the consultation, you know, the doctor often uses writing a prescription as a way of ending the consultation, as it's often difficult to end it, so therefore being able to give something out other than a prescription is quite a good way of getting round that. (UK, expert 8).

In addition, along with experts from Spain, the amount of trust a patient had in the GP was also thought to be crucial in helping patients to feel more satisfied when a decision did not result in a prescription. Experts stressed that a patient having a good, lasting relationship with the same GP, helped both the GP to explain his or her decision and a patient to feel confident in that decision.

> Family doctors play with that advantage of having direct contact with the patient daily. That makes us win a lot of confidence with them. (Spain, expert 3).

Experts from Poland and Belgium commented less on patient education materials but some felt that GPs should spend more time explaining decisions to patients.

As well as educating patients, other health professionals were also identified as a group who could help to lower prescribing with appropriate education. A few experts from all five countries felt that there was a conflict between the practice of GPs and other health professionals which made it harder for GPs to follow guidelines. This was particularly when GPs received a recommendation from a specialist who did not have to follow the same guidelines as for primary care. Some experts felt that, whilst this was very difficult for a GP, it was also confusing for patients who were often given different recommendations from different doctors.

> I believe that what the patients are thankful for is that we all do the same, to have the impression that a certain pathology has this diagnosis, has this treatment… Because how is it possible that I was given one antibiotic here and another one here? Even one week after another, a patient has a bronchitis this week goes to a doctor and is given an antibiotic and then in the following fifteen days he has another acute bronchitis and comes to me and I don’t give him an antibiotic, it’s difficult. (Spain, expert 1).

> I think there is a trap, when a GP sends someone to a specialist and he prescribes expensive medication, it's not him, he sends a letter to the GP and [the GP] has to prescribe the medication, so that category isn't really in relation to the normal prescription behaviour. It's because of the prescriptions ordered by the specialist. So it is logical that there might be some frustration. (Belgium, expert 4).

> Another thing that affects [the prescribing rate] is that high numbers of antibiotics can be prescribed by the hospital or the GPs are asked to prescribe it by the hospital consultants. (UK, expert 10).

In addition to this, experts from Poland and Spain mentioned that often patients could receive antibiotics from a pharmacist before they had been consulted by a GP, despite this being illegal.

> It's ridiculous that in Spain antibiotics are still [illegally] prescribed in the pharmacy. That's why we have that pressure in the surgery, and it's an insulting pressure, patients tell us to prescribe them an antibiotic they have already taken. This is unacceptable and this is happening now. And guidelines are good and everything is good but some things are just unacceptable. (Spain, expert 4).

5.4 Discussion

5.4.1 Main findings

This was the first qualitative study to explore the attitudes of experts, from different countries, on strategies to promote prudent antibiotic use and to translate these attitudes into recommendations for future guidelines and interventions. The most interesting finding was that despite differences in context and widely varying cultures of antibiotic use, experts from five countries held broadly similar views on how to improve the quality of guidelines and interventions to help implement guidelines. Experts were judged as having similar views when the majority of experts from each country reported the same views as the majority of experts in the other countries.

There were clear indications of which elements interventions should include to maximise chances of successful implementation and subsequently influence clinical practice. Experts recognised the importance of producing high quality, transparent, evidence-based guidelines and felt these were more successful when GPs had input into the content. Guidelines were viewed as being more successful when they were written whilst considering how recommendations were going to be implemented which experts felt made recommendations more feasible for GPs to carry out in practice. Experts stated that GPs needed to be aware of the need for strategies and that this should be emphasised rather than making the assumption that GPs were aware of the need. Additional resources were highlighted as something which was needed to support recommendations and examples of these were particular interventions (e.g. POCTS, financial incentives). Experts discussed interventions in terms of what was appealing for GPs themselves and felt that delivering of interventions should highlight the benefit for GPs. Lastly, experts identified other groups which needed education, alongside GPs, to help support behaviour change in all relevant individuals.

Despite this similarity in views, two differences in attitudes arose both as a result of context as well as experts' experience. Firstly, experts reported that GPs experienced different barriers to following guidelines when, in some countries, patients could access antibiotics without a prescription. Secondly, the use of POCTs was only suggested by experts with experience of using these. These experts were mainly from France, where POCTs are widely used; however, some experts were also from Poland, where a limited number of practices (linked with research centres) had access to such tests. It is not clear whether the same attitudes towards POCTs would be found in other countries. These differences clearly highlight the difficulties when implementing strategies in different contexts and suggest that content and delivery

may need to be tailored in certain areas in order to be applicable to the relevant context(s) involved.

As for chapter 4, when identifying differences between experts' views between countries there was a clear divide between countries for the two points mentioned above. Differences were highlighted when the majority of experts in one country reported something which experts in other countries did not report at all. One example here was the preference for types of intervention of which the experts had had previous experience. For instance, experts in the UK were unlikely to mention POCTs as a potential intervention to provide to GPs if they had little knowledge or awareness of that type of intervention.

5.4.2 Comparison to previous research

Due to the limited existing research in this area comparisons to existing studies were few. The findings of the current study suggested that interventions which were flexible, allowing a better fit with general practice, were likely to help GPs follow recommendations more easily. In certain situations experts also recommended tailoring to specific contexts to aid implementation. These points are consistent with previous research suggesting that tailoring of strategies to different contexts can increase guideline adherence (Forsner, Hansson, Brommels, Wistedt & Forsell, 2010; Ploeg et al., 2007). Some experts, when talking about additional resources which should be provided for GPs, mentioned POCTs. Most often experts referred to CRP blood test which they had had experience of. This suggestion is supported by research indicating the effectiveness of POCTs in changing GP prescribing behaviour (Cals et al., 2010b). Experts also emphasised the need to educate patients and other health professionals, to promote consistent practice and support changing behaviours. This was consistent with previous work which suggested interventions should be aimed at multiple groups and supported the idea of campaigns such as

the European Antibiotic Awareness Day, which target multiple audiences (Ploeg et al., 2007; Earnshaw et al., 2009). Lastly, experts recommended the development of independent guidelines, apart from pharmaceutical industries or any other body with conflicting interests and the involvement of GPs in creating such guidelines. This was in line with previous research exploring GPs' views of primary care guidelines in general (Carlsen & Norheim, 2008).

5.4.3 Comparison of expert and GP interviews

Expert interviews were carried out alongside interviews with GPs described in chapter 4. The majority of themes between participant groups were similar, with both experts and GPs recommending that interventions should offer efficient delivery of evidence based advice, support for GPs to help them follow recommendations in practice and education for patients and other health professionals. Experts also suggested that the need to follow recommendations should be highlighted to GPs which linked with GPs comments about wanting information on how well their current practice matched guidelines. GPs also stated what they liked most about interventions and, in line with this, experts stressed that interventions should be made appealing to GPs with many of their examples matching the GPs suggestions. Lastly, experts felt that the development of guidelines should be more efficient.

The similarity between the two participant groups was unsurprising because of the number of experts who were a qualified GP themselves, some of whom were still practicing. In these cases, experts often reported what they would want from an intervention in their own surgery and had an excellent understanding of primary care practice. Despite this knowledge, comments made by all the experts were very similar indicating that, on the whole, the group had a good understanding of their target audience whether or not they had worked in the same environment themselves. The only theme which was not

common between groups concerned the development of guidelines mentioned by experts. This was a task which only concerned the expert group and of which GPs were likely to have little knowledge.

Despite the overall similarity between the groups, some differences did occur. These were mainly in the specific details each group decided to focus on within the main themes. Experts, although mentioning similar themes to GPs, were less likely to go into specific details about general practice. An example of this was when participants talked about patient education. GPs felt this was a major issue which affected their prescribing and spoke about several aspects in detail, with experts purely mentioning that patient education may be an additional support for a GP to change their prescribing behaviour. Alternatively, expert interviews gave greater insight into aspects which influenced the implementation of interventions. An example here was given when experts discussed designing interventions both to help GPs follow recommendations in their daily practice and to fit into existing settings. Differences between GPs' and experts' comments gave good examples about what each group felt was most important in relation to their own position in providing health care, and it was encouraging to see that despite differences in focus, both groups presented similar solutions to a shared problem.

5.4.4 Study strengths and limitations

This study replicated that described in the previous chapter and holds the same strengths and limitations. It should be noted here that the data collected are based purely on participants' own observations and opinions. On some occasions where experts were asked about GPs' behaviour, this conflicted with what GPs reported themselves and therefore results need to be appreciated according to both the context in which comments were said as well as the position of the person speaking. Experts did not necessarily hold true representations of GPs'

practice in their country and again GPs may not always have held a true representation of their, or their colleagues, actual practice.

5.4.5 Conclusion

This study demonstrates that experts who have designed, developed and/or implemented strategies to promote a more prudent use of antibiotics for RTIs, have similar views and preferences despite their different experiences with interventions and the different countries in which they work. The consistency between views supports findings reported in the previous chapter, suggesting that there is potential to develop an intervention which could induce desired behaviour change in GPs from different European countries and offers information about how the design and implementation of interventions could be tailored to specific contexts.

CHAPTER 6: Exploring GPs' views of antibiotic prescribing and interventions to promote prudent use: a meta-synthesis of qualitative research.

6.1 Introduction

Much research to date has focused on assessing the effectiveness of single interventions in reducing inappropriate prescribing (Butler et al., 2009; Little et al., 2005; Welschen et al., 2004). Systematic reviews to date have only been used to aggregate this quantitative research to establish which types of intervention, or components of interventions, are most effective at changing health professionals' prescribing behaviour (Arnold & Straus, 2005). To complement these reviews, a systematic review of qualitative studies looking at GPs' perceptions would help to understand why certain interventions are, or are not, effective by identifying the barriers to reducing unnecessary prescribing experienced by GPs.

To date, there has been no attempt to systematically review the qualitative literature which has examined GPs' perceptions of antibiotic prescribing or interventions to promote prudent use. This study aimed to carry out a meta-synthesis of qualitative research examining GPs' attitudes and experiences of antibiotic prescribing and interventions aimed at more prudent prescribing for RTIs in primary care. The results were expected to expand upon the current understanding of how GPs perceive antibiotic prescribing and interventions that promote prudent prescribing, and to offer a more comprehensive review of the characteristics of interventions that make them acceptable, plausible and attractive to GPs.

6.2 Method

6.2.1. Search strategy and eligibility criteria

Studies for review were identified by searching five databases, Medline, EMBASE, Web of Science, PsychInfo and CINAHL, from 1950 to May 2011. Search strategies were developed for each database in collaboration with a librarian. A sample search strategy for EMBASE is shown in Appendix G. Studies were eligible for inclusion if they investigated GPs' views and experiences of antibiotic prescribing and/or GP's views and experiences of interventions that aimed to promote prudent antibiotic use for RTIs, if they used qualitative methods and analysis and if they were published in English. Titles and abstracts were assessed on the search criteria followed by the full text of relevant articles. Reference lists of all potentially relevant articles were examined and at least one author of all articles that were included was contacted to identify any studies which may have been missed.

6.2.2. Quality appraisal

There is debate amongst researchers about whether the use of checklists to appraise the quality of qualitative research can provide an accurate assessment of a study's rigour (Barbour, 2001). Although such checklists may have limitations I felt it was beneficial to assess the quality of studies in some format to ensure that studies at least appeared to have considered validity and reliability in both their methods and analysis. The quality of papers selected for inclusion was assessed based on the Critical Appraisal Skills Programme (CASP) quality assessment tool for qualitative studies (CASP, 1988). This tool has previously been used in several meta-ethnographic reviews and provides a straightforward checklist by which to assess studies quickly and easily. The CASP tool consists of ten questions however two initial screening questions were added to this scoring system, "Is this relevant

to the review question?" and "Are both qualitative methods and analysis used?" in order to ensure that studies met the criteria for the review. The CASP criteria and additional questions are shown in Table 11.

6.2.3. Analysis

The analysis followed the meta-ethnographic approach developed by Noblit and Hare (Noblit & Hare, 1988). Meta-ethnography is one of several approaches which can be used to carry out a qualitative synthesis of research studies. This particular approach was chosen as it offered a method which was interpretative rather than aggregative; in this way, the synthesis had the potential to provide some unique interpretation and explanation of the data set as a whole as opposed to reporting a pure summation of studies' results.

Meta-ethnography involves two elements- identifying metaphors and forming translations. Papers were read and re-read to establish the "key metaphors, phrases, ideas and/or concepts" emerging from each (Noblit & Hare, 1998, p.28). These metaphors included both the original quotes from GPs in each paper as well as the interpretation of these quotes by that paper's authors. After identifying these metaphors I could begin to assess how papers were related to each other and whether there were similarities, differences or contradictions between findings.

The analysis followed a reciprocal translation process whereby "each study is translated into the terms (metaphors) of the others and vice versa" (Noblit & Hare, 1998, p.38). Papers were compared one at a time, firstly comparing metaphors between papers 1 and 2, then assessing how metaphors of paper 3 compared to those from the previous two, and so forth. Through this comparison I could identify "translations" which were shared between all or some of the papers (Noblit & Hare, 1988). Each translation represented common metaphors which papers

shared and was therefore a summary of the various author interpretations from each paper.

Table 11: Modified CASP criteria used to assess quality of selected studies.

A. Screening Questions
1. Was there a clear statement of the aims of the research?
*Is this relevant to the review question?
2. Is a qualitative methodology appropriate?
* Are both qualitative methods and analysis used?
Continue? YES/NO
B. Detailed questions
3. Was the research design appropriate to address the aims of the research?
4. Was the recruitment strategy appropriate to the aims of the research?
5. Were the data collected in a way that addressed the research issue?
6. Has the relationship between researcher and participants been adequately considered?
7. Have ethical issues been taken into consideration?
8. Was the data analysis sufficiently rigorous?
9. Is there a clear statement of findings?
10. How valuable is the research?

**Indicates questions which were added to the CASP criteria.*

Once this translation had been completed, I followed a "line of argument synthesis" to add a "second-level inference" about the relationship between studies and begin to draw out characteristics of the whole set which could not have been identified in the individual studies alone. At

this stage the translations were compared for similarities and differences in order to identify themes which encompassed similar translations. I then organised these themes into an explanatory model to suggest how GPs perceive antibiotic prescribing and interventions aimed at more prudent prescribing. This is summarised in Figure 15. I gained support for the synthesis by checking translations and interpretations taken from the studies with the original authors of papers and incorporating their ideas where possible.

6.3 Results

6.3.1. Article selection

243 papers were identified through database searches and contact with relevant authors. Papers were excluded because they did not contain qualitative methods and analysis, did not focus on GPs' views of antibiotic prescribing (strategies) as a main topic, were not set in primary care or did not focus on RTIs (Figure 16). All studies were able to meet the quality criteria satisfactorily and no papers were excluded based on this assessment. Twelve papers were included in the final synthesis, details of which are shown in Table 12.

6.3.2. Meta-ethnography

6.3.2.1 Translation of papers

Following the process previously described, 32 translations were identified across the 12 papers. Translations were named by paraphrasing terms used by the original authors. Table 11 presents definitions of each translation and an index of which translations were present in which of the 12 papers. I then created 13 themes that encompassed all translations (Table 13). Themes grouped together similar translations under the same heading. Some themes only

represented one translation if it appeared to be distinct from all others. The themes are described and illustrated in more detail below and are summarised in Figure 17.

Perceptions of antibiotic prescribing decisions

Seven of the thirteen themes related to how GPs perceive antibiotic prescribing. These themes represented factors that may influence GPs prescribing decisions.

1. Perceptions of RTI management

GPs view RTI management decisions as complex. The lack of obvious treatment strategies may result in varied prescribing behaviour across GPs and subsequently send mixed messages to patients. There can be variation in whether or not GPs believe that antibiotics are helpful for RTIs and subsequently how often they may prescribe.

> Almost all clinicians acknowledged that antibiotics were prescribed too often for upper RTIs [and that] antibiotics modify the course of infections only slightly… However, most felt that this evidence was not “watertight” and that antibiotics may help some patients. Butler et al. (1998b).

Prescribing decisions may also be affected by the importance GPs place on antibiotic resistance and whether they are convinced that their own prescribing contributes to resistance rates.

Figure 16. Flow diagram showing identification of papers from database searches.

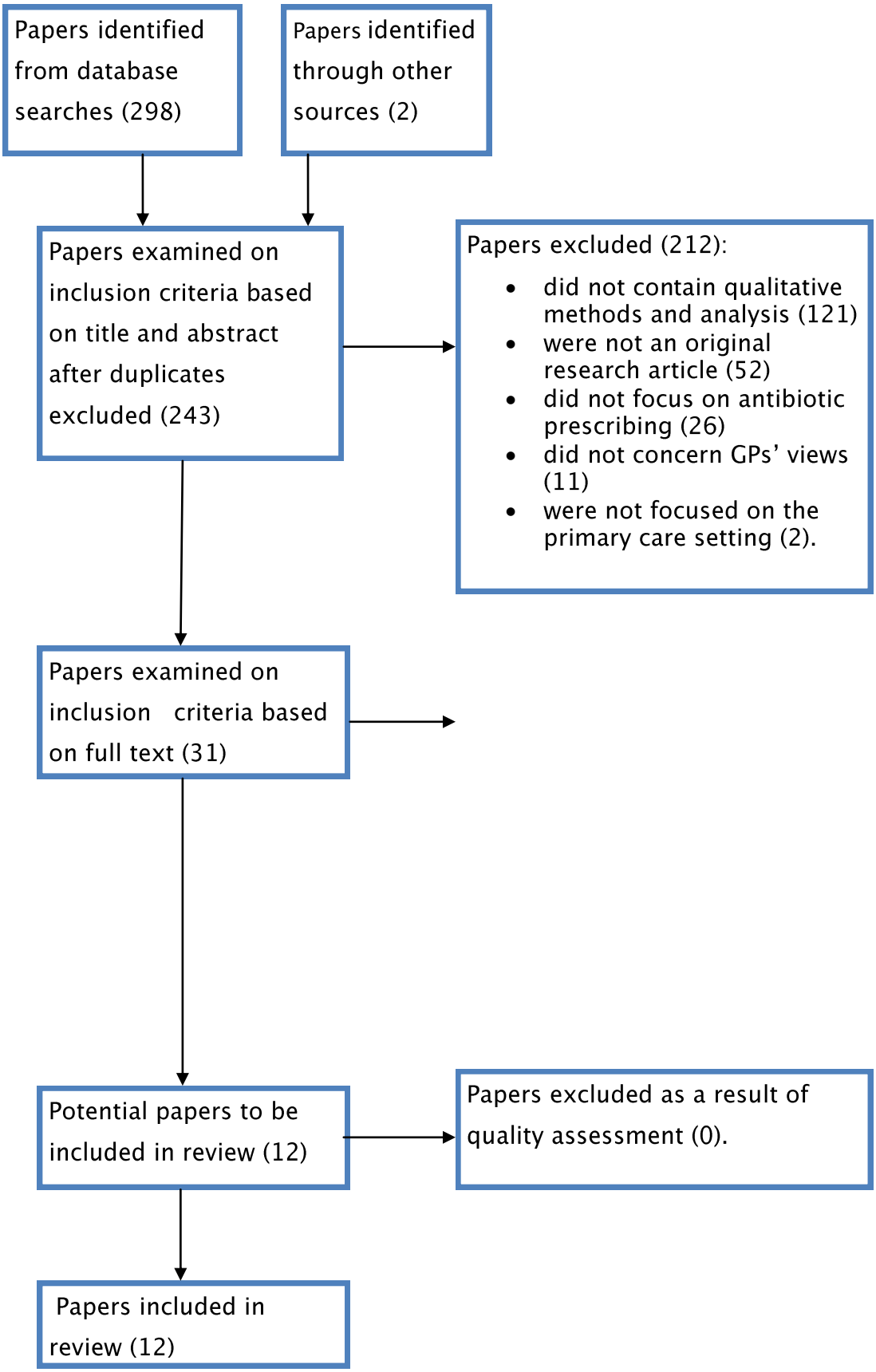


Figure 16. A model showing the potential relationships between the thirteen themes identified.

*Dotted arrows reflect inferences about relationships made by the current author.

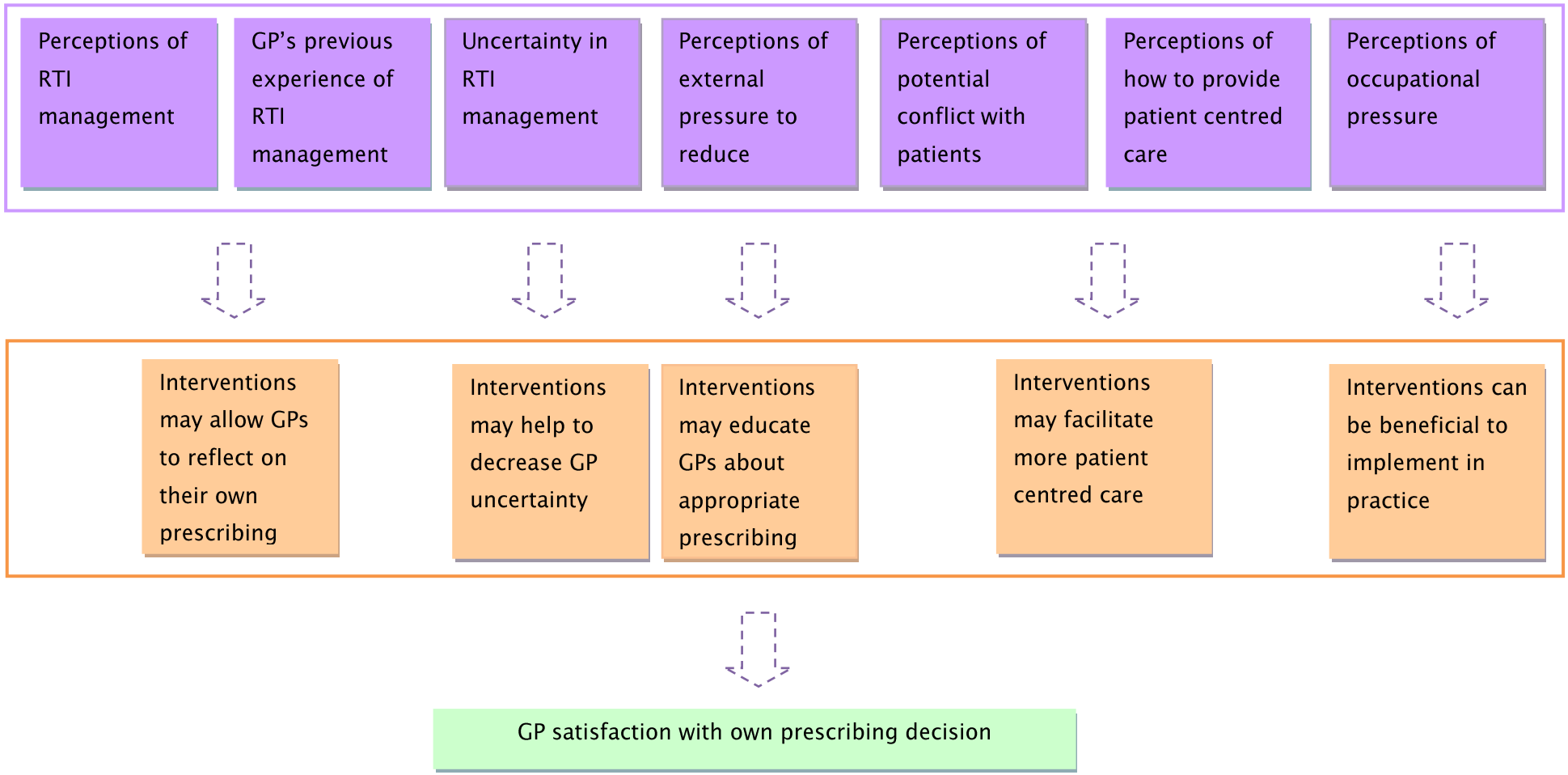


Table 12: Study characteristics of 12 papers to be included in synthesis.

	Paper	Setting	Number of HCPs *	Method of data collection	Method of analysis	Aim
1	Butler, Rollnick, Pill, Maggs-Rapport and Stott (1998b)	South Wales, UK	21	Semi-structured interviews in person.	Grounded theory.	To better understand reasons for antibiotics being prescribed for sore throats.
2	Bjornsdottir and Hansen (2002)	Iceland	10	Semi-structured interviews in person.	Grounded theory.	To explore physicians' perceived reasons for deciding to prescribe antibiotics.
3	Kumar, Little and Britten (2003)	UK	25	Face to face, open ended interviews.	Grounded theory.	To understand why GPs prescribe antibiotics for sore throat and to explore factors that influence their prescribing.
4	Petursson (2005)	Iceland	16	Face to face, open ended interviews.	Vancouver School of doing phenomenology.	To study the reasons cited by GPs for their "non-pharmacological" prescribing of antibiotics.

5	Hart, Pepper and Gonzales (2006)	Rural western US community	21	Semi-structured interviews in person.	Grounded theory.	To describe how clinicians make decisions to prescribe antibiotics for acute RTIs.
6	Arroll, Goodyear-Smith, Thomas and Kerse (2002a)	Auckland, New Zealand.	13	Semi structured telephone interviews.	Grounded theory.	To explore the experiences of family physicians regarding the delay of antibiotic prescriptions in treating RTIs.
7	Butler, Simpson and Wood (2008)	Wales, UK	40	Semi-structured interviews in person.	Thematic analysis.	To explore GPs' views of near patient tests to manage common infections.
8	Frich, Hoye, Lindbaek and Straand (2010)	Norway	39	Focus groups.	Thematic analysis.	To explore GPs' experiences of peer group academic detailing.
9	Bekkers, Simpson, Dunstan, Hood, Hare, Evans, Butler (2010)	UK	31	Semi-structured telephone interviews.	Thematic analysis.	To explore GPs' views and experiences of an educational programme to enhance the quality of antibiotic prescribing.

10	Cals, Chappin, Hopstaken, van Leeuwen, Hood, Butler and Dinant (2010)	Netherlands	20	Semi-structured interviews in person.	Thematic content analysis.	To explore GPs' attitudes to and experiences of using a CRP point-of-care test for LRTI and other common infections in general practice.
11	Hoye, Frich and Lindbaek (2010)	Norway	33	Semi-structured focus groups.	Thematic content analysis.	To explore GPs' views on and experiences with delayed prescribing in patients with acute upper respiratory tract infections.
12	Tonkin-Crine, Yardley, Verheij and Little (2011)	Belgium, France, Poland, Spain, UK.	52	Semi-structured interviews in person and by telephone.	Thematic analysis and framework analysis.	To explore the views and experiences of GPs in five countries on multiple interventions to promote more prudent prescribing.

* Indicates the number of health care professionals who prescribe antibiotics. Where studies have involved exploring views of different kinds of participants (e.g. patients) I have only included the number of GPs, and in one case nurse prescribers, involved.

Table 13: Translations and themes shared between all 12 papers.

Themes identified in synthesis (13)	Translations identified from 12 papers (32)	Translation definition	Papers with construct*
Perceptions of ARTI management	GP's view on making RTI management decisions	GP's perception of whether making management decisions for RTIs are simple or complex.	1, 3
	GP's view of whether antibiotics aid recovery for RTIs	GP's perception of whether taking an antibiotic aids a patient's recovery from an RTI.	1, 2, 3, 5
	GP's view of protecting against resistance	GP's perception of the importance of protecting against antibiotic resistance and how to do this in practice.	1, 2, 3
GP's previous experience of ARTI management	GP's experience with managing patients with RTI	GP's own previous experience in managing patients with RTIs may influence prescribing decisions.	3, 4, 5
Uncertainty in ARTI management	GP's uncertainty about RTI diagnosis	Uncertainty about RTI diagnoses may make management unclear.	3, 2, 4
	GP's uncertainty about potential illness consequences	Concern about potential consequences of illness may lead to uncertainty and may influence prescribing decisions.	1, 2, 3, 4, 12
	GP's uncertainty about RTI guidelines	Changes in guidelines or recommendations may cause uncertainty about RTI management for GPs.	2
	GP's uncertainty about	Lack of continuity in care may cause uncertainty for	4

	access to patients for review	GPs about when patients can access help from them again.	
Perceptions of external pressure to reduce prescribing	Discussion with peers and knowledge of peers' prescribing	Discussion with colleagues and knowledge of how others' practice may influence GP's prescribing decisions.	2, 5, 12
	Perceptions of recommendations on antibiotic prescribing.	GP's perception of guidelines and recommendations given to them to promote more prudent antibiotic prescribing.	12
Perceptions of potential conflict with patients	GP's view of patient expectations	GP's perception of patient expectations and experiences of patient demand for antibiotics.	1, 2, 3, 4, 10,12
	GP's view of patient satisfaction	GP's opinion of the importance of patient satisfaction and the perception of whether patients will go elsewhere for treatment.	1, 2, 3, 4, 5
Perceptions of how to provide patient centred care	GP's view of how they can help their patients	GP's perception of what they personally can do to help their patients and what types of help they can offer (e.g. emotional, practical).	1, 2, 4
	GP's view of providing explanations to patients	GP's perceptions of how easy or difficult it is to explain prescribing decisions to patients.	1, 4, 5
	Decision making may be influenced by patients'	GP's prescribing decisions may be influenced by a patient's fear or concerns about their illness.	3, 4, 5

	concern		
	Decision making may be influenced by patients' non-clinical context	GP's prescribing decisions may be influenced by the patient's work, social life or socio-economic background in additional to their illness.	2, 3, 4, 5
Perceptions of occupational pressure	GP's perception of whether prescribing decision will affect GP workload	GP's perception of whether prescribing (or not) will increase their workload, in the short or long term, may influence the prescribing decision.	1, 3, 12,
	GP's perception of time available for RTI management	GP's perception of how much time they have available to manage a patient with an RTI may influence the prescribing decision.	1, 2, 3, 4
	GP's emotional and physical state at time of prescribing decision	GP's emotional and physical state at the time of consultation may affect the prescribing decision (e.g. stress, tiredness).	1, 2, 3, 4
	GP's perception of financial benefits of prescribing	GP's perception of potential financial benefits which can be gained from prescribing antibiotics may affect the prescribing decision.	4, 5
	GP's perception of the support offered by their health system.	GP's perception of their health system and the amount of support offered to them to help change their prescribing behaviour.	12
Interventions may allow GPs to reflect	Interventions may allow reflection on own	Personal or local feedback allows an opportunity for GPs to reflect on their own prescribing and potential	8, 9, 10, 11, 12

on their own prescribing.	prescribing.	effects and offers motivation to change.	
Interventions may help to decrease GP uncertainty	Interventions may help to decrease GP uncertainty.	Interventions may decrease uncertainty about an ARTI diagnosis and/or management as they offer additional information to inform decisions and/or aspects to increase GP confidence.	1, 3, 6, 7, 10, 11, 12
Interventions may educate GPs about appropriate prescribing	Interventions may involve learning from and/or working with peers.	Interventions may involve discussion with peers and/or creating a united practice in a surgery. GPs report wanting to learn from peers who share and understand their working situation.	8, 9, 11, 12
	Interventions may raise awareness of the need to reduce unnecessary prescriptions	Interventions educate or remind GPs about the issue of resistance and why some antibiotic prescriptions are unnecessary.	6, 9, 12
Interventions may facilitate more patient centred care.	Interventions may support communication of GPs decisions to patients when opposite to expectations.	Interventions help to “sell” decisions to patients which may be opposite to patients’ expectations. GPs ask for materials to support their decisions not to prescribe antibiotics.	1, 6, 9, 7, 10, 11, 12
	Interventions may encourage more patient centred care.	Interventions may encourage more patient centred care, allowing GPs to understand patient wishes and offer reassurance without recourse to antibiotics. GPs	1, 3, 4, 5, 6, 7, 9, 10, 11

		report a more holistic approach when assessing a patient's needs.	
Interventions can be beneficial to implement.	Interventions may reduce GPs' workload.	Interventions may fit well with existing workload and reduce GP workload in some circumstances.	1, 7, 8, 9, 10
	Interventions may be flexible to fit with practice.	Interventions can be flexible to fit with current practice and can be easy to implement.	9, 10, 11
	Interventions may cost additional money.	Interventions may cost practices additional money and be more expensive than usual care.	4, 7, 9, 10, 12
	Interventions may affect consultation time.	Interventions may affect consultation time, positively or negatively.	1, 7, 9, 10
GP's satisfaction with decision.	GP's satisfaction with own prescribing decision.	GP's perceptions of own prescribing decisions and whether they feel comfortable with their final decision.	1, 2, 3, 5

*Key to papers

1 – Butler et al. (1998b)
2 – Bjornsdottir and Hansen (2002)
3 – Kumar et al. (2003)
4 – Petursson (2005)
5 – Hart et al. (2006)
6 – Arroll et al. (2002a)
7 – Butler et al. (2008)
8 – Frich et al. (2010)
9 – Bekkers et al. (2010
10 – Cals et al. (2010a)
11 – Hoye et al. (2010)
12 – Tonkin-Crine et al. (2011)

2. GPs' previous experience with RTI management

GPs' concern about management may increase if they have previous negative experience with prescribing or withholding antibiotics.

> One practitioner explained that his high prescribing was grounded in an experience when he withheld antibiotics and the patient subsequently developed streptococcal septicaemia. Kumar et al. (2003).

Alternatively, a lack of experience may mean that GPs are less able to manage complex RTI consultations, in which the patient may have expectations for an antibiotic or where management is unclear, as effectively as more experienced colleagues.

> Lack of experience is undoubtedly a real factor when a physician has to keep his/her head in stressful circumstances and proven medical science is no longer at the forefront. Petursson (2005).

3. Uncertainty in RTI management

Uncertainty appeared as a major theme. GPs may feel uncertain about making an RTI diagnosis, about having access to patients for review, or about following guideline advice when they query its relevance to an individual. Many may feel uncertain about potential illness consequences when not prescribing an antibiotic. Uncertainty may lead to inappropriate prescribing as a way to ensure that patients are protected from negative consequences in each case.

> The patient's duration and severity of symptoms increased uncertainty about the causal agent….GPs managed their uncertainty by prescribing or offering to prescribe. Kumar et al. (2003).

4. Perceptions of external pressure to reduce prescribing

Although guidelines can be seen to be helpful some GPs may not always trust information they receive and may disregard this when making decisions. In contrast, GPs appear to regard the opinions and actions of peers highly. Discussion and comparison with peers may be very influential on a GP's own prescribing because of their motivation to fit with professional norms.

> [GPs showed] curiosity about colleague's prescribing habits and indicated the importance of being able to discuss cases of doubt with colleagues. Bjornsdottir and Hansen (2002).

5. Perceptions of potential conflict with patients

Not meeting patient expectations can be viewed, by some GPs, as a sure route to conflict and may result in prescribing to maintain good relationships.

> Many were concerned to preserve and build relationships with their patients and it was not worth jeopardising this 'for the sake of a prescription for Penicillin V'. Butler et al. (1998b).

In contrast, other GPs may feel that the patient-doctor relationship is not reliant on the final prescribing decision and that, exploring patient expectations even without meeting them, can improve doctor-patient relations.

> Prescribing antibiotics for sore throat was acknowledged as relevant but not the most important factor in maintaining the doctor-patient relationship. Kumar et al. (2003).

> Only a few GPs said they actively explored patient's concerns when they attended for sore throat. These doctors thought that this style of consultation was more powerful in bolstering the doctor-patient relationship that not prescribing was detrimental. Kumar et al. (2003).

This contrast in views may reflect the time at which research was carried out. In this case a five year gap between publications, and assuming a similar gap between timing of interviews, may reflect a change in attitudes of GPs over time and/or a change in patient expectations about RTI consultations as a result of more awareness and education on antibiotic prescribing. Alternatively, GP views may be influenced by treating very different patient populations, one of which may exhibit higher expectations for antibiotics.

GPs may also feel that delivering patient satisfaction is crucial when they perceive a risk of losing patients (and subsequently money in some contexts) to other doctors. These perceptions may be more pronounced in certain contexts, supported by the two Icelandic studies in this group, and may be influenced by culture or financial incentives.

> Fear of conflict and discomfort due to conflict appear to be common among GPs who will make great efforts to maintain peace with their patients. Petursson (2005).

Alternatively, some may not regard patients' expectations or satisfaction an influential factor in their decision making at all.

> The last balancing act described by clinicians was holding firm to their ideas regarding individual best practice, regardless of patient satisfaction. Hart et al. (2006).

6. Perceptions of how to provide patient centred care

Providing individualised care appears to be a priority. Sometimes the GP perceives benefits from achieving patient satisfaction or meeting expectations, such as saving time; however, some motivations for prescribing (or not) appear to be purely altruistic. In order to help patients GPs may believe that they must offer something "tangible". Others may feel that reassurance and explanation may prove equally appropriate to counteract patients' illness concerns. Again, Icelandic studies suggest that GPs may have a certain "mentality" which may make the former more likely. Lastly, GPs' decisions may be influenced by non-clinical patient factors. For example, GPs may prescribe inappropriately based on work or social commitments (e.g. an approaching holiday).

> Most participants mentioned their patient's obsession with plans and their craving for security, the antibiotic here serves the purpose of trying to help the patient do what he/she has planned. Petursson (2005).

7. Perceptions of occupational pressure

GPs appear concerned about how management fits with daily practice. Some GPs may recognise long term advantages of withholding prescriptions appropriately as patients do not return for similar infections. However, others may see short term advantages in giving antibiotics if they are able to keep consultations short. Perceptions of consultation time may also lead to GPs feeling they have few feasible choices in terms of management. For example, GPs may not feel they have time to explain non-prescription decisions to patients satisfactorily.

> It is primarily lack of time that leads the physician to lower his/her threshold of tolerance, a prescription may in such cases be the quickest option. Petursson (2005).

Equally, GPs who are fatigued or working under stress may choose different management styles than usual. In some situations this may lead to inappropriate prescribing if GPs view this as a way to end consultations quickly or to avoid discussions with patients. In particular contexts, financial incentives for GPs or practices may discourage appropriate prescribing; examples include GPs who work on a fee for service basis, who benefit from treating patients quickly and from patients returning for re-consultations.

8. GP's satisfaction with own prescribing decision

One additional theme which was related to, but distinct from, those described above was "GP's satisfaction with own prescribing decision". GPs can appear more satisfied with their decisions when they have overcome any factors influencing their choice; however, competing factors may lead to decreased satisfaction. For example, when guidelines recommend not giving an antibiotic to a patient who wants one, a GP may not feel satisfied about a decision either way. Alternatively, a GP may choose to prioritise the patient over the guideline, or vice versa, and feel satisfied after having made a choice. In this respect, satisfaction with a decision does not necessarily relate to whether or not an appropriate prescribing decision has been made but whether the GP believes it is appropriate for the specific situation.

> Ultimately, each clinician made a decision based on what he or she believed was best for the patient. What defined "best" was clinician-specific. Hart et al. (2006).

Perceptions of interventions aimed at more prudent prescribing

The six subsequent themes highlighted how GPs perceived interventions. Each appeared to have a direct relation with one or more of the seven factors influencing prescribing, previously identified.

9. Interventions may allow GPs to reflect on their own prescribing

GPs appear to value opportunities for reflection on their own practice. Prescribing feedback may help GPs to identify any areas where they would like to change their prescribing. Equally, offering information on local prescribing and how this may affect resistance rates may also provide additional motivation to change.

> Prescribing feedback, where GPs received data on the number of prescriptions issued in a given period, was another intervention that was praised for its ability to make comparisons. GPs felt it was influential in identifying whether they and their partners were prescribing more antibiotics than average. Tonkin-Crine et al. (2011).

This theme may relate to experiences and perceptions of RTI management, as interventions may draw attention to how often GPs prescribe, what proportion of their own prescriptions may be inappropriate and how their prescribing may affect resistance rates.

10. Interventions may help to decrease GP uncertainty

GPs appear enthusiastic about interventions which may decrease their uncertainty about RTI management. POCTs may help to reduce uncertainty in diagnosis and uncertainty about potential negative illness consequences.

> Clinicians generally used the test to help reduce diagnostic and prognostic uncertainty. The majority of GPs said they continued to use

> the test and half of all GPs mainly use it to 'rule out' serious disease. Cals et al. (2010a).

GPs may feel reassured by such a test and therefore more confident that an antibiotic is not necessary for a particular patient. A delayed prescription may also be viewed as a solution to the problem of uncertainty since in cases where future need is uncertain, a GP can give the patient the opportunity to access antibiotics at a later time if they feel it is necessary.

11. Interventions may educate GPs about appropriate prescribing

GPs may support interventions which educate them about appropriate prescribing. Whilst information needs to come from a source which is viewed as knowledgeable and trustworthy by GPs, they may also feel that they can learn most from others in the same situation. GPs can be attracted to information sessions which are run by colleagues and where they can learn about the experience of peers. Here GPs may learn how it could be possible to change their prescribing from peers who have already managed it.

> The participating GPs experienced the CME [continuous medical education] group meetings as an important arena for learning. They reported picking up good advice from others. Frich et al. (2010).

12. Interventions may facilitate more patient centred care

GPs may value interventions which provide benefit to patients. Communication skills may allow GPs to offer individualised explanations to patients, which address their personal worries and concerns and have the potential to raise satisfaction. GPs may feel that POCTs can also help to provide reassurance, as GPs are seen as taking the illness seriously and doing something practical in assessing its severity. Lastly, delayed

prescribing may provide reassurance to a patient by giving them control over their treatment.

> The GPs said that they more often issued a wait-and-see prescription if a weekend or holiday was approaching; this was reflected in the notion of 'Friday prescriptions'. It was important for the GPs to help their patients so that they did not have to seek after-hours care, because of the long distances and long waiting time at the after-hours care facility. Hoye et al. (2010).

Some GPs may feel that delayed prescriptions are not appropriate for all patients, based on their perception of the patient's ability to use them appropriately.

Although some GPs are altruistic in their support for interventions which offer benefit for patients, others may favour such interventions if they can offer benefits for the GP as well. GPs may specifically like interventions which can help to communicate prescribing decisions to patients and which therefore address GPs' concerns that not meeting expectations could create conflict or risk losing patients. Again, delayed prescribing may be useful in meeting expectations or POCTs may be useful to support explanations that antibiotics are unnecessary.

> GPs suggested [a POCT] would be particularly useful in helping ''to sell'' decisions not to prescribe antibiotics to their patients, for example: 'Yes, if it was available, then yes. Then at least we can, um, even explain to the patient that, look, we have done it, it is a viral thing and the antibiotics are not going to work for this condition, then you can justify what you are saying to the patient. Because nowadays, patients want the evidence as well. (GP1, high fluoroquinolone prescribing practice)". Butler et al. (2008).

Finally, GPs may feel that improved communication skills may help them to explain non-prescription decisions without alienating patients or causing dissatisfaction.

> The theme of 'effects on physician-patient relationship' delineated an associated factor for physicians: the strategy of delayed prescribing strengthened physician-patient relationships by helping physicians cope with the pressure they experienced from patients expecting antibiotics for common colds. Arroll et al. (2002a).

13. Interventions can be beneficial to implement in practice

GPs welcome interventions that can benefit their daily practice either by decreasing workload or offering financial gain. Examples may include fewer re-consultations as a result of better communication skills or the use of POCTs or the provision of financial incentives.

> Three GPs stressed the potential educational effect of natural recovery without antibiotic treatment: 'If you don't treat a patient with antibiotics [after CRP testing] and the complaints resolve spontaneously, I think that patients will tend to wait and see and not consult the doctor again for the next similar illness episode. So what we hope is that this management including CRP will lead to fewer consultations or repeat consultations for new infections (GP17).' Cals, et al. (2010a).

> GPs from Spain and the UK supported financial incentives which they felt gave clinicians more motivation to change. 'The new contract says what financial incentives does, they didn't think general practice would change, they thought no one would achieve the targets and when there was money on the table, the whole organisation, across

> the country, changed dramatically, almost overnight (British, 4).'. Tonkin-Crine et al. (2011).

In addition, interventions which provide flexibility in their implementation can also be attractive to GPs.

> The online aspect of the training was generally evaluated positively, with a particular emphasis on its promotion of independent learning and flexibility in accessing the program. Bekkers, et al. (2010).

Although offering potential benefits, interventions must also be practical to fit with everyday practice and be seen as feasible to implement. GPs may be concerned about interventions disrupting existing work or being too time consuming.

> [GPs] had some concerns on organizational issues, such as interference with practice nurses' activities including answering phone calls. Cals et al. (2010a).

> Peer group academic detailing was experienced as a suitable method to learn more about pharmacotherapy, though there were participants who argued that the scheme was time-consuming. Frich et al. (2010).

6.4 Discussion

6.4.1. Main findings

This synthesis of 12 papers provides a comprehensive overview of processes involved in management decisions for RTIs. The results provide evidence to suggest how interventions may address factors which influence

GPs' prescribing of antibiotics for RTIs and thus change prescribing behaviour. Factors influencing the decision to prescribe include perceptions of RTI management, previous experience in managing RTIs, uncertainty about management, perceptions of external pressure to promote prudent use, perceptions of potential conflict with patients, perceptions of providing patient centred care and perceptions of occupational pressure. Interventions designed to promote prudent use appeared to be feasible and attractive to GPs when they addressed one or more of these factors. The results suggest that to be acceptable to GPs an intervention should allow GPs to reflect on their own prescribing, decrease uncertainty about management, educate about appropriate prescribing, facilitate patient centred care and be beneficial for GPs to implement in practice. A multi-faceted intervention which is able to address all of the five factors identified may be widely accepted by GPs and feasible to implement in practice.

6.4.2. Implications for practice and research

In these results, I do not suggest that each individual GP is influenced by all seven of the factors identified; instead these themes represent a range of potentially relevant factors. Some factors may be relevant for a GP at different points in his or her career (e.g. previous experience), or may be relevant to different cases or at different points in their everyday practice (e.g. occupational pressure on a Monday morning compared to a Friday evening). Interventions which aim to alter the prescribing behaviour of a group of GPs would therefore likely benefit from addressing all of these factors in order to potentially target every GP in every possible situation.

The studies reviewed asked GPs about a variety of types of intervention and my findings provide indications of how each may aid prescribing decisions by addressing the specific factors identified. It was reassuring to see that

many interventions were able to tackle more than one factor; however, none appeared to address all seven factors identified and, indeed, no single approach that does may exist. An intervention may therefore only be able to have maximum impact on prescribing behaviour when combined with other, complementary techniques. This may explain the findings of Arnold and Straus that a multi-faceted approach to changing prescribing behaviour is likely to be more effective that a single technique (Arnold & Straus, 2005).

6.4.3. Study limitations

In following a meta-ethnographic approach, I recognise that the synthesis presented here is only one interpretation of the set of studies analysed. Other interpretations from the same data set would be possible and could be equally valid. By checking the results of this meta-synthesis with authors of the original papers I was able to gain additional corroboration that the model represented all articles included in the analysis.

The inclusion criteria for the review were strictly defined in order to create a homogeneous set of the most relevant papers available, but this meant that some papers on related topics were excluded. Consequently, on completion of the review, I compared my findings with studies which had been excluded in order to assess any similarities or differences. Encouragingly, I found that those studies that had been excluded mainly provided corroboration of the model shown in Figure 17; further, these included examples of GP uncertainty in RTI management (Cals et al., 2009b; Wood, Simpson, & Butler, 2007) potential conflict with patients because of expectations (Cals, et al., 2009b; Simpson, Wood, & Butler, 2007; Wood, et al., 2007) and influences of occupational pressure (Cals, et al., 2009b; Wood, et al., 2007). However, some papers also presented new

ideas which may offer additional insights in to GPs' views and appropriate interventions.

Wood et al. (2007) found that GPs justified their prescribing decisions based on their perceptions of social responsibility and suggested that interventions may want to specifically promote prudent use as socially responsible both in the short and long term. Simpson et al. (2007) suggested that interventions linking prescribing decisions to local resistance rates may provide an incentive for more prudent prescribing. Specifically, if GPs are aware of their own impact on resistance, from either narrow or broad spectrum antibiotics, they may be motivated to prescribe more prudently.

Lastly, Cals et al. (2009b) reported that the preference of GPs for two different types of intervention differed according to whether they had experienced both types of intervention or not. This finding suggests that GPs may change their views of an intervention after having experienced it. Two studies included in this review asked GPs about interventions which they had no experience of and this should be taken into consideration (Butler, Simpson, & Wood, 2008; Tonkin-Crine et al., 2011). It is encouraging; however, that the results of Butler et al. (2008) who considered views on hypothetical near patient tests are similar to those of other studies where GPs had had experience of these tests (Cals et al., 2010a). It is possible that, for some types of intervention, GPs have to have had experience of it in order to appreciate its benefits but for others the benefits are apparent initially; again, this may be important when first introducing GPs to new interventions.

The selection of studies included in the review represented GPs from many different developed countries, including some from outside Europe. The synthesis was able to identify themes that were consistent across these

different contexts whilst specifying why specific issues may be harder to tackle in some contexts than others. Whilst similarities between the themes indicate that GPs in different contexts may respond well to the same types of intervention one cannot determine whether these themes would be relevant to GPs in countries where no qualitative research has been carried out and where prescribing contexts may be very different (such as developing countries).

Although the themes are presented as distinct, I recognise that some may be linked in certain situations. For example, previous experience may lead a GP to feel more uncertain about RTI management. In such cases, it was felt that retaining distinction between themes would help to isolate the precise factors influencing a prescribing decision and therefore determine exactly what would need to be targeted in order change behaviour. In this sense, it was felt appropriate to present more, rather than fewer, targets for change to avoid a synthesis which missed an important influence on RTI management.

6.4.4. Conclusion

In conclusion, results suggest that, in order to decrease inappropriate prescribing, an intervention is needed which encourages prudent use whilst also addressing all potential factors which may influence a GP's prescribing decision. An intervention should allow GPs to reflect on their own prescribing, decrease GP uncertainty about management, educate about appropriate prescribing, facilitate patient centred care and be beneficial for GPs to implement in practice. Providing such an intervention to address these factors will likely be acceptable and feasible for those at whom it is targeted and, as a result, have the potential to be effective at changing prescribing behaviour.

CHAPTER 7: Discussion

7.1 Introduction

This final chapter summarises and concludes the research programme reported in this thesis. Firstly, this chapter gives an overview of the findings of the two qualitative studies and meta-ethnography reported in the previous chapters and discusses how the findings of these compare with one another. Secondly, this chapter discusses how research with primary care patients with RTIs may help to inform interventions to encourage GP behaviour change. Lastly, this chapter considers the implications of findings for primary care practice and future research and discusses the limitations of the research presented here.

7.2 Major findings of this research

7.2.1 Summary of work completed from previous chapters

This research aimed to understand the acceptability and feasibility of interventions to promote prudent antibiotic prescribing for acute RTIs, across multiple European countries, by GPs. The thesis began by identifying the relationship between primary care antibiotic prescribing and the world-wide problem of antibiotic resistance, with its subsequent health effects (Goossens et al., 2005). The existing literature showed great variety in interventions to promote more prudent antibiotic prescribing in primary care (Arnold & Straus, 2005). The literature also indicated the current trend towards trying to tackle the problem of unnecessary antibiotic prescribing at an international, rather than national, level (Earnshaw et al., 2009).

Chapter 2 explored whether psychological models of behaviour change could help to inform interventions aimed at changing GP behaviour. Both existing literature on GP antibiotic prescribing behaviour, and more general literature on GP adherence to general practice guidelines, were helpful in identifying potential psychological theories which could explain GP behaviour and suggest potential mediators for behaviour change. Five psychological models were discussed. Whilst some models were explored more frequently in the literature, for example the Theory of Planned Behaviour, results were mixed about how well the associated constructs explained behaviour. Given the limited existing research and mixed findings, no preference could be given to any single psychological model as a framework by which to try to explore GP prescribing behaviour.

Due to a lack of psychological theoretical evidence in regards to changing GP behaviour, and as a result of limited research into GP antibiotic prescribing behaviour across countries, this research took an exploratory approach to search for new ideas and concepts regarding GP antibiotic prescribing across Europe. A qualitative methodology was suitable for undertaking this task and, consequently, two qualitative empirical studies were planned. The first of these explored GPs' views and experiences of prescribing antibiotics for acute RTIs across five European countries. The study indicated that GPs across the five countries held similar beliefs and experiences in prescribing antibiotics for acute RTIs, and presented seven recommendations to be considered in the design and development of international interventions aimed at promoting more prudent prescribing by GPs. These recommendations were to deliver and promote guidelines to GPs, to increase GPs' trust in recommendations, to address barriers to following recommendations, to offer practical support in appropriate prescribing, to support patient education, to encourage a united practice amongst GPs and to educate other health professionals and increase responsibility for prescribing.

The second of the empirical studies, explored the views of experts- professionals involved in the design, development or dissemination of interventions to promote prudent antibiotic prescribing- on changing GPs' antibiotic prescribing behaviour. The results produced six recommendations, a consensus of all experts' views, to suggest ways interventions could be designed and delivered to be more acceptable to GPs and potentially more effective. The recommendations stated that guidelines should be developed appropriately to be relevant for GPs, guideline content and delivery should be appropriate for easy use by GPs, that the need for guidelines and interventions should be explained, that interventions should be designed to help GPs follow recommendations in daily practice, that interventions which are appealing to GPs should be provided and that education for patients and other health professionals should be provided.

Finally, chapter 6 presented a meta-synthesis of qualitative literature which explored GPs' views of prescribing antibiotics for RTIs and interventions to promote more prudent prescribing of antibiotics for RTIs. The synthesis produced a model which showed seven common barriers, shared by GPs, to reducing the prescription of unnecessary antibiotics and five aspects of interventions which were helpful in overcoming these barriers to result in a prescribing decision that the GP was satisfied with. The barriers identified were GPs' perceptions of ARTI management, GPs previous experience of ARTI management, uncertainty in ATRI management, perceptions of external pressure to reduce prescribing, perceptions of conflict with patients, perceptions of how to provide patient centred care and perceptions of occupational pressure. The five ways interventions may address these barriers included allowing GPs to reflect on their own prescribing, helping to decrease GP uncertainty, educating GPs about

appropriate prescribing, facilitating more patient centred care and being beneficial to implement in practice.

Both the qualitative studies and the systematic review provided unique insights into healthcare professionals' views and experiences of prescribing antibiotics for acute RTIs across multiple countries. Whilst the findings from each of these three investigations were independent, there appeared to be broader themes which were present across the three sets of results. Firstly, each study found that there was high consistency between healthcare professionals' views across multiple countries regarding antibiotic prescribing and opinions on interventions to promote prudent prescribing. Secondly, results supported the idea that designing multi-faceted interventions, as opposed to single component interventions, may be more appropriate for meeting the needs of GPs and addressing common barriers to prudent prescribing. Further, they identified which aspects interventions should try to address through their content. Lastly, results indicated the importance of targeting patients, as well as GPs, in order to help support GP behaviour change. These broader findings are discussed in detail below.

7.2.2 Consistency in healthcare professionals' views and experiences of antibiotic prescribing across European countries

As discussed in the introduction to this thesis, very little qualitative work had explored the views of healthcare professionals from different countries on primary care guidelines and other interventions. Two examples suggested that healthcare professionals' views across countries towards guidelines were, on the whole, similar but that some differences arose as a result of differences in context (Carlsen & Kjellberg, 2010; Christiaens et al., 2004). The research suggested that primary care recommendations may be largely acceptable to healthcare professionals across countries;

however, differences in views may arise as a result of how health care is organised and delivered in a country. Whilst these studies were helpful for highlighting the issue of context as a potential reason for differences in healthcare professionals' views, the studies only focused on perceptions of primary care guidelines and did not discuss the implications of such results for GP behaviour or general practice. The consistency in views between healthcare professionals across countries of other types of interventions remained unknown. The three empirical studies presented in this thesis suggested that healthcare professionals' views on guidelines and other types of interventions across countries are largely consistent.

The results of the three studies reported in this thesis indicated that there was very good support from healthcare professionals for interventions to promote more prudent antibiotic prescribing for RTIs. All GPs and other healthcare professionals, across the five countries were in agreement about why antibiotic prescribing in primary care needed to change. This finding is likely due to the fact that antibiotic resistance is a world-wide health priority recognised by the WHO and has been given much publicity over several decades, across many countries (Huttner et al., 2010). The support shown for reducing antibiotic resistance seemed to help GPs accept primary care interventions as methods that were necessary to helping to promote good clinical practice. The consistency in GPs' views found across countries may therefore reflect the general acceptance of antibiotic resistance by the medical community as a real threat to health care and it may be that it is this topic in particular which leads to such similarity in views between healthcare professionals across countries.

Although GPs across countries may think that prudent prescribing is important and may want to prescribe prudently, differences may appear in the barriers they experience when trying to prescribe prudently. Results presented in this thesis indicated this was largely not the case. Several

barriers which were described by healthcare professionals in chapters 4 and 5 were seen to be relevant to all contexts involving prescribing for RTIs, regardless of the country in which a consultation took place. Examples of these included GPs' uncertainty about whether antibiotics were needed or not for an RTI, GPs offering antibiotics to patients because it was nearing the weekend when a patient would not have access to normal healthcare services, and GPs prescribing antibiotics when they were short of time in a consultation.

One major reason reported for unnecessary prescribing was because a patient wanted antibiotics. There did not appear to be any differences in how GPs perceived patient demand for antibiotics. It could be hypothesised that patients in some countries may expect antibiotics more than in other countries because of the existing healthcare practices in a country; however, the GPs who took part in the study presented here reported that they all had patients who "demanded" antibiotics but they felt that this type of patient was always in the "minority". It may be that in some countries these patients are more common than in other countries, and therefore this "minority" is larger; however, it appeared in these studies that every GP always had some patients like this and this therefore indicates that every GP needs to be "equipped" to handle such patients effectively, not prescribing antibiotics unless they are necessary. Maintaining patient satisfaction in a consultation was seen to be very important to GPs regardless of the country in which they worked, and all were eager not to "lose" patients to other doctors. This general feeling amongst GPs seemed to reflect the concept that GPs were providing a service to their patients and that patient satisfaction reflected how good a doctor they were.

Each of these examples, which appeared to be common across countries, were situations which could be seen to be potential barriers in any primary care context and related to the typical general practice consultation. A

typical consultation is a face to face meeting between a GP and a patient which has a determined length (usually around 10-12 minutes). A primary care consultation is usually the first contact patients have with the healthcare service and GPs usually act as a gatekeeper to secondary care, providing referrals when needed. GPs may see patients they have treated for several years, new patients or their colleagues' patients so will have different relationships with individuals depending on this. The responsibilities of the GP involve establishing what the patient has consulted for, making a diagnosis and providing an appropriate treatment. This general format of the consultation applies for all GPs working in the five countries of interest in this research.

GPs working in this type of consultation are likely to report the same barriers to prudent prescribing as they are barriers which are imposed by the consultation itself. Limited time in the consultation requires GPs to diagnose an RTI and make a decision about management quickly. Unnecessary antibiotic prescribing may then occur when GPs are short on time and information and want to safeguard against any potential negative consequences. Being face to face with patients (contrary to telephone consultations) may lead to GPs feeling more pressure to ensure that patients are satisfied with the outcome of their consultation. GPs may experience, or perceive, more demand for antibiotics from patients by reading visual cues that patients display. Lastly, the illness presentation in a consultation would be the same for GPs regardless of the country they were working in. The diagnosis of some RTIs, particularly acute cough, can be difficult and there is no definite way to establish whether an RTI is viral or bacterial. This dilemma is faced by all doctors regardless of where they are working.

Looking at the context of the individual consultation, there were many similarities in the actual environments GPs were working in when an

antibiotic prescribing decision had to be made. GPs were also seen to spend the majority of time in interviews talking about the individual consultation when a patient was in front of them and spent less time talking about the wider healthcare context. Interview questions were focused on the individual consultation and the GP's own decision making rather than asking specifically about outside influences. This can help to explain why GPs across countries held similar viewpoints about some of the barriers to more prudent prescribing.

Whilst the results presented in this thesis found a vast majority of similar views between healthcare professionals from different countries, some minor differences in views were still present. The results reported in chapter 4 identified three differences appearing between GPs' views across countries. It appeared to be the larger healthcare context which led to differences in GPs' views rather than what they did as individuals in their consultations.

Firstly, the amount of advice and information GPs had previously received on prudent prescribing appeared to be quite different between countries. GPs working in the UK, Belgium and France reported receiving several different types of guidelines, attending educational meetings and being aware of several healthcare campaigns to warn of the dangers of antibiotic resistance. GPs from Spain and Poland however reported more problems accessing information and reported that they had less advice offered to them. This difference led to differences in how enthusiastic GPs were in receiving more information, with the former not seeing the need to receive further advice of a similar nature to that they had received before. This finding highlights the importance of avoiding an overload of information being given to GPs, which ultimately could lead to GPs disengaging with advice. Any researcher designing an intervention for a primary care context should acknowledge any interventions which have preceded it and indicate

how a new intervention fits with these. In short, any new advice for GPs should state explicitly why it is needed and what is different or new from previous advice.

Secondly, GPs from different countries appeared to hold different preferences for the types of intervention they favoured. GPs from Spain and Poland reported finding near patient tests helpful when making an RTI diagnosis. GPs interviewed in other countries, however, had not had any experience of these tests and were not directly asked about them and, therefore, were not able to share any views on the topic. Differences between countries also arose when GPs discussed financial incentives. This was one type of intervention that all GPs were directly asked about; however, only GPs working in Spain and the UK had personal experience of them. GPs who had experience of financial incentives were supportive of them, although, GPs with no experience did not view incentives positively. These results suggest that differences in GPs' views between countries may reflect a lack of experience with a particular type of intervention and therefore a lack of knowledge to make a true judgement, rather than indicating that GPs in different countries have different preferences for types of interventions.

Lastly, GPs from Poland and Spain reported that they commonly had patients who attended a consultation when they had already purchased an antibiotic prior to seeing a doctor. Countries which are members of the European Union (EU) all fall under certain prescribing and dispensing laws and this includes antibiotics "authorised as human and veterinary medicine being prescription-only-medicines" (Council of the European Union, 2009). This law is intended to prevent the dispensing of antibiotics without a prescription and reduce the risk of patients deciding to self-medicate with antibiotics. Research studies indicate however that, in some EU countries, antibiotics are still available to patients over the counter, with Spain being

one of the countries where this is most common (Grigoryan, Burgerhof, Degener, Deschepper, Stalsby Lundborg & Monnet, 2008; Llor & Cots, 2009). With practices such as this still in place, GPs working in countries like these are unable to control patients' access to antibiotics and, rather than focus on their prescribing decision, have to educate patients in advance of common illnesses occurring. This difference in the availability of antibiotics between countries may then lead to GPs from different countries having different views about what types of interventions may be most important.

In summary, the results of studies reported in this thesis showed high consistency in healthcare professionals' views of antibiotic prescribing and interventions to promote prudent antibiotic prescribing across countries. The most consistent views appeared to be those related to factors regarding the individual RTI consultation. This was an environment which GPs held in common regardless of the country in which they worked. Differences in views appeared when GPs considered factors outside of the consultation; for example, how GPs had been educated about good clinical practice and how their healthcare system supported (or not) GPs to prescribe prudently. The consistency in views suggests that international interventions could be designed to aid GP decision making in the RTI consultation but that interventions may have to be tailored to fit with the wider context of the healthcare system which may differ between countries.

7.2.3 Identifying intervention techniques to develop multi-faceted interventions

The existing literature on GP antibiotic prescribing has focused on testing the effectiveness of interventions which have multiple components (Butler et al., 2012; Cals et al., 2010b; Bjerrum et al., 2006). Reviews of this literature suggested that these multi-faceted interventions may be more

effective than single component interventions at encouraging GP behaviour change (Arnold & Straus, 2005; Ranji et al., 2008).

The three studies presented in this thesis provide an insight into the barriers that GPs experience when trying to prescribe antibiotics more prudently in practice for RTIs. The results from the GP study highlighted several barriers which were seen to be shared amongst GPs regardless of the country in which they worked. Examples included GPs' concern about the potential negative consequences of not prescribing an antibiotic, patients who demanded antibiotics from their GP and GPs' belief that they were already prescribing prudently. In the expert study, experts, who were GPs themselves or who worked closely with GPs, reported that they felt GPs had problems with prudent prescribing for similar reasons. Examples from these results included experts' views that GPs thought prudent prescribing would lead to an increased workload, GPs not seeing the benefits for themselves of changing their practice and GPs being worried about why they were being asked to change their prescribing, with experts feeling that GPs were worried that recommendations were based on saving money rather than improving clinical outcome. Following these studies, the meta-ethnography identified seven themes which appeared to encompass these barriers and presented five themes which identified ways interventions could help GPs to overcome these barriers. Comparing the results from the three studies presented here showed great overlap in both GPs' and experts' views of the typical barriers GPs face when trying to prescribe antibiotics more prudently.

Comparing the results of the GP study and the meta-ethnography

The published results of the GP study directly helped to develop the model in the meta-ethnography, contributing to 9 of the 13 themes identified. This showed a strong overlap across the two sets of results. Table 14

presents the results of the GP qualitative study and results of the meta-ethnography, to see how the two compare. It shows the overlap between the 7 themes found in the GP study and the 9 themes they contributed to in the meta-ethnography. Both sets of results indicate that GPs from different countries struggle with similar barriers to prescribing prudently. These include uncertainty about whether an RTI requires an antibiotic or not, lack of trust in guideline recommendations leading to doubt about whether to follow them in practice and worries about conflict with patients if not prescribing an antibiotic. In terms of interventions, both sets of results show that GPs want interventions to provide some sort of benefit for themselves in practice. In addition, GPs seem to favour information about how well they are currently prescribing, information on the latest research evidence and any intervention which can help to maintain patient satisfaction when not prescribing an antibiotic.

Comparing the results of the expert study and the meta-ethnography

Table 15 presents another comparison between the themes found in the expert qualitative study and the themes from the meta-ethnography to see how these compare to one another. In this comparison, again, both studies identified barriers that GPs experience when trying to reduce unnecessary prescribing. Experts felt that GPs prescribed for RTIs out of habit, that some GPs felt that they didn't need recommendations because they already prescribed prudently and that GPs wanted guidelines that were based on the most recent evidence. In terms of interventions, comments from the expert group were similar to the meta-ethnography as they recommended telling the GPs how well they were currently doing in their prescribing, giving additional education to GPs and also providing education to patients. Although experts identified common barriers experienced by GPs, they did not provide as much detail about some of these barriers as the GPs participating in the GP qualitative study. One example of this was that

experts consistently talked about the importance of patient education but did not expand on this and mention patient satisfaction or avoidance of conflict with patients. In this respect, the results from the GP study and meta-ethnography provide addition details which could not have been obtained from the expert study alone.

Interestingly, the results of expert study can be seen to correspond with 8 of the 13 themes identified in the meta-ethnography. This is most likely due to the fact that around half of the experts interviewed were also qualified GPs and therefore were commenting on their own experiences, much like those interviewed in the GP study. The expert study could have been considered for inclusion in the meta-ethnography; however, it was not included because it focused on a different population and research question, looking at how to deliver and develop interventions, as well as how to encourage engagement with them. The difference in research questions between the expert study and the GP study and meta-ethnography resulted in a different focus on the same topic. The results from the expert study were able to reflect more on the delivery of interventions and added to the knowledge gained from previous studies with GPs. Experts talked about the importance of GPs knowing where to access guidelines and involving GPs in the writing of recommendations. They stressed that it was important to deliver continuous, repetitive messages to GPs about best practice, rather than one off interventions, and also recognised that the health system had to encourage change for all healthcare professionals and patients, not just GPs alone. With this additional information, the results of the expert study are able to deliver a broader view which helps to consider, not just what interventions need to contain, but how they could be designed and delivered to get to the target audience and to be taken up in the first place.

Summarising the results from all three studies

Although the results of the GP study were able to make a substantial contribution to the model produced within the meta-ethnography, four additional themes also emerged from the synthesis which were a result of the inclusion of other papers. These additions indicate that the results of the meta-ethnography are likely to be more comprehensive in explaining GP prescribing behaviour than the results of the GP study. The model identified in the meta-ethnography provides a potentially useful reference point for any reader who wishes to evaluate the content of an intervention, either one in development or one already in existence, quickly and easily. The model may be especially useful in the way that it separates the barriers experienced by GPs from the ways interventions try to address these barriers. The results of the meta-ethnography suggest that interventions should focus on five areas in order to cover the range of barriers that GPs experience. The identification of these five aspects allows those who are currently developing interventions to consider what they wish to include in their intervention, or those who are evaluating existing interventions, to consider which aspects an intervention includes and how this impacts on its acceptability, feasibility and potentially, its effectiveness.

Table 14: Comparing the results from the GP qualitative study and the meta-ethnography.

Themes identified in the meta-ethnography (13 themes, 1-13)	Themes identified in the GP study* (7 themes, A-G)
3. Uncertainty in ARTI management.	B. Explain evidence behind recommendations. C. Recognise GP concerns about following guidelines.
4. Perceptions of external pressure to reduce prescribing.	B. Increase trust in recommendations. C. GPs may feel they are being monitored. C. Acknowledge the importance of clinical judgment. F. Encourage consistent decision making within a practice. G. Use European/international guidelines to spread education.
5. Perceptions of potential conflict with patients.	C. Address (non-clinical) aspects which make reduced prescribing difficult. E. Support patient education.
7. Perceptions of occupational pressure.	A. Deliver the message and promote guidelines to GPs. C. Address (non-clinical) aspects which make reduced prescribing difficult. D. Offer practical support in appropriate prescribing. F. Encourage a united practice amongst GPs. G. Educate other health professionals and increase responsibility for prescribing.

8. Interventions may allow GPs to reflect on their own prescribing.	C. Specify how guidelines are/are not being met. F. Give feedback to allow peer comparison.
9. Interventions may help to decrease GP uncertainty.	D. Provide tools to support appropriate prescribing.
10. Interventions may educate GPs about appropriate prescribing.	A. Deliver recommendations to GPs effectively. B. Highlight the clinical rationale behind antibiotic recommendations. C. Specify how guidelines are/are not being met. D. Offer practical support in appropriate prescribing. F. Encourage a united practice amongst GPs.
11. Interventions may facilitate more patient centred care.	C. Address barriers to following recommendations. E. Support patient education.
12. Interventions can be beneficial to implement in practice.	A. Highlight how recommendations are useful for GPs. D. Offer practical support in appropriate prescribing. E. Support patient education. F. Encourage a united practice amongst GPs. G. Educate other health professionals and increase responsibility for prescribing.

*In column 2, themes underlined represent the whole theme from the GP qualitative study, those not underlined represent only a subtheme of one theme from the GP study.

Table 15: Comparing the results from the expert qualitative study and the meta-ethnography.

Themes identified in the meta-ethnography (13 themes, 1–13)	Themes identified in the expert qualitative study* (6 themes, A–F)
1. Perceptions of ARTI management	B. Promote guidelines to raise awareness. C. GPs don't feel they need recommendations.
2. GPs' previous experience of ARTI management	C. GPs don't feel they need recommendations.
4. Perceptions of external pressure to reduce prescribing.	A. Involve appropriate and diverse range of expertise. A. Involve GPs in guideline development. B. Evidence base should be clear and current. C. State clear motivations behind recommendations. C. Interventions should acknowledge the importance of clinical judgment.
5. Perceptions of potential conflict with patients	F. Educate patients to support GPs' prescribing.
8. Interventions may allow GPs to reflect on their own prescribing.	C. Interventions should specify how/when practice does not match guidelines. E. Provide opportunities to answer queries and compare practice.

10. Interventions may educate GPs about appropriate prescribing.	D. Health authorities need to work to prioritize education. E. Provide interventions which are appealing to GPs.
11. Interventions may facilitate more patient centred care.	F. Educate patients to support GPs' prescribing. F. Encourage GPs to educate patients.
12. Interventions can be beneficial to implement in practice.	B. Development of recommendations should consider implementation. D. Recommendations should be flexible to work on a local level. D. Design advice to fit with surgery. E. Provide interventions which are appealing to GPs. F. Provide education for patients and other health professionals.

**In column 2, themes underlined represent the whole theme from the expert study, those not underlined represent only a subtheme of one theme from the expert study.*

The results from the meta-ethnography support the idea from previous literature that it may be more advisable to develop multi-faceted interventions than single component interventions. The meta-ethnography indicates what is likely to be acceptable for GPs in terms of intervention content, and interventions are likely to be more effective at changing behaviour if GPs accept and implement them. Multi-faceted interventions are likely to support GPs to a greater extent than single component interventions because they provide different forms of help (e.g. information, education, tools) in different areas (e.g. explanation for patients, diagnosis). In this way multi-faceted interventions can help GPs to change several aspects of their behaviour all of which contribute to more prudent prescribing. Multi-faceted interventions, by their design, are also likely to be attractive for a greater number of GPs than single component interventions. A single component intervention which focuses on reducing GP uncertainty about whether or not to prescribe an antibiotic would not appeal to those GPs who did not have any feelings of uncertainty in their daily practice. Providing an intervention with several components, however, increases the likelihood that a GP will associate their own barriers to prudent prescribing with at least one of the aspects covered by the intervention.

Therefore, in order to engage with a multi-faceted intervention a GP only has to make an association with at least one of many components, rather than identify with one, sole component. Multi-faceted interventions should, therefore, promote engagement from a larger number of GPs than a single component intervention. Working on this basis interventions are likely to have a somewhat cumulative effect where the more components are included, the more likely they are to provide something of use to a GP. The caveat of this, however, is not to be tempted to over complicate interventions or provide too much for a GP to take on which could equally lead to GPs disengaging from an intervention. An ideal compromise may be

to identify two or three components which could address the five aspects identified in the meta-ethnography as crucial to address barriers to prudent prescribing.

Overall, the results of the meta-ethnography provide a comprehensive account of antibiotic prescribing in current primary care practice. The model presented provides evidence which indicates that interventions should strive to incorporate five aspects to address barriers to prudent prescribing. Interventions need to provide opportunities for GPs to acknowledge and reflect on what they currently prescribe, interventions should help provide assistance in identifying which infections require antibiotics to reduce uncertainty, interventions should educate GPs about current evidence on prudent prescribing, interventions should promote patient centred care to help maintain or increase patient satisfaction and interventions should provide benefit and support for GPs through their implementation. Results from the expert study provide an addition to this, highlighting that GPs need consistent messages to promote behaviour change, GPs needed to be made aware of and have easy access to information and that GPs should be involved in intervention development. Developing interventions with these concepts in mind should help to create strategies which are attractive to GPs, are likely to increase uptake and subsequently likely to initiate behaviour change.

7.2.4 Interventions which encourage patient behaviour change

This research has focused on GP antibiotic prescribing behaviour and has thus looked at interventions aimed at GPs. Whilst this is the most important focus, it is also crucial to look at other stakeholder groups, such as the experts interviewed in chapter 5. One group not covered in this thesis is patients. Whilst GP prescribing behaviour is dependent on the decision of the individual GP concerned, it cannot be separated from the patient

presenting to primary care with the RTI. It was not in the scope of this thesis to look at patient perceptions of antibiotic prescribing and their consultations, as this is a substantial segment of the literature which is important in its own right and was not one of the aims of the original research proposal. Although it was not a focus of this research, it is important to consider how research with patients can inform research with GPs. This is especially relevant because the results reported on indicate that one of the main concerns of GPs is how patients react to prescribing decisions and whether patients remain satisfied with consultations when an antibiotic is not prescribed for an RTI. Research carried out with patients can reflect their perceptions of the consultation and establish whether GPs' concerns are warranted.

Previous qualitative studies investigating patients' views in this area have mainly focused on patients' understanding of antibiotic resistance and the correct use of antibiotics. Some studies have shown that patients have a poor understanding of antibiotic resistance and do not realise how they, personally, may contribute to either the problem or solution of resistance (Hawkings, Wood & Butler, 2007; Brookes, Shaw, Sharp & Hay, 2008). However, more recent cross-country studies indicate that patients are aware of the link between antibiotic use and bacterial resistance and acknowledge that overuse of antibiotics is negative for health (Brookes-Howell, Elwyn, Hood, Wood, Cooper, Goossens et al., 2012). These authors state that knowledge about patient perceptions of illness can help to improve patient-clinician communication and help GPs to emphasise what individuals can do personally to help reduce antibiotic resistance and negative effects on public health.

Other research has focused on patients' understanding of what antibiotics are for and for which type of illness they should be used. Cals et al. (2007) found that patients in the Netherlands reported several misconceptions

about when antibiotics were needed for respiratory tract infections. This included almost half of patients believing that antibiotics were effective in treating viruses and 60% of patients believing that antibiotics should be prescribed for “acute bronchitis”. Patients’ beliefs about the effectiveness of antibiotics are naturally associated with whether they are likely to expect them when presenting to primary care with a specific illness. Studies exploring patient expectations, however, suggest that patients do not always expect antibiotics but instead attend primary care consultations to get reassurance from their GP and that it is this reassurance which influences patient satisfaction, rather than the prescribing decision (Welschen et al., 2004; Butler et al., 1998b; Stivers, Mangione-Smith, Elliott, McDonald & Heritage, 2003). This research suggests that GPs may overestimate patients’ expectations about receiving an antibiotic which may lead to GPs prescribing less prudently. The results reported in this thesis indicated that GPs felt that a “minority” of their patients had high expectations for, or demanded, antibiotics. This suggests that over time GPs may have more accurate perceptions about patient expectations and/or have experienced fewer “demands” from patients for antibiotics in more recent years, either of which may help to increase prudent use.

A decrease in patient demand for antibiotics could be a result of interventions aimed at patients and the public. The influence of public campaigns, national and international, may have helped with patient demand for antibiotics across countries. In addition, other patient-focused interventions have previously been developed to try and influence patient attitudes and knowledge towards antibiotics; these include patient education material handed out by the GP, education meetings for patients in their local health centre or different prescribing styles, for example delayed prescription or watchful waiting (Little et al., 2005; Samore, Bateman, Alder, Hannah, Donnelly, Stoddard et al., 2005). A review of this work, however, has suggested that not giving antibiotics or providing a

delayed prescription may work just as well as educating patients and may not necessarily result in lower patient satisfaction (Thoolen, de Ridder & van Lensvelt-Mulders, 2012). This finding presents the idea that patient interventions may not be needed in primary care and that the prescribing style of the physician alone may be enough to help change patients' expectations and consulting behaviour. This finding has important implications. It suggests that patient focused interventions are not needed in primary care and that concentrating on GPs alone would be enough to promote prudent prescribing. This may be beneficial as it may lead to less resource intensive interventions. It is important, however, to consider the GP's reaction to this. If patient education programmes are stopped then it will be the sole responsibility of the GP to educate their patients. This could be beneficial as it means GPs may be more motivated to try and educate their patients if they know it is their responsibility. Alternatively, GPs may feel unsupported by their healthcare system and apprehensive about fitting another "task" into a consultation which is already tight on time.

In addition to this, the results reported in this thesis found that GPs were concerned that some patients would not accept their word that antibiotics were not needed, and stressed that they felt more patient education would support them. "Losing" patients to other doctors because patients do not accept an explanation appeared to be a common concern amongst GPs. Ceasing patient education programmes may run the risk of GPs being overloaded with tasks, delivering a poorer service for patients and patients swapping doctors in order to try and find one which confirms their incorrect perceptions about the necessity of antibiotics. Having a third "voice" or point of reference in the discussion about whether antibiotics are necessary, either in the form of patient education or public campaigns, may help GPs feel more supported in their explanations to patients and may help increase patient awareness and alter illness perceptions.

7.3 Exploring the relationship between the thesis findings and psychological theory

If we accept that multi-faceted interventions are preferable to single component interventions, the results of the meta-ethnography may provide a useful framework from which to work. There are many components which can be included in interventions to change GP behaviour, so how do we know which components will target the aspects that we want to change? Which combination of components will provide an intervention which addresses the five aspects that the meta-ethnography results suggest that interventions need to target to change GP prescribing behaviour?

Whilst designing a multi-faceted intervention may seem straightforward, by just adding two types of intervention together, there is no guarantee that simply designing an intervention which has two or more components will be more effective, acceptable or feasible than an intervention with one component. This is only likely to be true when a researcher can be sure that the two or more interventions, being delivered together, actually "do" different things. Interventions which appear to be very different may still help a GP overcome the same barrier(s), in which case the behaviour change resulting from the use of two components will likely be the same as that from using one component.

One barrier to prudent prescribing, identified in the results presented here, is a GP's belief that they are already a low prescriber and therefore do not need to change their behaviour. Providing a GP with evidence to show that their prescribing could be improved upon could be done in a variety of ways; for example, by using audit and feedback or educational meetings. Both of these can address the same barrier to behaviour change. However,

if one also wanted to address GPs' lack of trust in guideline recommendations, this may be better addressed in an educational meeting where GPs can talk to local peers, rather than receiving text materials from national organisations/governments. In this respect, one intervention type- educational meetings- can address two barriers to prudent prescribing and adding another intervention, audit and feedback, may not provide anything new.

On initial impressions of the types of intervention which are currently used to address GP behaviour, it may seem obvious how each differs from one another, and which types would complement one another, rather than overlap; however, much of the research to date in this area has not focused on the mechanisms by which interventions are changing behaviour. The majority of research has looked at whether interventions are effective or not without trying to explain why interventions are effective. Chapter 2 presented previous research which had explored how psychological theories of behaviour change may be able to explain GP prescribing behaviour and potentially offer ideas about mechanisms by which to influence and change this behaviour. It is these behavioural mechanisms which are crucial to identify if a full understanding of a specific behaviour is to be achieved. Researchers can test the effectiveness of an intervention and then conclude that it is effective at changing behaviour but it is not until one understands how the intervention is working and what exactly is changing "about" an individual, that one understands the cognitions behind the behaviour. Although it was not an initial aim of the meta-ethnography, or of this research, the results of chapter 6 led to the development of a model which depicted common barriers to prudent prescribing which GPs report and aspects of interventions which GPs felt addressed these barriers. These components represent the GPs' cognitions about their prescribing behaviour and, in that respect, mirror psychological theories of behaviour change which map the relationship between cognitions and behaviour.

Comparing the model in chapter 6 with psychological models may contribute to the work examining the relationship between psychological theory and GP behaviour.

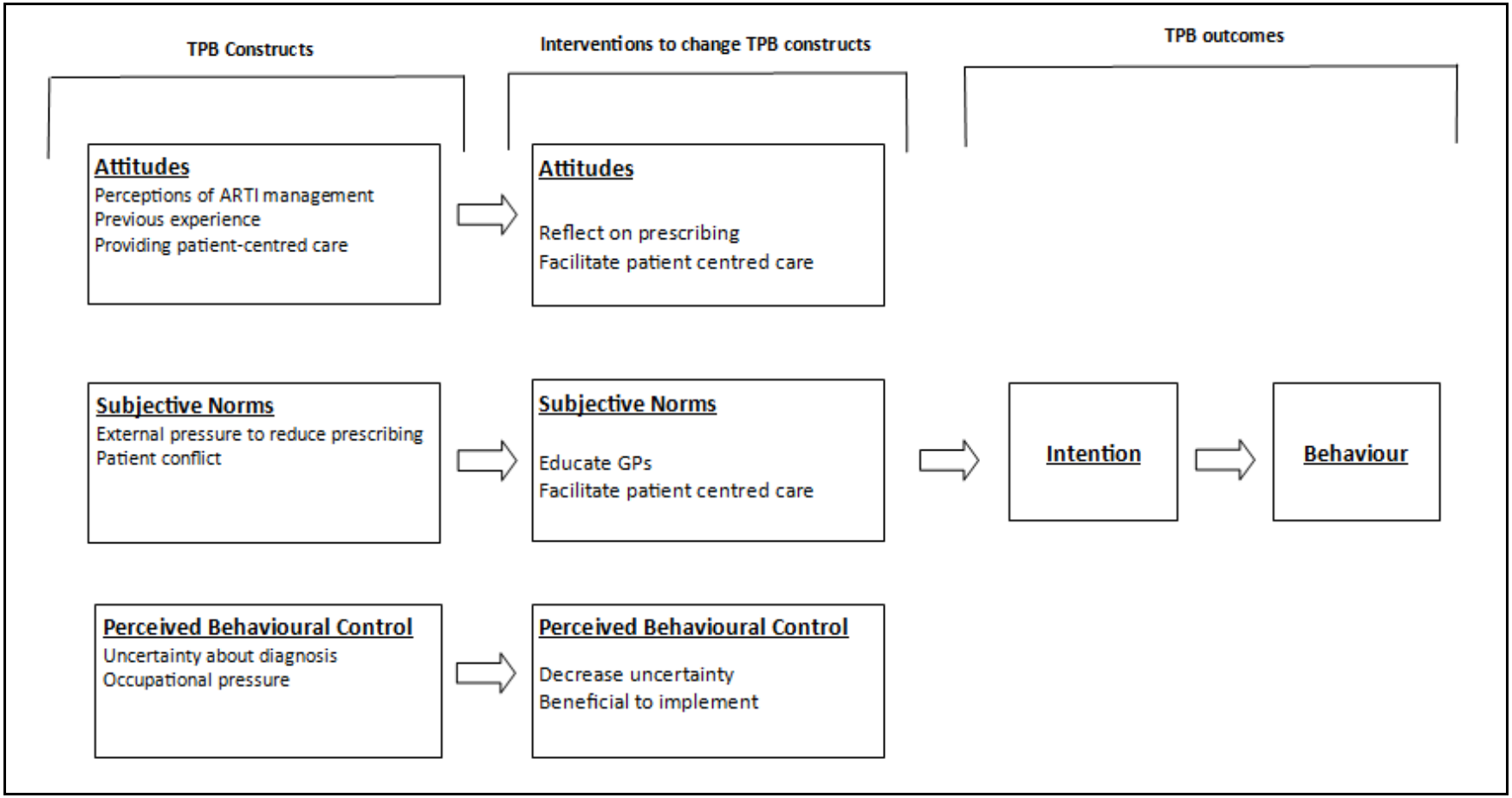
Whilst it is not in the scope of this thesis to examine this in detail, initial ideas can be discussed for consideration for future research. Examining the model in chapter 6, one can look at the themes identified within it to see whether they appear to relate to psychological constructs. Similarities can be noted between some themes emerging from the meta-ethnography and the psychological theories presented earlier in this thesis, in particular the Theory of Planned Behaviour (TPB).The TPB, as described previously, concentrates around three constructs, attitudes, subjective norms and perceived behavioural control (Ajzen, 1985). The themes identified in chapter 6 appeared to reflect these three constructs to a certain extent. The seven barriers to more prudent prescribing, identified in chapter 6, appear to fit with concepts of attitudes, subjective norms and perceived behavioural control in the TPB. The five aspects identified by which interventions can address these barriers, can also be seen as a way to change these TPB constructs. This comparison can be seen in Figure 18.

Each of the themes identified in the model in chapter 6 appears to link to one of the three determinants of intention as defined by the TPB. Three themes emerging from GPs' views appear to link to the TPB construct of attitude. Perceptions of ARTI management reflect whether GPs view an ARTI as a serious or acute infection, which in turn influences their perceptions of whether they feel an antibiotic is necessary and their intention of whether or not to prescribe. Previous experience may also build on GPs' attitudes to prudent prescribing depending on whether or not they have seen patients get better or worse after having not received an antibiotic. Ideas concerning the provision of patient-centred care can feed into a GP's attitudes about antibiotic prescribing as a GP may believe that their role

requires them to “give” something to the patient; GPs who hold this belief about their role may then have higher intentions of prescribing antibiotics for patients.

Both perceptions of potential patient conflict and perceptions of pressure to reduce prescribing could be linked to subjective norms as described in the TPB. GPs indicated that patient satisfaction in consultations was very important to them. Not providing an antibiotic when it is perceived as needed could be seen as less socially acceptable, with patients forming negative judgements of GPs and their skills as a physician. In terms of pressure to reduce prescribing, GPs may be seen negatively by peers if they do not prescribe antibiotics when clinically needed and, as a result, patients suffer more serious consequences; effectively a non-prescribing decision leading to patient harm.

Figure 18. The 13 themes identified in chapter 6 arranged according to constructs from the theory of planned behaviour.



Lastly, two themes from chapter 6 appeared to be linked to perceived behavioural control. GPs indicated that they sometimes felt uncertain about whether or not it was necessary to prescribe an antibiotic for an RTI and that this uncertainty about how symptoms were likely to develop meant they had less control over whether the patient recovered or became more ill. Occupational pressure also indicated that GPs may feel less in control of certain situations. An example of this was whether or not a patient received an antibiotic for their infection. Having peers who prescribed antibiotics less prudently meant that GPs felt less personal control over whether their patients did or did not receive an antibiotic for an infection. Each of these components can be seen to feed into whether a GP intends to prescribe or not, which can then lead on to the actual prescribing behaviour.

The comparison of the model of GPs' views, presented in chapter 6, to the model of the theory of planned behaviour gives an initial insight into potential mechanisms which may help to explain GP behaviour change. Developing on this work further could help to design new approaches and evaluate existing interventions to explain how different components, for example, the provision of near patient tests lead to GP behaviour change.

7.4 Methodological limitations of the current research

7.4.1 Qualitative studies

It was not possible, given the design of both qualitative studies, to undertake concurrent data collection and analysis in all contexts. This meant that data collection could not be led by the data collected in initial interviews. For interviews in the UK, the interviewer identified aspects in initial interviews which were of interest and asked additional questions in later interviews if time permitted. In the other four countries, four

interviewers collected data which had to be translated into English before it could be read and analysed by the researcher in the UK. This meant that transcripts were not received in English until the majority, or all, of the interviews in one country had been carried out. Although no feedback could be given to these interviewers about aspects to follow up in later interviews, interviewers in each country were trained qualitative researchers who were encouraged to follow up anything they felt was important from their initial interviews. In this respect, later data collection could be informed by earlier data collection but only within each country and not across countries. One possible way of avoiding this issue would be for interviewers to have regular discussions whilst undertaking data collection to highlight any important issues emerging from early interviews. This could not have been done in this project because one of the interviewers involved was not confident in speaking English and could not have joined discussions. Interviews were also carried out at slightly different times in each country with interviews carried out over a 12 month period. This meant that data collection in some countries finished well in advanced of other countries starting.

The GPs and experts who took part in the qualitative studies were all volunteers who had to be willing to spend time in order to take part. This is likely to have led to an unrepresentative sample of participants with an interest in this area or with an interest in research. For the GP qualitative study, the original plan was to recruit both high and low prescribers from each country to identify potential differences in views. However, prescribing data of individual GPs could not be obtained in any of the countries, either because it was not available or because it required the permission of the GP. Prescribing data for a GP's surgery was obtained in the UK and guided recruitment; however, there was no guarantee that GPs working in a high prescribing surgery were high prescribers themselves or that GPs working in a low prescribing surgery prescribed fewer antibiotics

on average. For the expert qualitative study, the aim was to sample views from experts who had contributed to many different types of intervention to promote prudent antibiotic use. Identifying potential participants in this study proved to be very difficult and snowball sampling helped to identify additional participants once initial interviews had been carried out. This method of sampling; however, led to experts with similar experience being sampled, and may therefore have missed out on other potential groups of experts with different experience.

7.4.2 Systematic Review and Meta-ethnography

The systematic review aimed to be comprehensive by including all relevant qualitative research which had been carried out worldwide. As a result 12 studies were identified with the majority of research being carried out in Europe. This meant that, although findings were informative in terms of European antibiotic prescribing, the interpretation of findings in order to explain antibiotic prescribing in other countries worldwide had to be more tentative. In the future, more qualitative studies may become available which offer an insight into GPs' views of antibiotic prescribing for RTIs in countries outside of Europe, will allow a more informed understanding.

Meta-ethnography was chosen from a selection of methods available for carrying out a meta-synthesis of qualitative studies. It was chosen because it was a method which helped to retain the context from which individual data sets were obtained, rather than reframing others' results under new interpretations which may lose the original context. Some researchers may argue that, despite this, the method of synthesising qualitative data is inadvisable because the one doing the synthesis does not know the original data. In this respect offering an "interpretation of an interpretation of an interpretation" is seen to be too far removed from the original participants' viewpoint and therefore open to more misconception.

As the results presented in chapter 4 were able to be included in chapter 6, it was possible to explore how well the detail of the results of the GP qualitative study were incorporated and reflected in the meta-ethnography. As the systematic review identified published papers, it was the published format of the results of the GP study which were included in the meta-ethnography. This meant a less detailed description of the results fed into the review. Whilst the GP results fed into nine of the themes identified in the meta-ethnography, the additional four themes emerging from the results of other papers included in the review were also familiar in the data reported in chapter 4. Perceptions of ARTI management, GP's previous experience of ARTI management and providing patient centred care were all relevant to the results of the GP study; however, these were not issues which were emphasized in the published copy of the study. The restricted length of journal articles and authors' desire to emphasise the findings of most interest to an audience, rather than report all findings, may lead to readers being unaware of some findings of a study. This has implications for reviews of this kind as it is not possible to know whether more detail has emerged from data collected than has been reported in a publication. In an ideal situation, it may be more appropriate for reviewers to carry out a secondary analysis of the original data rather than the reported results of a study. This method may have more support from qualitative researchers in general as it then reverts to researchers making their own interpretations of original data, rather than "interpretations of interpretations of interpretations" (p. 63).

7.5 Implications for practice and research

7.5.1 Most recent research on GPs' views of antibiotic prescribing

Since the first qualitative study in this thesis was carried out, three additional studies have explored GPs' views on interventions aimed at promoting more prudent antibiotic prescribing in primary care.

Similarly to the findings reported in chapter 4, Wood, Brookes-Howell, Hood, Cooper, Verheij, Goossens et al. (2011) reported that GPs from nine countries held similar views about using a point of care test to help reduce unnecessary prescribing. The countries in which the GPs worked were Belgium, Hungary, Spain, Wales, Poland, Italy, England, Norway and the Netherlands and this selection contained countries where POCTs were common in general practice (e.g. Norway), as well as countries where POCTs were not routinely used (e.g. Poland). For GPs in countries where POCTs were not used, clinicians were asked their opinions about the theoretical use of tests in their practice. Wood et al. (2011) found that clinicians' views between countries were similar despite differences in experience of using the tests. GPs felt that tests were useful in managing patient expectations for antibiotics but felt there were problems interpreting test results, problems with test performance, the amount of time to carry out tests and the cost of implementing tests into usual practice. Wood et al. (2011) concluded that POCTs were viewed as acceptable for implementation in general practice by GPs in all the countries but that this could be improved upon if tests were able to be made to be quicker, more reliable, simpler and cheaper. In this example, GPs were seen to hold consistent views about an intervention which influenced what happened in the context of individual consultations. This supported the findings of the research reported in this thesis where GPs

held consistent views about interventions which influenced individual RTI consultations.

As a continuation of the European project which funded the work in this thesis, a research project was set up to develop a multi-national European intervention to promote prudent antibiotic prescribing, by GPs for adults consulting with acute cough. This project involved the design and development of a web-based intervention offering GPs training in the use of a near patient C-Reactive protein test (CRP test) and communication skills with the use of a patient booklet. Anthierens, Tonkin-Crine, Douglas, Fernandez-Vandellos, Krawczyk, Llor et al. (2012) explored GPs' views of a pilot version of the web-based intervention, to assess whether GPs thought the website was acceptable and feasible for use in their own context. The authors found similar views between GPs across five countries, UK, Spain, Poland, Belgium and the Netherlands, with GPs finding the intervention acceptable and feasible. Differences in views arose when GPs from Poland and Spain felt that the intervention could not help them in situations where patients had obtained antibiotics prior to the consultation, mirroring findings reported in chapter 4. In addition, GPs from Belgium and Poland highlighted potential difficulties with following the intervention when they felt their patients presented very early on in their illness, within the first three days of having a cough, which made it harder to diagnose the illness even with the help of a CRP test. Both these differences in views between countries reflected specific sections of the intervention the GPs had been given and illustrate how important it is for all aspects of an intervention to be tailored to the context in which it is being implemented. The results of this qualitative study were able to be fed back into the design and development of the intervention in order to make it more feasible for use in an RCT. The intervention was tested across six countries in 2011 and quantitative results indicated that GPs who received either CRP training,

communication training or both types of training prescribed significantly fewer antibiotics than a control group (Little et al., in preparation).

In a second qualitative study, with GPs who had taken part in the RCT to test the effectiveness of the intervention, Anthierens, Tonkin-Crine, Cals, Yardley, Brookes-Howell, Fernandez-Vandellos et al. (*unpublished manuscript*) explored GPs' views of following the intervention in practice. Again, authors found a majority of similarities in GPs' perceptions of the CRP test and communication skills training across countries. Minor differences appeared when GPs from Poland, the Netherlands and Belgium, reported that the example communication skills provided in the intervention did not fit with their usual consultation style. In addition, although GPs from all countries had problems using the CRP test, GPs in Belgium had particular difficulty incorporating tests into practice because they worked single-handedly. GPs in other countries were able to ask nurses or healthcare assistants to carry out tests to prevent delays with other consultations. Again, these examples provide evidence that GPs' views of interventions are often similar across countries and that GPs are supportive of the use of interventions, but that differences arise when fitting interventions into the context of different countries. These studies also help to expand on previous research by focusing on a particular intervention, rather than asking GPs about interventions theoretically.

7.5.2 Implications for promoting more prudent antibiotic prescribing through research and practice

The results reported in this thesis indicate that healthcare professionals' views across countries remained similar in factors which related to the context of the consultation; however, differences emerged in healthcare professionals' views when they considered factors outside of the consultation, more relevant to the healthcare systems in which they

worked. More recent research, asking GPs' views on a specific intervention have provided largely consistent results but have also indicated that differences in views can arise in terms of the context of the consultation as well (Anthierens et al., *unpublished manuscript)*. This collection of research appears to suggest that, in general, GPs have consistent views about types of interventions to promote prudent antibiotic use and that this research can support the development of an intervention for international use. The views on a single, specific intervention, however, may be more likely to highlight differences between countries as GPs require interventions to closely match both the consultation, and healthcare organisation, in which they work. Consequently, it is important for any intervention to address the consistent views amongst GPs from different countries and then to identify any contextual issues which may be relevant to the healthcare system present in individual countries and tailor an intervention appropriately. In this sense, it could be appropriate to have one intervention "template" for use by all, which can then be amended to fit with different contexts. The most recent research in this field has made a start at exploring interventions designed for use in multiple countries. The continuation of this field will hopefully be able to tell us more about whether interventions can be effective across countries as well as widen the scope of European research to countries for which there is no current data on GPs' views.

The similarity in views found in the studies presented in this thesis do not help to explain the national variation in prescribing shown in previous research (Goossens et al., 2005). The results from chapter 4 indicated that all GPs felt that they could prescribe more prudently in some situations. This indicated that it is not the case that some GPs are prescribing in line with guidelines all of the time and some GPs are not; it is more true to say that all GPs are prescribing unnecessarily at least some of the time. The difference in national prescribing levels between countries is likely to be a result of all GPs doing this to a greater or lesser degree in some countries

than others. France was included in the studies in chapters 4 and 5 because it was shown to have high rates of antibiotic prescribing compared to the rest of Europe, yet the GPs and experts working in France reported similar views and experiences as GPs in the UK, which was considered the lowest prescribing country out of the five studied. One reason for this may be selection bias as a result of the sample obtained for both studies, discussed under the limitations above. An alternative or additional explanation may be that a GP's view of what is "acceptable" prescribing may differ between countries. All GPs who took part in the study in chapter 4, and many who took part in chapter 5 who were GPs as well as experts, confessed that they sometimes prescribed antibiotics when they were not necessary. All GPs felt that this happened only in the "minority" of patients presenting with an RTI; however, there may be great variation in what GPs consider a minority and whether these perceptions of frequency are a true representation of reality. These perceptions may also be different between GPs from different countries. A minority which is 5% may be seen as acceptable by GPs working in the UK, whilst a minority of 35% may be seen as acceptable by GPs working in France, reflecting the general culture of prescribing in each country. Whether such a difference exists is a possibility for future research to investigate.

The results reported in chapter 6 supported the finding of consistent views between GPs across countries; however, the review also included two studies which had taken place in non-European countries, extending the scope of investigation. These studies were included in the systematic review to ensure that the review was comprehensive and covered all available literature. It was an interesting finding in itself that only two of the studies included were carried out in non-European countries. This highlights the interest in this field by European researchers and also indicates the high calibre of European work, making the focus of this thesis very relevant. The non-European studies were found to present very similar

findings to the European studies and were equally represented in the final emerging themes. With only two examples, however, it is difficult to assess how representative these results are for other countries but this similarity gives some initial insight into the possible associations between GPs' views inside and outside of Europe. When one considers that the similarities in views reported in this thesis appeared to stem from GPs working within similar contexts in terms of their individual consultations, the findings may also apply to other countries where similar consultation styles are used. This goes some way to suggesting that the results of this thesis may not apply to Europe only. Additional research carried out in such other countries will help to inform this theory.

Chapter 5 reports on data from experts who designed and delivered interventions to GPs their views on what types of intervention content and which methods of intervention delivery they felt were feasible for general practice in the country in which they worked. The exploration of the views of this participant group was seen to be particularly helpful with providing insights into how interventions could be developed. For GPs, the content of the intervention was the most important thing, as it influenced whether they wanted to follow an intervention and whether they felt it was going to be useful. The experts interviewed had a greater knowledge of how to implement interventions, a factor which influences whether GPs are able to access an intervention in the first place. The inclusion of experts' views helped to identify the limits of GPs' views and highlight the benefit of involving other stakeholders. Similarly to patients, experts who design and deliver interventions can provide a unique contribution in the discussion of how to reduce antibiotic prescribing and resistance. Future research may benefit from the inclusion of this group of professionals alongside research with GPs and patients.

Many of the experts were GPs themselves which was not expected prior to the study being carried out. As a result of this, experts' views were found to be very similar to the views of GPs across each country of interest. It was interesting to note that the proportion of experts who were also qualified GPs was different in the UK than in the other four countries studied. Experts from the UK were mainly professionals who had helped to develop guidelines for appropriate management of RTIs in primary care; however, many of them were qualified in a secondary care speciality. This difference may give an advantage to guideline development in the UK because the process may be more likely to involve experts from different disciplines and therefore may have the opportunity to be more comprehensive and include a broad evidence base. This may also, however, work as a negative because, without the input from an expert who is also a qualified GP, guidelines may end up being too far removed from primary care practice. Experts from the UK were the first participants to be recruited in the qualitative study and this difference in expert specialty was not obvious to the research team until participant data was collected from other countries once all interviews had been carried out. Future research could explore the differences highlighted between these participant groups to explore how guideline development may differ between countries, whether that reflects the evidence base used to support guidelines and subsequently whether this represents any differences in recommendations for the management of RTIs.

One aspect which the healthcare professionals interviewed for this thesis were concerned with was the patient's reaction to various interventions. Only a few studies have explored patients' views of interventions aimed to promote prudent antibiotic prescribing by GPs. Wood et al. (2011) explored patients' views of the use of a point of care test (POCT), a CRP test, in their consultations for LRTIs. Patients reported that they trusted the test results and their doctor when told the test was necessary. In addition, some felt it

saved time and money when blood did not have to be sent to a lab for tests. Others, however, felt anxious having the test because of their dislike of needles and some felt it took too long to carry out in consultations. The authors found that patients, on the whole, accepted the use of tests in their consultations and were happy for doctors to use tests when they felt it was necessary. In a separate study, Francis et al. (2008) explored parents' views of a booklet which gave advice about managing LRTIs in young children to help develop the content of the booklet and make it more acceptable for parents. They found that parents asked for more information than initially anticipated, particularly in reference to differentiating between usual signs for RTIs and ones which could indicate more serious complications. In a third example, Tonkin-Crine, Anthierens, Francis, Yardley, Brugman, Fernandez-Vandellos, et al. (*unpublished manuscript b*) explored patients' views of a CRP test and patient booklet in consultations for acute cough across six European countries. The authors found general acceptance by all patients of both types of intervention but that patients particularly favoured the booklet which they could refer to once they had left the GP consultation. These studies indicate that patients are content for intervention materials or equipment to be introduced into their consultations as long as their purpose is explained and patients' concerns are listened to.

These examples have provided useful information to assess whether intervention materials designed to change GP behaviour are acceptable for patients for use in consultations. Although GPs may find an intervention appealing and useful in practice, patients may not accept changes to their usual consultations. This may be in terms of materials they are given, equipment which is used, such as near patient test, or anything which impacts on the length of the consultation or the (number of) healthcare professionals they see. Something which is unacceptable to patients is very unlikely to be used by GPs regardless of how much it may benefit them in

other ways. At present this type of research is limited to the studies above; however, it seems advisable that the development of future interventions for GPs should follow such exploration of patients' views as well. Overall, these results indicate it is important to consider both GP and patient studies in order to compare results and to get a broader picture of what is happening in RTI consultations and to find out what is likely to work best in practice.

In summary, there are multiple opportunities for future research to extend on current studies and expand on the findings reported in this thesis and other work. Research has already started looking at the possibility of creating an intervention to promote prudent prescribing in multiple countries. The extension of this with different interventions and the inclusion of different countries, possibly outside of Europe, will help to provide more information on whether or not multi-national interventions are feasible. Studies which explore GPs' views of prescribing may benefit from obtaining more information about the prescribing practices of their participants. This may not be possible in all countries when data are not available, but in others GP consent or other ethical approval may allow such data to be collected. The inclusion of other stakeholder groups is also likely to be beneficial for understanding the broader context of prescribing. Patients are the crucial variable in RTI consultations and any intervention which allows their needs to be met, as well as the needs of the GP, is likely to be more acceptable and feasible in practice. Finally, it is crucial for any intervention to be testable, not only in whether it is able to change GP behaviour, but in how it is working to change behaviour. Not exploring these mechanisms of change restricts researchers' understanding of how interventions are working and make approaches less flexible by "missing" components of interventions which are potentially exchangeable. Psychological theories of behaviour change appear to have some power at explaining GP behaviour change and the exploration of these in this area,

along with models from any other relevant disciplines, may provide a stronger theoretical basis which is lacking from some current interventions.

7.6 Conclusions

The research presented in this thesis confirmed that making decisions about the prescription of antibiotics for RTIs in primary care is complex. It highlighted the barriers to prudent antibiotic prescribing which GPs can experience in practice and how the decisions GPs make about prescribing for RTIs are influenced by multiple factors, only one of which are primary care guidelines. This research found that GPs who work in different European countries hold similar views of antibiotic prescribing for RTIs and of interventions aimed at promoting prudent antibiotic use. The barriers to prudent prescribing experienced by GPs are often a factor of the consultation between the patient and the GP; either being related to one of these participants of the consultation or the disease with which the patient is presenting. These barriers, resulting from the context of the consultation, are most likely relevant for GPs across countries because this context does not change. GPs see patients in the same consultations, regardless of where they work. Differences in views appear between GPs from different countries when the broader healthcare context is considered. This broader context can influence GPs' perceptions of how much support they have to prescribe more prudently and to what degree other health professionals are working towards the same goal. The thesis presented a model which identified common barriers to prudent prescribing and indicates how these barriers can be addressed by interventions. Continued research in this field will likely expand on this, providing a framework by which to assess interventions and explain how effective interventions differ from those which are ineffective, as well as creating further possibilities for investigating how psychological theory can explain GP behaviour.

Appendices

APPENDIX A: Information for GPs taking part in the qualitative study.

Participant Information Sheet - GPs

Study Title: CHAMP: Investigating the knowledge and attitudes of general practitioners and policy makers on guidelines for the management of respiratory tract infections.
Researchers: Professor Paul Little, Professor Lucy Yardley, Miss Sarah Tonkin-Crine
Ethics Reference: 08/H0502/118

You are being invited to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. The following information details the purpose of this study and what will happen to you if you take part. Please ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?
The purpose of this study is to investigate the attitudes and opinions of GPs and policy makers (guideline developers and prescribing advisors) on current UK guidelines for prescribing antibiotics. Information collected will be used to inform future guideline development and to aid health care professionals in incorporating recommendations in to everyday practice.

Why have I been invited?
GP's have been invited to take part if they are currently working within a surgery in a local PCT. Surgeries have been selected based on their location, number of GPs in the practice and according to their overall prescribing data.

What will happen to me if I take part?
If you consent to take part in the research you will be required to take part in an interview lasting approximately 1 hour where you will have the opportunity to discuss your thoughts on primary care guidelines. This can be done in person (if viable) or can be carried out by phone at an appropriate time. All interviews carried out will be tape recorded regardless of the method of interviewing. The information will be anonymised and treated with strict confidentiality. Only the project researchers (named above) and a professional transcriber will have access to the tapes and transcripts. To reimburse you for your time you will receive £70.00 for your participation in the interview.

What will happen to the results of the interviews?
As a qualitative study, the transcripts of all participants will be analysed by the researchers, with recurrent themes identified and listed. Anonymous quotations from the interview

transcripts will be chosen to illustrate key themes. The tapes and transcripts will be kept in a secure filing cabinet for 15 years, in accordance with Data Protection standards.

What are the possible benefits in taking part?
You are unlikely to directly benefit yourself from taking part in the study. The information collected will help with the planning and development of future primary care guidelines and the implementation of these by general practitioners.

Do I have to take part?
Participation in this research is entirely voluntary. It is up to you to decide. If you decide to take part you are still free to withdraw at any time, without giving a reason.

What will happen if I don't want to carry on with the study?
You are able to withdraw from the study at any time without giving a reason.

What if there is a problem?
If you have any complaints about the conduct of this study or any people involved in it, you may write to or ask to speak to the researchers who will do their best to answer your questions (Contact no: 02380 240180). If you remain unhappy and wish to complain formally you can do this through the NHS complaints procedure.

Will my taking part in this study be kept confidential?
All interviews will be recorded on audio tape and transcribed. All data will be held on a secure site, only identified by a code number, with personal information removed. Your name will not be used in any reports or publications or given to the sponsor of the project or passed on to any other person.

What will happen to the results of the research study?
Your details will not be identified in any report or publication. Nothing you say will be connected to your name, it will be anonymous. Audio-taped recordings of the interviews will be stored securely. As Research Sponsor the University of Southampton are the 'owners and custodians' of the data; their policy is to keep all source data (including tapes) for 15 years and then destroy them.

Who is organising and funding the research?
The research is funded by the European Commission and is sponsored by the University of Southampton.

Who has reviewed the study?
This study was given a favourable ethical opinion for conduct by Southampton and South West Hampshire Research Ethics Committee A.

If you would like to take part or would like more information, please reply to Sarah Tonkin-Crine at S.K.Tonkin-Crine@soton.ac.uk or Tel: 02380 240180.

APPENDIX B: Consent form used for general practitioners taking part in the qualitative study in chapter 4.

Consent Form

Study Title: CHAMP: Investigating the knowledge and attitudes of general practitioners and policy makers on guidelines for the management of respiratory tract infections.
Researcher: Professor Paul Little, Miss Sarah Tonkin-Crine
Ethics Reference: 08/H0502/118
Participant Identification Number:

Please *initial* boxes

1. I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without affecting my employment and without my legal rights being affected. ☐

3. I agree to take part in the study and understand that only the research team will have access to the interview data. ☐

4. I agree to take part in an interview which will be audio taped. ☐

5. I agree to anonymous quotations from my interview transcripts being used in the presentation of the study findings. ☐

6. I understand that all information collected will be anonymised and kept in a secure filing cabinet for 15 years. ☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of Person taking consent	Date	Signature

APPENDIX C: Interview guide used for semi-structured interviews with GPs in chapter 4 (English version).

Interview Guide A: Health Professionals

Study Title: CHAMP: Investigating the knowledge and attitudes of general practitioners and policy makers on guidelines for the management of respiratory tract infections.
Researchers: Professor Paul Little, Professor Lucy Yardley, Miss Sarah Tonkin-Crine
Ethics Reference: 08/H0502/118

We are carrying out research to compare guidance on antibiotic prescribing across different European countries. Our aim is to find out what works well and what does not work so well, and why. We are interested in what experiences you may have had of guidance on antibiotic prescribing for respiratory infections, and *your* views of this guidance.
First I will be asking about your views of antibiotics and your views and experiences of the content of the guidance. I will then ask about your views and experiences of strategies to help you follow the guidance.

Part A
1. What are your views of prescribing antibiotics for respiratory infections?

2. What are your views of providing guidelines for prescribing antibiotics?

3. Can you tell me about any guidelines or other forms of advice or recommendations you have received?
(prompts e.g. published national or local guidelines, seminars/talks, advice from senior colleagues/managers. Start with any personal experiences, then ask about guideline identified as one they should be aware of/using e.g. national or recent guideline)
Guideline 1:
Guideline 2:
Other advice:

For each different form of guidance mentioned / presented ask:

4. What did you think of these guidelines (advice/recommendations)?
5. How did you feel about putting them into practice? OR How did it go, putting it into practice?
6. How do you think your colleagues felt about the guidelines?
7. Can you describe any situations in which you felt that following the guidelines would be / was helpful?
8. Can you describe any situations in which you felt that following the guidelines would not be / was not helpful?
9. How do you think patients felt about you following these guidelines?

10. How do you think the guidelines might have been improved?

11. What could be done to make it easier to follow the guidelines?

Summary of Guideline 1:
NICE Guidance on RTIs (2008)
One (other) guideline is from NICE, which concerns antibiotic prescribing for respiratory infections in primary care.

Are you familiar with or have you received this guideline?
If yes, continue with questions.
If no, continue below.

First I will read you some summary points from the guideline and after each one I will ask about your views of that point.

- The NICE guidance recommends three strategies when managing a respiratory tract infection, no prescription, a delayed prescription or an immediate prescription.
- The guidance recommends giving an immediate antibiotic when the patient is at risk of complications.
- Recommendations also suggest considering an immediate of delayed prescription when the patient has certain risk factors, i.e. children younger than 2 years with bilateral otitis media.
- The guidance recommends no prescription or a delayed prescription for all other cases of acute otitis media, acute pharyngitis, acute rhinosinusitis, common cold or acute bronchitis.

Summary of Form of Advice 1:
Educational Meetings
One (other) form of advice GPs may come in to contact with is Educational Meetings which help to provide advice on prescribing antibiotics for respiratory infections in primary care.

Have you received any advice on antibiotic prescribing in this way?
If yes, continue with questions.
If no, continue below.

First I will read you a short description of Educational Meetings then I will ask about your views on this as a way of giving advice to GPs.

- Educational meetings involve any conference, workshop or training that a GP may have attended away from their practice which discusses the prescription of antibiotics for RTIs.

Part B

Now I would like to ask about your views and experiences of strategies to help you follow the guidance.

1. Can you tell me about any experiences you have had of strategies to help you follow the guidelines?

(prompts e.g. formal interventions, seminars/talks, staff meetings, audit / feedback, posters or leaflets, media campaigns)

Note: Clarify which specific guideline or specific recommendations each strategy was concerned with.

Strategy 1:
Strategy 2:
Strategy 3:

For each different strategy mentioned and for each type of strategy not mentioned but identified by systematic review as effective ask:

2. What did you think of this strategy?
3. How did you feel about using the strategy / putting it into practice? OR How did it go, using the strategy / putting it in to practice?
4. How do you think your colleagues felt about the strategy?
5. Can you describe any situations in which you felt that following the strategy would be / was helpful?
6. Can you describe any situations in which you felt that following the strategy would not be / was not helpful?
7. How do you think patients felt about you using this strategy?
8. How do you think the strategy might have been improved?
9. What could be done to make it easier to use the strategy?

Summary of Strategy 1:

Educational Materials to Practice Patients

One (other) strategy which GPs may come in to contact with is providing educational materials to practice patients, which aims to provide support to GPs in following guidelines on prescribing antibiotics for respiratory infections.

Have you had any experience of a strategy like this?
If yes, continue with questions.
If no, continue below.

First I will read you a short description of providing educational materials to practice patients then I will ask about your views on this as a way of supporting GPs to follow prescribing guidelines.

- Practices are provided with educational materials aimed at all patients in a practice to use where they feel appropriate, for example leaflets, posters and/or booklets.

- Materials can give information on when antibiotics are needed, when they are not needed and their side effects.

Summary of Strategy 2:

Financial Incentives

One (other) strategy which GPs may come in to contact with is financial incentives which aim to make following guidelines on prescribing antibiotics for respiratory infections more desirable for GPs.

Have you had any experience of a strategy like this?
If yes, continue with questions.
If no, continue below.

First I will read you a short description of an example of a financial incentive then I will ask about your views on this as a way of supporting GPs to follow prescribing guidelines.

- GPs are provided with a document giving specific guidelines on the prescription of antibiotics, encouraging prudent use, for relevant diseases.
- GPs receive a financial bonus for taking part in the intervention which is independent of their prescribing behaviour.
-

GP Demographics:

Age:
Gender:
Years as a practicing GP / Years since qualified:
Years in current surgery/location:
Number of GPs in current surgery/location:
Whether involved in teaching/training:

City or rural location:

Deprivation level of local area (if available):

High or low prescriber (if available):
If GP took part in GRACE 08, percentage of people prescribed antibiotics:

Any other relevant information:
(i.e., specific interest in RTIs, work on guidelines, interest in prescribing)

APPENDIX D: Participant information sheet used in the expert qualitative study in chapter 5.

Participant Information Sheet

Study Title: CHAMP: Investigating the knowledge and attitudes of general practitioners and policy makers on guidelines for the management of respiratory tract infections.
Researcher: Professor Paul Little, Miss Sarah Tonkin-Crine
Ethics Reference: 08/H0502/118

Part 1
We would like you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Part 1 tells you the purpose of this study and what will happen to you if you take part. Part 2 gives you more detailed information about the conduct of the study. Please ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?
The purpose of this study is to investigate the attitudes and opinions of GPs, academics and guideline developers on the current UK guidelines for prescribing antibiotics. Information collected will be used to inform future guideline development and to aid health care professionals in incorporating recommendations in to everyday practice.

Why have I been invited?
You have been invited to take part as you have been identified either as a GP currently working in primary care or as an academic/policy maker who has previously contributed to guideline development.

What will happen to me if I take part?
If you consent to take part in the research you will be required to take part in an interview lasting approximately 45 minutes where you will have the opportunity to discuss your thoughts on primary care guidelines. This can be done in person (if viable) or can be carried out by phone at a convenient time. All interviews carried out will be tape recorded regardless of the method of interviewing. The information will be anonymised and treated with strict confidentiality. Only the Chief and Principal Investigator's (Professor Paul Little, Sarah Tonkin-Crine) and a professional transcriber will have access to the tapes and transcripts.

What will happen to the results of the interviews?
As a qualitative study, the transcripts of all participants will be analysed by the researchers and recurrent themes identified and listed. Anonymous quotations from the interview transcripts will be chosen to illustrate key themes. The tapes and transcripts will be kept in a secure filing cabinet for 10 years, in accordance with Data Protection standards.

What are the possible benefits in taking part?
You are unlikely to directly benefit yourself from taking part in the study. The information collected will help with the planning and development of future primary care guidelines and the implementation of these by general practitioners.

Do I have to take part?
Participation in this research is entirely voluntary. It is up to you to decide. If you decide to take part you are still free to withdraw at any time, without giving a reason.

This completes Part 1. If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2
What will happen if I don't want to carry on with the study?
You are able to withdraw from the study at any time without giving a reason.

What if there is a problem?
If you have any complaints about the conduct of this study or any people involved in it, you may write to or ask to speak to the researchers who will do their best to answer your questions (Contact no: 02380 240180).

Will my taking part in this study be kept confidential?
All interviews will be recorded on audio tape and transcribed. All data will be held on a secure site, only identified by a code number, with personal information removed. Your name will not be used in any reports or publications or given to the sponsor of the project or passed on to any other person.

What will happen to the results of the research study?
The results will be written up at the end of the study for publication in scientific journals and conference presentation. Your details will not be identified in any report or publication. Nothing you say will be connected to your name, it will be anonymous. Audio-taped recordings of the interviews will be stored securely. As Research Sponsor the University of Southampton are the 'owners and custodians' of the data; their policy is to keep all source data (including tapes) for 15 years and then destroy them.

Who is organising and funding the research?
The research is funded by the European Commission and is sponsored by the University of Southampton.

Who has reviewed the study?
This study was given a favourable ethical opinion for conduct by the University of Southampton.

If you would like to take part or would like more information, please reply to Sarah Tonkin-Crine at S.K.Tonkin-Crine@soton.ac.uk or Tel: 02380 241080.

APPENDIX E: Consent form used in the expert qualitative study presented in chapter 5.

Consent Form

Study Title: CHAMP: Investigating the knowledge and attitudes of general practitioners and policy makers on guidelines for the management of respiratory tract infections.

Researcher: Professor Paul Little, Miss Sarah Tonkin-Crine

Ethics Reference: 08/H0502/118

Participant Identification Number:

		Please *initial* boxes
1.	I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2.	I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without affecting my employment and without my legal rights being affected.	☐
3.	I agree to take part in the study and understand that only the research team will have access to the interview data.	☐
4.	I agree to take part in an interview which will be audio taped.	☐
5.	I agree to anonymous quotations from my interview transcripts being used in the presentation of the study findings.	☐
6.	I understand that all information collected will be anonymised and kept in a secure filing cabinet for 10 years.	☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	
Name of Person taking consent	Date	Signature

APPENDIX F: Interview guide used in the expert qualitative study presented in chapter 5.

Interview Guide B: Policy Makers

Study Title: CHAMP: Investigating the knowledge and attitudes of general practitioners and policy makers on guidelines for the management of respiratory tract infections.
Researchers: Professor Paul Little, Professor Lucy Yardley, Miss Sarah Tonkin-Crine
Ethics Reference: 08/H0502/118

We are carrying out research to compare guidance on antibiotic prescribing across different European countries. Our aim is to find out what works well and what does not work so well, and why. We are interested in what involvement you may have have had in developing, disseminating or implementing guidance on antibiotic prescribing, and *your* experiences and views of the guidance, and its development and implementation.

First I will be asking about your views and experiences of the development of the content of the guidance, and then I will ask about your views and experiences of the development and implementation of strategies to help health professionals follow the guidance.

Part A

1. Can you tell me about any guidelines or other forms of advice or recommendations you have been involved with relating to antibiotic prescribing?
(Prompts e.g. published national or local guidelines, seminars/talks/advice to health professionals)

For each different form of guidance mentioned / presented ask:

2. What did you think about the way these guidelines (advice/recommendations) were developed?
3. How did you feel about the way in which they were developed?
4. How do you think your colleagues felt about the guidelines?
5. Can you describe any situations in which you felt that following the guidelines would be / were helpful?
6. Can you describe any situations in which you felt that following the guidelines would not be / were not helpful?
7. How do you think health professionals felt about the guidelines?
8. How do you think patients felt about health professionals following these guidelines?
9. How do you think the guidelines might have been improved?
10. What could be done to make it easier to follow the guidelines?

Part B

Now I would like to ask about your views and experiences of developing, disseminating or implementing strategies to help health professionals follow the guidance.

1. Can you tell me about any experiences you have had of developing, disseminating or implementing strategies to help health professionals follow the guidance?
(Prompts e.g. formal interventions, conferences/seminars/talks, staff meetings, audit / feedback, posters or leaflets, media campaigns)

For each different strategy mentioned (and for each type of strategy not mentioned but identified by systematic review as effective) ask (for developing/disseminating/implementing as relevant):

2. What did you think of this strategy?
3. How did you feel about developing/disseminating/implementing this strategy?
4. How do you think your colleagues felt about developing/disseminating/implementing the strategy?
5. Can you describe any situations in which you felt that implementing the strategy would be / was helpful?
6. Can you describe any situations in which you felt that implementing the strategy would not be / was not helpful?
7. How do you think health professionals felt about implementing the strategy?
8. How do you think patients felt about health professionals implementing this strategy?
9. How do you think the strategy might have been improved?
10. What could be done to make it easier to implement the strategy?

APPENDIX G: One of the search strategies used to identify relevant papers for the systematic review in chapter 6.

Database: EMBASE <1980 to 2010 Week 39>

1 exp general practitioner/ (41663)

2 exp medical decision making/ (54665)

3 antibiotic*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (398464)

4 prescri*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer] (158214)

5 1 and 2 and 3 and 4 (81)

6 limit 5 to english language (73)

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