EVALUATION OF THE DISCHARGE MEDICINES REVIEW SERVICE

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Introduction

The Discharge Medicines Review (DMR) Service

The Discharge Medicines Review (DMR) service was introduced on 1 November 2011 and operates only in Wales. It was developed to improve the management of medicines following the discharge of a patient from a care setting.

The service consists of a two part intervention described below:

Part One - Patient Identification and Medicines Reconciliation

Following discharge from a care setting, patients are identified and recruited to the service either by referral by a healthcare professional, by patients or their nominated carer presenting in the pharmacy, or opportunistically by the pharmacy.

Patients discharged from a care setting are eligible for the service:

- Where the pharmacy is in receipt of the Discharge Advice Letter (DAL) resulting from the most recent discharge, either from the patient, their carer, or from a healthcare professional;

and where any of the following criteria are met:

- The patient’s medicines have been changed during their stay in the care setting from which they are being discharged;
- The patient is taking four or more medicines;
- The patient’s medicine requires dispensing into a multi-compartment compliance device;
- The pharmacist has, in their professional opinion, reason to consider that the patient would benefit from the service.

On 5 January 2012 the Chief Pharmaceutical Officer wrote to all community pharmacies to instruct that:

‘A community pharmacist may initiate a DMR when in receipt of information regarding a patient’s medicines issued from the care setting from which the patient has been discharged. This might include:

- Hospital prescriptions intended for dispensing in the community (i.e. WP10 HP forms);
- Patient reminder cards used to support self administration of medicines;
- Take home prescription details;
- Medicines a patient is given at discharge (recognising that patient’s may not bring some medicines to the pharmacy e.g. fridge or bulky items).

In all cases the pharmacist must satisfy themselves that the list of medicines available is reliable, accurate and up-to-date.’
The part one service must be completed within four weeks of the most recent discharge. The pharmacy provides the patient with information about the service, which includes an explanation that the information may be shared with their GP as necessary.

The patient needs to consent to the sharing of this information in order to access the service. If the patient does not consent to share information with the Local Health Board (LHB) and the NHS Wales Shared Services Partnership then the intervention will not normally be provided other than in exceptional circumstances. Exceptional circumstances may arise when, despite the patient withholding consent to share their information with the NHS, the pharmacist believes there will be significant benefit to patient care from undertaking a DMR. In this situation the pharmacist will need to annotate the claims form accordingly whilst also ensuring no patient specific data is submitted. In all cases the patient must consent to sharing relevant information with their GP.

At this stage the pharmacy will collect relevant information regarding the patient’s medication and check the medicines prescribed by the primary care team following discharge correspond to those the patient should be receiving (as per information from the care setting), and that they are prescribed at the correct dose and frequency. The pharmacist records the relevant information on the forms agreed for the service (referred to in this report as the DMR1 form).

Where the medicines prescribed by the primary care team following discharge do not, in the opinion of the pharmacist, correspond to those the patient should be receiving, the pharmacist must bring this to the attention of the patient’s GP and resolve the discrepancy.

The pharmacist and patient will agree a time and method (i.e. by face to face discussion or by telephone) for the second part of the service.

**Part Two – Support for Adhering to Medication**

The pharmacist and patient, at the agreed time and by the agreed method, discuss the patient’s use of medicines since discharge. The discussion focuses on:

- Whether any problems identified in the first part of the service have been resolved;
- And any changes to the patient’s medicine regimen identified in the first part of the service.

The pharmacist also discusses the patient’s use, understanding and experience of taking their medicines and completes the necessary forms – referred to here as DMR2. The pharmacist provides pharmaceutical care and advice leading to agreed actions which support self care, promote adherence and reduce waste.

The DMR service can be provided by any pharmacy provided:

- The pharmacy meets the minimum premises requirements for providing the Medicines Use Review service;
- The pharmacy contractor has an acceptable system of clinical governance and is complying with any obligation under Schedule 2 to the Pharmaceutical Services Regulations to provide essential services;
- The pharmacy has a Standard Operating Procedure (SOP) in place covering the service;
- The pharmacy contractor has confirmed that all dispensing staff understand the aims of the service, understand the SOP and understand their role, if any, in delivering the service;
The pharmacy contractor has confirmed that service will be provided only by pharmacists that have the Practice Certificate in Medicines Use Review (MUR)\(^1\) and who have completed and signed the Discharge Medicines Review Self Assessment.

It can be seen from this outline that the DMR scheme is a service that could be offered to the general population (as any member of the public may be receiving healthcare) and could be initiated, or initiation prompted, by the patient, General Practitioner or care setting. This design allows great flexibility and encourages variation in operation. The implications of this are discussed in the evaluation.

**The Brief for this Evaluation**

Community Pharmacy Wales (CPW), the organisation that represents community pharmacy contractors in Wales on NHS matters has commissioned this independent evaluation of the DMR service. The intention is to share the findings of this evaluation with the Welsh Government. The evaluation was to examine the benefits and cost effectiveness of the DMR service and to inform decisions relating to the continuation of the service and potential service improvements.

The specific aims of the evaluation as set out in the *Request for a Proposal* (CPW 2012) were to determine if the DMR Service has met the planned outcomes. The planned outcomes are:

- Contribute to a reduction in risk of medication errors and adverse drug events by increasing the availability of accurate information about a patient’s medicines;
- Improve communication between healthcare professionals and others involved in the transfer of patient care, and patients and their carers;
- Increase patient involvement in their own care by helping them to develop a better understanding of their medicines;
- Reduce the volume of medicines that are wasted when unnecessary, or duplicated prescriptions are dispensed;
- Contribute to avoiding medicines-related admission to hospital or care homes which can occur when un-reconciled medicines lead to prescribing or medicines administration errors;
- Better use the skills of pharmacists, recognising the contribution that they can make in optimising medicines use.

In addition CPW were also interested in evaluating a range of other potential outputs and outcomes of the DMR service such as:

- Potential financial benefit to NHS Wales in terms of reduced hospital readmissions;
- The number of potential patient safety events avoided and the financial benefits of this to NHS Wales;
- The financial savings to NHS Wales of medicines that have been stopped, and identified as not required, that would otherwise have been wasted;

\(^1\) The Medicine Use Review (MUR) service includes medicines use reviews undertaken periodically, as well as those arising in response to the need to make a significant prescription intervention during the dispensing process. The service consists of accredited pharmacists, who have successfully completed a competency assessment, undertaking structured adherence-centred reviews with patients on multiple medicines, particularly those receiving medicines for long term conditions. The MUR process attempts to establish a picture of the patient’s use of their medicines - both prescribed and non-prescribed. The review will help patients understand their therapy and it will identify any problems they are experiencing along with possible solutions. [https://www.wcppe.org.uk/community-pharmacy-contract/mur](https://www.wcppe.org.uk/community-pharmacy-contract/mur)
• An estimate of the financial benefits arising from improved adherence to medicine regimens;
• Additional benefits from the DMR service to patients and NHS Wales not currently anticipated in the planned service outcomes.

CPW also suggested the evaluation should seek to identify any barriers to service implementation and how those barriers could be overcome.

**Policy Overview**

In 2009 the Care Quality Commission for England published a report examining the arrangements organisations had in place to ensure the safety of patients who had been discharged from hospital with a change of medication. The report identified:

• Information shared between healthcare providers when a patient moves between sectors is often incomplete and not shared in a timely enough fashion;
• GP’s do not routinely review medication with a patient following discharge, making it more difficult for patients to manage their medicines appropriately;
• Improved medicines management post discharge has been cited as one means of improving the transfer of information between secondary and primary care.

The report summarised that the transfer of patients and their medicines between care settings can lead to:

• Information on changes to medication not being received by the patient’s GP practice;
• Misinterpretation of transferred information;
• Unintended changes in medication;
• Intended changes in medication not being acted upon (e.g. changes in dose or formulation);
• The continuation of medication that had been stopped prior to the transfer;
• Medicines for longer-term conditions being overlooked.

The international evidence of the negative impact on the patient of poor information transfer in transition between care settings is discussed further in the literature review section. Certainly this is an acknowledged difficulty of the NHS in Wales. In 2010 the Welsh Government published *Setting the Direction* the Primary & Community Services Strategic Delivery Programme. Two of its goals were to help create:

• Systems and processes that guide people through services, where individual elements of care are joined-up and easily navigated;
• Sharing high quality information appropriately to inform decision-making.

CPW highlighted the potential benefit to both patients and the efficiency of the NHS of a DMR service in their published manifesto for the May 2011 elections to the National Assembly for Wales. In September 2011 the National Assembly for Wales Health and Social Care Committee held an Inquiry into the contribution of community pharmacy to health services in Wales. In their evidence to the Inquiry CPW again drew attention to the benefits of the Welsh Government introducing a DMR service.
On the 26th October 2011 the Chief Pharmaceutical Officer wrote to all pharmacy contractors outlining changes to the Contractual Framework agreed between Welsh Government and CPW for 2011/12 (these were published as a separate detailed document in November 2011) which included the introduction of a DMR service.

The DMR service can be seen in context as one of a number of initiatives designed to improve care transitions. For example in December 2011 the All Wales Medicines Strategy Group (AWMSG) issued a recommendation to the Medicines and Therapeutics Committees, or similar multi-professional groups within health boards, to promote the provision of better information to patients about their medicines on discharge (e.g. the use of medicines reminder charts). At the same time it urged the Welsh Government to assist in the provision of suitable software for hospital pharmacies so that information did not need to be hand-written and could be provided in an accessible and consistent format.

The NHS Delivery Framework for 2013-14 states that ‘completeness and timeliness of discharge letters’ is a Quality Trigger and will be elevated to a Tier One standard once data sources, and intervention processes have been confirmed. This work stream is being led by the Chief Medical Officer. The All Wales Medicines Strategy Group (AWMSG) is also working to ensure this standard can be reached. Their five year strategy 2013-2018 has the successful roll-out of electronic discharge advice letters across Wales as a key outcome.

**Outline of the Report**

The report begins with the overview of the literature review which places the goals of the DMR scheme and the findings of this evaluation in the wider international context. This allows the reader to assess the findings of the report against this wider evidential base. Chapter Two provides an analysis of the DMR claims. This illustrates factors such as the type of pharmacies taking part in the scheme and the variance in numbers of claims submitted. This is a rich source of information which proves a useful baseline for any further analysis and indicates a number of promising future sources of inquiry. The key findings are summarised at the end of the chapter. Chapter Three presents community pharmacists’ views and experiences of the scheme. The value of the scheme as perceived by this group and barriers faced are analysed and a number of suggestions for potential improvement to the scheme are made. Chapter Four comments on the views of GPs towards the scheme. GPs are one of the most significant stakeholders in the discharge process and this section provides an illuminating insight into their experiences and suggestions for improvement. The next chapter outlines the views of hospital pharmacists and the differing operations of the DMR process across Health Boards. Again a number of suggestions are made for improvement. Chapter Six outlines patients’ experiences of the DMR scheme and the strong value placed by patients on the scheme. Chapter Seven provides the economic evaluation for the DMR scheme where the cost of the resources (such as healthcare professionals’ time) to implement the scheme are weighed against the economic impact (such as avoided use of NHS resources). Chapter Eight proves a useful counterpoint analysis to Chapter Seven in assessing the financial impact of costs inputted and avoided by the scheme.
Methodology

Ethical Considerations

The project was defined by the team (and understood as such by the commissioners) as service evaluation and clinical audit with reference to the meaning of these terms as set out by the National Research Ethics Service.

The intention of the study was to judge current practice and produce information to inform improvement. It questioned the standard the current service intervention has achieved (without any allocation or alteration of the intervention). It analysed existing data including the administration of interview and questionnaire. It did not involve randomisation or require a research ethics committee review. The statistical information analysed by the team did not include patient identifiable data.

As part of the study interviews were sought and undertaken of NHS personnel in six Health Boards (excluding Powys). An explanation of the rationale and methodology of this process is provided later in this section. Therefore a full project outline and application was made for approval as a service evaluation to each of these Health Boards and permission granted by all six by November 2013.

Method Overview

Figure 0.1 provides an overview of the method.
Phase 1: Literature Review

The aim of Phase 1 was to identify relevant background information for the evaluation by completing a structured literature review. This was essential as no pre-service data was available. The review focused on studies in the United Kingdom and other countries where similar services have been introduced in order to identify the factors which can affect the implementation of such a service and to identify baseline data on intervention rates of community pharmacists where available.

Phase 2: Analysis of DMR Claims

The aim of Phase 2 was to analyse the National Electronic Claim and Audit Form (NECAF) data on the DMR claims which had been submitted up to the end of December 2013. This data contained no patient identifiers. The analysis provides descriptive data about the operation of the scheme to date.

Key indicators included:

- To identify the number of completed DMRs submitted from October 2011 until the end of December 2013;
- To measure the number of community pharmacies and pharmacists who have engaged with the DMR service;
- To recount the Health Board from which the patients were discharged from and the patient’s eligibility for a DMR;
- To describe, and compare per Health Board, the number, type and range of discrepancies on the DMR forms (part 1 and 2), including the number where there were no discrepancies identified;
- To identify the proportion and type of recommendations accepted and implemented, as well as identify the number which remain unresolved following the intervention.

Phase 3: Economic Analysis of DMR Interventions & Financial Analysis

The economic analysis estimates the potential reduction in medication errors, adverse drug events, medicines-related admissions and medicines wastage as a result of the DMR service.

The pharmacies (n=25) which undertook the most DMRs up to April 2013 were identified from the NECAF data and all were invited to participate in this phase of the evaluation. DMRs from 12 pharmacies were used. Recruitment of pharmacies was essential as the details of the discrepancy in medication are not supplied on the NECAF summary form but instead are only found on the DMR 1 and DMR 2 forms which are held within the community pharmacy where the DMR was undertaken. The pharmacy once recruited supplied the relevant data to the project team. This did not contain patient identifiable data.

The resulting data was reviewed by a panel of experts including community and hospital pharmacists as well as a general practitioner. Membership of the Panels is listed in Appendix 1. The Panel categorised the predicted outcomes if the intervention not been made using the severity ratings developed by the EQUIP study, namely minor, significant, serious and potentially lethal.

After assessment, each intervention was economically evaluated as outlined overleaf:
1) Cost of the Intervention
The main cost of the intervention is the additional time requirements of community pharmacists, plus any additional time of hospital pharmacists and general practitioners. Pharmacists and other staff (where relevant) were asked to assess the amount of time required in their most recent involvement in DMRs. Quantities were multiplied by relevant unit costs and results presented on a cost per patient and on a year per year basis.

2) Effects of the Intervention
The direct effects of the intervention result from a reduction in adverse drug events, hospital admissions, attendance at A&E departments and wasted medicines. The methods described above provided estimates of these reductions. Quantities were multiplied by relevant unit costs to determine the value of the resources saved to the NHS.

3) Cost effectiveness
Cost effectiveness evidence emerged from a cost utility analysis. This assessed the costs of the intervention, net of cost savings from avoided adverse drug events, hospital admissions and wasted medicines against health benefits to patients expressed as quality adjusted life years (QALY).

This was done using a de novo economic model developed by health economists at Sheffield University which was used to evaluate the cost effectiveness of interventions to prevent medication errors at hospital admission. Although the focus of the earlier application of the model was on admission rather than discharge, these interventions had the same aims as those of the Welsh scheme i.e. medicines reconciliation. We obtained permission from the owners of the intellectual property rights to access a working version of this model and to modify its structure and data as necessary.

In addition, the financial costs and benefits of the service were explored and extrapolated.

**Phase 4: Views of Hospital & Community Pharmacists, General Practitioners and Patients**

This phase comprised interviews with hospital pharmacists, community pharmacists, general practitioners and patients to explore views and experiences of the scheme.

Using the NECAF data, the team identified a range of community pharmacies at the lower and higher levels of service provision, chosen to ensure a geographical spread and range of types of pharmacy (e.g. large multiple/independent/city centre/local community). These pharmacies were contacted and pharmacists invited to participate in a semi-structured interview relating to their views and experiences of the DMR service. Participating pharmacists were asked to provide completed pro forma, providing information on the time taken to undertake recent DMR activities (e.g. time to complete paperwork, undertake DMR, communicate with General Practitioner and pursue any follow-up issues). The semi-structured interviews used a topic guide based around five main areas: communication issues, perceptions of patient knowledge and understanding of medication, the pharmacist’s role, additional benefits of the service and barriers to the service. In addition, the DMR process within the pharmacy was outlined. Interviews were conducted via telephone and were audio-recorded (where consent was obtained), reviewed and coded thematically using constant comparison to review the themes which arose. Where appropriate, sections of text were transcribed verbatim and have been used to illustrate the themes. Of the 14 pharmacists approached, seven pharmacists across four Health Boards agreed to be interviewed. The interviews were carried out in October and November 2013.
Alongside the interviews with community pharmacists outlined above, interviews with hospital based pharmacists were also conducted. A nominated pharmacist lead for the DMR service in six Health Boards (Powys was excluded) was identified and invited to participate in a semi-structured interview. Participating pharmacists were asked to provide completed pro forma from pharmacy colleagues, providing information on the time taken to undertake recent DMR activities (e.g. time to identify suitable patients and initiate the process). The semi-structured interviews used a topic guide based around five main areas: communication issues, perceptions of patient knowledge and understanding of medication, the pharmacist’s role, policy implementation, logistics of running the service, additional benefits of the service and barriers to the service. Interviews were conducted via telephone (one in person) and were audio-recorded and/or notes taken. These were reviewed and coded thematically using constant comparison to review the themes which arose. Where appropriate, sections of text were transcribed verbatim and have been used to illustrate the themes. Six interviews across six Health Boards were undertaken between October and December 2013.

In order to interview GPs an e-mail outlining the project was sent to the Director of Primary Care or other similar senior role in four Local Health Boards requesting GP volunteers for interview. Six interviews were subsequently undertaken across two Local Health Boards. Five of these interviews were with GPs and one was with a practice pharmacist. All interviews took place in November 2013. The semi-structured interviews used a topic guide based around five main areas: communication issues, perceptions of patient knowledge and understanding of medication, the pharmacist’s role, additional benefits of the service and barriers to the service. Interviews were conducted via telephone and notes taken. Thematic analysis, using a combination of inductive and deductive approaches to identify key themes, was utilised.

Finally community pharmacies were asked to distribute an information sheet and consent form to appropriate patients inviting them to participate in a semi-structured interview relating to their views and experiences of the DMR service. Six interviews were conducted across two Health Boards via telephone and notes taken. Thematic analysis, using a combination of inductive and deductive approaches to identify key themes, was utilised.

**Phase 5: Quantifying the Views of Hospital and Community Pharmacists Involved in the Service**

Two questionnaires were developed by the team, for hospital and community pharmacists respectively, informed by the previous phases. Copies of the surveys are attached as Appendix 2 and 3. The survey included statements with the use of a Likert scale for respondents to indicate their level of agreement. Demographic data was also sought including the geographical area (first part of postcode), approximate number of DMRs with which they have been involved (if any), and specialisation (where appropriate). There was also the opportunity for respondents to provide free-format responses to expand on their answers or to provide additional views on the subject.

The invitation to participate in the questionnaire was sent to hospital pharmacists via email using lists of practicing pharmacists who are active on the wards (n=369) and all community pharmacists who were on CPW database (n=704). The covering email provided an overview of the study and invited participants to complete the anonymous survey via an online format (Survey Monkey was used). Reminder emails were sent after two weeks. Resulting data were extracted from Survey Monkey into a Microsoft Excel® spreadsheet and Word® documents for further analysis.
Chapter One – Literature Review

Overview

Many patients leave hospital having had new medicines initiated, doses of existing medicines changed, and medicines stopped. Unintended discrepancies in patients’ medicines after discharge from hospital frequently occur, affecting up to 87% of patients. Patients’ understanding of the nature of and reasons for changes made to their medicines in hospital is often incomplete; hence it is unsurprising that their medicines taking may be different from that intended by the hospital.

Medicines-related problems after hospital discharge are associated with potential and actual adverse health consequences, many of which are preventable. Groups of patients at particular risk include those taking warfarin, those with heart failure and following a hospital admission for acute coronary syndrome (ACS).

The literature shows clear potential to reduce medicines-related problems after discharge and thus a role for Discharge Medicines Reviews (DMRs). There is some evidence from other countries (notably the Netherlands and Australia) that post-discharge medicines reviews are effective in resolving discrepancies and problems in medicines use.

A systematic review of interventions to reduce emergency department (ED) visits and hospital readmissions found some evidence that “bridging” strategies incorporating both pre- and post-discharge components and with a “transitions provider” are effective. Although this review was not specific to medicines this principal finding is also echoed in a 2013 medicines-specific systematic review.

Experience from Australia suggests that successful implementation of DMRs will be more dependent on effective working relationships between community pharmacy providers and general practices than was the case with MUR. In addition the “bridging” strategies of local hospitals will be critical to success including not only accurate discharge medicines information but promotion and active referral to the DMR service.

Many patients admitted to hospital, particularly older people, have multiple co-morbidities and associated polypharmacy. The patient groups who might benefit most from DMR may thus be likely to require a considerable input of time from the community pharmacist. Evidence on likely time needed is sparse with only one study reporting this, a mean of 45 minutes.

Background

In the evaluation proposal we said: “The review will focus on studies in the United Kingdom and other countries where similar services have been introduced in order to identify the factors which can affect the implementation of such a service and to identify baseline data on intervention rates of community pharmacists where available”.

Methods

A structured search of published peer-reviewed literature was used to identify relevant studies; an initial list of key words was reviewed and refined by the research team and the final list is at Appendix 4. The key concepts were patient discharge / transfer of care / care transitions; community pharmacists / community pharmacies; medicines / medication and
medicines/medication review. The databases used were MEDLINE and CINAHL and the search period 1995-2013.

In total some 930 abstracts were retrieved and filtered. Studies in languages other than English were included if they had an abstract in English. All publications were critically appraised for relevance, applicability and quality. Electronic searches were supplemented by personal reference collections, hand searches of relevant journals and conference supplements.

An inclusive policy was applied to the review, incorporating grey literature (for example PhD theses and project reports) as well as peer-reviewed published research studies. In addition to the searches relating to medicines review and patient discharge additional searches were undertaken to identify studies relating to continuity at care transitions, with the aim of scoping the prevalence of medicines-related problems. Other relevant literature including policy documents, NHS reports and other relevant sources relating to MUR and other community pharmacy medicines optimisation services were identified through a combination of sifting reference lists from published papers, personal contacts and internet searches.

**Presentation of Findings**

This chapter will first consider the need for intervention after patients are discharged from hospital before going on to explore studies of the provision and outcomes of post-discharge medicines reviews and then an examination of the factors which may affect the implementation of the DMR service.

**Findings**

1. **Prevalence of medicines-related problems following discharge from hospital**

During a hospital stay many patients’ medicines are changed – new medicines started, dose changes to existing medicines, and some medicines are stopped.

Discrepancies in patients’ medicines following discharge from hospital are an international problem affecting 14-87% of patients.

There is evidence that a considerable further number of medicines changes are made in the 3-4 months after patients leave hospital.

These discrepancies, if unresolved, are associated with an increased burden of ill-health ranging from patient discomfort, through clinical deterioration, to readmission to hospital.

Incomplete and delayed discharge information is experienced by GPs in many countries.

Patients’ medicines may need to be monitored over at least a three-months’ period after discharge.

Unintentional discrepancies in patients’ medicines frequently occurred in all of the countries in which studies were conducted.

The studies are summarised in Table 1.1 overleaf.
Table 1.1: Discrepancies in patients’ medicines following discharge from hospital.

<table>
<thead>
<tr>
<th>Study &amp; Country</th>
<th>Patient Group</th>
<th>Prevalence of Discrepancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coleman et al. 2005</td>
<td>Community-living patients in the US aged 65 years and older and admitted with one of nine conditions</td>
<td>14.1% of patients interviewed at home 24-72 after discharge</td>
</tr>
<tr>
<td>Herrero-Herrero ad Garcia-Aparicio 2011</td>
<td>Patients admitted to a tertiary care university teaching hospital in Spain</td>
<td>87.2% of 945 discharge reports</td>
</tr>
<tr>
<td>Wong et al. 2008</td>
<td>General internal medicine patients (n=150) in Canada admitted for at least 72 hours to a tertiary care teaching hospital</td>
<td>106 (70.7%) patients had at least one actual or potential unintentional discrepancy</td>
</tr>
<tr>
<td>Paulino et al. 2004</td>
<td>Patients attending a community pharmacy after discharge from hospital</td>
<td>108 (24.8%) of 435 patients</td>
</tr>
<tr>
<td>Geurts et al. 2013</td>
<td>100 patients discharged from hospital whose medicines were reviewed in one community pharmacy</td>
<td>73 (73%) patients had at least one discrepancy with a mean of 3 per patient</td>
</tr>
<tr>
<td>Foust et al. 2012</td>
<td>162 patients with heart failure</td>
<td>58.9% patients had at least one discrepancy, many involving high risk medicines</td>
</tr>
<tr>
<td>Garfield et al. 2009</td>
<td>Literature review</td>
<td>11-27% of discharge prescription items and 43% in repeat medication received from the GP; affecting 57% of patients</td>
</tr>
</tbody>
</table>

The percentage of patients affected by medicines discrepancies ranged between 14.1% and 87.2%. The mean number of discrepancies per patient was 3.05. (Geurts et al., 2013) The number of discrepancies increases with the number of medicines the patient is taking at discharge (Cornu et al., 2012; Geurts et al., 2013)The most common unintentional discrepancies found in Wong’s study in Canada were an incomplete prescription requiring clarification (49.5%) and the omission of medications (22.9%) (Wong et al., 2008). A German study reported omitted medications after discharge in 24% of patients.(Mildner and Kramer, 2012) In their US study of patients with heart failure Foust and colleagues (2012) found that incomplete discharge summaries (52.5%) and inadequate instructions for patients (49.5%) were key issues.

Coleman’s study explored contributory factors using the Medication Discrepancy Tool, and found that 50.8% were categorized as patient-associated, and 49.2% were categorized as system-associated. (Coleman et al., 2005)
Discrepancies in patients’ medicines were found to be associated with potential and actual adverse health consequences. In Coleman’s US study 14.3% of the patients who experienced medication discrepancies had been readmitted to hospital at 30 days compared with 6.1% of the patients who did not experience a discrepancy (P = .04(Coleman et al., 2005)). Wong and colleagues found that 29.5% of unintentional discrepancies had the potential to cause possible or probable patient discomfort and/or clinical deterioration (Wong et al., 2008).

A six-country European study (Austria, Denmark, Germany, Netherlands, Portugal and Spain) recruited 435 patients when they visited their community pharmacy after discharge from hospital. (Paulino et al., 2004) Pharmacists identified discrepancies in the medicines of 24.0% (108) patients including dosage, drug duplication, drug interactions and prescribing errors. The study also recorded the Drug Related Problems (DRPs) experienced by 63.7% of patients and identified using a structured questionnaire with the patient. The most frequently found DRPs were: uncertainty or lack of knowledge about the aim or function of the drug (133; 29.5%) and side effects (105; 23.3%). Fifty six patients (12.4%) reported having practical problems with their medicines.(Paulino et al., 2004)

Mansur et al followed up 212 elderly patients one month after discharge from hospital in Israel and found that the average medication modification rate in hospital was 49.8% and one month later was a further 37.5%. These data were analysed with 3-month readmission and mortality data and the authors concluded that “hospitalization of elderly patients is characterized by extensive medication regimen modifications, which are directly correlated with postdischarge modifications and may indicate an increased risk of mortality”.(Mansur et al., 2008a) During the month after discharge 62% of prescribed medicines were taken without modification and 50% of all changes involved the addition of a drug or an increase in dosage, and 26%, 16% and 8% consisted of stopping, omission or switching within the same medication type, respectively. Almost three quarters of changes were based on specialists' recommendations or because of a change in the patients' clinical condition, and 13%, 8% and 3% were because of poor adherence, adverse effects, and restrictions on prescribing.(Mansur et al., 2008b) Few studies have followed up patients beyond the early weeks after their discharge from hospital. Wai and colleagues reported baseline data from their study involving 49 hospitals and 1545 patients in Australia discharged following admission for Acute Coronary Syndrome. At discharge, 57% of patients were prescribed a combination of antiplatelet agent(s), beta-blocker, statin and angiotensin-converting enzyme inhibitor and/or angiotensin II-antagonist.

Three months post discharge, 48% of patients reported using the same combination, with just over half having discontinued one or more treatments. Two thirds of patients said they were referred to cardiac rehabilitation but only one in three of these had completed the programme.(Wai et al., 2012) ACS patients were followed up one year after discharge in a Canadian study which found that substantial numbers of patients discontinued medicines, while some were started on new treatments illustrating the occurrence of medication changes over a period of months after discharge.(Yan et al., 2007) The dynamic nature of medication use following an ACS admission is confirmed in Yang’s study which also investigated the relationship between medicines use in the 8 months’ period after discharge, and readmission. Most changes to medicines occurred within 3 months after discharge, with fewer changes in the next five months. Taking a beta-blocker, angiotensin-converting enzyme inhibitor, or angiotension receptor blocker significantly reduced the probability of hospital readmission 3 months after discharge, illustrating the potential adverse consequences of discontinuing treatment.(Yang et al., 2006)

Viktil and colleagues measured the changes made to 105 patients’ medicines while they were in hospital and then in primary care 4-6 months later.(Viktil et al., 2012) Hospital clinical pharmacists
visited the patients’ GP practices, reviewed patients’ records and interviewed their GPs. A mean of 4.4 changes per patient were made by the hospital and a further 3.4 changes within four to five months of discharge, and of the 456 changes made in hospital 153 were subsequently changed again.

2. Post-discharge medicines reviews in research and practice

The majority of patients have contact with their community pharmacy soon after discharge from hospital and medicines reviews were very rare in routine practice.

Many patients report receiving insufficient information and explanation about medicines changes at discharge, contributing to patient-associated discrepancies in medicines taking.

Many studies have tried, with some success, to improve patient education and counselling in the hospital in order to reduce subsequent discrepancies in patients’ medicines.

The point of discharge may not be the most effective time for patient education and evidence from systematic reviews indicates that more effective “bridging” strategies with primary care are needed.

Medicines reviews conducted by community pharmacists post-discharge have identified discrepancies and medicines use problems in 39-67% of patients and there is some evidence of resolution of problems at follow-up.

Few studies have reported on the practical aspects of post-discharge medicines reviews such as time involved (45 minutes per patient in one study) or the relative proportions of clinical and non-clinical issues dealt with. Obtaining supplies of medicines used less often in primary care and payment-related issues were only examined in one study.

There is evidence from research studies in Australia that Home Medicines Reviews (HMRs) reduce adverse events and readmissions in patients with heart failure and those taking warfarin.

Many HMRs are conducted by accredited pharmacists to whom HMRs are sub-contracted by the patient’s community pharmacist. The logistics of “bridging” between hospitals and community pharmacies proved a major challenge in Australia.

Delays in HMRs being conducted post-discharge in Australia led to trialling of Hospital Initiated Medicines Reviews (HIMRs) where hospital doctors make a direct referral to accredited HMR pharmacists rather than to the community pharmacy.

Experience of discharge medicines reviews in the UK is limited but one small study indicates their provision is rare and is limited by restrictions on MUR delivery other than when the patient attends the pharmacy.

The literature clearly shows the extent of medicines-related problems associated with discharge from hospital and the potential for improvement. Within 30 days of hospital discharge 86% of patients in an Australian study had medicines dispensed from a community pharmacy with a median time of 6 days to the first pharmacy visit. Most patients visited their pharmacy before they saw their GP and fewer than 2% of patients received a medication review in the month after
discharge. The authors concluded that “more active engagement of this professional group (community pharmacists) in the continuum of care might improve care after hospital discharge”. (Roughead et al., 2009a)

Qualitative research in the UK with patients aged over 75 and their carers found that inadequate explanations about medicines at discharge were commonly reported and led to medicines being omitted, incorrect doses being taken, confusion and anxiety.(Knight et al., 2011) Patients discharged from respiratory, cardiology and general medical wards in the Netherlands were found to have different experiences and preferences for amount and type of information about their medicines at discharge with many seeking further information.(Karapinar, 2012) In a telephone survey conducted 4-18 days after discharge, 86% of patients were aware that they had been prescribed new medications, 64% could name the purpose of the medicine, and a minority could name possible side effects. The authors concluded that “Overall, we found that patients had limited knowledge about their medications after discharge from an internal medicine residency service, with age but not years of education significantly associated with level of knowledge”.(Maniaci et al., 2008) However as Geurts points out, when patients are discharged from the hospital they “often have a lot on their mind and wish to go home as soon as possible”, highlighting the need for monitoring of medicines and reinforcement of information after discharge. Geurts argued for greater patient involvement in medicines management to resolve potential problems. (Geurts et al., 2013)

Recent systematic reviews have sought to identify approaches and interventions that have been tested in practice. Rennke and colleagues reviewed a range of interventions to reduce readmissions and emergency department (ED) visits after discharge from hospital found that a "bridging" strategy (incorporating both predischarge and postdischarge interventions) with a “dedicated transition provider” reduced readmission or ED visit rates in 10 studies, however the researchers also reported that “the overall strength of evidence for this strategy was low”.(Rennke et al., 2013) Combining hospital discharge actions with home follow-up strategies was also identified in the Garcia-Caballos review of interventions to reduce medicines-related problems in older people after discharge.(Garcia-Caballos et al., 2010)

Spinewine and her team looked specifically at interventions (studies conducted up to the end of 2010) to improve continuity of care in medication management and undertook a detailed analysis of 14 studies which met their inclusion criteria for research quality.(Spinewine et al., 2013)

The researchers concluded that “patient education and counselling” and “health professional communication” had some supporting evidence of effectiveness and commented on the paucity of studies in ‘high risk’ patient groups. In her review of discharge medication related interventions (DMIs) Karapinar included 58 studies published prior to August 2010.(Karapinar, 2012) She reported reductions in hospital readmissions and health service use, and increases in medication knowledge and adherence and commented that studies of good methodological quality more frequently showed improvements in readmission rates and patient knowledge.

**Potential of medicines reviews to identify and address medicines-related problems**

In Paulino’s European study 112 community pharmacists recorded 305 interventions in 205 (67%) patients who had been discharged from hospital. These interventions included patient medication counselling (39.0%) and practical instruction to the patient (17.7%). In 26.2% the intervention involved the prescriber and in 28 cases (9.2%) the pharmacists' intervention led to a change of the medicine. (Paulino et al., 2004) The time taken for these interventions to be conducted and completed was not reported by the authors. Geurts and colleagues reported that post-discharge
medicines reviews in their single community pharmacy research site took a mean time of 45 minutes, with 69% requiring contact with the hospital to resolve discrepancies. (Geurts et al., 2013) In a single pharmacy New Zealand study conducted over 3 months DRPs were identified in 20% of discharge prescription items (n = 172), affecting 38% patients (n = 155). Just over half of these were classified as ‘Administrative’ interventions concerning product availability and payment issues. The remaining 45% of DRPs concerned clinical and patient issues. (Maxwell et al., 2013)

Other studies have investigated post-discharge domiciliary medicines reviews. Bergheim and colleagues’ research involved a multiple visit model in which pharmacist home visits were made at 1, 5 and 26 weeks after discharge to patients 70 aged years or older and who were taking five or more medicines. (Bergheim et al., 2008) Discrepancies were identified in 57% of the 51 patients at the first visit, reduced to 31% at the second visit and 32% at the third. Hospital doctors and GPs agreed that home visits by a pharmacist were useful for selected patients. (Bergheim et al., 2008)

The Home Medicines Review (HMR) service in Australia has been the subject of a series of research studies relating to post-discharge reviews. An analysis of HMR reports for 76 patients discharged following a cardiology admission showed that a total of 398 drug related problems were identified for 71 (93.3%) patients with mean 5.6 problems (range 1-21). The most frequent were the patients' uncertainty about the purpose of the medicine (32.0%), potential interactions (22.4%) and adverse reactions (15.1%). (Ellitt et al., 2010)

'Bridging’ models between hospital and community pharmacy have been a component of a small number of studies. A clinical pharmacist discharge service for patients with heart failure in the Netherlands included review of discharge medication, preparation of a written overview of the discharge medication and communicating this information to the community pharmacist as well as the GP. At 6 weeks 39% of patients in the intervention group were found to have one or more discrepancies in their medicines compared with 68% in the control group. (Eggink et al., 2010) A pharmacist transition coordinator based in the hospital coordinated post-discharge medicines reviews by community pharmacists in a RCT of patients discharged from hospital to a care home, some outcomes were improved in the intervention group.

Most patients changed GP after being discharged to the care home and scores for the Medication Appropriateness Index (MAI) worsened in the control group, perhaps indicating a protective effect of community pharmacist medicines review. (Crotty et al., 2004)

Spinewine’s recommendation that high risk patient groups should be a priority for post discharge intervention is reinforced by the UK finding that beta blockers are discontinued within a year of hospital discharge by 27% of patients with heart failure, and that the majority of patients are only titrated to 40% of target dose. (Kalra et al., 2012)

Post-discharge medicines reviews targeted at specific patient groups (those with heart failure and those taking warfarin) have been tested in Australia. (Roughead et al., 2009b, Roughead et al., 2011, Stafford et al., 2011a) Outcomes in patients who received a pharmacist-general practitioner collaborative Home Medication Review (HMR) were compared with those receiving usual care. The findings showed a 45% reduction in hospital admissions in the intervention group and the researchers concluded that HMR is effective in delaying time to next hospitalisation for heart failure. A mean of 12.2 issues were recorded per patient. (Roughead et al., 2009b)

A study in patients (veterans and veterans’ widows) aged 65 and over and taking warfarin tested HMR in this patient group and showed a 79% reduction in the likelihood of hospitalisation for
bleeding in the period between 2 and 6 months after the review. The effect was sustained for up to 6 months and the researchers concluded that six-monthly medicines reviews may be required for patients taking warfarin. (Roughead et al., 2011) In a further post-discharge HMR study 109 patients taking warfarin received 2 or 3 home visits from one of 32 accredited pharmacists within 8-10 days of being discharged from hospital. A total of 157 warfarin-related problems were identified and documented; potentially hazardous problems were found in a subsequent audit to have been under-reported. Nevertheless the authors conclude that the HMRs made a contribution to reducing preventable harm. (Stafford et al., 2011b, Stafford et al., 2011a) Qualitative research with patients identified deficiencies in usual care for patients newly-prescribed warfarin while in hospital and patients valued home-based support. (Stafford et al., 2012)

The HMR service requires the active involvement of the patient’s GP and its implementation has been challenging. Despite generally positive evaluations and a payment to the GP in recognition of action taken in response to HMR reports, adoption of the service by GPs has been slow. Initiatives to spread the use of HMR have involved the appointment of local pharmacist facilitators to liaise between community pharmacies and GPs. Work to adapt HMR for post-discharge reviews was undertaken with a view to patients being visited within a week of leaving hospital. This model proved so difficult to implement that a parallel HIMR (Hospital-Initiated Medicines Review) pathway was trialled whereby liaison pharmacists facilitated post-discharge medication reviews by supporting hospital doctors to make referrals directly to the patient’s community pharmacy or an accredited pharmacist. The patient’s GP was informed that the hospital was organising a post-discharge medication review for their patient. (Angley et al., 2011) Analysis of issues identified in HIMRs for 36 patients whose reviews were conducted by 10 accredited pharmacists was conducted. These patients had a mean of 8.7 co-morbidities with hypertension, ischaemic heart disease and heart failure the most common. In total 1442 ‘issues’ were identified and documented, 84% of which involved the provision of information to the patient, and a mean of 4.2 pharmacist actions per report (Lovgren et al., 2009).

Thirty-seven community pharmacies in the Netherlands participated in a controlled study of home medicines reviews for patients discharged from hospital with 336 patients in the intervention group. The mean number of drugs per patient not dispensed, concomitantly dispensed, or where the quantity was changed was higher in the intervention group than in the control group (0.70 vs. 0.40; 0.11 vs. 0.038, and 0.29 vs. 0.097 respectively). The mean number of drugs per patient for which contact was required with the physician or the hospital Pharmacy department was higher in the intervention group (0.35 vs. 0.16). About 40% of home visits resulted in the clearing of redundant drug supplies. The intervention did not influence discontinuation of drugs prescribed at discharge, nor did it influence mortality. Medication costs were slightly reduced. More patients of intervention pharmacies than of control pharmacies indicated that they were (very) satisfied with the drug counselling by their community pharmacist upon delivery of their discharge medication (87% vs. 50%; < 0.001). (Hugtenburg et al., 2009)

Community pharmacist clinical medication reviews were tested in a RCT in New Zealand, with significant improvement in Medication Appropriateness Index found in the intervention group. (Bryant et al., 2011) However only 39% of the 44 pharmacies that originally agreed to participate contributed data to the study and the authors concluded that this poses a risk to the generalisability of the findings.

**UK experience of discharge medicines reviews**

In a 2013 survey of community pharmacists in West Yorkshire eight of 26 reported having provided one or more DMURs in the previous month and overall 1.1% of 643 MURs provided were
for patients discharged from hospital. (Bhatti et al. 2012) Discharge medication summaries were rarely received and mainly when a patient was discharged with a compliance aid; generally community pharmacists did not know when a patient had been in hospital. Patients not being able to visit the pharmacy in person was a key barrier to provision.

In England recent Department of Health guidance on MUR enabled follow-ups in post-discharge reviews.

Direction 5 (4) clarified that “a patient can have: (a) more than one MUR service consultation in a period of 12 months, or (b) an MUR service within six months of an NMS consultation, if they have been discharged from hospital and if they had changes made to the drugs they are taking while they were in hospital”. (Department of Health, 2012) However the extent to which this has influenced or changed practice is not known.
3. Factors affecting service implementation

The Discharge Medicines Review (DMRs) is a variant of the community pharmacy Medicines Use Review (MUR), an advanced service within the Community Pharmacy Contractual Framework. MURs were introduced in 2005 in England and Wales and there is a body of research literature exploring their implementation which remains of potential relevance to the DMR service. Hinchcliffe’s structured literature review brought this work together in 2011 (Hinchcliffe, 2011) and the current review builds upon and updates this. Since then medicines review services have been introduced in other countries, notably New Zealand and Australia and although the health systems in these countries are different from the NHS many of the factors involved in new service implementation and change in community pharmacy have been shown to apply regardless of setting. The experience of these countries is therefore of relevance and value to DMR implementation.

Independents and multiple pharmacies display differential patterns of adoption and provision of MURs.

The geographical distribution of independents and multiples may therefore have potential to impact on patients’ access to services.

The relationship between prescription volume, levels of deprivation and long-term illness, and numbers of MURs, is not straightforward.

Community pharmacists appear to be very supportive of the principles and potential benefits of MUR for patients but many report barriers to effectively delivering MUR in practice.

Patient perceptions of MUR appear to be coloured by potential or actual opinions of their GPs, and concerns about whether the community pharmacist is part of the practice team. Furthermore patients may perceive that MUR is driven or influenced by considerations of payment rather than patient need.

Information transfer to community pharmacies about discharge medicines could be facilitated by patients being asked to show the information to their pharmacist; a majority of patients did so in research studies.

Many GPs appear sceptical about the value of MUR and in practice there seems to be little active communication between pharmacies and practices. There is some evidence that GPs would be more supportive of targeted MURs. Since much of the research data dates from before the introduction of targeted MURs it is difficult to discern whether GP attitudes might now be more favourable.

Pharmacy factors

By 2012 93% of community pharmacies in Wales were accredited to provide MURs. The maximum number of MURs for which a pharmacy can claim payment is 400 and in 2012-13 the average number provided by pharmacies in England and Wales was 160-170. Level of provision of MURs in England and Wales has consistently been shown to be strongly associated with pharmacy ownership type, with independent pharmacies delivering (or claiming payment for) fewer MURs. (Blenkinsopp et al., 2007c, Blenkinsopp et al., 2008, Bradley et al., 2008, Bush et al., 2009, McDonald et al., 2010, ) Analysis of two years’ national data on MUR provision showed that
pharmacies dispensing higher numbers of prescriptions also conducted higher numbers of MURs. (Bradley et al., 2008) It is noteworthy that the same study found higher levels of deprivation and higher levels of long-term limiting illness to be associated with lower numbers of MURs. Numbers of MURs conducted (or claimed for) were highest in the final two months of the NHS year in both years, and company pressure was reported to be driving MUR provision in some areas. (Bradley et al., 2008)

Research since the introduction of the Community Pharmacy Contractual Framework in 2005 has reported the escalating workload of community pharmacists in England and Wales. (Blenkinsopp et al., 2007a, Gidman, 2011, Lea et al., 2012) Workload has been cited by community pharmacists as a reason for lower numbers of MURs provided (Latif and Boardman, 2008) although analysis of service provision data showed that higher provision is associated with higher prescription volume. (Bradley et al., 2008) This might suggest that capacity of pharmacy teams and staffing levels plays an important role. An early survey of community pharmacist experience of delivering MURs in England and Wales found the mean time taken per MUR to be 51 minutes, 22 of which were spent in consultation with the patient (Blenkinsopp et al., 2007b) compared with 57 minutes by New Zealand pharmacists. (Lee et al., 2009)

Insufficient time and inadequate support staff levels were reported by three quarters of community pharmacists surveyed in 2006 as key reasons for not undertaking more MURs. (Latif and Boardman, 2008) A follow-up survey in 2009 found the proportion citing these factors was lower at 55-60%. (Latif et al., 2010)

Although almost all UK community pharmacies now have a consultation space there is little research on patient perceptions of the level privacy afforded by these new facilities, or on their acceptability to patients for MURs. Patients’ perceptions may be influenced by other users of the consultation space - patients in a recent qualitative Scottish study were “reluctant to use these due to the consultation room’s association with the provision of methadone substance services for problem drug users”. (Gidman et al., 2012) Public perceptions of commercial activities of community pharmacies and how these fit with NHS work may also play an important role. Participants in Gidman’s study perceived a conflict between the two and the researchers discerned concerns among participants about the influence of profit as a motive for service provision. (Gidman et al., 2012) This is reflected in data from a pharmacist perspective in concerns expressed that asking a patient to sign a MUR form may change the nature of the interaction from the patient’s perspective to a financially rather than patient-driven service. (McDonald, 2010)

**Pharmacist factors**

Surveys have shown a generally high level of support among community pharmacists for MURs in principle, for example high levels of agreement with these statements: MURs make better use of pharmacists’ professional skills (86%), MURs will enhance pharmacists’ understanding of their patients’ views about medicines (96%, and MURs will improve patients’ use of medicines (93%). (Latif and Boardman, 2008) Pharmacist gender, number of years qualified and possession of a postgraduate Diploma were not found to be associated with numbers of MURs provided by individual pharmacists. (Latif and Boardman, 2008) Locum pharmacists reported providing fewer MURs than other pharmacists and the need for additional support for locums was noted. (Latif and Boardman, 2008)

Two thirds of community pharmacist respondents in the national evaluation of CPCF reported having delegated more work to non-pharmacist staff since the new contract was introduced. (Blenkinsopp et al., 2007a) One in four pharmacists in that study said they had
employed a locum specifically as a means of increasing capacity in the pharmacy team to enable MURs to be delivered – either providing cover or conducting reviews. (Blenkinsopp et al., 2007b)

Patient factors

Prior to the introduction of the MUR service patient feedback following a medicines consultation with their community pharmacist showed that although many patients valued their discussion with the pharmacist they perceived the GP to be “in charge” of their medicines. (Bissell et al., 2008) More recent research found this still to be the case with GPs perceived to have authority over medicines and “a few (patients) worry that MURs had the potential to cause tensions between these professionals and possibly adversely affect their own relationship with their doctor”. (Latif et al., 2013b)

Differential levels of trust in GPs and community pharmacists were explored in Gidman’s qualitative study with patients in Scotland and “many considered that the GP knew their medical history. By comparison, relationships with community pharmacists were more distant and less consistent”. Gidman also found that patients sought a tacit or implicit GP endorsement of community pharmacy services where there was any perceived encroachment on GP territory (Gidman et al., 2012)

A focus group study (n=80) in Australia with patients who had participated in a Home Medicines Review (HMR) or were eligible to do so identified that worry about medicines was a key factor in motivating participants to engage with the review. (Carter et al., 2012) Older patients appeared less likely to worry about their medicines and less willing to participate in medicines management services.

Lack of access to discharge medicines information has been reported as inconsistent and cited as a key barrier to the provision of MUR, with many hospitals reported to fax information to community pharmacies only for selected patients, particularly those being discharged with a compliance aid. (Urban et al., 2013) An alternative method of transferring information is for patients to show their discharge medicines summary to their community pharmacist and in Duggan’s study 89% of patients asked to give this information to their community pharmacist did so. (Duggan et al., 1998)

In a survey of 152 patients who received an MUR at a single community pharmacy 68% reported knowing more about their medicines and 58% greater awareness of side effects. (Youssef et al., 2010) Relatively little is known about MUR consultation style, patient experience and how these affect perceived value and acceptability of the service to patients. Latif and colleagues’ 10-week observational study in two pharmacies provides the most detailed account of the provision and receipt of MURs from patient and pharmacist perspectives. The MUR consultations were described as “brief encounters dominated by closed questions . . . . . resembled counselling when handing out prescription medicines . . . MURs did little to increase patients’ knowledge”. (Latif et al., 2011) Although a small scale study these data together with pharmacists’ self reports in other studies indicate that some pharmacists may remain in the model of information provision rather than of eliciting patients’ knowledge and views. This in turn may influence patient perceptions of the value of community pharmacists’ medicines reviews.

GP attitudes towards MUR

From the outset of the MUR service in England and Wales researchers reported a less than positive reception from general practitioners. After the first year of MUR provision GPs reported
that MUR had not, in practice, fulfilled the generally positive initial expectations they had and suggested it would be more valuable with a stronger focus on compliance and the reduction of waste. (Celino et al., 2007) A year later two thirds of the GP prescribing leads who participated in Wilcock’s study said they found pharmacists’

MUR recommendations generally useful. However when asked about the views of other GPs in their practices most expressed negative views about MUR.(Wilcock and Harding, 2007) McDonald and colleagues reported negative attitudes from GPs towards MUR.(McDonald, 2010)

MURs have been perceived by GPs to focus on clinical recommendations rather than on practical issues in medicines use(Wilcock and Harding, 2007, Celino et al., 2007), and to be a duplication of the work of general practice(Wilcock and Harding, 2007). Although only a minority identified specific areas of potential in MUR, patients discharged from hospital and the housebound were cited as key recipients.

New Zealand GPs were supportive of community pharmacists’ involvement in medicines review but also concerned about resulting additional unremunerated GP workload and the limited benefit they perceived for patients.(Hatah et al., 2012)

Communication and inter-professional relationships between general practice and community pharmacy

Data from a survey of community pharmacists in England and Wales showed that information flow in relation to MURs was almost exclusively from pharmacist to GP and in hard copy, with only one in four pharmacists reporting receiving feedback from GPs.(Blenkinsopp et al., 2007b) Over 80% of pharmacists providing MUR said it had no effect on their relationship with local GPs; where the local working relationships were already good community pharmacists reported a more positive reception for MURs.(Blenkinsopp et al., 2007a) In their qualitative study of patients’ experience of MUR Latif and colleagues found little evidence suggesting that pharmacists and GPs were working collaboratively or communicating outcomes resulting from MURs. Instead MURs were shown to be conducted in isolation from other aspects of patient care. (Latif et al., 2013b, Latif et al., 2013a)

Commissioners

Key barriers affecting MUR provision perceived by Primary Care Organisations (PCOs) were lack of support from GPs, pharmacists’ low confidence in performing MURs and accreditation of premises. (Bradley et al., 2008) PCOs had used a range of methods to support the roll out of MUR implementation locally.(Blenkinsopp et al., 2007c)

Although most PCOs had taken action to support MUR implementation many also expressed concerns that monitoring of the MUR service focused on process and argued for service audit to provide evidence of value for money. (Blenkinsopp et al., 2007a)

Hospital policy and practice

Transfer of accurate and timely medicines information to primary care after patients are discharged from hospital is a recurrent theme in the literature. Variation between and within hospitals in communication with community pharmacists is reported.(Chevalier et al., 2006, Bhatti et al. 2012) Differences between the content of the discharge medication list held by the hospital and the discharge letter sent to the GP were identified in a Belgian study, with the latter more often found to be more complete.(Cornu et al., 2012)
One in three discharge notes was incomplete or inaccurate in a 2012 Norwegian study and only a quarter were received by the GP within 7 days. (Viktil et al., 2012) Three quarters of the GPs in Karapinar’s 2010 survey in the Netherlands reported delays in receiving discharge medicines information. (Karapinar et al., 2010)

Medicines that were stopped in hospital were represcribed in 27% of cases in the six months after discharge from hospital. (van der Linden et al., 2006) In a study with 400 patients discharged from hospital no reason was given for discontinuation of 39.8% of medicines. (van der Linden et al., 2010)

**Health economy wide policy and practice**

There are reports in the grey literature of notable practice relating to post discharge medicines support from community pharmacies in Staffordshire (domiciliary model) (Royal Pharmaceutical Society, 2011, Colquhoun, 2010) and London (New Medicines Service and targeted MURs) (Barnett and Oboh, 2013), in which “bridging” referral systems have been established between local hospitals, pharmacies and GP practices. In the Staffordshire service 69 home MURs were conducted for elderly patients discharged from a community hospital with reported reduction in readmissions and positive effect on functional independence. However these models have not appeared in the peer-reviewed literature.

**Incentives**

Remuneration for medicines reviews acts as an incentive at different levels, influencing both individual practitioners, managers and employing organisations’ policies. The literature shows that pharmacy employers (not only in large multiples) have used a variety of organisational levers and incentives including bonus systems for pharmacists and their teams, target-setting and performance monitoring. Some pharmacists have reported feeling under pressure to meet numerical targets for medicines reviews and some report selecting ‘easier’ cases and avoiding engaging with polypharmacy. (McDonald, 2010, McDonald et al., 2010) It is noteworthy that selecting ‘easier’ cases and conducting reviews outside of the allowed conditions have also been reported in the Australian Home Medicines Review (HMR) service among pharmacist providers generally, not related to multiples specifically. (Gilbert and Rigby, 2013)

Community pharmacies in England and Wales can claim for one MUR per patient per year with an exception for patients who have been discharged from hospital with changed medicines. In New Zealand community pharmacies can provide up to four MUR consultations per patient per year (Hatah et al., 2013).

**Training**

A national study in 2006 found that training for MURs was generally considered useful by community pharmacists although some felt its emphasis on clinical aspects had led them to have an expectation that the MUR was intended to be more clinically focused than they subsequently found to be the case in practice. (Bradley et al., 2006)

The HMR service in Australia required considerable additional clinical training to the extent that many community pharmacists are not themselves accredited to provide the service and instead sub-contract provision to an accredited pharmacist.
Finally Table 1.2 provides information on the preliminary frameworks of factors affecting DMR implementation.

**Table 1.2: Preliminary framework of factors affecting DMR implementation**

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<thead>
<tr>
<th>Factor</th>
<th>Effect</th>
<th>Evidence</th>
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<tr>
<td><strong>Pharmacy</strong></td>
<td></td>
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<tr>
<td>1-4 branches /5+ branches</td>
<td>Higher level of provision by multiples; independents less likely to provide MURs; owners found it harder to balance MUR provision with managing dispensing volume</td>
<td>Blenkinsopp et al. 2008, Bradley et al. 2008, McDonald 2010</td>
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<tr>
<td>Prescription volume</td>
<td>Higher volume more likely to provide MURs</td>
<td>Bradley et al. 2008</td>
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<tr>
<td>Staff capacity, training &amp; roles</td>
<td>Inadequate support staff levels reported as barrier to provision</td>
<td>Latif and Boardman 2008, Latif et al. 2010</td>
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<tr>
<td>Proximity to GP surgery/ies</td>
<td>No evidence</td>
<td></td>
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<tr>
<td>Premises consultation facility</td>
<td>No evidence</td>
<td></td>
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<tr>
<td>Pre-registration training practice status</td>
<td>GP training practices more likely to be early adopters of innovations</td>
<td>Baker &amp; Thompson 1995</td>
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<tr>
<td>Regular pharmacist in charge vs. locums</td>
<td>Locums less likely to provide MURs</td>
<td>Latif &amp; Boardman 2008</td>
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<tr>
<td>History of adoption of innovative services incl. previous provision of MUR service</td>
<td>No evidence</td>
<td></td>
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<tr>
<td>Deprivation level of area</td>
<td>Higher deprivation lower MUR provision</td>
<td>Bradley et al 2008</td>
</tr>
<tr>
<td>Level of long-term limiting illness</td>
<td>Higher level lower MUR provision</td>
<td>Bradley et al 2008</td>
</tr>
<tr>
<td>Factor</td>
<td>Effect</td>
<td>Evidence</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Pharmacist</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time qualified</td>
<td>None</td>
<td>Latif &amp; Boardman 2008</td>
</tr>
<tr>
<td>Postgraduate qualifications</td>
<td>None</td>
<td>Latif &amp; Boardman 2008</td>
</tr>
<tr>
<td>Pre-registration tutor status</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Employee or owner</td>
<td>Pressure from employers/ targets</td>
<td>Bradley et al 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Latif &amp; Boardman 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McDonald 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McDonald et al 2010</td>
</tr>
<tr>
<td>Commitment to cognitive services</td>
<td>Higher pharmacist motivation higher provision</td>
<td>Bradley et al 2008</td>
</tr>
<tr>
<td>Previous provision of MUR service</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Consultation skills</td>
<td>Didactic consultation model</td>
<td>Latif et al 2011</td>
</tr>
<tr>
<td>External ‘soft’ networking and support</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Utilisations of ‘hard’ networks including NHS.net intranet</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Previous requests to conduct MURs in non-pharmacy settings /by telephone</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Strength of collaboration with local GP practices</td>
<td>Pre-existing good relationships facilitated MURs; little or no effect otherwise</td>
<td>Blenkinsopp et al 2007b</td>
</tr>
<tr>
<td>Strength of belief that DMRs make a difference for patients</td>
<td>Pharmacist attitudes support belief but no evidence on relationship with provision</td>
<td>Latif et al 2010</td>
</tr>
<tr>
<td>Feedback sought &amp; received from GPs/nurses about MURs</td>
<td>One in 4 pharmacists reported receiving feedback from GPs</td>
<td>Blenkinsopp et al 2007b</td>
</tr>
<tr>
<td>Feedback sought &amp; received from patients about MUR</td>
<td>Survey data indicates patients perceive improved knowledge</td>
<td>Youssef et al 2010</td>
</tr>
<tr>
<td>Leadership style and delegation to team</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Factor</td>
<td>Effect</td>
<td>Evidence</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>General Practice</td>
<td>Negative attitudes</td>
<td>McDonald 2010</td>
</tr>
<tr>
<td></td>
<td>Mixed attitudes – generally positive attitudes among GP prescribing leads but perceived negative attitudes among their practice colleagues</td>
<td>Wilcock and Harding 2007</td>
</tr>
<tr>
<td>Attitudes towards pharmacist MURs</td>
<td>Positive potential was acknowledged; perceived weaknesses were potential for patient confusion, and conflict/irritation of GPs. Unremunerated additional workload was a concern</td>
<td>Hatah et al 2012</td>
</tr>
<tr>
<td>Priorities for targeting of MUR</td>
<td>Preference for MURs to focus on compliance and be targeted (post-discharge; housebound patients)</td>
<td>Celino et al 2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wilcock and Harding 2007</td>
</tr>
<tr>
<td>Feedback to commissioners about MUR generally &amp; DMR specifically</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Feedback to community pharmacists about MUR generally</td>
<td>26% of community pharmacists reported having received feedback from GPs on MURs; 12% thought that providing MURs had improved their relationships with GPs</td>
<td>Blenkinsopp et al 2007a</td>
</tr>
<tr>
<td>Presence/ absence of networking between LMC/LPC</td>
<td>No evidence</td>
<td></td>
</tr>
<tr>
<td>Health economy – wide</td>
<td>Presence/absence of joint local implementation plan for DMR</td>
<td>No evidence</td>
</tr>
<tr>
<td></td>
<td>Inclusion of DMR in care pathways/ service redesign</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanisms for pharmacy input into commission</td>
<td></td>
</tr>
<tr>
<td>Factor</td>
<td>Effect</td>
<td>Evidence</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>Incentives</strong></td>
<td>Contractual payments</td>
<td>Target-setting by</td>
</tr>
<tr>
<td></td>
<td>Employer bonuses</td>
<td>employers reported to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>have negative effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on quality of MURs</td>
</tr>
<tr>
<td></td>
<td><strong>Evidence</strong></td>
<td>McDonald 2010</td>
</tr>
<tr>
<td><strong>Training</strong></td>
<td>Opportunities for training</td>
<td>Training opportunities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>associated with higher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>provision</td>
</tr>
<tr>
<td><strong>Patient</strong></td>
<td>Continuity of pharmacy use</td>
<td>No evidence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Awareness of availability/entitlement to MUR</td>
<td>No evidence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Willingness to engage in MUR</td>
<td>Patient perception that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GP ‘in charge’ of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medicines</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambulatory vs. housebound</td>
<td>No evidence</td>
</tr>
<tr>
<td><strong>Primary Care</strong></td>
<td>Commissioner commitment/actions to support DMR</td>
<td>Many PCOs supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>implementation of MUR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>using various strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospital policy and</strong></td>
<td>Policy of sharing of discharge</td>
<td>Variation in policies</td>
</tr>
<tr>
<td>practice</td>
<td>medication summary</td>
<td>on transfer of</td>
</tr>
<tr>
<td></td>
<td>Policy on promoting/referring for DMR</td>
<td>information; information</td>
</tr>
<tr>
<td></td>
<td>Practice in communication/information sharing with community</td>
<td>transfer more likely</td>
</tr>
<tr>
<td></td>
<td>pharmacists</td>
<td>for patients</td>
</tr>
<tr>
<td></td>
<td>Presence or absence of networking with community pharmacy</td>
<td>discharged with a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>compliance device</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Evidence</strong></td>
<td>Chevalier et al 2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bhattie et al 2012</td>
</tr>
</tbody>
</table>
References


Chapter Two – Analysis of DMR Claims to Date

Background

In order for the pharmacy to make a claim for a completed DMR, the following information from Part 1 and 2 of the DMR forms is provided to the NHS Wales Shared Services Partnership:

- The method of entry to the service (e.g. referral);
- Reason for providing the service (e.g. medicines changed during admission);
- Patient demographic details;
- Date of discharge and unit discharged from;
- Date and method of part one intervention;
- Number of medicines on discharge advice letter;
- Number of medicines on first prescription following discharge;
- Number and nature of discrepancies between discharge advice letter and first prescription following discharge;
- Date and method of part two intervention;
- Number and nature of issues identified and resolved at part 2.

This chapter provides an overview of the analysis of the data from October 2011 until December 2013.

Objectives

- To identify the number of completed DMRs submitted from October 2011 until the end of December 2013;
- To measure the number of pharmacies and pharmacists who have engaged with the DMR service;
- To recount the Health Board from which the patients were discharged from and the patient’s eligibility for a DMR;
- To describe, and compare per Health Board, the number, type and range of discrepancies on the DMR forms (part 1 and 2), including the number where there were no discrepancies identified;
- To identify the proportion and type of recommendations accepted and implemented, as well as identify the number which remain unresolved following the intervention.

Method

The National Electronic Claim and Audit Form (NECAF) database, containing all claims from October 2011 until the end of December 2013, was obtained from the NHS Wales Shared Services Partnership and inputted and analysed in Microsoft Access® and Excel®. Our analysis was verified by NHS Wales Shared Services Partnership. In order to further analyse the data, community pharmacies were categorised into independents, small chain (2-4), medium sized multiple (5-25) and large sized multiple (>25) chains and supermarkets, using data from NHS Wales Shared Services Partnership and Community Pharmacy Wales.

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3 The data was for all registered pharmacies in Wales during the period October 2011 until the end of December 2013. A number of pharmacies changed ownership during this period; each time the pharmacy changed this was classed as a separate ‘pharmacy’ in the NECAF database.
Findings

Number of DMR Claims

In total there have been 14,649 DMRs initiated and completed. From the scheme’s initiation in October 2011 until the end of March 2012, 1883 claims were completed, whereas for the financial year April 2012 until end of March 2013, there were 7155 completed claims and from April 2013 until the end of December 2013 there were 5611 completed claims. Figure 2.1 illustrates the number of DMR claims per month.

When the scheme was introduced, the Welsh Government offered an implementation payment of £1400 to the contractor for 10 DMRs initiated before 31st March 2012 and subsequently completed. One hundred and fifty-two community pharmacies received this payment. The maximum number of DMRs that could be claimed per pharmacy during this period was 100; however no pharmacy reached that number. The maximum number completed was 44.

For 2012/13, pharmacies that did not receive the implementation payment in 2011/12 could receive this payment in 2012/13 if they provided 15 DMRs and initiated the DMR service in at least 4 of the 6 months between the beginning of October 2012 and the end of March 2013. Ninety-two community pharmacies received this payment. During 2012/13, those pharmacies who had not received the implementation payment in 2011/12 could complete up to 100 DMRs; those which had previously received the implementation payment could complete up to 140 DMRs. Only one pharmacy reached the maximum of 140 DMRs in the financial year 2012/13, although another two pharmacies completed over 100 DMRs each.

Number of Community Pharmacies Involved with the DMR Service

Whilst on average there are 712 community pharmacies in Wales in any one month, over the time period of the evaluation there have been 744 community pharmacies registered. Of these 744 community pharmacies, 520 have completed at least one DMR, 224 have not initiated a DMR and 70 have not completed a DMR or MUR. Five hundred and eleven have completed both a DMR and MUR.

Twenty-six community pharmacies completed over 100 DMRs during the analysis period (October 2011 – December 2013). This accounts for 5% of the total number of community pharmacies who have contributed to the scheme. The number of completed DMRs per pharmacy range from 1 to 270 (mean 28 ± 35, mode 1, median 17). Thirty-six percent (n=185/520) of community pharmacies have completed less than 10 DMRs (i.e. between 1 and 9). Figure 2.2 presents the percentage of community pharmacies and the number of claims they have completed whereas Figure 2.3 illustrates the top 5% of community pharmacies performing the DMR service.

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**Figure 2.1:** Total number of completed DMR claims per month.

**Figure 2.2:** Percentage of Community Pharmacies and the Number of DMRs Completed.
Each community pharmacy was categorised into the type of pharmacy as previously described. Within the NECAF database, independent pharmacies contribute 31.6%, small chains 7.4%, medium sized multiples 7.8%, supermarkets 4.3% and large sized multiples 48.9%. The large sized multiple pharmacies completed 56% (n=8236/14649) of the DMRs claimed for from October 2011 until end of December 2013, followed by the independents (31%). Supermarket pharmacies provided less than 1% of the overall DMRs during this period. Table 2.1 provides a breakdown of the number and range of DMRs completed per pharmacy category.

Number of Community Pharmacists Involved with the DMR Service

Data on linking the community pharmacist’s General Pharmaceutical Council (GPhC’s) registration number with DMRs completed was only collected from April 2012. There were 1838 completed claims which were not coded to the pharmacists’ GPhC number. The remaining DMRs were completed by 663 community pharmacists. The mean number of DMRs completed per pharmacist was 19 (range 1-288; mode 1, median 10). Sixteen of the 663 community pharmacists (2.4%) have completed over a 100 DMRs since the scheme’s initiation, with 50% of community pharmacists completing between 1 and 9 DMRs each. Figure 2.4 presents the percentage of community pharmacists and the number of claims they have completed.
Figure 2.4: Percentage of Community Pharmacists and the Number of DMRs Completed

Percentage of Community Pharmacists Completing DMRs vs. Number of DMRs (Oct. 2011 - Dec. 2013)

- 1 DMR: 14%
- 2 DMRs: 6.8%
- 3-4 DMRs: 11.5%
- 5-9 DMRs: 17.3%
- 10-19 DMRs: 20.1%
- 20-29 DMRs: 11.2%
- 30-39 DMRs: 5%
- 40-59 DMRs: 6.6%
- 60-79 DMRs: 3.8%
- 80-99 DMRs: 1.4%
- 100-149 DMRs: 1.8%
- 150-199 DMRs: 0.3%
- >200 DMRs: 0.3%
Table 2.1: Number of DMRs per Each Pharmacy Category

<table>
<thead>
<tr>
<th>Category of Pharmacy</th>
<th>ID</th>
<th>Percentage of Stores who have Provided DMR Service</th>
<th>Mean DMR per ‘Engaged’ Pharmacy</th>
<th>Range of DMRs</th>
<th>Mode</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple (&gt; 25 stores)</td>
<td>A</td>
<td>&gt;95%</td>
<td>45.4</td>
<td>11-148</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>&gt;95%</td>
<td>45.9</td>
<td>1-238</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>90-95%</td>
<td>16.2</td>
<td>1-120</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>40-50%</td>
<td>15.4</td>
<td>1-113</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>90-95%</td>
<td>18.1</td>
<td>1-63</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Supermarkets</td>
<td></td>
<td>30-35%</td>
<td>1.9</td>
<td>1-5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Independents</td>
<td></td>
<td>60-65%</td>
<td>32.8&lt;sup&gt;6&lt;/sup&gt;</td>
<td>1-270</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>Small Chain (2-4 stores)</td>
<td></td>
<td>75-80%</td>
<td>24.2</td>
<td>1-55</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Medium Sized Chain (5-25 stores)</td>
<td></td>
<td>80-85%</td>
<td>26.6</td>
<td>1-138</td>
<td>11</td>
<td>14</td>
</tr>
</tbody>
</table>

<sup>6</sup> The two pharmacies whom have completed 270 DMRs each are independent pharmacies. If these two pharmacies are excluded from the dataset, the mean number of DMRs for the independent pharmacy subset is 29.4
Number of Completed DMRs per Health Board

Figure 2.5 illustrates the number of completed DMRs per Health Board and figure 2.6 the number of completed DMRs per Health Board over time.

Figure 2.5: Number of Completed DMRs per Health Board.
The number of DMRs per 1000 discharges was calculated using the annual PEDW data tables\(^7\) (providers and residents) for each Health Board and Wales for the year 1\(^{st}\) April 2012-31\(^{st}\) March 2013. The number of DMRs per 1000 population was calculated using the 2011 census data\(^8\) and number of DMRs 2012/13 (Table 2.2).

---


Table 2.2: Number of DMRs per 1000 in-patient discharges and per 1000 population

<table>
<thead>
<tr>
<th>Health Board</th>
<th>DMR per 1000 in-patient discharge episode (PEDW Health Board data)</th>
<th>DMR per 1000 in-patient discharge episode (PEDW resident data)</th>
<th>DMR per 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abertawe Bro Morgannwg University Health Board</td>
<td>10.5</td>
<td>11.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Aneurin Bevan Health Board</td>
<td>14.9</td>
<td>13.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Betsi Cadwaladr University Health Board</td>
<td>16.5</td>
<td>14.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Cardiff and Vale University Health Board</td>
<td>10.0</td>
<td>11.4</td>
<td>1.8</td>
</tr>
<tr>
<td>Cwm Taf Health Board</td>
<td>13.7</td>
<td>14.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Hywel Dda Health Board</td>
<td>21.1</td>
<td>19.0</td>
<td>2.9</td>
</tr>
<tr>
<td>Powys Teaching Health Board</td>
<td>93.0</td>
<td>10.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Wales</td>
<td>14.2</td>
<td>13.7</td>
<td>2.3</td>
</tr>
</tbody>
</table>

DMR Process

Of the 14,649 DMR claims, the majority of patients were discharged from a Welsh hospital (n=13,901); 508 patients were discharged from an English hospital, 61 from a care home and 8 from a prison setting. There were 125 other care settings stated, although no specific details provided. No details regarding place of discharge were documented for 46 claims.

Discharge information was provided to the community pharmacist mainly by the hospital (n=8643; 59%), followed by the patient (n=2260; 15.4%), the GP (n=1669; 11.4%), carer (n=1691; 11.5%) and other means (n=386; 2.6%). No details regarding the latter were documented within the database. Table 2.3 provides a comparison per Health Board of how information was provided to the Community Pharmacy.

The age of the patient for 13,998 claims were recorded; the mean age of the patient having a DMR was 74 years (range 0 - 107 years, median 77 years, mode 82 years). The mean number of medicines on discharge was 9 (range 1-70, median 9, mode 8).
Table 2.3: Comparison of how Discharge Information was Provided to Community Pharmacies in each Health Board

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Hospital (%)</th>
<th>Patient (%)</th>
<th>GP (%)</th>
<th>Carer (%)</th>
<th>Other (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abertawe Bro Morgannwg University Health Board (n=2115)</td>
<td>1556 (73.6)</td>
<td>121 (5.7)</td>
<td>205 (9.7)</td>
<td>209 (9.9)</td>
<td>24 (1.1)</td>
</tr>
<tr>
<td>Aneurin Bevan Health Board (n=2941)</td>
<td>1531 (52.1)</td>
<td>114 (3.9)</td>
<td>556 (18.9)</td>
<td>461 (15.7)</td>
<td>279 (9.5)</td>
</tr>
<tr>
<td>Betsi Cadwaladr University Health Board (n=3309)</td>
<td>1997 (60.4)</td>
<td>312 (9.4)</td>
<td>643 (19.4)</td>
<td>316 (9.5)</td>
<td>41 (1.2)</td>
</tr>
<tr>
<td>Cardiff and Vale University Health Board (n=1871)</td>
<td>1200 (64.1)</td>
<td>311 (16.6)</td>
<td>195 (10.4)</td>
<td>160 (8.6)</td>
<td>5 (0.3)</td>
</tr>
<tr>
<td>Cwm Taf Health Board (n=1879)</td>
<td>783 (41.7)</td>
<td>475 (25.3)</td>
<td>393 (20.9)</td>
<td>211 (11.2)</td>
<td>17 (0.9)</td>
</tr>
<tr>
<td>Hywel Dda (n=2134)</td>
<td>1379 (64.6)</td>
<td>268 (19.4)</td>
<td>193 (9.0)</td>
<td>275 (12.9)</td>
<td>19 (0.8)</td>
</tr>
<tr>
<td>Powys Teaching Health Board (n=400)</td>
<td>197 (49.3%)</td>
<td>68 (17.0)</td>
<td>75 (18.8)</td>
<td>59 (14.8)</td>
<td>1 (0.3)</td>
</tr>
</tbody>
</table>

The DMR scheme has four criteria for which a patient can have a DMR completed; these are the patient’s medicines changed during admission, the patient requires an adjustment to their medicines, the patient was taking four or more medicines and/or on the pharmacist’s professional discretion. Table 2.4 presents information of the eligibility criteria for each Health Board.
Table 2.4: Patients’ Eligibility Criteria for a DMR

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Medicines changed during admission (%)</th>
<th>Patient requires adjustment to medicines (e.g. MDS or MAR) (%)</th>
<th>Patient taking four or more medicines (%)</th>
<th>Pharmacist professional discretion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abertawe Bro Morgannwg University Health Board (n=2115)</td>
<td>1470 (69.5)</td>
<td>693 (32.8)</td>
<td>1724 (81.5)</td>
<td>189 (8.9)</td>
</tr>
<tr>
<td>Aneurin Bevan Health Board (n=2941)</td>
<td>2027 (68.9)</td>
<td>505 (17.2)</td>
<td>2139 (72.7)</td>
<td>278 (9.5)</td>
</tr>
<tr>
<td>Betsi Cadwaladr University Health Board (n=3309)</td>
<td>2375 (71.8)</td>
<td>919 (27.8)</td>
<td>2499 (75.5)</td>
<td>464 (14.0)</td>
</tr>
<tr>
<td>Cardiff and Vale University Health Board (n=1871)</td>
<td>1233 (65.9)</td>
<td>953 (50.9)</td>
<td>1543 (82.5)</td>
<td>276 (14.8)</td>
</tr>
<tr>
<td>Cwm Taf Health Board (n=1879)</td>
<td>1196 (63.7)</td>
<td>484 (25.8)</td>
<td>1564 (83.2)</td>
<td>242 (12.9)</td>
</tr>
<tr>
<td>Hywel Dda Health Board (n=2134)</td>
<td>1359 (63.7)</td>
<td>680 (31.9)</td>
<td>1680 (78.7)</td>
<td>201 (9.4)</td>
</tr>
<tr>
<td>Powys Teaching Health Board (n=400)</td>
<td>300 (75.0)</td>
<td>119 (30.0)</td>
<td>311 (77.8)</td>
<td>42 (10.5)</td>
</tr>
</tbody>
</table>

The main methods of the intervention for part one and two are presented in Table 2.5. The majority of interventions were completed over the telephone, with the minority being completed at the patient’s home. Just under half of the interventions (42%) in part 1 were completed with a carer being present +/- the patient, with 31% involving the carer in part 2.
Table 2.5: Methods of Intervention for Part 1 and 2 of the DMR

<table>
<thead>
<tr>
<th>Intervention Method</th>
<th>Intervention Part 1 (n=14,649)</th>
<th>Intervention Part 2 (n=12,801)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With patient by telephone</td>
<td>4937</td>
<td>5995</td>
</tr>
<tr>
<td>With carer at pharmacy (without patient)</td>
<td>4483</td>
<td>2949</td>
</tr>
<tr>
<td>With patient at pharmacy (without carer)</td>
<td>3275</td>
<td>2653</td>
</tr>
<tr>
<td>With patient at pharmacy (with carer)</td>
<td>1647</td>
<td>973</td>
</tr>
<tr>
<td>With patient at home/care home</td>
<td>307</td>
<td>231</td>
</tr>
</tbody>
</table>

Of the 14,649 DMRs initiated, 1848 were incomplete. Reasons for this were: patient readmitted to hospital (n=953), patient died (n=348), patient did not attend the appointment (n=267), patient moved house/pharmacy (n=133), other (n=122) (no specific details recorded for these ‘other’). Twenty-five patients withdrew their consent to the DMR after the first intervention.

The mean number of medicines on discharge was 9 (range 1-70, median 9, mode 8) and the mean number of medicines on the patient’s first prescription following discharge were found to be 9 (range 0-81, median 9, mode 7).

Number of Discrepancies

The total number of discrepancies recorded was 19,878. There were 19,108 discrepancies recorded in DMR part 1 and 770 in part 2. Taking the discrepancies for part 1, the rate of discrepancy per DMR is 1.3. Table 2.6 presents the number of discrepancies identified in part 1 and part 2 and Table 2.7 displays the number of each type of discrepancy. There were 2,740 DMRs completed which had no discrepancies in part 1 of the service (18.7%).

The number of discrepancies per community pharmacy was calculated for those community pharmacies who had completed 100 or more DMRs (n=26). The range of discrepancy per DMR was 0.3 to 2.7. Taking the top 26 community pharmacies who identified the most discrepancies (134-717), the range of discrepancy per DMR was 1 to 7.0. Of the 26 pharmacies with the most DMRs (top 5% performing pharmacies), 13 were among the 26 pharmacies with the most discrepancies identified.
Table 2.6: Number of Discrepancies Identified in Part 1 and 2 of the DMR

<table>
<thead>
<tr>
<th>Number of Discrepancies</th>
<th>Part 1 (n=19108)</th>
<th>Part 2 (770)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8111</td>
<td>349</td>
</tr>
<tr>
<td>2</td>
<td>2267</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>795</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>316</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>158</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>109</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>59</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>27</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Table 2.7: Type of Discrepancy in Part 1 and 2 of the DMR forms

<table>
<thead>
<tr>
<th>Type of Discrepancy</th>
<th>DMR Part 1 (n=19073)</th>
<th>DMR Part 2 (n=769)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicines discontinued in the community after discharge</td>
<td>5053</td>
<td>180</td>
</tr>
<tr>
<td>Medicines restarted in the community after discharge</td>
<td>4843</td>
<td>310</td>
</tr>
<tr>
<td>Other(^{10})</td>
<td>4248</td>
<td>119</td>
</tr>
<tr>
<td>Medicines continued but at wrong dose</td>
<td>2631</td>
<td>69</td>
</tr>
<tr>
<td>Medicines continued but at wrong strength</td>
<td>984</td>
<td>25</td>
</tr>
<tr>
<td>Medicines continued but in wrong formulation</td>
<td>786</td>
<td>21</td>
</tr>
<tr>
<td>Medicines discontinued by the patient</td>
<td>402</td>
<td>38</td>
</tr>
<tr>
<td>Medicines duplicated</td>
<td>126</td>
<td>7</td>
</tr>
</tbody>
</table>

The number of discrepancies per DMR per Health Board ranges from 1.1 to 1.44 (see Table 2.8). The types of discrepancies for Wales are illustrated in figure 2.7, and figure 2.8 illustrates the types of discrepancies per Health Board.

Table 2.8: Number of Discrepancies per DMR per Health Board

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Total Number of DMRs</th>
<th>Total Number of Discrepancies(^{9})</th>
<th>Number of Discrepancies per DMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abertawe Bro Morgannwg University Health Board</td>
<td>2115</td>
<td>2357</td>
<td>1.11</td>
</tr>
<tr>
<td>Aneurin Bevan Health Board</td>
<td>2941</td>
<td>4223</td>
<td>1.44</td>
</tr>
<tr>
<td>Betsi Cadawaladr University Health Board</td>
<td>3309</td>
<td>4388</td>
<td>1.33</td>
</tr>
<tr>
<td>Cardiff and Vale University Health Board</td>
<td>1871</td>
<td>2568</td>
<td>1.37</td>
</tr>
<tr>
<td>Cwm Taf Health Board</td>
<td>1879</td>
<td>2221</td>
<td>1.18</td>
</tr>
<tr>
<td>Hywel Dda Health Board</td>
<td>2134</td>
<td>2876</td>
<td>1.35</td>
</tr>
<tr>
<td>Powys Teaching Health Board</td>
<td>400</td>
<td>440</td>
<td>1.10</td>
</tr>
<tr>
<td>Wales</td>
<td>14649</td>
<td>19073</td>
<td>1.30</td>
</tr>
</tbody>
</table>

\(^{9}\) Note: the number of discrepancies vary slightly from the overall number of discrepancies documented; this is an anomaly in the way data is recorded in the NECAF database.

\(^{10}\) No further information about these discrepancies are held within the NECAF database.
Figure 2.7: Type of Discrepancies on Part 1 and Part 2 of the DMR forms for Wales
Figure 2.8: Type of Discrepancies on Part 1 and 2 of the DMR Forms per Health Board
Summary

The analysis is limited by the quality of the database. Whilst further analysis was anticipated initially in order to identify the proportion and type of recommendations accepted and implemented, as well as identify the number that remained unresolved following the intervention, some queries were unable to be completed as the information was not held in the appropriate form in the database.

To date (October 2011 until the end of December 2013), there have been 14,649 DMR claims, from 520 community pharmacies. Two hundred and twenty four community pharmacies have not completed even one DMR and of these 70 have not completed a DMR or MUR.

70% of community pharmacies registered over the time period have participated in the scheme and of these about 47% (n=244/520) received the implementation payment.

Whilst 70% of community pharmacies have completed a DMR, the range of DMRs per pharmacy varies considerably. Five percent have completed more than 100 DMRs since the scheme’s initiation, whilst 36% have completed between 1 and 9.

The engagement of the scheme varies across the different types of pharmacies. From the results, it suggests that some large sized multiples made a strategic decision to be involved. The large sized multiples (>25 branches) have completed 56% of all DMRs, followed by independents (31%).

50% of community pharmacists on the database have completed between 1 and 9 DMRs over the time period. Sixteen pharmacists have completed over a 100 each.

The main method of completing the DMR was by telephone. A third of part 1 DMRs involved a carer.

1,848 DMRs were not completed (DMR 2). The main reason was the patient had been readmitted to hospital, although 25 patients withdrew their consent.

There does not seem to be a large variation in the number of DMRs per in-patient discharge across Health Boards. For Wales as a whole, the rate is 13.7 per 1000 in-patient discharges (based on PEDW resident data).

2,740 of the 14, 649 DMRs had no discrepancies (19%).

The discrepancy rate was 1.3 per DMR (part 1), (range 0-18). The rate for discrepancies per Health Board were similar (1.10 – 1.44). Likewise the types of discrepancies were similar across Health Boards. The main discrepancies (52%) were medicines discontinued or restarted after discharge.
Discussion Points

The analysis of the DMR claims has provided a baseline of DMR activity for this evaluation and has generated further queries. The number of patients where there was a discrepancy on the first prescription post discharge was 81%; this figure is similar to that found in the literature (14-87%). The literature reported a mean number of discrepancies per patient as 3, whereas for the DMR data analysed is was 1.3 discrepancies per DMR, although the range was 0-18. Over half of the discrepancies were related to medicines discontinued or restarted after discharge; again similar to the literature where omission of medicines is often stated as one of the main discrepancies reported. Independents, multiples and supermarkets display different patterns of adoption and provision of the DMR service, which has also been reported for the MUR scheme.
Chapter Three – Community Pharmacy Views about the DMR Service

Overview

This section brings together the two phases of the evaluation of the DMR service from the community pharmacy perspective. These were:

Phase 1: One-to-one interviews with a small sample of community pharmacists;

Phase 2: Survey of all community pharmacies in Wales.

Phase 1: One-to-one interviews with a small sample of community pharmacists

Objectives

This phase addressed the following aims:

- To explore whether the service has improved communication between those involved in the transfer of a patient’s care;
- To explore community pharmacists’ views on the impact of the service on the pharmacist’s role and whether they better utilise their skills as a result;
- To explore community pharmacists’ experiences of the implementation of the service;
- To identify any additional, unanticipated, benefits of the DMR service as well as any barriers to service implementation together with suggestions as to how these can be overcome.

Method

Semi-structured interviews were identified as the most appropriate methodological approach as they would allow focus on the key areas while allowing participants to expand and to comment on further issues which were important to them. A topic guide (Appendix 5) was thus developed based on the key issues identified by the team from the literature and anecdotally from discussions with pharmacists informally and at a Royal Pharmaceutical Society local practice forum.

Sampling

In order to maximise the data obtained, it was important that a range of pharmacists were interviewed. Review of the NECAF data enabled the identification of pharmacies at both the upper and lower levels of DMR submissions. Other characteristics used to identify potential interviewees included geographical location and type of pharmacy (including independent / small chain / large multiple and pharmacy setting such as supermarket or health centre based pharmacies).

Recruitment

Identified pharmacies were sent a letter of invitation together with an information sheet and consent form (Appendix 6). This was followed up with a reminder telephone call. Pharmacists who were willing to be interviewed could confirm this by returning the consent form in the freepost envelope provided or verbally over the telephone.
Those who agreed verbally were asked to return the consent form so that the form was received before the interview took place. Interview arrangements were then made via telephone.

**Data collection**

Interviews were carried out at the pharmacist’s convenience. In all cases this was via a telephone call (to home or work as preferred). The interview began with a reminder of the research aims and the interview procedure. Consent was confirmed verbally (in addition to written consent already received). A digital recorder coupled to the telephone line was used to record the interview where consent for this was given. In addition the researcher made notes to supplement the recording. The topic guide (Appendix 5) was used to ensure the key areas were covered but the order in which these topics were discussed varied from interview to interview as directed by the interviewee. Open questions were used to explore and closed questions were used for confirmation and to probe further. At the end of each interview, the interviewee was asked if they had anything further to add to the topic. They were then thanked and the interview ended.

**Analysis**

The resulting data were reviewed and coded thematically using constant comparison to review the themes which arose. Where appropriate, sections of text were transcribed verbatim and used to illustrate the themes.

**Findings**

A total of fourteen pharmacists were approached. Seven agreed to take part in an interview and two declined to participate; the remainder did not respond. The key characteristics are not presented specifically for each interviewee as this may breach anonymity. However, all interviewees were from pharmacies that had completed DMRs – numbers ranged from around 20 to over 150. Four Health Boards (Hywel Dda, Aneurin Bevan, Betsi Cadwaladr and Cardiff and Vale) were represented by the interviewees and they came from a range of settings including city centre, health centre and small town/community based pharmacies. Independent pharmacies and large multiples were both represented.

**Main themes**

The data from the interviews were coded into the following broad themes for analysis: overall views of the DMR service, reasons for participating, overview of the DMR process (including comments on identifying patients, gaining consent, accessing information, documentation and follow-up), impact of the service on the community pharmacists themselves, impact on patients (including specific examples), the impact on working relationships with other health professionals, barriers and facilitators to conducting the service and suggestions for future change.

**Overall view of the service**

Overall the interviewees regarded the DMR service very positively with words such as ‘worthwhile’, ‘needed’, ‘useful’, ‘invaluable’ being used to describe the service. Three interviewees commented on the fact that it made them realise how many errors may have slipped through in the past and one described the service as ‘a very good safety net’.

Two interviewees specifically mentioned that the first part – the reconciliation of information – was the most important aspect, while others were not so explicit but also predominantly talked
about the aspect of identifying problems on first prescriptions.

In addition to the positive impact on patients themselves which was noted by all participants, positive outcomes at a higher level included prevention of medication-related problems and thus positive impact on bed availability (‘stops the revolving doors’ of readmissions for medication-related problems) and increasing the profile of pharmacy. Another interviewee highlighted the fact that the DMR enabled some baseline figures to be identified to support previous anecdotal suggestions that there were problems in transfer of information about medicines between secondary and primary care. While one interviewee said that the service was ‘not negative in any way’, another said that while it was a useful service there was a ‘long way to go’. Many of these specifics will be raised and discussed in the following sections.

**Reasons for participating in DMR service**

A range of drivers were identified. Three interviewees explained that the service provided a valuable additional source of revenue, although for two this was alongside other drivers. A decision taken by the pharmacy company and resulting push from their respective Head Offices was also a reason for three interviewees to participate. Only one discussed specific targets being set but there were no consequences of not meeting the targets. The service was described as an opportunity to do ‘clinical work’, making it particularly attractive to one interviewee. Two of the respondents said that it was a logical service to sign up to as they were already providing a similar service on an informal basis. Regardless of the reasons for initially participating, the interviewees explained that the benefits of the service were what kept them involved in providing DMRs.

**The DMR process**

The interviewees took quite different approaches to the DMR service, with two taking a preemptive approach. This involved the pharmacist identifying discharged patients at a much earlier stage, before the first community prescription had been produced. There was then comparison of the discharge information with pre-admission medication and any discrepancies were addressed immediately. The first prescription was then produced based on this corrected information. This approach was enabled by very good relationships with the local surgery and appropriate IT support.

**Identifying patients** was generally recognised as the key limiting step in offering the service. Often the pharmacist was not aware that a patient had been in hospital unless it came up in discussion – a common strategy was for the counter staff to listen out for conversations where a customer mentioned they or their relative had been in hospital and then to step in and discuss the DMR service. In a more active approach, one interviewee said they advertised the service to patients through use of flyers and when undertaking MURs so patients were aware if they went into hospital in the future. An exception to this was for ‘tray patients’ (i.e. those patients who have regular medicines supplied by the pharmacy in compliance aids). Three pharmacists said that for these patients there was already a system in place whereby the hospital would phone the community pharmacy to warn them that a patient was about to be discharged and therefore needed their trays preparing. This meant that the community pharmacist was able to flag up this patient as being a potentially suitable candidate for a DMR.

Similarly, another interviewee said that care home patients were easier to identify as the care home would be in regular contact with the pharmacy and would therefore inform them of any patients being discharged from hospital.
It was commented that, although easier to identify, ‘tray patients’ tended to be more complex cases compared to ‘walk-ins’ – they tended to have been in hospital for more serious reasons and were less easy to speak to face-to-face. The two pharmacies taking a pre-emptive approach understandably had less of an issue in identifying patients as they obtained this information direct from the GP. Nevertheless one mentioned problems early on even with this approach as some surgeries were unwilling to provide the information on the grounds of ‘patient confidentiality’. This pharmacist felt this was an excuse for not being sure as advice they had sought in relation to Data Protection had said this should not be a barrier. Only four interviewees mentioned getting information faxed through directly from the hospital and three of these related to ‘tray patients’ as already discussed.

Obtaining consent for the service was not generally seen as a problem. According to five interviewees, in most cases it was the carer who tended to give consent as patients were often too ill on discharge to come into the pharmacy and a carer tended to look after their medicines at this stage. If the patient was, however, present then they were usually happy to provide consent themselves. In contrast to the majority of the interviewees, one did feel consent was an issue. This interviewee frequently used the word ‘awkward’ in these discussions. While they did not describe any specific problems they had experienced with patients giving consent, they were not comfortable with when the best time was to get consent. They were concerned that patients may get worried if asked for consent at the start. In addition, the pharmacist was concerned that consent was needed for so many different services that it was becoming a ‘runaway train’ – they felt it might be easier to have a blanket consent form for all of the services. However in this case they would be concerned for how long consent would remain valid.

For those pharmacists who had access to the DAL, getting hold of the information about discharge medication was not a problem. But most of the interviewees did not see the DAL even though they expressed a desire to, as they felt it would be most helpful. The main reasons were that the patient didn’t have it, had forgotten it or had given it to their GP. Instead these pharmacists were reliant on other sources of information such as reminder cards or bags of medicines. These were viewed as incomplete sources of information and caused problems as further information often needed to be located.

Most interviewees would speak to the GP surgery about the information they needed but, while some GPs were willing and able to help (with one interviewee saying the surgery has staff members dedicated to the task and given protected time to help), three interviewees said that in their experience some surgeries were reluctant to provide information or even refused to provide it, citing patient confidentiality as a reason. Another interviewee said that while they may ask the GP for information there is no legal obligation for the GP to provide it. Getting information from the hospital was also a mixed experience – while two interviewees reported that, in their experience, the hospital staff were really helpful and willing for fax information through, others found it more difficult with one citing the difficulties of ringing the hospital as they did not know who to ask for or how to access the right information.

Another said they had rung the hospital a couple of times and been told the records were in storage so they need to ring the GP instead. This all adds to a task which was acknowledged by two interviewees that could be time consuming already. While faxes were useful there was a note of caution that they can be difficult to read especially if handwritten or if the fax received by the pharmacist is ‘third-hand’ (faxed by the hospital to the GP, then the GP faxes the fax to the pharmacy). Accessing information at the weekend was cited as a problem by one interviewee.

For most interviewees, documenting the DMR was initially done on paper, using rough notes, a
company template form or the ‘official’ DMR form, before inputting the information onto the computer. Two interviewees mentioned the use of Pro-Script which, they said, saved time once they had got used to it as it is all done electronically through the computerised Patient Medication Records which they already use to label and record the patient’s medication. Another interviewee used Clinical Workstation which again means the documentation process is all done electronically. This approach was felt to be more in line with the MUR scheme – some interviewees made comments about the fact the MUR documenting was done electronically unlike the DMR documentation. They found this approach easier and, in fact, one interviewee said they used the MUR forms but just adapted them to DMR purposes.

Interviewees discussed how the follow-up aspect (Part 2) of the DMR process could be problematic. Most tried to do the follow-up face-to-face as this was felt to be better but the practical issues meant that it often needed to be done over the telephone. One pharmacist did try to visit patients at home where they were not able to come to the pharmacy but noted the practical (time/availability) and financial consequences of this. The main reasons why face-to-face follow-up with the patient was preferred related to adherence issues – two interviewees highlighted this, although another interviewee felt it was possible to assess adherence over the telephone. Another interviewee also commented on the difficulties of doing the follow-up with a carer as, although they may be able to comment on adherence, they were not so able to assess the impact of side-effects as these may not be so obvious to them and they may not recognise the impact on the patient. Practical issues around difficulty locating the patient for the follow-up were raised – one interviewee said this was particularly problematic for ‘walk-in’ patients but not such a problem with ‘tray patients’. Other key reasons for not being able to do the follow-up stage were that the patient had been re-admitted to hospital or had died. One pharmacist noted that if the pharmacist who did the first part of the DMR was not available to do the follow-up this impacted on the workload involved as the second pharmacist needed to ‘wade through paperwork to get up to speed’. As one interviewee summarised, for the follow-up you ‘can only do your best’.

Submission for claims was done in various manners – some submitted piecemeal while others did them in small batches or even monthly. This seemed to relate to the number of DMRs undertaken suggesting pharmacists adapted their system to optimise efficiency. One advantage of submitting after each claim was explained by an interviewee – all the information is fresh in the mind and so there is no need to ‘dig out’ the details to check – it can be ‘done and dusted’ immediately.

Timing estimates for a ‘typical’ DMR varied from 20 minutes to 2 hours but all interviewees pointed out that this very much depends on the complexity of the patient case and the number of issues. The shorter estimates related to pharmacies which carry out the ‘pre-emptive’ system of undertaking DMRs.

Examples from DMRs

The interviewees were asked to give examples of the DMRs they had undertaken in terms of common errors and associated drugs. The discrepancies identified varied widely: the most commonly mentioned were examples whereby a medicine had been restarted (six interviewees) or where the dose had changed (four).

Three interviewees mentioned wrong strength, wrong form and a new medicine not being given. In contrast one interviewee said that dose changes were not so common and another said there had been none where a medicine had been omitted. In the examples discussed, the most commonly mentioned drugs were aspirin (five interviewees), warfarin (four), ulcer-healing drugs (four), beta-blockers (two), furosemide (two), paracetamol (two) and Seretide® (two). Generally
the DMR discrepancies were described as preventing issues of minor to moderate severity, although there were comments that most were ‘significant’ even if not viewed as severe medically – one interviewee for example commented that even simple compliance issues could result in significant effects on the patient.

**Impact of the service**

When asked about the impact of the service, the interviewees had a lot to say about the benefits to patients. As well as improving safety and smoothing transitions between care-settings there were also more intangible benefits such as patients being ‘happier’ as noted by three interviewees. This may be due to reported feelings that patients welcomed the additional support and information and the pharmacist doing the service for their benefit meant that they felt more than ‘just a number’. This was not the case for all patients – two pharmacists said that some patients were only interested in getting hold of their medicines while other patients felt that taking part in a DMR would take up their time unnecessarily. On the whole though it was felt that patients appreciated the service and the time taken to ensure their needs were addressed. Two pharmacists mentioned that patients were more willing to talk to the pharmacist about their medicines as a result of the service and one said that patients who had had a DMR were more aware of the service and thus more likely to let the pharmacy know when they had been in hospital.

Most interviewees did not feel the service significantly impacted on their support staff as the DMR service was mostly carried out by the pharmacist themselves. In one case however, the pharmacist was only involved when needed and in another case there was a comment that the dispenser spent a lot of time chasing information for DMRs. One pharmacy had a member of staff whose role included organising the DMR service as part of their normal workload.

In terms of impact on themselves the pharmacists highlighted both positive and negative impacts. The main negative impact mentioned by six interviewees was time and associated workload in undertaking the service. One interviewee in particular described the major impact offering additional services such as the DMR had on him personally with working hours long beyond the pharmacy opening times and the associated impact on home life. Workload was added to by the time spent on increased administration and paperwork which was felt to be unnecessary. This negative point was tempered by some respondents who countered it with a positive such that although it is time consuming it is worth it as the service is needed. The positives were the feelings of satisfaction and fulfilment in terms of doing a good job and offering a necessary service which ‘makes a difference’.

Comments such as feeling more ‘in the loop’ and having a ‘more clinical role’ highlighted this attitude. The sense of seeing real outcomes where the patient had benefited also boosted enthusiasm for the service.

**Relationships**

It was apparent from the interviews that the pre-existence of a good relationship with the local surgery or hospital helped in setting up and running the DMR service, particularly in gaining access to information about potential patients or about their medication changes.

With regard to the hospitals, some pharmacists already had a good relationship with the local hospital prior to the start of the DMR service while others discussed a developing relationship – for example one explained how the hospital staff are ‘getting used to us now’ and said that the
hospital staff now ask for the dispenser by name when telephoning. Only one pharmacist said they had never spoken to the hospital while another explained how it could be hard to access the right person at the hospital. On the whole though, the relationship between the community pharmacist and the hospital appeared to be one which is building and developing over time.

In relation to the GP surgeries the overall view from the interviewees was that the relationships were very variable depending on the surgery – four interviewees specifically described how the situation was ‘mixed’ while another said that although they had a good relationship with the local GP surgery they knew that it could be a problem for others. In terms of the negatives this was in terms of experiences whereby surgeries had been reluctant or unwilling to share information; indeed in one case the reaction from the surgery had been so negative that the pharmacist had reported it as a formal complaint. In addition to reported experiences, a couple of interviewees were also wary of potential problems with one suggesting that the GPs might feel they were being undermined. Another interviewee explained how their local surgery at first had been worried the pharmacy was ‘encroaching on their territory’ but that this was resolved after a meeting whereby the GPs were reassured. For those GP surgeries who had engaged with the DMR service, the view was that they felt that GPs generally appreciated it (‘they feel we’ve got their back’) and one interviewee even pointed out that it would be bad for the relationship if the pharmacy was not highlighting errors. Examples were given by interviewees as to how the service was improving the relationship between the pharmacy and the surgery, with the GPs appreciating the worth of the service and thus enabling closer ties to be forged (in one case with the GP now prepared to raise issues directly with the pharmacy). N.B. It should be noted that in two cases the interviewees pointed out that they dealt with a receptionist or manager rather than the GP directly.

**Barriers**

A number of interviewees highlighted barriers to the optimisation of the service. These principally fell into three categories – difficulties identifying patients, lack of access to the necessary (quality) information and problems associated with the paperwork and administration. The first two have been discussed in some detail in earlier sections although poor patient awareness of the service was further highlighted as a barrier which impacted on the identification of eligible patients.

With regard to the paperwork there were issues around getting the information to match the form (i.e. how to classify discrepancies to match the boxes on the form) which meant some pharmacists were going for a ‘best fit’ which might not exactly capture the issue, and also with regard to the terminology used (one interviewee said that ‘restarted in community’ was misleading as the drug may have been missed off in hospital accidentally). The volume of paperwork was an issue and this also took time in terms of needing to review the paperwork at each stage and refamiliarise themselves with the case. Two respondents highlighted further issues with regard to the form – one felt the second ‘MUR stage’ ought to be done sooner, while another found it easier to adapt the MUR form which is available electronically to record the information.

One respondent suggested there needed to be more ‘push’ from the hospitals while another pointed out that hospitals were not likely to get engaged as it is the community pharmacist who gets the payment for the service. The setting up of the service flagged up a few queries around identifying patients and defining what discharge meant and there was also a lot of paperwork and guidance from various sources which one interviewee found overwhelming. However this was easily addressed and is not an ongoing barrier.

**Facilitators**

Electronic provision of information as well as electronic means of recording the DMR interventions
were identified as key facilitators, although prompt and good quality faxed information helped if electronic was not available. Having a good relationship with other health professionals involved in the patient’s care was also viewed as essential – one interviewee explained that the relationship with the hospital was key to successful DMR service: ‘building the bridges between hospital and community pharmacy’. One interviewee summed up that a successful DMR service depends on ‘the personality of the pharmacist, availability of the DAL, organisation of the pharmacy staff and relationship with the surgery’.

Suggestions for Improvements

Tied into the comments above, provision of clear information, whether through direct access to the DAL or (preferably) electronic provision of the information was identified as something which was needed. Another common theme was ‘streamlining’ of the paperwork and administration to lighten impact on workload. Working to get other stakeholders informed and on-board (patients, GPs and hospital staff) was highlighted by two interviewees. One interviewee also said they would like positive encouragement from ‘higher powers’ – being told you’re doing a good job is motivating and encouraging so feedback on the service would be beneficial.

Summary of Interview Findings

Overall the pharmacists who were interviewed saw the DMR service as a very beneficial service for patients which fulfilled an important role in patient safety. However, they reported a number of different barriers to its delivery. These were: identifying patients, getting hold of information, dealing with the paperwork and time. Where the service worked well, this was facilitated by the existence of electronic copies of information and good relationships with other healthcare colleagues (i.e. hospital pharmacy or the GP surgery).

A number of improvements were suggested. These were obtaining better quality of information in a timelier manner, streamlining of the DMR paperwork and getting other stakeholders on-board.

These views from the interviews were used to develop the questionnaire for the next phase of the study, which is discussed in the next section.

Phase 2: Community Pharmacy Questionnaire

Objectives

The objectives of this section were to quantify the extent to which the views of the 7 participants captured in Phase 1 can be generalized to the wider population of community pharmacists (CPs) in Wales.

Specific objectives were:

- To investigate CPs’ views about issues regarding communication about the DMR service;
- To establish CPs’ views about the impact of the DMR service on their role;
- To quantify the number of DMRs undertaken in the community pharmacy and determine any barriers to the implementation of the DMR service;
- To propose suggestions as to how any barriers could be overcome;
- To capture CPs’ views about any further issues arising from the one-to-one
interviews;

- To determine the amount of time spent in the community pharmacy on DMR activities.

Note: Data on the time spent by community pharmacists on DMR activities were collected on the questionnaire as part of this phase, these findings are presented in Chapter Seven.

Method

A questionnaire approach was adopted in order to capture the views of as many community pharmacists as possible and to gauge the extent to which the issues identified in the interview phase were generalisable to the wider population.

Sampling and Recruitment

A questionnaire was sent to all community pharmacies in Wales (n = 704, based on the Community Pharmacy Wales database) in December 2013 with a deadline for responses by January 31\textsuperscript{st} 2014.

Data Collection

Questionnaire Design

Thematic analysis of the interview transcripts yielded key themes for inclusion in the questionnaire. Related statements or issues were grouped for each theme with spaces for free text comments to be added to each. The questionnaire was divided into seven sections measuring different aspects of the DMR service.

Part A – contained questions about the pharmacy and DMR activity; Part B – focused on questions about the discharge information; Part C – included questions relating to the DMR process; Part D – captured views about the barriers and facilitators to implementing the DMR service; Part E – asked questions about potential solutions to address the barriers to the delivery of the DMR service; Part F – consisted of questions about the impact of the DMR service and general views about the service; Part G – offered the opportunity to provide any further comments about the DMR service. A copy of the study questionnaire is presented in Appendix 3.

Pilot

The questionnaire was piloted on 9 community pharmacists and their views are included in the main study findings (since the number of changes made were minimal). The pilot stage was completed using a paper format, followed by further review of an electronic format. A number of minor modifications were made to the study questionnaire following their feedback (related mainly to ordering, or adding categories for ‘other’ or ‘not applicable’). All pilotees agreed that the electronic version was preferable to a paper format.

Distribution of Questionnaires

The questionnaire was distributed using Survey Monkey\textsuperscript{®} to all registered community pharmacies in Wales on 12\textsuperscript{th} December 2013 with an initial return date of 31\textsuperscript{st} December 2013. All e-mail addresses were obtained from the Community Pharmacy Wales (CPW) database. The survey link was sent as part of an e-mail which explained the purpose of the study (Appendix 7). Subjects
were told to contact the research team if they preferred to complete a paper copy of the questionnaire. Two further reminders were issued to all pharmacies via e-mail informing them of an extended return date of 31st January 2014. The survey link was closed on 6th February 2014.

Analysis

Data analysis was conducted using the Survey Monkey software which was then extracted into a Microsoft Excel® spreadsheet and Word® documents for further analysis.

Findings

A total of 143 responses were received to the electronic survey. This represented a response rate of 20%. All surveys were completed on-line and no requests were made for a paper copy of the questionnaire. The distribution of respondents by postcode is shown in Table 3.1.

Table 3.1: Postcode of responding community pharmacies (n = 143***)

<table>
<thead>
<tr>
<th>Postcode</th>
<th>Number of pharmacies responding (%)</th>
<th>Number of pharmacies undertaken DMRs (% responded to survey) (taken from NECAF database)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiff postcode</td>
<td>50 (35.0%)</td>
<td>148 (33.8%)</td>
</tr>
<tr>
<td>Chester postcode</td>
<td>6 (4.2%)</td>
<td>154 (3.9%)</td>
</tr>
<tr>
<td>Llandudno postcode</td>
<td>19 (13.3%)</td>
<td>100 (19.0%)</td>
</tr>
<tr>
<td>Newport postcode</td>
<td>14 (9.8%)</td>
<td>96 (14.6%)</td>
</tr>
<tr>
<td>Swansea postcode</td>
<td>22 (15.4%)</td>
<td>84 (26.2%)</td>
</tr>
<tr>
<td>Shrewsbury postcode</td>
<td>4 (2.8%)</td>
<td>4 (0.1%)</td>
</tr>
</tbody>
</table>

*21 (14.7%) respondents did not provide the first part of their post code.
**This information was not available for the 7 pilot respondents.

Table 3.2 shows the distribution of survey responses by the number of Community Pharmacy branches, indicating that the large multiples were the main respondents (64%), followed by independent and small chain pharmacies (24%).

Table 3.2: Response rate by number of branches of Community Pharmacies (n=143)

<table>
<thead>
<tr>
<th>This pharmacy is one of:</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4 branches</td>
<td>34 (24%)</td>
</tr>
<tr>
<td>5 - 10 branches</td>
<td>12 (8%)</td>
</tr>
<tr>
<td>11 - 20 branches</td>
<td>6 (4%)</td>
</tr>
<tr>
<td>More than 20 branches</td>
<td>91 (64%)</td>
</tr>
</tbody>
</table>

As shown in Table 3.3, in the majority of cases, the survey was completed by the Pharmacist Manager (64%), followed by Responsible Pharmacist (27%) and Pharmacy Owner / Contractor
(17%). Only 3% of surveys were completed by a locum. Other respondents included an Area Manager, Superintendent Pharmacist, Trainee Pharmacist, Dispenser and a Second Pharmacist.

Table 3.3: Role of responder within the Pharmacy (n=143)

<table>
<thead>
<tr>
<th>What is your role within this pharmacy?</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner / Contractor</td>
<td>24 (17%)</td>
</tr>
<tr>
<td>Pharmacist Manager</td>
<td>92 (64%)</td>
</tr>
<tr>
<td>Responsible Pharmacist</td>
<td>38 (27%)</td>
</tr>
<tr>
<td>Locum</td>
<td>4 (2%)</td>
</tr>
<tr>
<td>Other</td>
<td>6 (4%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>164</strong></td>
</tr>
</tbody>
</table>

*21 responders selected more than one answer for this question

Most (60%) reported that the pharmacy company does not have targets in place for DMRs, whereas nearly a third (31%) did, whilst the remainder (9%) were not sure.

Table 3.4 shows that the largest proportion of those who responded to the questions about their DMR activity had neither started (43%) nor completed (41%) any DMRs. Of those who had DMR activity in November 2013, most respondents started and completed between 2 and 3 DMRs.
Table 3.4: DMR activity for November 2013 (n=143)

<table>
<thead>
<tr>
<th>Number of DMRs (Total)</th>
<th>Started (DMR 1 only) Responses (%)</th>
<th>Completed (DMR 1 &amp; 2 – i.e. plus follow-up) Responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>56 (43.0%)</td>
<td>50 (41%)</td>
</tr>
<tr>
<td>1</td>
<td>15 (11.5%)</td>
<td>21 (17.4%)</td>
</tr>
<tr>
<td>2 – 3</td>
<td>34 (26.9%)</td>
<td>27 (22.3%)</td>
</tr>
<tr>
<td>4 – 5</td>
<td>15 (11.5%)</td>
<td>11 (9.1%)</td>
</tr>
<tr>
<td>6 – 10</td>
<td>6 (4.6%)</td>
<td>7 (5.8%)</td>
</tr>
<tr>
<td>11 – 20</td>
<td>4 (3.1%)</td>
<td>4 (3.3%)</td>
</tr>
<tr>
<td>More than 20</td>
<td>1 (0.08%)</td>
<td>1 (0.08%)</td>
</tr>
<tr>
<td>Total answered this question</td>
<td>131</td>
<td>121</td>
</tr>
</tbody>
</table>

These figures suggest that more DMRs are started by pharmacists than are completed. Although it is not expected that DMRs are completed within the same calendar month, this question related to the overall number started or completed in a typical month. Table 3.5 indicates that for some pharmacies, this could in part be due to difficulty in arranging the follow-up stage of the DMR process (with a mean rating of 6.4 out of 10).

Table 3.5: Ease of arranging Part 2 (follow-up) of the DMR (n=143)

<table>
<thead>
<tr>
<th>How easy or difficult do you find it to arrange the follow-up stage (part 2) of the DMR?</th>
<th>1 Very easy</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 Very Difficult</th>
<th>Rating Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer Options</td>
<td>7</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>24</td>
<td>11</td>
<td>29</td>
<td>22</td>
<td>12</td>
<td>17</td>
<td>6.40</td>
</tr>
</tbody>
</table>

Table 3.6 shows the number of medication discharge letters (or DALs) received in the last month, where the majority of pharmacies received 2-3 (28%) or 4-5 (22%). However, 21% of respondents had not received discharge information from any source in the last calendar month. Receipt of a DMR referral to the community pharmacy does not therefore necessarily result in a DMR being undertaken. This indicates that there are other reasons why DMRs are not being actioned.
Table 3.6: Number of medication discharge letters / summary sheets / DAL received in last month (n=137)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>29 (21.1%)</td>
</tr>
<tr>
<td>1</td>
<td>21 (15.3%)</td>
</tr>
<tr>
<td>2 – 3</td>
<td>39 (28.4%)</td>
</tr>
<tr>
<td>4 – 5</td>
<td>30 (21.8%)</td>
</tr>
<tr>
<td>6 – 10</td>
<td>11 (8.0%)</td>
</tr>
<tr>
<td>11 – 20</td>
<td>7 (5.1%)</td>
</tr>
<tr>
<td>More than 20</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

Table 3.7 shows the type of information which pharmacies currently receive about the patient’s medication on discharge and what they would like to receive. Most currently receive information about the list of medicines prescribed on discharge (117/137; 85%) and those started while in hospital (89/137; 65%).

Table 3.7: Type of information currently received and would like to receive (n=137)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Currently receive information on: Responses (%)</th>
<th>Like to receive information on: Responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicines prescribed on discharge</td>
<td>117 (85%)</td>
<td>46 (34%)</td>
</tr>
<tr>
<td>Medicines started</td>
<td>89 (65%)</td>
<td>56 (41%)</td>
</tr>
<tr>
<td>Medicines stopped</td>
<td>76 (55%)</td>
<td>68 (50%)</td>
</tr>
<tr>
<td>Medicines restarted</td>
<td>41 (30%)</td>
<td>70 (51%)</td>
</tr>
<tr>
<td>Reasons for stopping or starting</td>
<td>13 (9%)</td>
<td>103 (75%)</td>
</tr>
<tr>
<td>Dose changes</td>
<td>72 (52%)</td>
<td>68 (50%)</td>
</tr>
<tr>
<td>Changes in tablet strength</td>
<td>64 (47%)</td>
<td>67 (49%)</td>
</tr>
<tr>
<td>Formulation changes</td>
<td>44 (32%)</td>
<td>77 (56%)</td>
</tr>
</tbody>
</table>

*Respondents could choose more than one option.
There is a mis-match between the type of information being received as part of the discharge process and that which pharmacies would like to receive for the following areas: Reasons for stopping or starting medicines (9% received; 75% would like to receive); Reasons for formulation changes (32% received; 56% would like to receive) and Reasons why medicines are restarted in hospital (30% receive; 51% would like to receive). Data presented in Table 3.7 would indicate that respondents who already receive certain types of information on the discharge advice letter are less inclined to state that they ‘would like to receive it’ (as they are already in receipt of this information).

Table 3.8 shows the methods of communication used for receipt of information following the patient’s discharge.

**Table 3.8: Methods of communication used (n=137)**

<table>
<thead>
<tr>
<th>How do you currently receive information about the patient’s medication following discharge? (Tick all that apply).</th>
<th>Answer Options</th>
<th>Fax n (%)</th>
<th>Email n (%)</th>
<th>Postal mail n (%)</th>
<th>Over the telephone n (%)</th>
<th>Letter or post-it note n (%)</th>
<th>In person n (%)</th>
<th>Not applicable (do not receive any information) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>36 (26.2)</td>
<td>1 (0.7)</td>
<td>1 (0.7)</td>
<td>29 (21.2)</td>
<td>14 (10.2)</td>
<td>23 (16.8)</td>
<td>63 (45.0)</td>
<td></td>
</tr>
<tr>
<td>Hospital (or care home)</td>
<td>100 (73.0)</td>
<td>0 (0)</td>
<td>5 (3.6)</td>
<td>24 (17.5)</td>
<td>13 (9.5)</td>
<td>15 (10.9)</td>
<td>23 (16.8)</td>
<td></td>
</tr>
<tr>
<td>Patient, relative or carer</td>
<td>5 (3.6)</td>
<td>0 (0)</td>
<td>5 (3.6)</td>
<td>12 (8.8)</td>
<td>24 (17.5)</td>
<td>101 (73.7)</td>
<td>19 (13.9)</td>
<td></td>
</tr>
</tbody>
</table>

Receipt of information in-person from the patient, relative or carer (74% of responses) is the most frequently cited method of communication. Information about the patient’s medication is also often faxed from the hospital (73%) or GP (26%). Electronic mail is almost never used and postal mail only rarely used to communicate this information.

How pharmacies would prefer to receive information about the patient’s medication upon discharge, is shown in Table 3.9. Respondents expressed a preference for increasing the use of e-mail and fax for communicating information. However, the patient, relative or carer was still viewed as an important source of this information.
Table 3.9: Preferred method of communicating discharge information (n=137)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Fax n (%)</th>
<th>Email n (%)</th>
<th>Postal mail n (%)</th>
<th>Over the telephone n (%)</th>
<th>Letter or Post-it note n (%)</th>
<th>In person n (%)</th>
<th>Not applicable (do not receive any information) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>93 (68.0)</td>
<td>54 (39.4)</td>
<td>19 (13.9)</td>
<td>25 (18.2)</td>
<td>21 (15.3)</td>
<td>21 (15.3)</td>
<td>9 (6.6)</td>
</tr>
<tr>
<td>Hospital (or care home)</td>
<td>108 (78.8)</td>
<td>67 (48.9)</td>
<td>24 (17.5)</td>
<td>25 (18.2)</td>
<td>25 (12.4)</td>
<td>17 (12.4)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>Patient, relative or carer</td>
<td>20 (14.6)</td>
<td>15 (10.9)</td>
<td>15 (10.9)</td>
<td>18 (13.1)</td>
<td>28 (20.4)</td>
<td>109 (79.6)</td>
<td>6 (4.4)</td>
</tr>
</tbody>
</table>

The main method of communicating issues identified during the DMR back to the GP, hospital or patient is largely via the telephone (see Table 3.10).

Table 3.10: Method of communicating issues identified following the DMR (n=126)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Not communicated n (%)</th>
<th>In person n (%)</th>
<th>Fax n (%)</th>
<th>Email n (%)</th>
<th>Postal mail n (%)</th>
<th>Over the telephone n (%)</th>
<th>Note attached to prescription n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>7 (5.5)</td>
<td>32 (25.3)</td>
<td>16 (12.6)</td>
<td>3 (2.4)</td>
<td>14 (11.1)</td>
<td>95 (75.3)</td>
<td>30 (23.8)</td>
</tr>
<tr>
<td>Hospital (or care home)</td>
<td>31 (24.6)</td>
<td>8 (5.8)</td>
<td>12 (9.5)</td>
<td>1 (0.8)</td>
<td>2 (1.6)</td>
<td>89 (70.6)</td>
<td>1 (0.8)</td>
</tr>
<tr>
<td>Patient, relative or carer</td>
<td>6 (4.4)</td>
<td>106 (77.4)</td>
<td>1 (0.8)</td>
<td>0 (0)</td>
<td>5 (4.0)</td>
<td>81 (64.2)</td>
<td>17 (13.5)</td>
</tr>
</tbody>
</table>
Very few respondents indicated that they target particular patient groups for a DMR (13%). Of those who did, the following groups were specified: MDS\(^ {11} \) patients (x10), elderly patients (x3) and care home residents (x1). (Note: MDS patients are those described as ‘tray’ patients by the interviewees).

**Barriers to Conducting DMRs**

*Issues related to the discharge summary sheet or letter*
Lack of access to discharge information appears to be the most commonly (58%) cited ‘major barrier’ to the conduct of the DMR service. The receipt of information when it is too late was the next most frequently cited barrier (39%) followed by reluctance by the GPs to share discharge information (29%). See Table 3.11 below.

**Table 3.11: Barriers relating to the Discharge Summary Sheet or Letter (n=130)**

<table>
<thead>
<tr>
<th>Which of the following issues relating to the DISCHARGE SUMMARY SHEET OR LETTER represent a barrier to community pharmacists’ involvement in the DMR service? Please answer each question by placing a tick in the box.</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of access to discharge information</td>
<td>8 (6.2)</td>
<td>8 (6.2)</td>
<td>8 (6.2)</td>
<td>21 (16.2)</td>
<td>75 (57.7)</td>
</tr>
<tr>
<td>Receiving discharge information too late</td>
<td>4 (3.1)</td>
<td>8 (6.2)</td>
<td>23 (17.7)</td>
<td>29 (22.3)</td>
<td>51 (39.2)</td>
</tr>
<tr>
<td>GP surgeries reluctant to share discharge information</td>
<td>16 (12.3)</td>
<td>18 (13.8)</td>
<td>28 (21.5)</td>
<td>19 (14.6)</td>
<td>38 (29.2)</td>
</tr>
<tr>
<td>Poor legibility of discharge information</td>
<td>21 (16.2)</td>
<td>20 (15.4)</td>
<td>26 (20.0)</td>
<td>28 (21.5)</td>
<td>20 (15.4)</td>
</tr>
<tr>
<td>Incomplete information on the discharge letter/summary sheet</td>
<td>14 (10.8)</td>
<td>26 (20.0)</td>
<td>25 (19.2)</td>
<td>28 (21.5)</td>
<td>22 (16.9)</td>
</tr>
</tbody>
</table>

Others also stated that the fact that discharge information for ‘MDS’ patients was more likely to be shared was a barrier for the delivery of the DMR service to self-medicating (non-MDS) patients.

*Issues related to communication*
Not knowing whether a patient has been discharged from hospital was the barrier most frequently cited by respondents (76%), followed by limited access to relevant information (45%), poor

\(^{11}\) Patients who have their medication provided in a multi compartment compliance aid to support them to best take their medicines. These devices are used for individual patient use at home or in a care provider.
communication between community pharmacy and the hospital (42%) and lack of access to patient records (35.5%). See Table 3.12 below.

**Table 3.12: Barriers relating to communication (n=121)**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not knowing when a patient has been discharged from hospital</td>
<td>3 (2.5)</td>
<td>0 (0)</td>
<td>8 (6.6)</td>
<td>17 (14.0)</td>
<td>92 (76.0)</td>
</tr>
<tr>
<td>Poor communication between community pharmacy and GP</td>
<td>12 (9.9)</td>
<td>18 (14.9)</td>
<td>20 (16.5)</td>
<td>37 (30.7)</td>
<td>34 (28.1)</td>
</tr>
<tr>
<td>Limited access to relevant documentation</td>
<td>4 (3.3)</td>
<td>3 (2.5)</td>
<td>31 (25.6)</td>
<td>28 (23.4)</td>
<td>54 (44.6)</td>
</tr>
<tr>
<td>Poor communication between community pharmacy and hospital</td>
<td>6 (4.9)</td>
<td>15 (12.4)</td>
<td>19 (15.7)</td>
<td>29 (24.0)</td>
<td>51 (42.1)</td>
</tr>
<tr>
<td>Information is primarily from the patient</td>
<td>13 (10.7)</td>
<td>18 (14.9)</td>
<td>31 (25.6)</td>
<td>21 (17.4)</td>
<td>31 (25.6)</td>
</tr>
<tr>
<td>Lack of access to patient records</td>
<td>9 (7.4)</td>
<td>11 (9.1)</td>
<td>26 (21.5)</td>
<td>28 (23.1)</td>
<td>43 (35.5)</td>
</tr>
<tr>
<td>No mechanism for providing feedback to the hospital</td>
<td>12 (9.9)</td>
<td>11 (9.1)</td>
<td>27 (22.3)</td>
<td>31 (25.6)</td>
<td>34 (28.1)</td>
</tr>
</tbody>
</table>

*Issues related to patient recruitment*

The main perceived barriers in terms of patient recruitment were: the hospital not referring patients to the community pharmacist (48%) and difficulty in identifying eligible patients (42%). Patient willingness to engage in the service was not seen to be a barrier at all by over a third of respondents (35%). See Table 3.13 overleaf.
Table 3.13: Barriers relating to patient recruitment (n=121)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major Barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying eligible patients</td>
<td>17 (14.0)</td>
<td>11 (9.1)</td>
<td>21 (17.4)</td>
<td>19 (15.7)</td>
<td>51 (42.1)</td>
</tr>
<tr>
<td>Patients not willing to engage in the service</td>
<td>42 (34.7)</td>
<td>33 (27.3)</td>
<td>17 (14.0)</td>
<td>13 (10.7)</td>
<td>12 (9.9)</td>
</tr>
<tr>
<td>Hospital not referring patients</td>
<td>5 (4.1)</td>
<td>10 (8.3)</td>
<td>21 (17.4)</td>
<td>25 (20.7)</td>
<td>58 (47.9)</td>
</tr>
</tbody>
</table>

Issues related to awareness of service
As shown in Table 3.14, lack of patient awareness of the DMR service was reported to be a major barrier (44%) more frequently than GP awareness of the scheme (34%).

Table 3.14: Barriers relating to awareness of service (n=121)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPs’ lack of awareness of DMR service</td>
<td>9 (7.4)</td>
<td>7 (5.8)</td>
<td>31 (25.6)</td>
<td>31 (25.6)</td>
<td>41 (33.9)</td>
</tr>
<tr>
<td>Patients unaware of DMR service</td>
<td>5 (4.1)</td>
<td>1 (0.8)</td>
<td>23 (19.0)</td>
<td>33 (27.2)</td>
<td>53 (43.8)</td>
</tr>
</tbody>
</table>

Issues related to paperwork and processes
Participants were asked to rate issues relating to paperwork and processes for conducting the DMR. The extent to which these are seen as barriers is presented in Table 3.15 overleaf. The amount of paperwork (44%) and the fact that it is not user friendly (42%) were reported as the main barriers. With regard to the issue of gaining consent from patients or carers, their views appear to be polarized with 42% reporting that it is not a barrier and 38% stating that it is. This could be due to the fact that we have asked about ‘patients’ or ‘carers’ in the same question.
Anecdotal feedback suggests that some pharmacists do not feel comfortable gaining consent from carers.

Table 3.15: Barriers relating to paperwork and processes (n=121)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaining written consent from patients or carers</td>
<td>19 (15.7)</td>
<td>30 (25.8)</td>
<td>24 (19.8)</td>
<td>13 (10.7)</td>
<td>34 (28.1)</td>
</tr>
<tr>
<td>DMR paperwork not user-friendly</td>
<td>10 (8.3)</td>
<td>13 (10.7)</td>
<td>16 (13.2)</td>
<td>31 (25.6)</td>
<td>51 (42.1)</td>
</tr>
<tr>
<td>Too much paperwork</td>
<td>9 (7.4)</td>
<td>12 (9.9)</td>
<td>18 (14.9)</td>
<td>28 (23.1)</td>
<td>53 (43.8)</td>
</tr>
<tr>
<td>Too many different stages involved in the DMR process</td>
<td>10 (8.3)</td>
<td>17 (14.0)</td>
<td>24 (19.8)</td>
<td>24 (19.8)</td>
<td>45 (37.2)</td>
</tr>
</tbody>
</table>

**Issues related to workload and time**

Barriers relating to workload and time are presented in Table 3.16 where 64% reported increase in workload as being a major barrier since a lot of input is needed into the DMR process. The remaining barriers relating to workload and time were not perceived to be as important as other factors mentioned.
Table 3.16: Barriers relating to workload and time (n=121)

Which of the following issues relating to WORKLOAD AND TIME represent a barrier to community pharmacists’ involvement in the DMR services? Please answer each question by placing a tick in the box.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in workload as lot of input needed</td>
<td>7 (5.8)</td>
<td>15 (12.4)</td>
<td>20 (16.5)</td>
<td>39 (32.2)</td>
<td>38 (31.4)</td>
</tr>
<tr>
<td>Inadequate staffing of community pharmacies</td>
<td>14 (11.6)</td>
<td>32 (26.4)</td>
<td>32 (26.4)</td>
<td>18 (14.9)</td>
<td>22 (18.2)</td>
</tr>
<tr>
<td>Time spent doing DMRs impacts on other services</td>
<td>14 (11.6)</td>
<td>18 (14.9)</td>
<td>26 (21.5)</td>
<td>41 (33.9)</td>
<td>20 (16.5)</td>
</tr>
<tr>
<td>Lack of recognition from employers for the extra work</td>
<td>24 (19.8)</td>
<td>19 (15.7)</td>
<td>22 (18.2)</td>
<td>23 (19.0)</td>
<td>23 (19.0)</td>
</tr>
</tbody>
</table>

Issues related to the Pharmacy

Table 3.17, shows ratings for issues relating to the Pharmacy. None of these were perceived to be major barriers, in particular proximity of the pharmacy to the healthcare provider where 47% reported that this was not a barrier at all. However, one commented that despite the community pharmacy being located next door to the GP surgery, not one discharge referral letter had been received. Views about the pharmacy computer systems not supporting DMR seem to be polarized since 40% did not perceive it to be a barrier and 41% reported this as a major barrier. This is probably influenced by the type of system being used by the respondent.
Table 3.17: Barriers relating to the Pharmacy (n=121)

Which of the following issues relating to THE PHARMACY represent a barrier to community pharmacists’ involvement in the DMR services? Please answer each question by placing a tick in the box.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy not located close to other healthcare providers (e.g. GP surgery or hospital)</td>
<td>57 (47.1)</td>
<td>27 (22.3)</td>
<td>14 (11.5)</td>
<td>11 (9.1)</td>
<td>6 (4.9)</td>
</tr>
<tr>
<td>Not knowing when part 2 (follow-up) of DMR will be undertaken</td>
<td>28 (23.1)</td>
<td>24 (19.8)</td>
<td>26 (21.5)</td>
<td>28 (23.1)</td>
<td>12 (9.9)</td>
</tr>
<tr>
<td>More than one pharmacist may be involved in one DMR</td>
<td>31 (25.6)</td>
<td>25 (20.1)</td>
<td>28 (23.1)</td>
<td>21 (17.4)</td>
<td>8 (6.6)</td>
</tr>
<tr>
<td>Pharmacy computer systems do not support the DMR service</td>
<td>27 (22.3)</td>
<td>21 (17.4)</td>
<td>18 (14.9)</td>
<td>20 (16.6)</td>
<td>29 (24.0)</td>
</tr>
<tr>
<td>Appointment system difficult to operate for single pharmacist stores</td>
<td>28 (23.1)</td>
<td>10 (8.3)</td>
<td>23 (19.0)</td>
<td>21 (17.4)</td>
<td>23 (19.0)</td>
</tr>
</tbody>
</table>

These data would suggest that community pharmacies do not perceive these issues to be the main barrier to DMR implementation.

Summary of Community Pharmacists’ Perceived Barriers

In summary, the major barriers to conducting the DMR service were identified as: not knowing when the patient has been discharged from hospital (76%), lack of access to discharge information (58%), hospitals not referring patients (48%), limited access to relevant information (45%), patients are unaware of the service (44%), too much paperwork (44%), identifying eligible patients (42%), poor communication between community pharmacy and hospital (42%), the DMR paperwork not being user-friendly (42%) and receiving discharge information too late (39%).
Suggested Solutions for Enhancing the DMR Service

Communication related suggestions
Pharmacists’ ratings of the communication issues which could make an improvement to the DMR process are shown in Table 3.18. Being automatically informed when a patient is being discharged (84%) and the existence of an electronic version of the DMR form (67%) were the most highly rated suggestions. Better communication between the hospital team and community pharmacy teams (63%) plus community pharmacy staff and GPs (51%) were also rated highly. Many participants also agreed that having a designated member of staff in the GP surgery to deal with DMRs was likely to be a major improvement (46%).

Table 3.18: Possible solutions related to communication (n=118)

The list below contains some solutions relating to COMMUNICATION that other community pharmacists have made to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence of an electronic version of the discharge information</td>
<td>4 (3.4)</td>
<td>3 (2.5)</td>
<td>10 (8.5)</td>
<td>22 (18.6)</td>
<td>79 (66.9)</td>
</tr>
<tr>
<td>Being automatically informed about when a patient has been discharged from hospital</td>
<td>2 (1.7)</td>
<td>0 (0)</td>
<td>7 (5.9)</td>
<td>12 (10.2)</td>
<td>99 (83.9)</td>
</tr>
<tr>
<td>Better communication between community pharmacy staff and GPs</td>
<td>3 (2.5)</td>
<td>9 (7.6)</td>
<td>25 (21.2)</td>
<td>22 (18.6)</td>
<td>59 (50.6)</td>
</tr>
<tr>
<td>Better communication between the hospital and the community pharmacy</td>
<td>1 (0.8)</td>
<td>2 (1.7)</td>
<td>16 (13.6)</td>
<td>25 (21.2)</td>
<td>74 (62.7)</td>
</tr>
<tr>
<td>Designated person in GP surgery to deal with DMRs.</td>
<td>8 (6.8)</td>
<td>8 (6.8)</td>
<td>22 (18.6)</td>
<td>28 (23.7)</td>
<td>54 (45.8)</td>
</tr>
<tr>
<td>Streamlining information from commissioners on how to undertake a DMR</td>
<td>11 (9.3)</td>
<td>10 (8.5)</td>
<td>27 (23.9)</td>
<td>26 (22.0)</td>
<td>44 (37.3)</td>
</tr>
</tbody>
</table>
Discharge information related suggestions
Participants’ ratings of the suggested improvements relating to the discharge information are presented in Table 3.19. Having discharge information sent directly to the community pharmacy and having access to electronic discharge information were both seen as likely to result in a major improvement to the service and no respondents felt these were unlikely to improve the service.

Table 3.19: Possible solutions related to Discharge Information (n=118)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge information sent directly to the community pharmacy</td>
<td>0</td>
<td>2 (1.7)</td>
<td>4 (3.4)</td>
<td>12 (10.2)</td>
<td>100 (84.7)</td>
</tr>
<tr>
<td>Access to electronic discharge information</td>
<td>0</td>
<td>2 (1.7)</td>
<td>9 (7.6)</td>
<td>13 (11.0)</td>
<td>94 (79.7)</td>
</tr>
</tbody>
</table>

Suggestions regarding promotion of service
As can be seen from Table 3.20, four main issues relating to promotion of the service were rated as likely to make a major improvement. These were: greater promotion of the service to hospital staff (57%), more promotion to patients when they leave hospital (53%), while they are in hospital (51%) and better promotion to GPs (50%).
Table 3.20: Possible solutions relating to Promotion of service (n=118)

The list below contains some solutions relating to PROMOTION that other community pharmacists have made to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater promotion of DMR service to patients while in hospital</td>
<td>3 (2.5)</td>
<td>5 (4.2)</td>
<td>17 (14.4)</td>
<td>34 (28.8)</td>
<td>60 (50.8)</td>
</tr>
<tr>
<td>More information about the DMR service provided to patients when they leave hospital</td>
<td>1 (0.8)</td>
<td>1 (0.8)</td>
<td>11 (9.3)</td>
<td>42 (35.6)</td>
<td>63 (53.4)</td>
</tr>
<tr>
<td>Better promotion of service to GPs</td>
<td>3 (2.5)</td>
<td>4 (3.4)</td>
<td>19 (16.1)</td>
<td>33 (28.0)</td>
<td>59 (50.0)</td>
</tr>
<tr>
<td>Greater promotion of DMR service to hospital staff</td>
<td>2 (1.7)</td>
<td>2 (1.7)</td>
<td>15 (12.7)</td>
<td>32 (27.1)</td>
<td>67 (56.8)</td>
</tr>
<tr>
<td>Better promotion to patients in the community pharmacy</td>
<td>4 (3.4)</td>
<td>7 (5.9)</td>
<td>27 (22.9)</td>
<td>34 (28.8)</td>
<td>47 (39.8)</td>
</tr>
</tbody>
</table>

**Funding and resource implications**
Pharmacists supported the suggestion that having a computer system in place which supports the DMR service would be a major improvement (47.5%). See Table 3.21.
Table 3.21: Possible solutions relating to funding and resources (n=118)

The list below contains some solutions relating to FUNDING AND RESOURCES that other community pharmacists have made to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having a computer system in place which supports DMR</td>
<td>9 (7.6)</td>
<td>8 (6.8)</td>
<td>16 (13.6)</td>
<td>29 (24.6)</td>
<td>56 (47.5)</td>
</tr>
<tr>
<td>Investment in staff to free up time for the pharmacist to undertake DMR activities</td>
<td>8 (6.8)</td>
<td>16 (13.6)</td>
<td>27 (22.9)</td>
<td>23 (19.5)</td>
<td>45 (38.1)</td>
</tr>
</tbody>
</table>

Other solutions
Other solutions are presented in Table 3.22 where streamlining of the DMR paperwork was rated highly (57%).

Table 3.22: Other possible solutions (n=118)

The list below contains some alternate solutions that other community pharmacists have made to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omit DMR part 2 (follow-up) and turn this into an MUR</td>
<td>15 (12.7)</td>
<td>10 (8.5)</td>
<td>25 (21.2)</td>
<td>23 (19.5)</td>
<td>45 (38.1)</td>
</tr>
<tr>
<td>Streamline DMR paperwork so easier to complete</td>
<td>3 (2.5)</td>
<td>6 (5.1)</td>
<td>23 (19.5)</td>
<td>20 (17.0)</td>
<td>67 (56.8)</td>
</tr>
</tbody>
</table>

In summary, the proposed solutions that respondents felt were most likely to result in major improvements to the service were: to send the patient’s discharge information directly to the community pharmacy (85%), to inform the community pharmacy automatically when the patient is discharged from hospital (84%), to have access to electronic discharge information (80%),
produce an electronic version of the discharge information (67%), improve communications between hospital and community pharmacy (63%), greater promotion of the DMR service to hospital staff (57%) and streamlining of the DMR paperwork so it is easier to complete (57%).

**Impact on Patient Care and Medicines Safety**
Participants were asked to rate how much they felt their involvement in medicines management had increased as a result of the DMR service. The findings are shown in Table 3.23. Over half the sample (52%) felt that their involvement in the medicines management process had increased a little and 29% thought it had increased a lot. Nearly a quarter of the sample provided some further explanation for this. These are summarized in Appendix 8.

**Table 3.23: Involvement in medicines management (n=116)**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not increased</td>
<td>24 (20.6%)</td>
</tr>
<tr>
<td>Increased a little</td>
<td>58 (51.7%)</td>
</tr>
<tr>
<td>Increased a lot</td>
<td>34 (29.3%)</td>
</tr>
</tbody>
</table>

Table 3.24 shows the pharmacists’ ratings of the potential impact of the DMR on patient safety. These findings will be discussed further in section 7.

**Table 3.24: Impact on patient safety (n=116)**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>32 (27.6%)</td>
</tr>
<tr>
<td>Significant</td>
<td>59 (50.8%)</td>
</tr>
<tr>
<td>Serious</td>
<td>35 (30.2%)</td>
</tr>
<tr>
<td>Potentially lethal</td>
<td>2 (1.7%)</td>
</tr>
</tbody>
</table>

**Community Pharmacists’ Views about the DMR Service**
The final part of the questionnaire asked for respondents’ overall view of the DMR service, all things considered, having weighed up all the different aspects of its delivery. In general, community pharmacies’ views about the DMR service were very positive, as shown in Table 3.25.
Table 3.25: Community pharmacists’ views about the DMR service (n=116).

The list below contains some statements that other community pharmacists have made about the DMR service. Please rate your agreement with the following:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Disagree (=1) or Strongly Disagree (=2) n (%)</th>
<th>Uncertain (=3) n (%)</th>
<th>Agree (=4) or Strongly Agree (=5) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient related</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMRs are making a positive difference for patients</td>
<td>8 (6.8)</td>
<td>22 (19.0)</td>
<td>86 (74.1)</td>
</tr>
<tr>
<td>It makes the patient’s transition on discharge smoother</td>
<td>9 (7.8)</td>
<td>31 (26.7)</td>
<td>76 (65.5)</td>
</tr>
<tr>
<td>Problems are being identified sooner and are ‘nipped in the bud’</td>
<td>7 (6.0)</td>
<td>17 (14.7)</td>
<td>92 (79.3)</td>
</tr>
<tr>
<td>Time spent on the DMR service takes me away from other patients</td>
<td>32 (27.2)</td>
<td>29 (25)</td>
<td>55 (47.4)</td>
</tr>
<tr>
<td>Providing DMRs means that I can contribute more to patient care</td>
<td>6 (5.2)</td>
<td>12 (10.3)</td>
<td>98 (84.5)</td>
</tr>
<tr>
<td>It makes me feel that I have actually done something for the patient</td>
<td>6 (5.2)</td>
<td>13 (11.2)</td>
<td>97 (83.6)</td>
</tr>
<tr>
<td>A DMR is more beneficial to the patient than an MUR</td>
<td>28 (24.1)</td>
<td>45 (38.8)</td>
<td>43 (37.1)</td>
</tr>
<tr>
<td><strong>Workload related</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMRs are a good thing but hard to do on top of everything else.</td>
<td>15 (12.9)</td>
<td>26 (22.4)</td>
<td>75 (64.7)</td>
</tr>
<tr>
<td>DMRs take up a lot of my time for which I am not reimbursed by my employers</td>
<td>42 (36.2)</td>
<td>32 (27.6)</td>
<td>43 (37.1)</td>
</tr>
<tr>
<td>The DMR form is too onerous to complete</td>
<td>28 (24.1)</td>
<td>22 (19.0)</td>
<td>66 (56.9)</td>
</tr>
<tr>
<td>The reimbursement by the commissioner is not proportional to the input needed</td>
<td>20 (17.2)</td>
<td>46 (39.7)</td>
<td>50 (42.4)</td>
</tr>
<tr>
<td>We are now being paid for something we were already doing</td>
<td>27 (23.3)</td>
<td>19 (16.4)</td>
<td>70 (60.3)</td>
</tr>
<tr>
<td>Statements</td>
<td>Disagree (=1) or Strongly Disagree (=2) n (%)</td>
<td>Uncertain (=3) n (%)</td>
<td>Agree (=4) or Strongly Agree (=5) n (%)</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>A DMR takes longer than an MUR</td>
<td>2 (1.7)</td>
<td>9 (7.8)</td>
<td>105 (90.5)</td>
</tr>
<tr>
<td>I acknowledge that the DMR takes a long time, but it is worth it</td>
<td>12 (10.3)</td>
<td>20 (17.2)</td>
<td>84 (72.4)</td>
</tr>
<tr>
<td>DMRs are a worthwhile use of my time</td>
<td>8 (6.8)</td>
<td>27 (23.3)</td>
<td>81 (69.8)</td>
</tr>
<tr>
<td>Working relationships</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It helps foster good working relationships with local hospitals</td>
<td>21 (18.1)</td>
<td>39 (33.6)</td>
<td>56 (48.3)</td>
</tr>
<tr>
<td>Relationships between pharmacy and GPs have generally improved as a result of the DMR service</td>
<td>48 (41.3)</td>
<td>43 (37.1)</td>
<td>25 (21.6)</td>
</tr>
<tr>
<td>It helps to build rapport with patients</td>
<td>7 (6.0)</td>
<td>16 (13.8)</td>
<td>93 (80.2)</td>
</tr>
<tr>
<td>It gets the patient ‘on side’ for future pharmacy encounters such as MURs</td>
<td>6 (5.2)</td>
<td>33 (28.4)</td>
<td>77 (66.4)</td>
</tr>
<tr>
<td>Other views</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In general, I am enthusiastic about the service</td>
<td>12 (10.3)</td>
<td>25 (21.6)</td>
<td>79 (68.1)</td>
</tr>
<tr>
<td>A DMR allows me to apply my clinical knowledge and skills to my practice</td>
<td>9 (7.8)</td>
<td>15 (12.9)</td>
<td>92 (79.3)</td>
</tr>
</tbody>
</table>

In summary, pharmacists agreed that although the DMR process takes longer than an MUR (90.5%), they feel as if they have actually done something for the patient (84%) which helps to build rapport (80%) and get the patient ‘on side’ for further pharmacy services such as MUR (66%). It provides Community Pharmacists with the opportunity to contribute to patient care (85%) and allows them to apply their clinical knowledge to their practice (79%) by doing something positive for the patient (74%). They agreed that problems with medication at discharge are being identified sooner and ‘nip[ped] in the bud’ (79%) making the transition on discharge smoother (66%). They recognised the value of DMRs but find it hard to do on top of everything else (65%), acknowledging that it takes a long time, but it is a worthwhile use of their time (70%). In general, pharmacists are enthusiastic about the service (68%), although some feel that they are now being paid for something which they were already doing (60%).
Main Discussion Points

The response rate of 20% is low, however only 520 community pharmacies have undertaken DMRs according to NECAF database. Comparing the responders to the NECAF database indicates that the percentage responding to the survey are not too dissimilar to the proportion of those who have undertaken DMRs for each post-code area; however there is under-representation from the Swansea area. It is not known if any of the 143 responses are from those who had not undertaken any DMRs since the service started. However, within the responders, there were a proportion of pharmacies who had not undertaken any DMRs in November 2013. Overall there was a good spread of experience with the DMR service and a good geographical spread.

Responses were received from all sectors of community pharmacy and all types of roles were represented. It must be acknowledged that there is potential for responder bias in that those who have never undertaken a DMR may not have responded to the survey and their issues may be different.

There seems to be an issue in completing part 2 of the DMR process for some community pharmacists, but not for all (average difficulty 6.4/10). Some of the qualitative data suggests that completing part 2 is cumbersome and the survey suggests that some pharmacists do not perceive any additional benefits from conducting part 2.

The evidence suggests that Community Pharmacists are reliant on the more traditional modes of communication (telephone, fax, face to face) for receiving and relaying information to others (GP, patient, hospital) relating to the DMR service. However, they would prefer to be able to do this electronically where possible /appropriate.

Community Pharmacists’ Views about the DMR Service

Whilst a DMR takes longer than doing a MUR, responders feel as if they have actually done something for the patient, which then helps to build rapport and get the patient ‘on side’ for further pharmacy services such as a MUR.

Community Pharmacists reported that the DMR service provides them with the opportunity to contribute to patient care and allows them to apply their clinical knowledge to their practice by doing something positive for the patient.

This sample of Community Pharmacists thought that problems with medication at discharge are being identified sooner and ‘nipped in the bud’ making the transition on discharge smoother.

The community pharmacy respondents recognised the value of DMRs but explained they are hard to do on top of everything else. Whilst they acknowledged that the DMR takes a long time, they feel it is a worthwhile use of their time.

In general, Community Pharmacists are enthusiastic about the service and some reported that they are now being paid for something which they were already doing.

The system seems to be working better for patients already having monitored dosages systems from the pharmacy than for those who are self-medicating. However, this specific issue was not directly measured as part of the questionnaire.
Major Barriers for Community Pharmacies to Engage in the Service

Based on these findings, the key barriers to conducting the DMR service from the community pharmacists’ perspectives are as follows:

- Inability to identify eligible patients since they do not know when the patient has been discharged from hospital;
- Lack of access to discharge information since community pharmacists have limited access to relevant information;
- Hospitals not referring patients;
- Patients are unaware of the service;
- Receiving discharge information too late (joint 6th);
- Too much paperwork;
- Poor communication between community pharmacy and hospital;
- DMR paperwork not user-friendly.

Suggestions for Potential Recommendations

The following suggestions were identified as the having the most potential for making a major improvement:

Identifying patients: automatically inform community pharmacy when patient is discharged from hospital;

Obtaining complete information in a timely manner: send the patient’s discharge information directly to the community pharmacy, ideally via electronic means, or allow access to the electronic discharge information;

Strengthening relationships and smoothing communication pathways: greater promotion of service to hospital staff and patients and also engagement with GP surgery staff to encourage better communication and ‘get them on board’;

Documentation: streamline the paperwork so it is easier and faster to complete.
Chapter Four: The GPs Perspective

Background

Patients discharged from hospital may receive care from a community nursing team or contact a pharmacist to fill a prescription or seek advice, or they may have a series of ongoing appointments with the hospital outpatient department; however if they are registered with a GP, it is to the GP that the consultant (as one medic to another) ‘transfers care’ of the patient.

GPs are of course independent contractors into the NHS system. They employ their own staff to accomplish the business of the GP surgery. Alongside salaried medics, nurses and healthcare support workers there is a diverse range of administrative functions and increasingly a role for employed pharmacists. No individual GP practice is alike, although there are professional similarities in role and function. Within this report, ‘GP’ should therefore be understood as convenient shorthand for the full GP practice.

The Policy Overview section of this report (to be found in the Introduction) set out how the DMR Service can be seen as part of a wider attempt to harmonise the transition of the patient from one care setting to another. Chapter One (the Literature Review) summarised the evidence of harm resulting from medication errors in this transition period. However the impact of the DMR service on the GP has hitherto been unclear.

The NHS system views the GP as gatekeeper back to secondary care and the coordinator of care outside the hospital. The primacy of GP held patient record system to which other areas of the NHS (e.g. A&E) seek access reinforces the significance of the GP role. From the GP perspective therefore the ‘information gap’ in the period of a patient’s transition appears to take place in a binary system; between themselves and the hospital. The purpose of this section is to explore the impact, barriers and potential benefits of the DMR service from the GP perspective.

Method

Approval to undertake the DMR review as a service evaluation project and to undertake GP interviews was gained from each of the Health Board’s Research and Development Offices.

Following this, an e-mail outlining the project was sent to the Director of Primary Care or other similar senior roles in four Local Health Boards requesting GP volunteers for interview. Six interviews were subsequently undertaken across two Local Health Boards (Cardiff and the Vale and Aneurin Bevan).

The interviews are not intended to be seen as representative of GP experience or views but rather as illuminating the process of the DMR service from the GP perspective. The experiences shown illustrate the broader analysis of the service from the literature and other accompanying evidence.

Five of these interviews were with GPs and one was with a practice pharmacist.

The semi-structured interviews used a topic guide based around five main areas: communication issues, perceptions of patient knowledge and understanding of medication, the pharmacist’s role, additional benefits of the service and barriers to the service. This is presented in Appendix 9.

Interviews were conducted via telephone and notes taken. Thematic analysis using a combination
of inductive and deductive approaches to identify key themes was utilised.

All interviews took place in November 2013.

Findings

The interviews indicated that there was little to no knowledge of the DMR service amongst GPs. The GPs that did possess limited knowledge of the service had acquired it from additional roles in the Local Health Board and not from their role as GPs.

Whilst GPs retained overall accountability for prescriptions issued by their practice they had in general little operational knowledge of the processes their ‘prescription clerks’ (or other similar staff – in one case a practice pharmacist) undertook to ensure prescriptions were updated and issued or re-issued to patients. All were confident that exceptions or difficulties would be brought appropriately to their attention but acknowledged that in practice the ‘clerk’ would likely be operating channels of communication to the community pharmacy or hospital (at an appropriate level) to minimise these exceptions and difficulties. The GPs all viewed the DMR service as an example of this type of low level communication that might occasionally escalate to their notice.

In general the GPs interviewed had a favourable impression on the service as:

- Providing better information and advice to the patient;
- Promoting better communication between the hospital, community pharmacist and the GP

‘I hope this is happening as it should be beneficial for patients. GPs don’t have the time to review medication and compliance is very important. Community pharmacists are well placed as psychologically many patients don’t notice changes until they physically see the colour or amount of the ‘pills’ change in their hand’.

‘More communication between professionals can only be good. I would like to know about this service!’

One negative view was expressed, perceiving the service as a waste of money providing an unnecessary extra check for patient safety.

‘Patients don’t have a relationship with the pharmacist. They don’t see them as frequently as they do their GP. Do pharmacists actually want this role?’

‘I’m not convinced at all of the merits of this service. It should be the prescriber - the GP - that reviews the prescription post-discharge. Anything the community pharmacist might find would already be being dealt with by the GP surgery. Overkill. Possibly a double safety check but seems more like inappropriate and unnecessary work.’

It was noticeable that whilst most of the GPs interviewed believed the opportunity to discuss medication post-discharge with the pharmacist would provide reassurance to the patient and thus improve compliance, none considered that patient safety might be improved by the scheme as they were confident in the security of their own systems. It is interesting to consider though, how far this confidence might depend on the actual operation of regular communication between the practice/community pharmacy and hospital of which the GP acknowledge as the remit of the
administrative staff. The practice pharmacist commented:

‘Most days I deal with two to three queries. This could be incomplete information. A common query is that medicines disappear from the list but is this a deliberate stoppage or an omission? A dosage may have altered – again is this an error? No information is provided on why.’

Generally GPs had a positive view of their interactions with the community pharmacies in their locality although one GP warned of other GPs who might see the pharmacist as an ‘irritant’ rather than as a ‘fellow colleague on conditions of parity’.

All GPs interviewed were deeply troubled by the overall context of the discharge process which they felt provided them with poor and inadequate information on the patient’s condition and treatment.

Medication queries were one aspect of this. Information was described as often missing or inadequate, illegible and provided on poorly faxed or carbonated sheets of paper. The exception to this was Aneurin Bevan Health Board which was highly praised by GPs for their electronic discharge information system.

Further to the inadequate information they were provided with by the hospital, GPs expressed a sense of frustration at not having a clearly defined and available contact point for information. Examples of unmanned fax machines or phone lines meant that either too much time was expended on tracking down information or alternatively the GP was forced to rely on making a judgement without this.

‘Hospital information on discharge tends to be nothing more than a list of medications. So if one is ‘missing’ – what does that mean? Recently the format has changed and it is better but there is still no explanation of any changes. If I wanted one I would have to fax a letter to the consultant. We have no relationship with the hospital pharmacy team and would welcome this – or even better if the community pharmacist could be the link!’

Suggestions for Improvement

The DMR scheme and any improved guidance on its operation should be devised in the overall context of improving discharge information to the GP (both in content and in medium of transmission).

Information about any relaunched scheme should be circulated through GP professional networks and directly to practices.

Health Boards should include GPs and their staff in any discussion or training on around the DMR scheme.

Information about the impact of the DMR scheme (including on patient safety) should be flagged with GPs and their practices (and also through professional networks).
Chapter Five: Hospital Pharmacy Views about the DMR Service

Background

The impetus for the DMR service was the need to improve the transfer of information between primary and secondary care, in an attempt to reduce the number of errors or problems patients have with their medicines after they have been discharged from hospital (Welsh Government, October 2011).

Part one of the DMR service requires the community pharmacist to check that the medicines prescribed in one care setting, e.g. the hospital, match those prescribed by the GP on the patient’s first prescription after being discharged. This requires the community pharmacist having access to the Discharge Advice Letter (DAL) or “any advice note, regarding the patient’s medicines issued from the care setting from which the patient has been discharged.” (Welsh Government, January 2012 p.1).

Patients can be identified and recruited to the service either by referral by a healthcare professional, by patients or their nominated carer presenting in the pharmacy, or opportunistically by the pharmacy (Welsh Government, October 2011). The engagement of the hospital pharmacy departments across Wales was therefore important, if the service was to be successful. The hospital pharmacists would either need to refer appropriate patients to the community pharmacy, or as a minimum ensure that appropriate information about the patient’s medicines and any changes during the admission, was legible and available to the community pharmacist. It was therefore felt that the views and opinions of the hospital pharmacy service were required in order to fully evaluate the DMR service.

Overview

This section brings together the two phases of the evaluation of the DMR service from the hospital pharmacy perspective. These were:

Phase 1: One-to-one interviews conducted with a small sample of hospital pharmacists;

Phase 2: Questionnaires sent to a larger sample of hospital pharmacies in Wales.

Phase 1: Hospital Pharmacy Interviews

Objectives

- To describe how the DMR service was implemented at each Health Board;
- To explore any facilitators and barriers to their involvement in the DMR service;
- To identify the hospitals’ suggestions for how the DMR service can be improved.

Method

Semi-structured interviews were identified as the most appropriate methodological approach as they would allow focus on the key areas whilst allowing participants to expand and to comment on further issues which were important to them. A topic guide (Appendix 10) was developed
based on the key issues identified by the team from the literature and anecdotally from discussions with pharmacists informally and at a Royal Pharmaceutical Society local practice forum.

**Sampling and recruitment**

Approval was gained to undertake interviews from each of the Health Board’s Research and Development Offices (n=6). Each Health Board confirmed that ethical approval was not required. The nominated hospital pharmacy lead for the DMR service for each Health Board were identified and invited to participate in a one-to-one semi-structured interview, either face-to-face or via telephone. Once confirmation of interest was gained, a Participant Information Leaflet, consent form and covering letter (Appendix 11) were e-mailed and a date for the interview was set.

**Data collection**

Interviews were carried out at the pharmacist’s convenience. The interview began with a reminder of the research aims and the interview procedure. Consent was confirmed verbally. The interviews were either taped-recorded and/or notes were made. The topic guide (Appendix 10) consisted of questions about the implementation of the scheme in their Health Board, the DMR process within the Health Board, barriers and facilitators of the DMR service, whether it was a pharmacy specific scheme and their ideas for how the DMR service could be improved. In addition, it asked for an estimate of the additional time it takes to complete a DMR; this was important for the economic evaluation of the DMR service (see Chapter 7). At the end of the interview, the interviewee was asked if they had anything further to add. They were then thanked and the interview ended. All interviews took place between October and December 2013.

**Analysis**

The transcriptions/notes from each interview were sent back to the interviewee for confirmation; no amendments to the notes were required. The data were then thematically analysed using constant comparison to review the themes. Where appropriate, sections of the text were transcribed verbatim and used to illustrate the themes.

**Findings**

All six Health Boards agreed to participate. Five interviews were completed via the telephone and one was face-to-face. Summary information of the interview with Health Boards is provided in Table 5.1 and an overview of the DMR Service in each Health Board is outlined in Table 5.2.

**Table 5.1: Summary Information**

<table>
<thead>
<tr>
<th>Health Board (HB)</th>
<th>Length of Interview (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>6</td>
<td>44</td>
</tr>
</tbody>
</table>
Table 5.2: Summary Information of the DMR Service in each Health Board

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Average number of DMRs Initiated by Health Board per month</th>
<th>DMR Policy or Procedure</th>
<th>Electronic or hand-written DALs</th>
<th>Process of Consent</th>
<th>Type of Information Provided</th>
<th>Method of communication with Community Pharmacist</th>
<th>Outline of DMR Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not formally documented</td>
<td>No</td>
<td>Electronic</td>
<td>Verbal</td>
<td>List of medicines and any changes</td>
<td>Patient held</td>
<td>Patient identified and pharmacist writes on drug chart 'DMR on discharge'. On discharge patient provided with a copy of electronic discharge in envelope with sticker on it saying 'This is for your community chemist to conduct a DMR'.</td>
</tr>
<tr>
<td>2</td>
<td>Not formally documented</td>
<td>No</td>
<td>Hand-written</td>
<td>Verbal</td>
<td>List of medicines and any changes</td>
<td>Patient held</td>
<td>Patient identified. On discharge a copy of the list of medicines and any changes is provided to the patient to hand to their community pharmacist.</td>
</tr>
<tr>
<td>3</td>
<td>80 (in-house data)</td>
<td>Yes</td>
<td>Electronic</td>
<td>Verbal</td>
<td>List of medicines and any changes</td>
<td>Fax information</td>
<td>Patient identified by pharmacist or pharmacy technician. Community pharmacist details documented on the drug chart. Patient provided with a leaflet about the DMR service. Verbal consent gained and documented on pharmacy section of the drug chart if completed prior to discharge. On discharge, a sticker is attached to TTH with community pharmacy details for faxing relevant information (patient’s medicines, those stopped and started). The patient is given a copy of their TTH in an envelope ‘Please take this information to your regular community pharmacist’.</td>
</tr>
<tr>
<td>4</td>
<td>15 (in-house data)</td>
<td>Yes</td>
<td>Electronic on one ward; other wards use hand-written DALs</td>
<td>Written</td>
<td>Discharge advice letter, including medical information</td>
<td>Fax information</td>
<td>'Push' Model Patient identified by pharmacy team and provided with information about the service. If patient agrees, written consent gained and community pharmacy nominated. Once confirmed community pharmacist is registered as DMR service provider, in-patient medication chart annotated with community pharmacy details and ‘DMRS’ in pharmacy section. At discharge patient consent confirmed and within 72 hours a copy of the TTH, medicines reconciliation chart (if available) and patient consent form transmitted to community pharmacy. 'Pull' Model Community pharmacist contacts relevant hospital and faxes a copy of the standard consent form signed by the patient. They provide details of patient name, date of birth, hospital, ward and date of discharge. Administrators fax information to community pharmacy.</td>
</tr>
<tr>
<td>Health Board</td>
<td>Average number of DMRs Initiated by Health Board per month</td>
<td>DMR Policy or Procedure</td>
<td>Electronic or hand-written DALs</td>
<td>Process of Consent</td>
<td>Type of Information Provided</td>
<td>Method of communication with Community Pharmacist</td>
<td>Outline of DMR Process</td>
</tr>
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</tr>
<tr>
<td>5</td>
<td>Not formally documented</td>
<td>No</td>
<td>Electronic and hand written</td>
<td>Verbal</td>
<td>List of medicines and any changes</td>
<td>Patient held for non-MDS patients Faxed for MDS patients</td>
<td>Non-MDS Patients Patient identified. On discharge a copy of the list of medicines and any changes is provided to the patient to hand to their community pharmacist. MDS Patients Patient identified and information faxed to community pharmacist.</td>
</tr>
<tr>
<td>6</td>
<td>Not formally documented</td>
<td>Yes</td>
<td>Hand-written (DALs have written information about the DMR service on the back of the patient’s copy)</td>
<td>Written</td>
<td>Discharge advice letter, including medical information</td>
<td>Fax information</td>
<td>'Push' Model Patient identified by pharmacy team and provided with information about the service. If patient agrees, written consent gained and community pharmacy nominated. Once confirmed community pharmacist is registered as DMR service provider, in-patient medication chart annotated with community pharmacy details and ‘DMR Service’ in pharmacy section. At discharge patient consent confirmed and within 72 hours a copy of the TTH and consent form transmitted to community pharmacy. 'Pull' Model Community pharmacist contacts relevant hospital and faxes a copy of the consent form, including details of the hospital, ward and discharge date. Pharmacy receptionist retrieves relevant information and then a pharmacist or senior technician must approve the request before information is faxed to community pharmacy.</td>
</tr>
</tbody>
</table>
Development of the DMR Service within the Health Board

A number of the Health Boards felt that when the DMR service was announced by the Welsh Government the hospitals had been ‘left out of the loop’ (HB 2). They explained that local discussions on how the hospitals would be involved in the scheme were held a few months after the DMR service had been initiated. All Health Boards discussed the scheme, usually at a senior management meeting. Health Board 4 established a stakeholder forum to develop their policy; however no community pharmacists were included. In Health Board 5, the introduction of the DMR scheme coincided with the senior managers attending a service improvement course and so they used the suggestions of the course to help implement the scheme. Health Board 2 explained that at the time of the launch of the DMR scheme, there were staff shortages throughout the hospitals in the Health Board and when the senior pharmacists met, a decision was made that the pharmacy departments could only provide a minimal service (i.e. advertise the service via posters on walls and by including the DMR leaflet in the bag of discharge medicines) as it was not known what the additional workload would be.

The majority of Health Boards felt that more guidance from the Welsh Government was required. The guidance the Government published provided an overview of the scheme but did not cover specific information about what the Health Board could or could not do, nor the roles and responsibilities of all involved in the scheme. Some Health Boards wanted more specific guidance with respect to the legalities of the DMR service.

Only three Health Boards (3, 4 and 6) developed a specific DMR policy/procedure. Health Board 6 also explained that awareness sessions for pharmacy staff on the DMR service were held initially and letters were sent to General Practitioners outlining the new service.

The Hospitals’ DMR Process/Procedure

All Health Boards identified that MDS patients are prioritised for the scheme; many explaining that they continued the service they had previously established. This was to fax a copy of the list of medicines the patient was prescribed to the community pharmacist on discharge. Health Board 6, who require written consent for the DMR service, explained that formal (via DMR service) and informal (without written consent) communication for MDS patients occur.

With respect to other patients being referred for the DMR service, three Health Boards have specific policies stating which patients to target, for example those on high risk medicines, those on four or more medicines, those who have started/stopped medicines during their hospital stay. Some Health Boards explained that as time has elapsed additional groups of patients have been added to the list of patients to have DMRs; for example Health Board 1 now initiate a DMR for all cardiac patients and Health Board 3 have added heart failure patients to their policy. All Health Boards explained that it is usually left for the pharmacist to make a professional judgement on whether a patient requires a DMR.

The methods for the DMRs seem to be dependent upon the discharge system which was already in place at the hospital and there is inter-and intra- Health Board variation. Three of the Health Boards (1, 2 and 5) have a similar method. Pharmacists use their professional judgement in identifying patients and once identified they provide the leaflet explaining the scheme, obtain verbal consent and then provide the patient with an additional copy of the prescription or a list of medicines in an envelope addressed to the community pharmacist. This scheme is dependent upon the patient taking the envelope to their pharmacist. The Health Boards do not fax any information to the community pharmacist unless they are MDS patients, explaining that it would
be too great a workload for the department (Health Board 1 and 5). The difference between the Health Boards is whether or not they have electronic discharge prescriptions. Health Board 2 and one hospital in Health Board 5 only use the traditional hand-written prescriptions, where as the others have an electronic one. Those with electronic discharges stated that it did not take them very long to print out a further copy of the medicines list and place it in an envelope and give it to the patient. The time required to complete the paperwork for those using hand written prescriptions was much greater as they needed to write out the list of medicines and possibly find out further information e.g. which medicines stopped and started; such information is usually contained on the electronic version of the discharge prescription.

Health Boards 3, 4 and 6 take responsibility for sending information to the community pharmacist rather than relying on the patient. Interestingly all of these Health Boards explained they use the pharmacy team and whilst the pharmacist is responsible for the service, identification of patients, providing the leaflet and faxing information to the community pharmacist could be completed by either the pharmacist or the technician. Feedback from Health Boards 3 and 4 indicated that the technicians were positive about the scheme whereas Health Board 6 felt the technicians could be more involved in the service in the future. The difference between the Health Boards is that Health Board 3 obtains verbal consent to send a list of medicines and those medicines stopped or started and documents this on the pharmacy section of the prescription form, whereas in Health Board 4 and 6 the pharmacist always obtains written consent to send a copy of the DAL, containing medical information to the community pharmacist. The written consent form in these Health Boards explicitly state what information is being shared with the community pharmacist i.e. that it is not just a list of their medicines but also medical information; however the consent form is only specific to the hospital’s contribution to the DMR process i.e. sharing information with the community pharmacist.

The models above all illustrate a ‘push’ model whereby the hospital identifies patients and informs the community pharmacist. Whilst much time was initially spent on developing this service, Health Board 4 explained that it became apparent that a ‘pull’ model was also required, whereby the community pharmacist identifies relevant patients and then ‘pulls’ information from the hospital. The reasons behind such a development included the pressures within the hospital service and the small window of opportunity there is to identify relevant patients in hospital. This point was also identified by Health Board 1. In order for the ‘pull’ model to work, the Health Board 4 have sent information to the community pharmacists, including a proforma (name of patient, ward, hospital etc) and established a hotline which is manned by administrators. If the community pharmacist identifies a patient, they can telephone the hotline and the administrators will then obtain the discharge prescription and fax it across, once they have checked that there is a signed consent form (which is kept in the administrators’ office). If necessary, the community pharmacist can discuss the patient with the relevant hospital pharmacist. Whilst Health Board 6 also uses a similar ‘push and pull’ model, they commented that the ‘pull’ system was not working as they have received minimal requests from community pharmacists for information (a general point made by all Health Boards). They explained that both systems are not optimal (too time consuming) and may consider a more ‘patient-led’ service in the future, whereby the patient is empowered to provide relevant information to the community pharmacist.

One hospital in Health Board 5 has completed a number of projects on how to identify appropriate patients. The first is where they looked at potential ‘problem’ patients on admission and highlighted those possible DMR patients. It was difficult though to follow the patients through to discharge. From the 16 patients identified with concerns, 4 patients were referred to community pharmacists for a DMR; all patients having multiple medication changes. One community pharmacist provided feedback explaining it was good to have the referral and the
The second project was based in one community pharmacy; the hospital reviewed the discharges and identified patients to the community pharmacist but it was for the community pharmacist to then find the patients after discharge. Eighteen discharges were identified and 17 DMRs undertaken by the community pharmacist; only one patient was unidentified. Twenty-six recommendations were made by the community pharmacist and all were actioned by the GP. Extra information was requested from the hospital on one patient. Positive feedback was received on the information provided to community pharmacists. The GP for the area was asked his opinion but he was unaware of the service.

The third project was for MDS patients where the community pharmacist was contacted both when a patient was admitted and again on discharge; a copy of a list of discharge medicines was faxed to the community pharmacist on discharge. About 4 patients a day were included in this project, which has continued. Feedback from community pharmacists emphasised the importance of notification the patient was admitted as well as notification of discharges.

All Health Boards as a minimum use a DMR leaflet, which they put in with patients medicines. In some Health Boards, it is provided to all patients and others it is targeted. The uptake of the scheme initially seems to be slow; time pressures, staff shortages and patients not consenting or being disinterested were stated as some reasons for the slow uptake. All Health Boards explained their schemes were pharmacy specific but when questioned did acknowledge it may be beneficial to include others. Nurses, healthcare assistants and social workers were the professionals mentioned. Health Board 2 explained that they had a recent enquiry to include the DMR Service in their COPD discharge pathway.

Attitudes and Barriers to the Scheme

Whilst many of the interviewees acknowledged the potential of the DMR scheme, seeing the benefit for the patient and also helping communication between primary and secondary care, they also acknowledged that individual pharmacists/pharmacy technicians attitude to the scheme was a barrier.

‘….some of our pharmacists are really willing to embrace new schemes and so on, others are less, well a little bit more cynical about, you know the benefits of such schemes and they may not be signed up to do it.’ (HB 1)

Health Boards 2,3 and 6 acknowledged that people did not understand the DMR service; Health Board 3 has therefore recently organised for a community pharmacist to come and talk to the team to explain the whole process and make it ‘come alive’. Whilst the interviewees discussed the lack of understanding of others, there were some comments made throughout the interviews that also illustrated some misunderstanding of the scheme on the part of the Health Boards DMR leads. These included that patients could only be identified by the hospital and not the community pharmacist and that house-bound patients are excluded from the scheme. Two Health Boards explained that pharmacists did not feel the MUR scheme was credible and that this had affected pharmacists’ engagement in the DMR scheme in hospital. One also discussed that the community pharmacy’s companies see the DMR service as income and worry that the focus is on that and not on the patient, asking what happens once the pharmacy had reached their quota of 140 per annum – do they stop doing any more DMRs?

‘so that the DMUR scheme, the payment is a lot higher again and cos people are sceptical
as to the value of the MUR, there is this scepticism around in secondary care as to the actual benefit to the patient.’ (HB 1)

All interviewees felt that the lack of feedback on the DMR scheme back into the hospital affected the pharmacist’s attitude and motivation.

‘That’s (lack of feedback) been raised a couple of times at our lunchtime meetings in terms of pharmacists ploughing a little bit of time and effort and not really knowing what the true benefits are...I suppose it’s like with anything we want to see the results.’ (HB 4)

‘we are quite happy to, signed up to taking part in the scheme, we think it’s really good idea, anything which aids information transfer to the GPs and cuts out errors, is always something we would support but because of the pressures on the service, and because we have never seen any output data or any impact of the scheme, then sometimes we wonder why, with everything that is going on, is, what is in it for the patient and for us?’ (HB 1)

All interviewees expressed that they were unaware of the number of DMRs completed in their Health Board, if the patients they had initiated in hospital had actually completed a DMR and what were the outcomes. When asked what feedback they would like, it usually consisted of quarterly feedback on the number of DMRs completed, types of interventions made, patient outcomes and whether the hospital can learn anything from them/do anything differently in the future.

A number of other barriers to the DMR service were identified. The main one discussed was the lack of IT-infrastructure, making it difficult to send information securely to the community pharmacist. Health Board 2 and 6 felt that if such infrastructure was present in their Health Board, the uptake of DMRs within the hospitals would have been much greater as it would require less of the pharmacists’ time. Lack of time for the pharmacy team to complete DMRs was another major factor identified by all Health Boards. Many Health Boards explained that the pressures on the NHS, the need for quick discharges and their other priorities make it difficult for the DMR scheme to be their main concern, especially if there are staff shortages. Health Board 5 explained this was particularly the case for ward pharmacists, whereas specialist pharmacists seemed to be more engaged, for example the heart failure pharmacist. When asked to approximate the time it takes to complete a DMR; it ranged from 3-5 minutes for those printing an additional copy of the electronic discharge and putting it in an envelope to 20-30 minutes for a hand-written prescription. For those Health Boards, with an electronic system, where they fax information to the community pharmacist an additional 10-15 minutes is required.

Another major barrier is that the length of stay for patients in hospitals is usually so small that time to identify patients, inform them about the scheme, consent them and complete the paperwork is often too short. This has led Health Board 4 to rethink their policy and concentrate more on the ‘pull’ model. The interviewee acknowledged that whilst this has helped the hospital service, research needs to be undertaken to identify if the system works for community pharmacists, as it may be difficult for the community pharmacist to phone the helpline when a patient is in front of them and this may cause delays in completing the DMR, as information firstly needs to be retrieved by the hospital and then sent to the community pharmacist. Health Board 6 also identified other barriers e.g. the telephone on the wards not having external lines, the lack of continuity of pharmacists, keeping it on the ‘work agenda’ and the process being too complex.

In some Health Boards, there was some doubt regarding patients’ genuine engagement with the scheme; some felt the patients nodded their heads when the DMR service was being explained to them as they just wanted to leave hospital as quickly as possible. However, others felt that some
patients were engaged with the scheme; perhaps the more elderly patients, who have a regular community pharmacy. Another felt that the patients who were engaged with the scheme were those who knew about their medicines and didn’t really need a DMR, whereas those who would benefit were very difficult to engage.

The issue of gaining consent was also identified as a barrier. Health Boards identified some patients refused to give consent, although reasons why are not known. Further guidance would be welcomed by the Health Boards to help with the situation whereby the patient refuses to give consent but the pharmacist feels a DMR would be in their best interest and also how to consent patients with dementia (something a number of interviewees stated pharmacists found challenging).

Lastly, a number of the Health Boards raised the issue that the community pharmacists get paid for their involvement in the DMR service but the hospital pharmacy departments receive nothing.

**Suggestions for Future**

Throughout the interviews a number of suggestions for the future of DMRs were received. The main suggestion was for there to be electronic transmission of information to the community pharmacy. Many interviewees felt that e-transfer would reduce the amount of time required for the hospitals to input into the service.

Another suggestion was for the community pharmacists to have access to the clinical work station for the hospital so the hospital pharmacists would not need to fax information and the community pharmacists could look their patients up on the system and check their DALs when needed. The onus would be for the community pharmacist to check their patients; similar to the GP system. However it was acknowledged that as patients are not registered with community pharmacists this would mean they would need access to all patients and therefore it may not be a viable option. If patients were registered with community pharmacists, as per minor ailment scheme, such a system could work.

The other main suggestion was the need for Health Boards to receive regular feedback on the number of DMRs completed and the types of interventions completed, with some examples. It was suggested that such feedback should stimulate the pharmacy teams’ motivation and enthusiasm for the DMR service.

**Summary**

There is intra- and inter Health Board variation in the way in which the DMR service has been implemented by the hospitals. The different methods seem to be dependent upon the discharge system which was already in place at the hospital and whether the full discharge advice letter (DAL) or an updated list of medicines is provided to the community pharmacist.

The method in which the community pharmacist obtains the information also varies, with some Health Boards faxing information directly to the pharmacy, whereas others provide the information to the patient to take to the pharmacy. Whilst the interviewees seemed to be supportive of the DMR service overall, a number of barriers were identified. These were: the attitude of some individual pharmacists and pharmacy staff to the scheme, the lack of understanding of the scheme by some staff, the lack of feedback to the hospital on the number of DMRs completed and the types of interventions made and the lack of IT-infrastructure preventing
a secure transfer of information directly to the community pharmacist. These views from the interviews were used to develop the questionnaire for the next phase of the study, which is discussed in the next section.

Phase 2: Hospital Pharmacy Questionnaire

Objectives

The objectives of this section were to quantify the extent to which the views of the 6 participants captured in Phase 1 can be generalized to the wider population of hospital pharmacists (HPs) in Wales.

Specific objectives were:

- To investigate HPs’ views about issues regarding communication about the DMR service;
- To establish HPs’ views about the impact of the DMR service on their role;
- To quantify the number of DMRs initiated by the hospital pharmacy and determine any barriers to the implementation of the DMR service;
- To propose suggestions as to how any of these barriers could be overcome;
- To capture HPs’ views about any further issues arising from the one to one interviews;
- To determine the amount of time spent in the hospital pharmacy on DMR activities.

Note: Whilst data on the time spent by hospital pharmacy staff on DMR activities were collected on the questionnaire as part of this phase, the findings will be presented in Chapter Seven.

Method

Sampling and Recruitment

A questionnaire was sent to approximately 369 hospital pharmacists in Wales in January 2014 with a deadline for responses by February 14th 2014. This sample of pharmacists was based on all hospital Diploma tutors in Wales who are associated with the MSc in Clinical Pharmacy course (delivered through the School of Pharmacy & Pharmaceutical Sciences at Cardiff University). These pharmacists were also asked to forward the questionnaire to other members of pharmacy staff involved in the DMR process. The aim of this recruitment approach was to reach as many hospital pharmacies as possible located in Wales in order to achieve a good geographical spread. The final number of questionnaires distributed is therefore not known.

Data Collection

Questionnaire Design

Thematic analysis of the interview transcripts yielded key themes for inclusion in the questionnaire. Related statements or issues were grouped for each theme with spaces for free text comments to be added to each. The questionnaire was divided into seven sections measuring different aspects of the DMR service. Part A – contained questions about the hospital pharmacy and its involvement in the DMR service; Part B – focused on questions about the discharge information for DMR; Part C – included questions about engaging with the DMR process; Part D – captured views about the barriers and facilitators to implementing the DMR service; Part E – asked questions about potential solutions to address the barriers to the delivery of the DMR service; Part F – consisted of questions about the impact of the DMR service on patient care and general views.
about the service; Part G – offered the opportunity to provide any further comments about the DMR service. A copy of the study questionnaire is presented in Appendix 2.

**Pilot**

The questionnaire was piloted on 10 hospital pharmacists and their views are included in the main study findings. The pilot stage was completed using an online format. A number of minor modifications were made to the study questionnaire following their feedback. All pilotees agreed that the electronic version was preferable to a paper format.

**Distribution of Questionnaires**

The questionnaire was distributed using Survey Monkey® to a sample of hospital pharmacists in Wales. All e-mail addresses were obtained from the Cardiff University database of hospital Diploma tutors. The survey link was sent as part of an e-mail which explained the purpose of the study. Subjects were told to contact the research team if they preferred to complete a paper copy of the questionnaire. Two further reminders were issued to all pharmacists via e-mail.

**Analysis**

Data analysis was conducted using the Survey Monkey software which was then extracted into a Microsoft Excel® spreadsheet and Word® documents for further analysis.

**Findings**

A total of 94 responses were received to the electronic survey. This represented a response rate of 25% of the original sample. One response was received from Oxford as sent in error. This was excluded from the analysis resulting in a total response from 93 pharmacists. All surveys were completed on-line and no requests were made for a paper copy of the questionnaire. The distribution of hospitals is shown in Table 5.3. The highest response was received from Abertawe Bro Morgannwg (25.5%), followed by Cwm Taf (20%) and Aneurin Bevan (17%).

**Table 5.3: Location of Hospital Pharmacist Responses (n=93)**

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Number of pharmacists responding (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aneurin Bevan</td>
<td>16 (17.2%)</td>
</tr>
<tr>
<td>Cardiff &amp; Vale</td>
<td>15 (16.1%)</td>
</tr>
<tr>
<td>Cwm Taf</td>
<td>19 (20.4%)</td>
</tr>
<tr>
<td>Hywel Dda</td>
<td>8 (8.6%)</td>
</tr>
<tr>
<td>Betsi Cadwaladr</td>
<td>10 (10.8%)</td>
</tr>
<tr>
<td>Abertawe Bro Morgannwg</td>
<td>24 (25.8%)</td>
</tr>
<tr>
<td>Powys</td>
<td>-</td>
</tr>
</tbody>
</table>

*This information was not provided by 1 respondent.*
Table 5.4 shows the distribution of survey responses from the different hospitals in each Health Board. The majority of respondents were from the Royal Gwent Hospital (16%), followed by University Hospital Wales (12%), Morriston (11%) and Princess of Wales (10%) hospitals. Two respondents worked in primary care (one in Betsi Cadwaladr Health Board plus one who was based in Royal Glamorgan Hospital, Cwm Taf Health).

Table 5.4: Responses from each Hospital in the Health Board (n=93)

<table>
<thead>
<tr>
<th>Health Board</th>
<th>Hospital</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aneurin Bevan</td>
<td>Royal Gwent</td>
<td>15 (16.1%)</td>
</tr>
<tr>
<td></td>
<td>Neville Hall</td>
<td>3 (3.2%)</td>
</tr>
<tr>
<td>Cardiff &amp; Vale</td>
<td>University Hospital Wales</td>
<td>11 (11.8%)</td>
</tr>
<tr>
<td></td>
<td>Whitchurch</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td></td>
<td>Llandough</td>
<td>3 (3.2%)</td>
</tr>
<tr>
<td>Cwm Taf</td>
<td>Royal Glamorgan</td>
<td>9 (9.7%)</td>
</tr>
<tr>
<td></td>
<td>Prince Charles</td>
<td>5 (5.4%)</td>
</tr>
<tr>
<td>Hywel Dda</td>
<td>Bronglais</td>
<td>2 (2.2%)</td>
</tr>
<tr>
<td></td>
<td>Withybushe</td>
<td>4 (4.4%)</td>
</tr>
<tr>
<td></td>
<td>Glangwili</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td></td>
<td>Prince Phillip</td>
<td>1 (1.2%)</td>
</tr>
<tr>
<td>Betsi Cadwaladr</td>
<td>Ysbyty Gwynedd</td>
<td>3 (3.2%)</td>
</tr>
<tr>
<td></td>
<td>Glan Clwyd</td>
<td>3 (3.2%)</td>
</tr>
<tr>
<td></td>
<td>Wrexham Maelor</td>
<td>3 (3.2%)</td>
</tr>
<tr>
<td></td>
<td>Primary care - Mold</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td>Abertawe Bro</td>
<td>Singleton</td>
<td>5 (5.4%)</td>
</tr>
<tr>
<td>Morgannwg</td>
<td>Morriston</td>
<td>10 (10.8%)</td>
</tr>
<tr>
<td></td>
<td>Princess of Wales</td>
<td>9 (9.7%)</td>
</tr>
<tr>
<td>Powys</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

This question was not answered by 6 respondents.

As shown in Table 5.5, in the majority of cases, the survey was completed by a Band 8a Pharmacists (34%), followed by Band 6 (26%), Band 8b (20.5%) and Band 7 (19%) Pharmacists. A further 5% of surveys were completed by respondents holding other pharmacy roles. These included three 8c pharmacists, one 8d pharmacist, one primary care pharmacist, one practice pharmacist, one independent prescriber, two Diploma pharmacists and one resident pharmacist.
Table 5.5: Role of Responder within the Hospital Pharmacy (n=93)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band 6</td>
<td>23 (26.1%)</td>
</tr>
<tr>
<td>Band 7</td>
<td>17 (19.3%)</td>
</tr>
<tr>
<td>Band 8a</td>
<td>30 (34.1%)</td>
</tr>
<tr>
<td>Band 8b</td>
<td>18 (20.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (5.4%)</td>
</tr>
</tbody>
</table>

The majority of respondents (56%) were non-specialist pharmacists with day to day responsibilities for seeing general medical, surgical or elderly patients (see Table 5.6).

Table 5.6 Description of Respondents Patient- Facing Role (n=93)

<table>
<thead>
<tr>
<th>What would best describe your patient-facing role (this may be at ward level or in clinics?)</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non – specialist (e.g. general medical, surgical or elderly patients)</td>
<td>54 (56.3%)</td>
</tr>
<tr>
<td>Specialist (e.g. heart failure, respiratory, diabetes)</td>
<td>27 (28.1%)</td>
</tr>
<tr>
<td>Other (e.g. primary care or management)</td>
<td>12 (12.9%)</td>
</tr>
</tbody>
</table>

When asked if their Health Board or hospital has a policy or standard operating procedure in place for DMRs, 54% answered yes, 9% answered no, whilst 37% were not sure of their existence. Table 5.7 shows the number of other hospital staff who are also involved in DMR activities. In 73% of cases, other non-pharmacist staff are also involved in the DMR process (Pharmacy Technician = 65%, administrative pharmacy staff = 25% and other pharmacy staff = 4%).

Table 5.7: Other members of staff involved in DMR activities (n=92)

<table>
<thead>
<tr>
<th>Which other members of pharmacy staff are also involved in the DMR service?</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer Options (Respondents were able to select more than one option)</td>
<td>Response (Percent)</td>
</tr>
<tr>
<td>Pharmacy Technician</td>
<td>60 (65.2%)</td>
</tr>
<tr>
<td>Administrative staff</td>
<td>23 (25.0%)</td>
</tr>
<tr>
<td>None</td>
<td>25 (27.2%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (4.3%)</td>
</tr>
</tbody>
</table>
Only 11% of respondents indicated that they were aware of other members of the hospital team being involved in the DMR service (see Table 5.8).

**Table 5.8: Other Healthcare-Professionals (i.e. non-Pharmacy Staff) Involved in the DMR process (n=92)**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10 (10.9%)</td>
</tr>
<tr>
<td>No</td>
<td>51 (55.4%)</td>
</tr>
<tr>
<td>Not sure</td>
<td>31 (33.7%)</td>
</tr>
</tbody>
</table>

Table 5.9 shows the methods of communication used to send information following the patient’s discharge.

**Table 5.9: Methods of communication used (n=83)**

| Q: How is this information communicated to the patient’s General Practitioner (GP) and / or community pharmacy following discharge? (Tick all that apply) |
|---|---|---|---|---|
| Answer Options | Fax n (%) | e-mail n (%) | Postal mail n (%) | Over the telephone n (%) | With the patient n (%) |
| GP - for MDS patients | 54 (65.1%) | 19 (22.9%) | 10 (12.1%) | 20 (24.1%) | 25 (30.1%) |
| GP - for other DMR patients | 14 (16.9%) | 19 (22.9%) | 13 (15.7%) | 5 (6.0%) | 30 (36.1%) |
| Community Pharmacy - for MDS patients | 76 (91.6%) | 1 (1.2%) | 7 (8.4%) | 41 (49.4%) | 21 (25.3%) |
| Community Pharmacy - for other DMR patients | 42 (50.6%) | 2 (2.4%) | 0 (0) | 18 (21.7%) | 34 (41.0%) |

For patients requiring MDS, information is most often sent by fax to the GPs (65%) and Community Pharmacists (92%). For patients who are able to self-medicate, the information is most commonly communicated via the patient (36%) to the GP and by fax to community pharmacists (51%). Electronic mail is almost never used to communicate with community pharmacists (1% and 2% for MDS and non-MDS patients respectively) but sometimes used to communicate discharge information to GPs (23% for MDS and non-MDS patients).

Table 5.10 shows the type of information which hospital pharmacies currently send to the community pharmacy about the patient’s medication on discharge. Of those who responded,
nearly all send information about the list of medicines prescribed on discharge (97%) and most send information about those medicines started (87%) or stopped (87%) while in hospital, whilst 80% of respondents indicated that they provided information on dose changes and 71% provided the reasons for starting or stopping medication. It was less common to include information on formulation changes (59%), medicines restarted (55%), formulation changes (59%) or changes in tablet strength (46%).

Table 5.10: Type of information currently provided to community pharmacy on discharge (n=69)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicines prescribed on discharge</td>
<td>66 (95.7%)</td>
</tr>
<tr>
<td>Medicines started</td>
<td>60 (87.0%)</td>
</tr>
<tr>
<td>Medicines stopped</td>
<td>60 (87.0%)</td>
</tr>
<tr>
<td>Medicines restarted</td>
<td>38 (55.1%)</td>
</tr>
<tr>
<td>Reasons for stopping or starting</td>
<td>49 (71.0%)</td>
</tr>
<tr>
<td>Dose changes</td>
<td>55 (79.7%)</td>
</tr>
<tr>
<td>Changes in tablet strength</td>
<td>32 (46.4%)</td>
</tr>
<tr>
<td>Formulation changes</td>
<td>41 (59.4%)</td>
</tr>
</tbody>
</table>

*Respondents could choose more than one option.

Table 5.11 shows the type of information which hospital pharmacies currently provide to patients about their medication on discharge. A list of medicines prescribed on discharge is provided by 80% of respondents and 70% provide information about those medicines stopped or started (68%) while in hospital. Responses to the other options are fairly similar to those sent to community pharmacies.
Table 5.11: Type of information currently provided to patients on discharge (n=90)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicines prescribed on discharge</td>
<td>72 (80.0%)</td>
</tr>
<tr>
<td>Medicines started</td>
<td>61 (67.8%)</td>
</tr>
<tr>
<td>Medicines stopped</td>
<td>63 (70.0%)</td>
</tr>
<tr>
<td>Medicines restarted</td>
<td>45 (50.0%)</td>
</tr>
<tr>
<td>Reasons for stopping or starting</td>
<td>51 (56.7%)</td>
</tr>
<tr>
<td>Dose changes</td>
<td>59 (65.6%)</td>
</tr>
<tr>
<td>Changes in tablet strength</td>
<td>38 (42.2%)</td>
</tr>
<tr>
<td>Formulation changes</td>
<td>46 (51.1%)</td>
</tr>
</tbody>
</table>

Study participants were asked how they advertised the DMR service within the hospital. The provision of a DMR leaflet to targeted patients’ discharge medicines was the most common form of publicising the service (40%). Only some respondents reported having posters on the wards (20%) or in the pharmacy waiting area (29%) (see Table 5.12). Some of the ‘other comments’ reflected that leaflets were used at the launch but no longer routinely used or they were only given to select patients. Some comments stated the pharmacists were unaware how the service was publicised.

Table 5.12: Methods of publicising the DMR service (n=90)

<table>
<thead>
<tr>
<th>How do you publicise the DMR service in the hospital (please tick all that apply)</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMR leaflet in with patients’ discharge medicines – given to all patients</td>
<td>16 (17.8%)</td>
</tr>
<tr>
<td>DMR leaflet in with patients’ discharge medicines – given to targeted patients only</td>
<td>36 (40.0%)</td>
</tr>
<tr>
<td>Posters on the wards</td>
<td>18 (20.0%)</td>
</tr>
<tr>
<td>Posters in the pharmacy waiting area</td>
<td>26 (28.9%)</td>
</tr>
</tbody>
</table>

Table 5.13 shows the number of patients requiring an MDS in the last month. Most respondents reported seeing over 6 patients (63%) in a typical month.
Table 5.13: Number of patients requiring an MDS per month (n=65)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4 (6.2%)</td>
</tr>
<tr>
<td>1</td>
<td>2 (3.1%)</td>
</tr>
<tr>
<td>2 - 3</td>
<td>7 (10.8%)</td>
</tr>
<tr>
<td>4 - 5</td>
<td>11 (16.9%)</td>
</tr>
<tr>
<td>6 - 10</td>
<td>15 (23.1%)</td>
</tr>
<tr>
<td>11 - 20</td>
<td>13 (20.0%)</td>
</tr>
<tr>
<td>More than 20</td>
<td>13 (20.0%)</td>
</tr>
</tbody>
</table>

*The 10 pilot participants did not answer this question as the wording was changed. A further 18 people did not answer this question.

However, when asked how many of these were referred for a DMR, the figures are considerably less. Table 5.14 shows the number of MDS patients referred in a typical month (e.g. November 2013), where the majority of respondents reported referring no patients (50%), followed by 11% who referred between 2-3 and 4-5 patients.

Table 5.14: Number of MDS patients referred for DMR per month (n=66)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>33 (50.0%)</td>
</tr>
<tr>
<td>1</td>
<td>4 (6.1%)</td>
</tr>
<tr>
<td>2 - 3</td>
<td>7 (10.6%)</td>
</tr>
<tr>
<td>4 - 5</td>
<td>7 (10.6%)</td>
</tr>
<tr>
<td>6 - 10</td>
<td>6 (9.1%)</td>
</tr>
<tr>
<td>11 - 20</td>
<td>(9.1%)</td>
</tr>
<tr>
<td>More than 20</td>
<td>3 (4.5%)</td>
</tr>
</tbody>
</table>

*The 10 pilot participants did not answer this question as the wording was changed. A further 17 people did not answer this question.

As can be seen from Table 5.15, the figures for referral of patients for a DMR for those who not require an MDS are similar to those who do need one.
Table 5.15: Number of self-medicating patients identified for a DMR per month (n=72)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32 (44.4%)</td>
</tr>
<tr>
<td>1</td>
<td>9 (12.5%)</td>
</tr>
<tr>
<td>2 - 3</td>
<td>12 (16.7%)</td>
</tr>
<tr>
<td>4 - 5</td>
<td>5 (6.9%)</td>
</tr>
<tr>
<td>6 - 10</td>
<td>5 (6.9%)</td>
</tr>
<tr>
<td>11 - 20</td>
<td>2 (2.8%)</td>
</tr>
<tr>
<td>More than 20</td>
<td>7 (9.7%)</td>
</tr>
</tbody>
</table>

*19 stated that they had not yet undertaken a DMR. A further 2 did not answer this question.

When asked whether or not they prioritised patients for a DMR, of the 67 who answered this question, 54% indicated that they did, 12% stated that they did not and the remaining 36% reported that they had not undertaken a DMR to date. This is further evidenced by data shown in Table 5.16 where 38% report not having undertaken a DMR referral to date. The types of patients prioritised for a DMR are also outlined below. Commencing a new medication in hospital was the most commonly reported reason for selecting a patient for a DMR (42%), followed by those judged to be at risk of poor adherence (35.5%). The ‘other’ responses included ‘Where I feel that there is a risk that the patient may not fully understand the changes that have been made to their regimen’, ‘Large number of changes to medication’ and ‘Patients admitted frequently or those needing monitoring of inhaler technique’.
Table 5.16: Types of patients prioritised for DMR (n=76)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on therapeutic class of medicines</td>
<td>8 (10.5%)</td>
</tr>
<tr>
<td>Compliance aid (e.g. medication tray) or MDS needed</td>
<td>23 (30.3%)</td>
</tr>
<tr>
<td>Risk of poor adherence</td>
<td>27 (35.5%)</td>
</tr>
<tr>
<td>High risk drug prescribed</td>
<td>19 (25.0%)</td>
</tr>
<tr>
<td>Specific patient groups (e.g. diabetes, epilepsy, heart failure)</td>
<td>13 (17.1%)</td>
</tr>
<tr>
<td>Medication stopped in hospital</td>
<td>24 (31.6%)</td>
</tr>
<tr>
<td>New medication started in hospital</td>
<td>32 (42.1%)</td>
</tr>
<tr>
<td>Change of dose or strength of medication</td>
<td>22 (28.9%)</td>
</tr>
<tr>
<td>Professional judgement of pharmacy staff</td>
<td>29 (38.2%)</td>
</tr>
<tr>
<td>Prescribed 4 or more medicines</td>
<td>14 (18.4%)</td>
</tr>
<tr>
<td>Not applicable (not undertaking DMRs)</td>
<td>29 (38.2%)</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>4 (5.3%)</td>
</tr>
</tbody>
</table>

In terms of gaining consent from the patient, 76% reported that this was done verbally and documented, whilst 24% sought written consent from the patient.

Table 5.17: Frequency of DMR activity (n=76)

<table>
<thead>
<tr>
<th>Please chose the response which best describes how often you undertake a DMR:</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer Options</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>9 (11.8%)</td>
</tr>
<tr>
<td>Once or twice a week</td>
<td>6 (7.9%)</td>
</tr>
<tr>
<td>Once or twice a month</td>
<td>15 (19.7%)</td>
</tr>
<tr>
<td>Less often than once a month</td>
<td>14 (18.4%)</td>
</tr>
<tr>
<td>Never</td>
<td>29 (38.2%)</td>
</tr>
<tr>
<td>Don't know</td>
<td>3 (3.9%)</td>
</tr>
</tbody>
</table>

Table 5.18 shows hospital pharmacists’ perceived difficulty in engaging with the DMR service (with a mean rating of 5.4 out of 10).
Table 5.18: Ease of engaging with the DMR service (n=76)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 Very easy</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 Very Difficult</th>
<th>Rating Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>n= (%)</td>
<td>5 (6%)</td>
<td>8 (10.5%)</td>
<td>5 (6.6%)</td>
<td>5 (6.6%)</td>
<td>20 (26.3%)</td>
<td>6 (7.9%)</td>
<td>11 (14.5%)</td>
<td>8 (10.5%)</td>
<td>3 (3.9%)</td>
<td>5 (6.6%)</td>
<td>5.39</td>
</tr>
</tbody>
</table>

Only 16% reported that they had been asked to initiate a DMR from a source outside of the hospital (e.g. GP surgery or community pharmacy) which is often described as the ‘pull’ system of engaging with the service. The vast majority (70%) had not experienced this whilst the remaining 16% who answered the question were not sure.

Barriers to Conducting DMRs

*Issues related to the discharge summary sheet or letter*

Table 5.19 overleaf lists hospital pharmacists’ rating of the perceived barriers relating to the discharge summary sheet or letter. Getting hold of relevant information, time taken to prepare and remembering to add information to the summary sheet do not appear to be major barriers in the DMR process.
Table 5.19: Barriers relating to the Discharge Summary Sheet or Letter (n=71)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting hold of relevant information for the discharge summary sheet or letter</td>
<td>24 (33.8%)</td>
<td>13 (18.3%)</td>
<td>11 (15.5%)</td>
<td>8 (11.3%)</td>
<td>3 (4.2%)</td>
</tr>
<tr>
<td>Time taken to complete the discharge summary sheet or letter</td>
<td>18 (25.4%)</td>
<td>13 (18.3%)</td>
<td>17 (23.9%)</td>
<td>9 (12.7%)</td>
<td>5 (7.0%)</td>
</tr>
<tr>
<td>Having to remember to add information to the discharge summary sheet or letter</td>
<td>15 (21.1%)</td>
<td>19 (26.8%)</td>
<td>9 (12.7%)</td>
<td>9 (12.7%)</td>
<td>5 (7.0%)</td>
</tr>
</tbody>
</table>

Issues related to identifying patients
Issues relating to gaining consent from patients was cited as a barrier for hospital pharmacists, both in terms of getting hold of consent from patients who need a DMR (39% rated as a major barrier) and the time pressures involved in doing so (31%). The short stay of the patient in hospital also contributes to this (27%). See Table 5.20.
Table 5.20: Barriers relating to identifying patients (n=71)

Which of the following issues relating to the IDENTIFYING PATIENTS represent a barrier to hospital pharmacy's involvement in the DMR services. Please answer each question by placing a tick in the box.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusion over who (i.e. hospital or community) is responsible for identifying patients</td>
<td>34 (47.9%)</td>
<td>5 (7.0%)</td>
<td>6 (8.5%)</td>
<td>10 (14.1%)</td>
<td>8 (11.3%)</td>
</tr>
<tr>
<td>Difficulty identifying suitable patients</td>
<td>26 (36.7%)</td>
<td>17 (23.9%)</td>
<td>9 (12.7%)</td>
<td>9 (12.7%)</td>
<td>2 (2.8%)</td>
</tr>
<tr>
<td>Patients unwilling to engage in the service</td>
<td>14 (19.7%)</td>
<td>13 (18.3%)</td>
<td>14 (19.7%)</td>
<td>12 (16.9%)</td>
<td>2 (2.8%)</td>
</tr>
<tr>
<td>Not finding enough suitable patients to refer</td>
<td>27 (38.0%)</td>
<td>14 (19.7%)</td>
<td>8 (11.3%)</td>
<td>4 (5.6%)</td>
<td>3 (4.2%)</td>
</tr>
<tr>
<td>Time pressures in obtaining consent from patients</td>
<td>8 (11.3%)</td>
<td>11 (15.5%)</td>
<td>5 (7.0%)</td>
<td>12 (16.9%)</td>
<td>22 (31%)</td>
</tr>
<tr>
<td>Gaining consent from patients who need it (e.g. dementia).</td>
<td>6 (8.5%)</td>
<td>6 (8.5%)</td>
<td>5 (7.0%)</td>
<td>13 (18.3%)</td>
<td>28 (39.4%)</td>
</tr>
<tr>
<td>Patients in hospital for a short length of stay</td>
<td>10 (14.1%)</td>
<td>9 (12.7%)</td>
<td>12 (16.9%)</td>
<td>12 (16.9%)</td>
<td>19 (26.8%)</td>
</tr>
</tbody>
</table>

Issues related to awareness of service
As shown in Table 5.21, it was felt that the DMR scheme was not ‘sold’ enough to hospital pharmacy (42% rated this as a major barrier). Lack of patient awareness of the DMR service was also reported to be a major barrier by 41% of respondents.
Table 5.21: Barriers relating to awareness of service (n=71)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients are unaware of the DMR service</td>
<td>5 (7.0%)</td>
<td>5 (7.0%)</td>
<td>7 (9.9%)</td>
<td>15 (21.1%)</td>
<td>29 (40.8%)</td>
</tr>
<tr>
<td>The DMR service was not ‘sold’ enough to hospital pharmacists, initially</td>
<td>9 (12.7%)</td>
<td>2 (2.8%)</td>
<td>10 (14.1%)</td>
<td>13 (18.3%)</td>
<td>30 (42.2%)</td>
</tr>
</tbody>
</table>

Issues related to paperwork and processes
Hospital pharmacists’ ratings of barriers relating to paperwork and processes is presented in Table 5.22. The lack of IT infrastructure for communicating information securely to community pharmacy is seen as the main barrier (49%) in this respect followed by the amount of paperwork (21%) and the fact that it is not user friendly (20%) were reported as the main barriers.

Table 5.22: Barriers relating to paperwork and processes (n=71)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of IT infrastructure for communicating information securely to community pharmacy</td>
<td>6 (8.5%)</td>
<td>4 (5.6%)</td>
<td>10 (14.1%)</td>
<td>10 (14.1%)</td>
<td>35 (49.3%)</td>
</tr>
<tr>
<td>DMR paperwork not user-friendly</td>
<td>8 (11.3%)</td>
<td>4 (5.6%)</td>
<td>11 (15.5%)</td>
<td>10 (14.1%)</td>
<td>14 (19.7%)</td>
</tr>
<tr>
<td>Too much paperwork</td>
<td>8 (11.3%)</td>
<td>2 (2.7%)</td>
<td>13 (18.3%)</td>
<td>13 (18.3%)</td>
<td>15 (21.1%)</td>
</tr>
</tbody>
</table>

Issues related to workload and time
Barriers relating to workload and time are presented in Table 5.23. These are rated very highly for most issues, in particular concerns about prioritizing the DMR scheme (52%) and lack of time to engage in the service (39%). Time spent of the DMR scheme impacts on other services (37%) and there is a perceived lack of recognition from hospital employers for the extra work involved (32%). Increase in workload due to the high level of input needed was reported as a major barrier by 27% of respondents.
Table 5.23: Barriers relating to workload and time (n=71)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Not a barrier at all</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major barrier n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time required to complete paperwork for hand-written prescriptions</td>
<td>12 (16.9%)</td>
<td>4 (5.6%)</td>
<td>8 (11.3%)</td>
<td>13 (18.3%)</td>
<td>15 (21.1%)</td>
</tr>
<tr>
<td>Increase in workload as lot of input needed</td>
<td>9 (12.7%)</td>
<td>6 (8.5%)</td>
<td>9 (12.7%)</td>
<td>20 (28.2%)</td>
<td>19 (26.8%)</td>
</tr>
<tr>
<td>Inadequate staffing of hospital pharmacies</td>
<td>11 (15.5%)</td>
<td>6 (8.5%)</td>
<td>10 (14.1%)</td>
<td>11 (15.5%)</td>
<td>14 (19.7%)</td>
</tr>
<tr>
<td>Time spent doing DMRs impacts on other services</td>
<td>9 (12.7%)</td>
<td>5 (7.0%)</td>
<td>8 (11.3%)</td>
<td>13 (18.5%)</td>
<td>26 (36.6%)</td>
</tr>
<tr>
<td>Lack of recognition from employers for the extra work</td>
<td>9 (12.7%)</td>
<td>7 (9.9%)</td>
<td>10 (14.1%)</td>
<td>15 (21.1%)</td>
<td>23 (32.4%)</td>
</tr>
<tr>
<td>Lack of time for the hospital pharmacy team to engage in the DMR scheme</td>
<td>6 (8.5%)</td>
<td>7 (9.9%)</td>
<td>8 (11.3%)</td>
<td>15 (21.1%)</td>
<td>28 (39.4%)</td>
</tr>
<tr>
<td>Staff shortages</td>
<td>7 (9.9%)</td>
<td>9 (12.7%)</td>
<td>12 (16.9%)</td>
<td>14 (19.7%)</td>
<td>21 (29.6%)</td>
</tr>
<tr>
<td>Other priorities make it difficult for the DMR scheme to be the main concern</td>
<td>5 (7.0%)</td>
<td>4 (5.6%)</td>
<td>6 (8.5%)</td>
<td>10 (14.1%)</td>
<td>37 (52.1%)</td>
</tr>
</tbody>
</table>

Over half (51% rated this statement as a 4 or a 5) thought that the issue of reliance on the patient to take information to their community pharmacy was another barrier to the success of the DMR service.

**Summary of Hospital Pharmacists’ Perceived Barriers**

In summary, the key barriers to conducting the DMR service from the hospital perspective were: other priorities make it difficult for the DMR scheme to be the main concern (52%), lack of IT infrastructure (49%), the service was not sold enough to hospital pharmacists initially (42%), patients being unaware of the service (41%), gaining consent from patients who need it (39%), lack of time for pharmacy staff to engage in the scheme (39%), time spent impacts on other services (37%), lack of recognition from employers for extra work (32%), time spent on obtaining consent (31%), patients being in hospital for too short a stay (27%) and the increase in workload involved and a lot of input is needed (27%).

**Suggested Solutions for Enhancing the DMR Service**

**Communication related suggestions**

Hospital pharmacists’ ratings of the communication issues which could make an improvement to the DMR process are shown in Table 5.24. The implementation of electronic discharge prescriptions across Wales was rated highest (68%), followed by having a system for automatically informing the community pharmacy when a patient has been discharged from hospital (63%) and the existence of an electronic version of the discharge information (62%). Better communication between the hospital team and community pharmacy teams (53%) was also rated highly.
Table 5.24: Possible solutions related to communication (n=68)

The list below contains some solutions relating to COMMUNICATION that other hospital and community pharmacists have suggested to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence of an electronic version of the discharge information</td>
<td>5 (7.4%)</td>
<td>2 (2.9%)</td>
<td>6 (8.8%)</td>
<td>7 (10.3%)</td>
<td>42 (61.8%)</td>
</tr>
<tr>
<td>Implement electronic discharge prescriptions across Wales</td>
<td>3 (4.4%)</td>
<td>1 (1.5%)</td>
<td>5 (7.4%)</td>
<td>6 (8.8%)</td>
<td>46 (67.6%)</td>
</tr>
<tr>
<td>Automatically inform community pharmacy when a patient has been discharged from hospital</td>
<td>2 (2.9%)</td>
<td>0 (0)</td>
<td>6 (8.8%)</td>
<td>10 (14.7%)</td>
<td>43 (63.2%)</td>
</tr>
<tr>
<td>Better communication between hospital pharmacy staff and GPs</td>
<td>7 (10.3%)</td>
<td>6 (8.8%)</td>
<td>10 (14.7%)</td>
<td>9 (13.2%)</td>
<td>29 (42.6%)</td>
</tr>
<tr>
<td>Better communication between the hospital and the community pharmacy</td>
<td>3 (4.4%)</td>
<td>4 (5.8%)</td>
<td>6 (8.8%)</td>
<td>13 (19.1%)</td>
<td>36 (52.9%)</td>
</tr>
<tr>
<td>Have a designated person in GP surgeries to deal with DMRs.</td>
<td>7 (10.3%)</td>
<td>2 (2.9%)</td>
<td>13 (19.1%)</td>
<td>10 (14.7%)</td>
<td>23 (33.8%)</td>
</tr>
<tr>
<td>More guidance from commissioners on how to implement DMR service</td>
<td>7 (10.3%)</td>
<td>2 (2.9%)</td>
<td>13 (19.1%)</td>
<td>13 (19.1%)</td>
<td>23 (33.8%)</td>
</tr>
<tr>
<td>Need specific information about what the Health Board can or cannot do in relation to legalities of the scheme</td>
<td>6 (8.8%)</td>
<td>3 (4.4%)</td>
<td>11 (16.1%)</td>
<td>15 (22.1%)</td>
<td>22 (32.4%)</td>
</tr>
<tr>
<td>Clearer description of roles and responsibilities of all involved in the service</td>
<td>9 (13.2%)</td>
<td>1 (1.5%)</td>
<td>9 (13.2%)</td>
<td>23 (33.8%)</td>
<td>20 (29.4%)</td>
</tr>
<tr>
<td>Invite community pharmacists to talk to hospital staff about their experiences of the DMR service</td>
<td>9 (13.2%)</td>
<td>1 (1.5%)</td>
<td>16 (23.5%)</td>
<td>15 (22.1%)</td>
<td>22 (32.4%)</td>
</tr>
<tr>
<td>Involve community pharmacists in developing (or reviewing) the Health Board’s policy for DMR</td>
<td>9 (13.2%)</td>
<td>2 (2.9%)</td>
<td>10 (14.7%)</td>
<td>15 (22.1%)</td>
<td>25 (36.8%)</td>
</tr>
</tbody>
</table>
**Discharge information related suggestions**

Participants’ ratings of the suggested improvements relating to the discharge information are presented in Table 5.25. Having discharge information sent directly to the community pharmacy (48.5%) was seen as likely to result in a major improvement to the service.

**Table 5.25: Possible solutions related to Discharge Information (n=68)**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send discharge information directly to the community pharmacy</td>
<td>4 (5.8%)</td>
<td>2 (2.9%)</td>
<td>5 (7.4%)</td>
<td>17 (25.0%)</td>
<td>33 (48.5%)</td>
</tr>
<tr>
<td>Give community pharmacists access to the clinical workstation for the hospital</td>
<td>4 (5.8%)</td>
<td>4 (5.8%)</td>
<td>7 (10.3%)</td>
<td>8 (11.8%)</td>
<td>28 (41.2%)</td>
</tr>
</tbody>
</table>

**Suggestions regarding promotion of service**

As can be seen from Table 5.26, three main issues relating to promotion of the service were rated as likely to make a major improvement. These were: greater promotion of the service to patients while in the community pharmacy (41%), in hospital (40%) and when they leave hospital (38%).
Table 5.26: Possible Solutions relating to Promotion of Service (n=68)

The list below contains some solutions relating to PROMOTION that other hospital and community pharmacists have suggested to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater promotion of DMR service to patients while in hospital</td>
<td>5 (7.4%)</td>
<td>3 (4.4%)</td>
<td>12 (17.6%)</td>
<td>13 (19.1%)</td>
<td>27 (39.7%)</td>
</tr>
<tr>
<td>More information about the DMR service provided to patients when they leave hospital</td>
<td>3 (4.4%)</td>
<td>3 (4.4%)</td>
<td>7 (10.3%)</td>
<td>22 (32.4%)</td>
<td>26 (38.2%)</td>
</tr>
<tr>
<td>Better promotion of service to GPs</td>
<td>6 (8.8%)</td>
<td>3 (4.4%)</td>
<td>11 (16.1%)</td>
<td>17 (25.0%)</td>
<td>22 (32.4%)</td>
</tr>
<tr>
<td>Greater promotion of DMR service to hospital staff</td>
<td>6 (8.8%)</td>
<td>6 (8.8%)</td>
<td>12 (17.6%)</td>
<td>18 (26.5%)</td>
<td>19 (27.9%)</td>
</tr>
<tr>
<td>Better promotion to patients in the community pharmacy</td>
<td>2 (2.9%)</td>
<td>3 (4.4%)</td>
<td>6 (8.8%)</td>
<td>20 (29.4%)</td>
<td>28 (41.2%)</td>
</tr>
</tbody>
</table>

**Funding and resource implications**

Over half the respondents (54%) reported that investment in staff to free up time for the pharmacist to undertake DMR activities would result in a major improvement (54%). Pharmacists supported the suggestion that having a computer system in place which supports the DMR service would be a major improvement (48.5%). See Table 5.27.
Table 5.27: Possible Solutions Relating to Funding and Resources (n=68)

The list below contains some solutions relating to FUNDING AND RESOURCES that other hospital and community pharmacists have suggested to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having a computer system in place which supports DMR</td>
<td>3 (4.4%)</td>
<td>2 (2.9%)</td>
<td>8 (11.8%)</td>
<td>11 (16.1%)</td>
<td>33 (48.5%)</td>
</tr>
<tr>
<td>Investment in staff to free up time for the pharmacist to undertake DMR activities</td>
<td>4 (5.8%)</td>
<td>1 (1.5%)</td>
<td>4 (5.9%)</td>
<td>9 (13.2%)</td>
<td>37 (54.4%)</td>
</tr>
</tbody>
</table>

**Other solutions**

Other solutions are presented in Table 5.28. Identifying ‘lessons learnt’ from the DMR interventions made and feeding this back to hospital staff was rated most highly (38%). Compulsory patient registration with a named community pharmacy was also rated highly (34%), followed by receiving detailed feedback about the type of interventions made when completed in the community (31%).
Table 5.28: Other Possible Solutions (n=68)

The list below contains some OTHER solutions hospital and community pharmacists have suggested to address the barriers for the effective delivery of the DMR service in Wales. Please rate how likely they are to improve delivery of the service.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>1 = Unlikely to be an improvement n (%)</th>
<th>2 n (%)</th>
<th>3 n (%)</th>
<th>4 n (%)</th>
<th>5 = Major improvement n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further guidance on what to do when those who need the DMR service decline it (i.e. do not give consent)</td>
<td>13 (19.1%)</td>
<td>12 (17.6%)</td>
<td>13 (19.1%)</td>
<td>9 (13.2%)</td>
<td>8 (11.8%)</td>
</tr>
<tr>
<td>Clarify position about gaining patient consent for faxing information to the community pharmacy</td>
<td>10 (14.7%)</td>
<td>7 (10.3%)</td>
<td>15 (22.0%)</td>
<td>15 (22.0%)</td>
<td>13 (19.1%)</td>
</tr>
<tr>
<td>Quarterly reports to hospital pharmacy about the number of DMR interventions completed in community</td>
<td>11 (16.2%)</td>
<td>10 (14.7%)</td>
<td>12 (14.7%)</td>
<td>18 (26.5%)</td>
<td>12 (17.6%)</td>
</tr>
<tr>
<td>Capture information on how many patients who provide consent in hospital complete a DMR in the community</td>
<td>11 (16.2%)</td>
<td>5 (7.4%)</td>
<td>14 (20.5%)</td>
<td>20 (29.4%)</td>
<td>12 (17.6%)</td>
</tr>
<tr>
<td>Detailed feedback about the types of interventions made when completing the DMR in the community</td>
<td>5 (7.3%)</td>
<td>6 (8.8%)</td>
<td>7 (10.3%)</td>
<td>24 (35.5%)</td>
<td>21 (30.9%)</td>
</tr>
<tr>
<td>Identify ‘lessons learnt’ from the DMR interventions made and feed this back to hospital staff</td>
<td>3 (4.4%)</td>
<td>5 (7.4%)</td>
<td>7 (10.3%)</td>
<td>21 (30.9%)</td>
<td>26 (38.2%)</td>
</tr>
<tr>
<td>Compulsory patient registration with a named community pharmacy</td>
<td>9 (13.2%)</td>
<td>7 (10.3%)</td>
<td>6 (8.8%)</td>
<td>16 (23.5%)</td>
<td>23 (33.8%)</td>
</tr>
<tr>
<td>The onus should be on the community pharmacy to check when their patients are discharged from hospital</td>
<td>17 (25.0%)</td>
<td>14 (20.5%)</td>
<td>14 (20.5%)</td>
<td>6 (8.8%)</td>
<td>9 (13.2%)</td>
</tr>
<tr>
<td>Patients should be required to opt-out of the DMR scheme so that a system of implied consent is in place</td>
<td>11 (16.2%)</td>
<td>9 (13.2%)</td>
<td>7 (10.3%)</td>
<td>9 (13.2%)</td>
<td>22 (32.3%)</td>
</tr>
</tbody>
</table>
In summary, the proposed solutions that respondents felt were most likely to result in major improvements to the service were: investment in staff to free up time for the pharmacists to undertake DMR (54%), having a computer system in place which supports DMR (48.5%), better promotion to patient in the community (41%) and while in hospital (40%), more information to be provided to patients when they leave hospital (38%), identify lessons learnt and provide feedback to hospital (38%), compulsory patient registration with a named community pharmacy (34%) and the receipt of detailed feedback about the types of interventions made by community pharmacists (31%).

**Impact on Patient Care and Medicines Safety**

Participants were asked to rate how much they felt their communication with the community pharmacist had increased as a result of the DMR service. The findings are shown in Table 5.29. Over half the sample (51.5%) felt that this had increased a little but only a few (4%) said that this had increased a lot. A large proportion (44%) reported that communications with the community pharmacist had not increased at all.

**Table 5.29: Communication with community pharmacy (n=68)**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not increased</td>
<td>30 (44.1%)</td>
</tr>
<tr>
<td>Increased a little</td>
<td>35 (51.5%)</td>
</tr>
<tr>
<td>Increased a lot</td>
<td>3 (4.4%)</td>
</tr>
</tbody>
</table>

**Hospital Pharmacists’ Views about the DMR Service**

Overall, hospital pharmacies’ views about the DMR service were mixed, as shown in Table 5.30. In summary, hospital pharmacists agreed that the service is not ingrained in the daily work of a ward pharmacist as yet (81%). They feel that the patient’s priority is to get home from hospital and may not be the right time to engage them in the MDR process (62%). They agreed that the scheme has potential benefits for patients (75%) but whilst being a good thing, they are hard to do on top of everything else (60%). They also agreed that DMR interventions made by community pharmacists should be quality assured (60%). They felt that time spent on DMR activities takes them away from other patients (56%). However, they recognised the value of DMRs in helping communication between secondary and primary care (53%). In general, hospital pharmacists disagreed with the statements that hospital staff are enthusiastic about the DMR service (53%).
Table 5.30: Community pharmacists’ views about the DMR service (n=68).

The list below contains some statements that other hospital pharmacists have suggested about the DMR service.
Please rate your agreement with the following:

<table>
<thead>
<tr>
<th>Statements</th>
<th>Disagree (=2) n (%)</th>
<th>Uncertain (=3) n (%)</th>
<th>Agree (=5) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient related</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMRs are making a positive difference for patients</td>
<td>13 (19.1%)</td>
<td>35 (51.5%)</td>
<td>20 (29.4%)</td>
</tr>
<tr>
<td>It makes the patient’s transition on discharge smoother</td>
<td>13 (19.1%)</td>
<td>27 (39.7%)</td>
<td>28 (41.2%)</td>
</tr>
<tr>
<td>Problems are being identified sooner and are ‘nipped in the bud’</td>
<td>13 (19.1%)</td>
<td>31 (45.6%)</td>
<td>25 (36.8%)</td>
</tr>
<tr>
<td>Time spent on the DMR service takes me away from other patients</td>
<td>14 (20.6%)</td>
<td>16 (23.5%)</td>
<td>38 (55.9%)</td>
</tr>
<tr>
<td>Providing DMRs means that I can contribute more to patient care</td>
<td>16 (23.5%)</td>
<td>20 (29.4%)</td>
<td>32 (47.1%)</td>
</tr>
<tr>
<td>A DMR is more beneficial to the patient than an MUR</td>
<td>12 (17.6%)</td>
<td>39 (57.3%)</td>
<td>17 (25.0%)</td>
</tr>
<tr>
<td><strong>Workload related</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMRs are a good thing but hard to do on top of everything else.</td>
<td>9 (13.2%)</td>
<td>18 (26.5%)</td>
<td>41 (60.3%)</td>
</tr>
<tr>
<td>The DMR form is too onerous to complete</td>
<td>14 (20.6%)</td>
<td>37 (54.4%)</td>
<td>17 (25.0%)</td>
</tr>
<tr>
<td>The lack of reimbursement for hospital pharmacists puts me off</td>
<td>36 (52.9%)</td>
<td>21 (30.9%)</td>
<td>21 (30.9%)</td>
</tr>
<tr>
<td>The scheme works well for MDS patients</td>
<td>11 (34%)</td>
<td>34 (50.0%)</td>
<td>23 (33.8%)</td>
</tr>
<tr>
<td>A specialist pharmacist (e.g. heart failure or COPD) may find it easier to recruit patients than a general ward pharmacist</td>
<td>30 (44.1%)</td>
<td>24 (35.3%)</td>
<td>14 (20.6%)</td>
</tr>
<tr>
<td>Engaging in DMRs is a worthwhile use of my time</td>
<td>18 (26.5%)</td>
<td>25 (36.8%)</td>
<td>23 (33.8%)</td>
</tr>
<tr>
<td>It helps foster good working relationships with local community pharmacists</td>
<td>18 (26.5%)</td>
<td>17 (25%)</td>
<td>33 (48.5%)</td>
</tr>
<tr>
<td>The service is not ingrained in the daily work of a ward pharmacist as yet</td>
<td>11 (16.2%)</td>
<td>11 (16.2%)</td>
<td>55 (80.9%)</td>
</tr>
<tr>
<td>Statements</td>
<td>Disagree (=1) or Strongly Disagree (=2) n (%)</td>
<td>Uncertain (=3) n (%)</td>
<td>Agree (=4) or Strongly Agree (=5) n (%)</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Other views</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMR interventions by the community pharmacist should be quality assured</td>
<td>7 (10.3%)</td>
<td>20 (29.4%)</td>
<td>41 (60.3%)</td>
</tr>
<tr>
<td>The DMR scheme has potential benefits to the patient</td>
<td>5 (7.4%)</td>
<td>12 (17.6%)</td>
<td>51 (75.0%)</td>
</tr>
<tr>
<td>The DMR scheme helps communication between secondary and primary care</td>
<td>7 (10.3%)</td>
<td>14 (20.6%)</td>
<td>36 (52.9%)</td>
</tr>
<tr>
<td>The patient’s priority is to get home from hospital and may not be the right time to engage them in the DMR scheme</td>
<td>13 (19.1%)</td>
<td>14 (20.6%)</td>
<td>42 (61.8%)</td>
</tr>
<tr>
<td>The DMR takes a long time, but it is worth it</td>
<td>13 (19.1%)</td>
<td>37 (54.4%)</td>
<td>18 (26.5%)</td>
</tr>
<tr>
<td>In general, hospital pharmacy staff are enthusiastic about the DMR service</td>
<td>36 (52.9%)</td>
<td>20 (29.4%)</td>
<td>11 (16.2%)</td>
</tr>
</tbody>
</table>

**Discussion Points**

**Response Rate and Responders**

The response rate of 25% is low. Whilst the reason for this is unknown, it may be the pharmacists have not engaged with the service or have not completed a DMR and hence did not complete the questionnaire. However it should be noted that of those responded 38% had never completed a DMR and so their views are included in the evaluation.

Response was obtained from pharmacists of all grades (6 to 8d) as well as specialist and non-specialist pharmacists.

**Overall Views of Hospital Pharmacists**

The hospital service seemed to be ‘left out of loop’ in developing the DMR service; many did not discuss how to be involved until after Welsh Government had launched it. Most felt clearer guidance from the Government (specific to hospitals) would have been useful and further guidance on obtaining consent in certain situations would be most welcomed.

There are different DMR processes in different hospitals; the process used is often dependent upon whether electronic discharge is in place and whether a full Discharge Advice Letter (DAL) or an updated list of medicines is provided to the community pharmacist. The method chosen then influences the method of obtaining consent and also the time taken by the pharmacist to be involved in the DMR process. Different models, for example the ‘push’ or ‘pull’ methods have been developed, however no one method seems to be working optimally.

The DMR service in hospital seems to be pharmacy specific (reflected by both interviews and the
questionnaire). In some hospitals it includes the pharmacist, pharmacy technician and administrative staff, whilst in others it seems to be only the pharmacist.

There seems to be a difference in the DMR process for MDS and non-MDS patients. Initially MDS patients were prioritised in the majority of Health Boards (from qualitative interviews). Even if MDS patients are identified by the pharmacy team, it does not necessarily mean the patient will be referred for a DMR (Table 5.13 and 5.14 illustrate the difference between the number of MDS patients seen and actually referred).

Just under half of respondents (44%) do not identify non-MDS patients for DMRs in any one month. Those who do tend to prioritise those patients who have commenced a new medicine in hospital or those patients judged to be at risk of poor adherence.

Identification of patients is often left to the pharmacists’ professional judgement. This means the service is dependent upon if the pharmacists value the service and how motivated they are. There seems to be some misunderstanding of the service in the hospital sector.

The methods of communication between the hospital pharmacy and the GP and community pharmacy varies. Faxing information for MDS DMR patients is preferred (for both GP and community pharmacy), whereas for non-MDS DMR patients information is often sent to GP via the patient, whilst information for the community pharmacy is either faxed or provided via the patient. This latter finding is unsurprising as from the qualitative interviews faxing information to community pharmacies is included in some hospitals’ DMR policy, whereas other hospitals the DMR process has been set up so the patient provides the information to the community pharmacist.

Major Barriers for Hospital Pharmacies to Engage in the Service

Based on these findings, the key barriers to conducting the DMR service from the hospital pharmacists’ perspectives are as follows:

- Other priorities which make it difficult for the DMR scheme to be the main concern;
- Lack of IT infrastructure;
- Lack of promotion of the service to the hospital pharmacists and patients;
- Lack of time to engage in the scheme or if engaged how the time it takes impacts on other services;
- Consent: gaining consent and time it takes;
- Lack of recognition from employers for extra work;
- Patients being in hospital for too short a stay making it difficult to do.

Hospital Pharmacists’ Views about the DMR Service

- The DMR service currently is not ingrained in the daily work of a ward pharmacist;
• The recruitment of patients in hospital may not be the best time for the patient as their priority is to get home;

• Whilst the scheme has potential benefits for patients, it is hard to do on top of everything else and it takes them away from other patients. However they recognised the value of DMRs in helping communication between secondary and primary care;

• They would like the DMR interventions made by community pharmacists to be quality assured;

• Respondents disagreed with the statement that hospital staff are enthusiastic about the DMR service (53%).

**Suggestions for Potential Recommendations**

The following suggestions were identified as the having the most potential for making a major improvement:

• Investment to free up time for pharmacists to be involved in the DMR service;

• Having a computer system which supports DMR;

• Better promotion of the scheme to patients both in the community and whilst they are in hospital;

• Identify lessons learnt and provide feedback to hospitals on types of interventions made by community pharmacists;

• Compulsory patient registration with a named community pharmacy.

**References**


Chapter Six: The Patient’s Perspective

At the heart of the DMR scheme is the intention to improve the transition from hospital to home for the patient and to provide an extra safeguard around their medication. The research team therefore felt it was important to try to capture the experiences and views of patients on the scheme.

Method

Community pharmacists were asked to distribute an information sheet describing the research and consent form to appropriate patients (thus avoiding vulnerable patients in their professional judgment) inviting them to participate in a semi-structured interview relating to their views and experiences of the DMR service. Six interviews across two Health Boards were conducted via telephone and notes taken. Five were in English and one in Welsh. Thematic analysis using a combination of inductive and deductive approaches to identify key themes was utilised.

Findings

The clear finding was the very high value indeed the patients put on being able to discuss their medications with the community pharmacist post-discharge. Safety was emphasised (unprompted) in the responses:

‘It makes you feel safe.’

‘It really gave me confidence in taking my drugs. I knew I was safe and well looked after. I knew the drugs would assist me, that is, I knew they were the right drugs.’

The interviewees also had a store of particular examples they used to illustrate why the service was important to them:

‘For example the pharmacist saw me trying to buy some over the counter medicine and said immediately not to do that. It wouldn’t be safe with what I’m on.’

‘I’m on a lot of tablets and I wanted to know if I could take them all in one go! Did I need to spread them out morning and night?’

‘I also told him I was taking a kind of injection for my arthritis which he didn’t know about. He was able to go and look it up and make sure it wouldn’t react with anything else I was prescribed.’

‘I’d seen an article in the paper about one of my drugs and I was able to ask about it’.

‘He [the pharmacist] saw me in person. I was really pleased because I had some trouble with my pills. I was down to take some of them twice. He sorted it out with the doctor for me.’

Despite all the patients interviewed having participated in a ‘DMR review’ interview with their pharmacist post-discharge only two had heard of the name of the scheme prior to the interview. Most viewed the experience as part of their general service from the pharmacist. This may make it easier for the pharmacists to engage in the conversation with the patient as part of a continuing relationship (rather than potentially confusing them with a piece of new jargon) but this approach
may also mean that patients are unaware that the service they value so highly is indeed an ‘extra’ offering. Examples of seeing the DMR service as part of their general relationship can be seen in the quotes below:

‘It is a lovely service. I talk on the phone with him if I need too. They deliver as well.’

‘All the staff are fantastic. They’ll check up on me with my wife if they see her or give me a ring.’

In contrast one interviewee was surprised by the service:

‘It was a service beyond what I expected. I thought I’d just walk in and out and I was surprised when the lady behind the till said the pharmacist wanted to talk with me. He prepared the staff you see – that was very good. I have added confidence now and I’m more than happy with the service.’

The patients interviewed clearly valued the opportunity for a conversation about their medication. Many put this in the context of the sometimes pressured opportunities (or lack of the same) they had for conversation with other healthcare professionals:

‘You see I never got to see my GP as he was on holiday. It was only a locum who didn’t know my history so I didn’t want to bother him.’

‘It was very helpful. Doctors these days can be so difficult to get in touch with.’

‘Roedd e fferylllydd yn lot well na’r meddyg – roeddwn yn gallu cael sgwrs hefo fo am y meddyginiaeth.’ [The pharmacist was a lot better than the doctor – I was able to have a conversation with him about the medication]

Not only did the patients interviewed value the service highly in terms of their own experience they were very positive about its potential benefits for others:

‘It’s a very good service. I think it must be very helpful for older people in particular. Lots of medication can be very confusing at times.’

‘I think pharmacists should be involved like this. Some patients don’t read the instructions and could have a catastrophic reaction. This service helps them and it must help the doctors too as the patients will make less mistakes and not take up appointment time. I’m impressed with the service and I think it’s a good idea.’
Chapter Seven: Economic Evaluation

Aim

The aim of the economic evaluation is to identify the cost of the DMR initiative and assess this against the benefits in terms of reductions in medication errors, adverse drug events, attendances at Accident and Emergency (A&E) departments, medicines related admissions to hospital and medicines wastage. It also aims, via economic modelling, to predict the health benefits gained, by identifying and correcting errors arising from hospitals, GP practices and patients and assess these against the net cost (direct costs minus resource savings) to indicate the cost effectiveness of the DMR initiative.

These analyses use standard methods of economic appraisal (Drummond et al, 2005) in which costs and savings reflect the value of resources used and freed (principle of opportunity cost). These are different from monetary costs and savings which are considered in Chapter Eight.

Methods

Cost of the DMR initiative

The cost of the DMR initiative is mainly in terms of health professional time in the community and in hospital. Data on the time spent by community pharmacists on DMR activities were obtained by questionnaire survey to all community pharmacies in Wales (n = 704) and by interviews with a sample of community pharmacists. In both cases, pharmacists were asked to estimate the total time spent on a typical DMR and independently to estimate the time spent on specified DMR related activities. Data on time spent by hospital pharmacy departments were obtained by questionnaires sent to 369 hospital pharmacists. Questions related to time spent on DMR activities by professions (pharmacist, pharmacy technician, other health professionals and administrative staff). Time of GPs was from interviews with a sample of GPs. Mean times have been valued using unit costs from Curtis (2013) and are expressed in 2013/14 prices.

Cost savings from the DMR initiative

The DMR initiative aims to reduce the number of errors or problems patients have with their medicines after they have been discharged from hospital (Welsh Government, 2011). In order to identify the resources which have been saved through this process it was necessary to predict what would have happened if a patient’s prescription had not been subjected to a DMR following discharge from hospital.

This was done using a set of expert panels, each constituted to include a community pharmacist, a hospital pharmacist, a hospital doctor and a General Practitioner. Each panel reviewed the DMR forms which had been provided by a sample of community pharmacies.

The 25 pharmacies which had undertaken the most DMRs up to April 2013 were identified from NECAF data and invited to provide all DMR forms (part 1 and part 2) which had been completed in 4 months; October 2012, January 2013, April 2013 and July 2013. The community pharmacists photocopied the appropriate forms, documenting the gender and age of the patient but ensuring patient anonymity.

Each expert panel reviewed a set of DMR forms, discussing all discrepancies and medication
errors. For purposes of the economic modelling (see below), errors were categorised into one of 4 classifications; minor, significant, serious or potentially lethal, based on severity rating system used in the EQUIP study (Dornan et al, 2012). Descriptions of each category of error and examples of errors in each category were provided to the panel prior to the meeting. (See Appendix 12)

A pragmatic approach was taken in which failure to reach an agreement within a defined time period would lead that DMR to be classed as ‘insufficient information’. Where there was sufficient information for the panel to agree that an error had occurred, but the panel could not agree on its severity, a conservative approach was taken in which the error score was based on the rating of the panel member who had assigned the lowest score.

Independently of the above exercise, the panel predicted for each DMR reviewed:
- whether an adverse drug event had been avoided;
- whether a medicines related A&E attendance had been avoided;
- whether a medicines related admission to hospital had been avoided;
- whether any medicines wastage had been avoided.

A conservative approach was taken with regard to avoided hospital admissions in that predictions were on a patient basis rather than on an individual drug basis i.e. only one hospital admission could be avoided per patient even if multiple drug errors/discrepancies were identified on the DMR. In order to estimate the avoided cost of hospital admissions, two of the GPs who had participated on the expert panels met to review all identified cases and, based on the details provided on the DMR forms, predicted, where possible, what the cause of admission would have been. Avoided admissions were then valued using the NHS Reference Cost (Department of Health, 2013) for a short stay non-elective hospital episode for the predicted procedure. It was assumed that all admissions were direct and not preceded by an A&E attendance. Given the level of available information these predictions inevitably must be viewed with a degree of caution.

Unit cost for an avoided A&E attendance was from Curtis (2013). In all cases it was assumed that the attendance did not lead to an inpatient admission. The effect of A&E attendances leading to hospital admissions is considered in a sensitivity analysis.

Medicine wastage was said to occur when the stopping of a prescription or a reduction in the dose of a prescribed drug had been initiated in hospital but not actioned in the community. In the former, it was assumed that the DMR had avoided a single dispensing of the drug and in the latter that the DMR had avoided a single dispensing of the drug at the wrong dose. This conservative approach may underestimate true savings from avoided wastage as in some cases dispensing of the inappropriate drug/dose could continue beyond the first prescription before the error was identified had the DMR not been undertaken. It may also underestimate true savings as no account was taken for changes in the prescribed frequency of use. Savings from avoided medicines were valued using BNF (2013) which is consistent with economic evaluations in the UK. Where wastage was with regard to a dose change, the difference in BNF prices between doses was used.

Total savings from this sample of pharmacies were then scaled up to reflect the likely savings across Wales by applying the ratio (avoided incidents: DMRs judged) to the total number of DMRs undertaken in Wales from time of the introduction of the DMR initiative in October 2011 through to December 2013.

Health benefits and cost effectiveness of the DMR initiative

Health benefits from the DMR initiative were estimated using an adapted version of an economic
model developed by Sheffield University to assess the cost effectiveness of interventions aimed at preventing medication error at hospital admission (Karnon et al, 2008). In the original model, medication errors which were not detected prior to reaching the patient were assigned a probability of causing harm and categorised as having minor, moderate or severe health effects. In the adapted model, these probabilities were replaced by the panel’s decisions on the severity of the errors described above.

For the main analysis (base case), error classifications were mapped onto health effect categories as follows; a minor error would have no health impact; significant, serious and potentially lethal errors would have minor, moderate and severe health effects respectively. A sensitivity analysis (see below) shows the effect of using a more conservative method of mapping.

Health effects are expressed in the model in terms of Quality Adjusted Life Years (QALY) which is preferred by the National Institute for Health and Care Excellence (www.NICE.org.uk) for the economic evaluation of medicines and other healthcare technologies.

The model was analysed by sampling 10,000 input parameter sets based on the probability that they represent an optimal set. These sampled input parameter sets were then used to estimate the baseline epidemiological model, i.e. estimating number of adverse drug events that would occur with no DMR intervention.

Sensitivity analyses

Two sensitivity analyses were undertaken as follows:
- each hospital admission was via the A&E department;
- an alternative method of mapping error classifications to health effects was used in the model exercise in which errors which the expert panel had classified as ‘potentially life threatening’ were re-classified as ‘serious’.

Results

Cost of the DMR initiative

Community pharmacist time 1: Questionnaire responses

Data on the time spent by community pharmacists in undertaking DMRs were obtained by questionnaire survey distributed to 704 community pharmacies in December 2013 (although only 520 pharmacies have undertaken DMRs since the initiative began). A total of 143 questionnaires were returned (response rate = 20.3%). Of these 25 did not provide answers to questions on time spent on DMR activities leaving 118 which included the requested information.

Respondents were asked to estimate the total time taken with regard to a ‘typical’ DMR. The mean (SD) was 61.29 minutes (31.83 minutes) as shown in column 8 of Table 7.1. The wide range, from 15 – 210 minutes, is likely to be due to variations between individual DMRs and pharmacists’ judgements of what was ‘typical’. It is also possible that estimates at the extreme high end included time spent waiting between the start and finish of an activity, e.g. waiting for a GP to respond to a query, despite an instruction not to include it. The relatively small standard deviation, however, suggests that the overall variation from the mean was not great.

Respondents were also separately asked to estimate the typical time spent on 4 specific DMR related activities which collectively (with ‘other’) should reflect total time. Results are shown in
columns 2 – 7 of Table 7.1. Time spent in identifying the patient/gaining consent and in completing the claim form were similar with a mean (SD) of 7.84 (6.53) minutes and 8.12 (6.70) minutes respectively. Time spent undertaking the initial (part 1) and follow-up (part 2) reviews were also similar with a mean (SD) of 21.18 (11.18) minutes for part 1 and 22.49 (14.33) minutes for part 2.

Thirty two pharmacists reported that some time that had also been devoted to ‘other’ activities. These mainly related to paperwork, phoning patients and queries to GPs and hospitals. The mean time on these activities was small (2.81 minutes, SD = 6.31 minutes) due to the large number of zero’s.

<table>
<thead>
<tr>
<th>Table 7.1: Community pharmacists: times (minutes) to undertake DMR (n = 118)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify patient / gain consent</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>SD</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>

Mean (SD) sums of individual activity times are shown in column 7 and estimated total time in column 8. There were some differences between these at the level of the individual pharmacy with 26 (22%) respondents providing an estimate for total time which was lower than the sum of the estimates for individual activities while in the case of 21 (18%) respondents it was higher. The estimated mean total time (62.25 minutes, SD = 30.16 minutes), however, was very similar to the sum of the estimated mean individual activity times (61.29 minutes, SD = 31.83 minutes).

**Community pharmacist time 2: Interview responses**

Seven interviews were carried out with community pharmacy staff. Results are shown in Table 7.2. Responses to the requests to estimate the total spent on a typical DMR varied from 41 to 120 minutes with a mean (SD) of 63.71 (17.64) minutes. Although other staff e.g. clerical assistants or counter staff contributed to some activities, most tasks were undertaken by pharmacists.

<sup>12</sup> The individual elements were summed together for each pharmacy as the “sum of activity time”. The mean for this variable was then calculated. This does not exactly match the sum of the means of the individual elements due to rounding. Costing proceeded by rounding this to an even hour.
Table 7.2: Community pharmacists: time (minutes) per task and estimates of total time per DMR (n = 7)

<table>
<thead>
<tr>
<th>Task</th>
<th>Interview &gt;</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Totals</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID pat</td>
<td></td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>23</td>
<td>3.00</td>
</tr>
<tr>
<td>Contacting &amp; consent</td>
<td></td>
<td>10</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>15</td>
<td>3</td>
<td>5</td>
<td>44</td>
<td>6.29</td>
</tr>
<tr>
<td>Initial review</td>
<td></td>
<td>30</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>85</td>
<td>12.14</td>
</tr>
<tr>
<td>Follow-up</td>
<td></td>
<td>20</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>100</td>
<td>14.29</td>
</tr>
<tr>
<td>Paperwork &amp; issues</td>
<td></td>
<td>30</td>
<td>30</td>
<td>10</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>130</td>
<td>18.57</td>
</tr>
<tr>
<td>Inputting claim</td>
<td></td>
<td>15</td>
<td>2</td>
<td>7</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td>29</td>
<td>4.14</td>
</tr>
<tr>
<td>Other tasks</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td>25</td>
<td>3.57</td>
</tr>
<tr>
<td>Reported Estimated Total time (not sum of individual elements)</td>
<td></td>
<td>120</td>
<td>63</td>
<td>43</td>
<td>74</td>
<td>60</td>
<td>45</td>
<td>41</td>
<td>446</td>
<td>63.71</td>
</tr>
</tbody>
</table>

This estimated total mean time spent on a typical DMR is very similar to the mean of 62.25 minutes estimated via the questionnaire. For costing purposes, it is therefore estimated that on average each community pharmacist devotes 1 hour to each DMR valued at £56 (Curtis, 2013).

**Hospital pharmacy team time**

Responses were received from 93 hospitals, 44 of which provided answers to the questions on the time input to DMR activities. Mean (SD) reported times in total and by profession are shown in Table 7.3. The mean (SD) time per DMR was 19.48 (13.53) minutes with the majority of this undertaken by the hospital pharmacist (12.98 minutes). Pharmacy technicians and administrative staff provided on average less than 5 minutes and 1 minute per DMR respectively. Only 3 hospitals reported any input by doctors (n = 1) or nurses (n = 2). Qualitative interviews with 6 pharmacy leads (see Chapter 5) confirmed that the DMR is essentially a task for the pharmacist.
Table 7.3: Mean (SD) time/cost of hospital pharmacy team in activities per DMR (n = 44)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Pharmacist</th>
<th>Pharmacy Technician</th>
<th>Other health professional (*)</th>
<th>Admin Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean time (mins)</td>
<td>19.48</td>
<td>12.98</td>
<td>4.84</td>
<td>0.57</td>
<td>0.98</td>
</tr>
<tr>
<td>SD time</td>
<td>13.53</td>
<td>7.99</td>
<td>7.07</td>
<td>2.50</td>
<td>3.02</td>
</tr>
<tr>
<td>Mean cost (£)</td>
<td>12.50</td>
<td>10.16</td>
<td>1.77</td>
<td>0.42</td>
<td>0.24</td>
</tr>
<tr>
<td>SD cost</td>
<td>10.11</td>
<td>6.26</td>
<td>2.59</td>
<td>1.80</td>
<td>0.74</td>
</tr>
</tbody>
</table>

(*) doctor x 1, nurse x 2

All staff time was valued using unit costs from Curtis (2013) apart from administrative staff where the mid-scale for a Band 2 advertised post (www.jobs.nhs.uk) was used. On this basis, the mean (SD) total cost per DMR was £12.50 (£10.11) as shown in Table 7.3.

**General practitioner time**

Interviews were carried out with a sample of 6 GP practices which included questions regarding the time spent on the DMR for a typical patient. Three stated that they spent no time on DMR queries as these were dealt with by clerical/administrative staff. Only 2 could put a figure on their own time.

GP practices have routines for ensuring that their patient records are updated when in receipt of the discharge advice letter from the hospital. The introduction of the DMR scheme would not require GPs to undertake any additional tasks other than respond to any discrepancy identified by that review. This response is necessary to ensure that appropriate clinical judgements are made and any system flaws are corrected. One respondent made the point that the number of queries about potential drug discrepancies after discharge from hospital had not changed since the introduction of the DMR initiative. For these reasons no additional time or cost is included in the DMR costing assessment.

On the basis of the above, the total economic cost (value of resources) for each DMR undertaken was £68.50 Multiplying this by the 14,649 DMRs undertaken in the period October 2011 to December 2013, the cost of the DMR initiative was just over £1 million (£1,003,457).

This estimate does not include a number of other costs such as costs borne by Community Pharmacy Wales or one-off set up costs.

**Resource savings from the DMR initiative**

Seventeen of 25 pharmacies submitted DMR forms for scrutiny by the expert panels. Forms from two of these were received too late to be considered by the panels and forms from one other were excluded as the paperwork was provided loose leaf and there could be no guarantee that
the appropriate papers for each patient could be collated. Forms received from a further two pharmacies were also excluded as these pharmacies were identified as having a pre-emptive system for DMRs in which they intervened at the GP surgery before the first community prescription was written. This meant that the results of discrepancies and errors on first prescription could be skewed.

The characteristics of the remaining 12 pharmacies and the number of DMRs undertaken by each during the reporting periods are shown in Table 7.4. The total number of DMRs undertaken by these pharmacies represents 10% of the total DMRs undertaken in Wales (2832) during the selected four months.

A discrepancy was said to occur where the community prescription contained differences compared with the hospital discharge prescription. An error was said to occur where there was an unintended discrepancy.

The submitted DMR forms were considered by 4 panels, each attended by a community pharmacist, hospital pharmacist and a GP. It had been intended that a hospital doctor would participate on each panel, but the individual who had agreed to do this was unable to attend any of the panels. While this was unfortunate, the impact was not felt to be great as each panel was represented by representatives from the 3 main professionals involved in the DMR process i.e. the hospital pharmacist who checks the discharge prescription, the GP who receives a copy and writes the first prescription and the community pharmacist who dispenses it.

A summary of results with regard to discrepancies and errors is given in Table 7.5. A total of 285 DMR forms were received of which 8 were excluded because 2 had no information on the DMR claim, 2 were complicated cases which could not be fully considered within the time constraint of the panels, 3 were illegible and 1 related to a patient who had been readmitted to hospital. Of the remaining 277 forms, 25 were excluded as they did not contain enough information on which the panel felt if could form a judgment.

Of the 252 judgements made, a total of 148 discrepancies were identified of which 82 were considered as errors. Of the 82 errors, 31 were classified as minor, 21 as significant, 22 as serious and 8 as potentially lethal.
Table 7.4: Characteristics of pharmacies supplying DMRs for expert panel assessment for the 4 months: October 2012, January 2013, April 2013, July 2013.

<table>
<thead>
<tr>
<th>Pharmacy Code</th>
<th>No of branches</th>
<th>Type as per census</th>
<th>Health Board</th>
<th>4 month total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-4</td>
<td>small chain</td>
<td>HD</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>Powys</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>CT</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>C&amp;V</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>1-4</td>
<td>Independent</td>
<td>ABHB</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>ABHB</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>C&amp;V</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>CT</td>
<td>37</td>
</tr>
<tr>
<td>9</td>
<td>1-4</td>
<td>Independent</td>
<td>HD</td>
<td>41</td>
</tr>
<tr>
<td>10</td>
<td>1-4</td>
<td>Independent</td>
<td>ABHB</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>5-10</td>
<td>medium multiple</td>
<td>C&amp;V</td>
<td>23</td>
</tr>
<tr>
<td>12</td>
<td>&gt;20</td>
<td>large multiple</td>
<td>HD</td>
<td>35</td>
</tr>
</tbody>
</table>

Total DMRs undertaken by sample | 285

Total DMRs undertaken in Wales | 2832
Table 7.5: Results of panel meetings

<table>
<thead>
<tr>
<th>Pharmacy</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases received</td>
<td>28</td>
<td>19</td>
<td>29</td>
<td>15</td>
<td>15</td>
<td>12</td>
<td>20</td>
<td>7</td>
<td>41</td>
<td>11</td>
<td>23</td>
<td>35</td>
<td>285</td>
</tr>
<tr>
<td>Cases considered</td>
<td>27</td>
<td>17</td>
<td>29</td>
<td>15</td>
<td>15</td>
<td>11</td>
<td>20</td>
<td>37</td>
<td>40</td>
<td>10</td>
<td>23</td>
<td>33</td>
<td>277</td>
</tr>
<tr>
<td>Not enough information</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>Judgements made</td>
<td>25</td>
<td>16</td>
<td>27</td>
<td>15</td>
<td>15</td>
<td>8</td>
<td>19</td>
<td>35</td>
<td>32</td>
<td>7</td>
<td>22</td>
<td>32</td>
<td>252</td>
</tr>
<tr>
<td>Discrepancies identified</td>
<td>15</td>
<td>8</td>
<td>20</td>
<td>7</td>
<td>5</td>
<td>8</td>
<td>14</td>
<td>15</td>
<td>21</td>
<td>5</td>
<td>10</td>
<td>19</td>
<td>148</td>
</tr>
<tr>
<td>Errors identified</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>13</td>
<td>13</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>13</td>
<td>82</td>
</tr>
<tr>
<td>Minor</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>Significant</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>Serious</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Potentially lethal</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

The number of cases received per community pharmacy varied from between 7 and 41 and the number on which judgments could be made between 7 and 35. Errors as a percentage of judgements varied from between 13% and 68%.

Examples of each category of error identified are given in Appendix 13. The information available to the panels was greater than that shown in the Appendix.
Adverse drug events by pharmacy are shown in Table 7.6 together with the estimated number of avoided visits to A&E departments, hospital admissions, wastage in terms of the number of reviews involving wastage and the number of drugs wasted which were the consequences of the 82 identified errors.

Table 7.6: Avoided adverse drug reactions, A&E attendances, hospital admissions and drug wastage

<table>
<thead>
<tr>
<th>Pharmacy</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADE</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>A&amp;E</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>Admission</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Wastage - cases</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>42</td>
</tr>
<tr>
<td>Wastage - drugs</td>
<td>4</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>13</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>47</td>
</tr>
</tbody>
</table>

**Accident and emergency visits**

The panels determined that 32 identified errors could have resulted in a visit to an A&E Department. On the assumption that each visit did not lead to an admission the unit cost per visit is £112 (Curtis, 2013). The total estimated savings from these avoided A&E attendances was thus £3,584. As this saving was from 252 DMR judgments, the A&E cost saving per DMR was £14.22.

Applying this to the 14,649 DMRs undertaken from the scheme’s initiation in October 2011 to the end of December 2013 produces a total saving from avoided A&E attendances of **£208,309**.

**Hospital admissions**

The panels determined that 32 admissions to hospital were avoided. The unit costs which have been used are shown in Table 7.7.
Table 7.7: Unit costs for avoided hospital admission by HRG tariff.

<table>
<thead>
<tr>
<th>Predicted reason for admission</th>
<th>Number of patients</th>
<th>HRG detail</th>
<th>Unit Cost (£)</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>7</td>
<td>HRG overall national average</td>
<td>456</td>
<td>3192</td>
</tr>
<tr>
<td>Asthma</td>
<td>1</td>
<td>WA21Z (respiratory medicine)</td>
<td>650</td>
<td>650</td>
</tr>
<tr>
<td>Heart failure</td>
<td>10</td>
<td>EB03A –E-mean-(heart failure or shock)</td>
<td>2436</td>
<td>24360</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>1</td>
<td>EB05A-C mean (cardiac arrest)</td>
<td>1553</td>
<td>1553</td>
</tr>
<tr>
<td>Dehydration/ acute renal failure</td>
<td>3</td>
<td>WA21Z (nephrology)</td>
<td>441</td>
<td>1323</td>
</tr>
<tr>
<td>Fit (epilepsy)</td>
<td>2</td>
<td>WA21Z (neurology)</td>
<td>250</td>
<td>500</td>
</tr>
<tr>
<td>GI bleed</td>
<td>5</td>
<td>FZ38G-P mean: (gastrointestinal bleed)</td>
<td>2220</td>
<td>11,100</td>
</tr>
<tr>
<td>Hyperglycaemia</td>
<td>2</td>
<td>WA21Z (endocrinology) (*)</td>
<td>1598</td>
<td>3196</td>
</tr>
<tr>
<td>Stroke</td>
<td>1</td>
<td>WA21Z (stroke medicine)</td>
<td>2236</td>
<td>2236</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>WA21Z (stroke medicine)</td>
<td></td>
<td>48,110</td>
</tr>
</tbody>
</table>

(*) Only long stay available

On this basis the total value of 32 avoided hospital admissions from this sample of DMRs is £48,110. As this saving was from 252 DMR judgments, the avoided hospital admission saving per DMR was £190.91. Applying this to the 14,649 DMRs undertaken from the scheme’s initiation in October 2011 to the end of December 2013 produces a total saving from avoided hospital admissions of £2,796,641.

Wastage

The number and value of drugs that would have been inappropriately dispensed without the DMR initiative are shown in Table 7.8.
Table 7.8: Drug wastage avoided by DMR initiative

<table>
<thead>
<tr>
<th>Pharmacy</th>
<th>1</th>
<th>2</th>
<th>3(*)</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of drugs</td>
<td>4</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>47</td>
</tr>
<tr>
<td>Total value of drugs (£)</td>
<td>16.66</td>
<td>0.97</td>
<td>181.09</td>
<td>0</td>
<td>0</td>
<td>13.39</td>
<td>5.74</td>
<td>16.56</td>
<td>4.52</td>
<td>0</td>
<td>16.30</td>
<td>22.91</td>
<td>278.14</td>
</tr>
</tbody>
</table>

(*) includes avoided Seretide 500 Accuhaler @ £40.92

On this basis the total value of avoided drug wastage from this sample of DMRs is £278.14. As this saving was from 252 DMR judgments, the avoided drug wastage per DMR was £1.10. Applying this to the 14,649 DMRs undertaken from the scheme’s initiation in October 2011 to the end of December 2013 produces a total saving from avoided A&E attendances of £16,114.

The total value of resources saved by the DMR initiative is shown in Table 7.9.

Table 7.9: Estimated total value of NHS resources saved by DMR initiative

<table>
<thead>
<tr>
<th></th>
<th>4 month sample period (£)</th>
<th>Whole period Oct 2011 – Dec 2013 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoided A&amp;E attendance</td>
<td>3,584</td>
<td>208,309</td>
</tr>
<tr>
<td>Avoided hospital admissions</td>
<td>48,110</td>
<td>2,796,641</td>
</tr>
<tr>
<td>Avoided drug wastage</td>
<td>278</td>
<td>16,114</td>
</tr>
<tr>
<td>Total</td>
<td>£51,972</td>
<td>£3,021,064</td>
</tr>
</tbody>
</table>

Sensitivity analysis

Replacing the assumption that all hospital admissions were direct, to an assumption that each occurred via the A&E department increases the expert panel assessed savings from avoided hospital admissions from £48,110 to £51,694. This corresponds to a total estimated savings across Wales from avoided admissions during the period of the DMR initiative to £3,005,021 and
the total savings from the DMR initiative to £3,229,444.

Health effects and cost effectiveness

The outputs from the model are presented in Table 7.10 which shows the estimated loss of QALYs per 1000 DMRs between a scenario with no DMR and one with DMR.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Total QALYs lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>No DMR</td>
<td>48.1 (19.7-86.9)</td>
</tr>
<tr>
<td>DMR</td>
<td>0.8 (0.1-3.2)</td>
</tr>
</tbody>
</table>

Results show that DMR saves 47.3 QALYs per 1000 DMRs. As 14,649 DMRs were undertaken during the period October 2011 – Dec 2013 the model estimates a saving of 692.9 QALYs over this period.

Sensitivity analysis

Table 7.11 presents the results of the sensitivity analysis in which potentially life threatening errors have been reclassified as serious.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Total QALYs lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>No DMR</td>
<td>7.6 (5.7-9.7)</td>
</tr>
<tr>
<td>DMR</td>
<td>0.1 (0.0-0.5)</td>
</tr>
</tbody>
</table>

The absence of any potentially life threatening errors means that the predicted QALY losses in the baseline scenario are much reduced. The DMR initiative now leads to a gain of only 7.5 QALYs per 1000 DMRs or 110 QALYs over the period.

Discussion

The estimated cost of the DMR initiative was just over £1 million based on 14,649 DMRs undertaken during the period of study and an estimated cost per DMR of £68.50. The number of DMRs undertaken, however, represents only a fraction of discharges that occurred over this period. Total cost clearly would have been higher if a greater number of DMRs had been undertaken.
In exchange for this cost, resources valued at around £3 million were freed up as a result of the DMRs having avoided A&E attendances, hospital admissions and drug wastage. This represents a return on investment in the order of 3:1.

The number of avoided adverse events which would otherwise have led to these NHS consequences is consistent with the literature (see Chapter 1) considering that DMRs tended to be taken on those patients where the risk of medication error following discharge from hospital is highest i.e. elderly people on multiple medications.

These results suggest that the DMR initiative is cost saving. In addition are the health benefits to patients from avoided adverse events. The economic model estimated a gain of 693 QALYs from the DMR initiative. If the NHS resource savings had not exceeded the cost of the DMR initiative, the model would have produced an incremental cost per unit of health (QALY) achieved through the initiative. This could then have been considered against the ‘willingness to pay threshold’ of £20,000 to £30,000 per additional QALY used by the All Wales Medicines Strategy Group to advise whether drugs should be recommended for use in NHS Wales i.e. considered to be cost effective.

The positive net savings and positive health gains estimated by these analyses imply that the DMR initiative is unambiguously cost effective which means it is justified on economic grounds.

References

British National Formulary (2013) [www.bnf.org](http://www.bnf.org)


Chapter Eight: Financial Assessment

Given the importance of ensuring value for money at this time of unprecedented austerity in the NHS, this section considers the service from a spend to save perspective and specifically:

To carry out a financial assessment of the cost / savings of the Discharge Medicines Review Service.

In simple terms it is to compare the cost of the scheme, made in terms the payments made to Community Pharmacy Contractors to carry out the reviews, and the subsequent savings measured in financial terms of the NHS avoiding hospital readmissions, A&E attendances and the cost of wasted medicines.

Method

The method adopted was to obtain details of all payments to contractors, measured over time. The schedule of payments supplied by the NHS Wales Shared Service Partnership enables assessment of the total spend and an examination of trends.

The measurement of financial savings stemmed from the analysis carried in the economic evaluation (See Chapter 7) but with an estimate of the impact on the costs in the NHS using Welsh average costing returns. It is unlikely that much of the saving will be realised in cash terms, for apart from savings in wasted drugs which are measured using the drug tariff, the resources consumed by the hospital will remain largely unchanged. However the space created by an avoidable hospital admission or A&E attendance will enable other patients to be seen and in particular those waiting for care.

Findings: Costs

DMR payments

The Welsh Government made two types of payment in respect of the DMR service as set out in the Drug Tariff rules. The first is a fixed one off implementation payment to cover the estimated set up costs of the service in each Community Pharmacy who qualified for the payment plus the advanced reimbursement of the levy to be charged to each Pharmacy to meet the cost of the formal evaluation and the cost of the set up and promotion paid for by CPW with materials dependent on approval by Welsh Government.

It subsequently transpired (CPW letter 11th March 2013) that all Community Pharmacies were charged the levy whether or not they qualified for the implementation payment.

The second is the activity payment made for each completed DMR to reimburse Community Pharmacy Contractors for their Pharmacists carrying out the work in undertaking the DMR. The numbers that can be undertaken are capped to certain maximum levels depending on the category of payment qualification under the Drug Tariff rules.

Implementation Payments

When the scheme was introduced, the Welsh Government offered an implementation payment of £1400 to each pharmacy premise. This comprised £1,000 for the set up costs and £400 for the levy. To qualify for the payment Contractors either completed 10 DMRs by the 31st March 2012 or
initiated 10 DMRs by the due date which were then subsequently completed. One hundred and fifty-two community pharmacies received this payment. For 2012/13, those pharmacies that did not qualify to receive the implementation payment in 2011/12 could receive this payment in 2012/13 if they completed 15 DMRs and initiated at least one DMR service intervention in not fewer than 4 of the 6 months between the beginning of October 2012 and the end of March 2013. Ninety one community pharmacies received this payment giving an overall total of 243 payments.

The payments made in total amounts to £340,200 (£1,400x 243) paid to 243 Community Pharmacy Contractors. This is out of a total of 713 eligible Community Pharmacy premises given that any premise that changed ownership during the reference period, the payment would only be made once.

**Activity payments**

The payment for each completed DMR is £37 with a maximum limit of 100 DMRs per Community Pharmacy in the first 6 months up to the 31st March 2012. Providing the Pharmacy met the minimum requirement to receive the implementation payment in this period, the maximum limit was increased to 140 between April 2012 and March 2013. For Pharmacies that qualified for the Implementation payment in 2012/13, the maximum number of DMRs for which payment would be made was 100. This payment has been unchanged since the start of the scheme which began from October 2011 with the first payments being made by contractor services prior to the NECAF system being finalised in February 2012.

Over the period from October 2011 to the December 2013, 14,649 payments have been made totalling £542,013. (14,649x£37)

**Figure 8.1: The graph below shows the value of payments over the period.**

---

13 Our reference period for examining payments was from Oct 11 to Dec 13. During this period 243 payments were made to 91 pharmacies. One additional payment was made in 2014 which was outside our reference period.
It can be seen that there has been some volatility in the level of payments over the period. However this is partly associated with changes to the timing of payments with the spike in March 2013 caused by two months payments being made. Overall the payments have averaged £20,074 per month taking the 27 months in the reference period. However excluding the slow start in the first three months, the payments over the two full calendar years have averaged just over £22,000 per month.

In summary therefore the costs of the scheme since its start in October 2011 to December 2013, is shown in the Table below. It should be noted that this additional financial cost does not include a number of other costs borne by Community Pharmacy Wales including one off set up costs. In addition the cost of the new service has been met out of retained surpluses from pharmacies that are normally paid back into the NHS Wales.

Table 8.1: Summary of DMR payments made to Community Pharmacy Contractors

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation payments</td>
<td>£340,200</td>
</tr>
<tr>
<td>Activity payments</td>
<td>£542,013</td>
</tr>
<tr>
<td>Total</td>
<td>£693,813</td>
</tr>
</tbody>
</table>

The levy of £400 which was recovered from all the Pharmacy contractors amounted to £288,400 (721 x £400) and according to CPW has been used to meet the costs of setting up, managing and evaluating the service.

Finding: Savings

The savings are calculated using the same methodology as that applied in the economic evaluation (Chapter 7), with the identification of errors from a sample of DMRs completed over 4 separate months between October 2012 and July 2013 reflecting the different seasons of the year. The overall number of DMRs paid since October 2011 to December 2013 total 14,649. The number of DMRs reviewed was 252 out of a sample of 285. Using the results from the 252 reviewed DMRs enables the extrapolation of the total number of avoided health care episodes impacting on the NHS.

A summary of the adverse drug events (ADE) avoided and avoided visits to A&E departments, hospital admissions, wastage in terms of the number of drugs wasted, are shown in the Table below.
Table 8.2: Summary of errors from sample DMRs and extrapolated for the total.

<table>
<thead>
<tr>
<th>Impact of identified errors</th>
<th>Avoided events from sample of 252 DMRs reviewed</th>
<th>Avoided events extrapolated to the total number of DMRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse drug events</td>
<td>32</td>
<td>1860</td>
</tr>
<tr>
<td>A&amp;E attendance</td>
<td>32</td>
<td>1860</td>
</tr>
<tr>
<td>Hospital Admission</td>
<td>32</td>
<td>1860</td>
</tr>
<tr>
<td>Drugs wasted</td>
<td>47</td>
<td>2732</td>
</tr>
</tbody>
</table>

**Adverse drug events**

There were 32 adverse drug events which were not regarded as having a resource impact on the NHS.

**A&E attendance**

There were 32 errors which could have resulted in visits to the A&E department. The average cost of an A&E attendance in Wales taken from the All Wales costing returns for 2012/13 is £140. Taking the extrapolated total avoided attendances of 1860, the value of the saving is **£260,400** (1860x£140) for the period.

**Hospital Admissions**

There 32 errors which could have led a Hospital admission. It is acknowledged that the expert panel identified the type of medical condition that would require the hospital admission and therefore allow the use of different specialty costs. However for the purpose of this assessment, after taking account of the varied mix of conditions, the average cost of medical specialties has been used.

From the Wales Cost Returns for 2012/13 the average daily medical inpatient cost is £328, with an average length of stay of 6.4 days. This amounts to £2,110 per patient and therefore taking the extrapolated total of 1860 cases, the value of the saving in inpatient stays amounts to **£3,924,600** (£2,110 x 1860) over the period.

**Drugs wasted**

The value of the 47 drugs wasted is based on the single prescription as per the Economic evaluation but using the drug tariff assessed the saving to be £234.99. This represents a saving of £5.00 per drug (£234.99/47). The annual saving is based on 2732 drugs saved and is valued at **£13,660** (2732x£5).
Summary of Costs and Savings

Table 8.3 shows a summary of the total costs and savings

<table>
<thead>
<tr>
<th></th>
<th>Total Activity</th>
<th>Total Cost/(Savings)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation payments</td>
<td>243</td>
<td>£340,200</td>
</tr>
<tr>
<td>Activity payments</td>
<td>14,649</td>
<td>£542,013</td>
</tr>
<tr>
<td>Levy</td>
<td>741</td>
<td>(£288,400)</td>
</tr>
<tr>
<td>CPW costs</td>
<td></td>
<td>£288,400</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td></td>
<td>£882,213</td>
</tr>
<tr>
<td><strong>Savings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A&amp;E attendances</td>
<td>1860</td>
<td>(£260,400)</td>
</tr>
<tr>
<td>Hospital inpatient</td>
<td>1860</td>
<td>(£3,924,600)</td>
</tr>
<tr>
<td>No. of drugs wasted</td>
<td>2732</td>
<td>(£13,660)</td>
</tr>
<tr>
<td><strong>Total savings</strong></td>
<td></td>
<td>(£4,198,660)</td>
</tr>
<tr>
<td><strong>Net saving</strong></td>
<td></td>
<td>(£3,316,447)</td>
</tr>
</tbody>
</table>

It can be seen that the scheme does show a substantial financial saving of over £3.3m when calculated using the full costs avoided by the NHS following the DMR intervention. However it is clear that apart from the saving delivered from not wasting drugs, the majority of the hospital based saving are not realisable. The actual cost of the NHS service would have largely remained unchanged given the spread of the cases across the many hospitals in Wales and with the predominantly fixed cost nature of staff and facilities.

However the resource consequence from the DMR intervention is the release in available capacity on the wards and in A&E depts. This capacity represented by 1860 A&E attendances and 11,904 bed days (1860 patients X 6.4days) does offer the NHS some additional flexibility to help meet important access and waiting times targets.

The scheme based on the results from the sample does therefore represent a good investment, not only in driving up quality in the reducing adverse health risks when patients move clinical settings, but also avoids using scarce NHS resources which can be applied in treating other patients.
Chapter Nine: Summary of Findings & Suggestions for Improvement

Purpose of this Chapter

The Discharge Medicines Review service is an innovative approach to tackling one of the key safety risks for the NHS in Wales – the potential for patients to be harmed as a result of inadvertent and inappropriate use of medicines at the point where their care is transferred from one setting to another. In doing so, it was assumed that significant economic and financial gains might also be realised, that patients would be helped to play a greater part in the management of their own care, that professionals’ contributions to care would be optimised, and that communication between professionals and sectors would be improved.

This evaluation has used a variety of quantitative and qualitative approaches in order to assess the extent to which these objectives have been realised. Each successive chapter has explored another of the different aspects of this, and for ease of comprehension, each chapter provides a succinct summary of its findings.

These will not be repeated here. Rather, the purpose of this final chapter is threefold:

A. To summarise the evidence in relation to each of the terms of reference of the study (set out in Chapter One); and
B. To discuss why the current DMR system may not be operating optimally; and
C. To suggests ways of improving it.

A. Summary of the Evidence in Relation to the Terms of Reference

Each of the terms of reference are considered here. They have been grouped into three:

1. Benefit to patients, including medication errors and discrepancies, and avoidance of iatrogenesis;
2. Other service improvements, including better communication and engagement; and
3. Economic and financial impact.

This is only a summary of the evidence, and further detail is provided in the preceding chapters.

Benefit to patients

To what extent has the DMR service contributed to:

- a reduction in risk of medication errors and adverse drug events by increasing the availability of accurate information about a patient’s medicines;
- avoiding medicines-related admission to hospital or care homes which can occur when un-reconciled medicines lead to prescribing or medicines administration errors.

The evaluation has revealed a substantial level of discrepancies in discharge medicines management – there have been a total of 14,649 DMRs processed, accounting for 19,878 discrepancies. The discrepancy rate was 1.3 items per DMR (part 1), ranging between LHBs from 1.10 to 1.44, and from 0 to as many as 18 discrepancies in individual DMRs. Just over half of these (52%) were for medicines which were either discontinued on the first prescription post-discharge or for medicines which had been stopped in one care setting and restarted after discharge.
The seriousness of these discrepancies varied. In the sample reviewed in detail as part of the economic evaluation, of the 252 DMRs reviewed, 82 unintended discrepancies were found. Of these, 21 were assessed by the expert panel as being ‘significant’, 22 as ‘serious’, and 8 were ‘life-threatening’. Of the last group, five involved aspirin or anti-coagulant drugs. Of this detailed sample, it was estimated that 32 patients would have been admitted to a hospital Emergency Department (all of the serious and life-threatening), of whom some (depending on their individual clinical circumstances) may subsequently have been admitted as a hospital in-patient.

It is not possible to ascertain which of these errors would have been discovered without the DMR service. The qualitative feedback from pharmacists and doctors was mixed, with some arguing that some errors would have been discovered anyway, but others of the view that many would have been undetected until the patient experienced significant harm as a result of the discrepancy.

In terms of realising the potential benefit of the scheme, in patient safety issues as elsewhere, it is clear that the penetration of DMR is still relatively low, with only about a third (34%) of community pharmacies taking up the implementation payment, and 70% having completed at least one DMR; only about 5% of pharmacies undertaking DMRs have done more than 100 since the scheme started. The reasons for this level of adoption are discussed later in this chapter, but there would appear to be a reasonable prima facie case that patient and other benefits could be increased if more pharmacies and pharmacists were to take part in the scheme.

**Other service improvements**

<table>
<thead>
<tr>
<th>To what extent has the DMR service contributed to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased patient involvement in their own care by helping them to develop a better understanding of their medicines;</td>
</tr>
<tr>
<td>• Improved communication between healthcare professionals and others involved in the transfer of patient care, and patients and their carers;</td>
</tr>
<tr>
<td>• Better use the skills of pharmacists, recognising the contribution that they can make in optimising medicines use.</td>
</tr>
</tbody>
</table>

Patients’ accounts of DMR – both first hand and as reported by professionals - were very supportive, with people appreciative of the opportunity to discuss their medication with pharmacists, resulting in a greater sense of on-going engagement with an element of NHS provision (community pharmacy) about which they previously had varying levels of understanding.

Of the various professional groups involved in DMR, it is community pharmacists who report the greatest professional benefit from their participation. Although DMR procedures take longer than those for Medicines Utilisation Review, community pharmacists reported professional satisfaction in having achieved something of demonstrable patient benefit as a result of using their clinical expertise, helping to build mutual understanding and rapport, and laying the ground for more effective co-production of health in a variety of contexts. Professional satisfaction amongst hospital pharmacists was apparently lower than for their community colleagues, in part because of the lack of feed-back to hospital staff on the realised benefits of the DMR scheme for their patients. The response of GPs was more cautious, with relatively little knowledge of or perceived
benefit from DMR, perhaps also reflecting this lack of feed-back. GPs were on the whole very positive about the potential of the DMR scheme. The GP response was confined to a small number, albeit from people with wide experience of service provision across their local areas.

This evaluation has confirmed that timely and easy communication between hospital and community remains one of the biggest obstacles to the safe and efficient transfer of care, and the DMR service is itself affected by these more widespread problems. In part this stems from difficulties in identifying which patients are eligible for DMR. More commonly it is the fact that community pharmacists have not been told that the patients have been discharged. The lack of established and familiar routes of communication can militate against easy sharing of information. In this context it is perhaps significant, for example, that the DMR service often works more effectively for patients on monitored dosage systems (where fax has become a common mode of communication) than for those who are not, possibly because such patients are already accepted as requiring proactive care transfer arrangements. The DMR service appears to have improved some of these channels of communication, by establishing an ‘approved’ mechanism for such communication, but major barriers remain.

**Economic and financial impact**

To what extent has the DMR service contributed to:

- Savings to NHS Wales of medicines that have been stopped, and identified as not required, that would otherwise have been wasted;
- Reducing the number of potential patient safety events and the benefits of this to NHS Wales, including reduced hospital readmissions; and
- Reducing the volume of medicines that are wasted when unnecessary, or duplicated prescriptions dispensed

The estimated economic cost of the DMR initiative was just over £1 million based on 14,649 DMRs undertaken during the period of study and an estimated cost per DMR of £68.50. The number of DMRs was only a fraction of discharges over this period; total costs would be higher if more DMRs had been completed.

In exchange for this cost, resources valued at around £3 million were freed up as a result of the DMRs having avoided A&E attendances, hospital admissions and drug wastage. This represents an attractive return on investment in the order of 3:1.

Apart from the saving delivered from not wasting drugs, the majority of the hospital based saving are not cash realisable. However the resource consequence from the DMR intervention is the release in available capacity on the wards and in A&E depts. This capacity represented by 1853 A&E attendances and 11,859 bed days (1853 patients X 6.4 days) does offer the NHS some additional flexibility to help meet important access and waiting times targets.

The detailed review of DMRs identified average savings from avoidance of medicines wastage of £1.10 per DMR. This figure is modest when compared with other savings.
B. Why the DMR Service May Not be Operating Optimally

During the course of the evaluation, evidence emerged about ways in which the current service is not yet being optimised. This section draws that evidence together, including the views of the professionals and patients with direct experience of its current operation, and their perspectives on possible improvements.

Variable participation by community pharmacies

As previously mentioned, only 70% of community pharmacies have participated in the DMR service and of these the level of engagement varies considerably. For example the majority of large sized multiples are active in the scheme whereas supermarket pharmacies’ engagement is considerably less. This may reflect either the strategic direction from the pharmacies or the types of patients who use the different pharmacies.

Over the 27 months of service provision around 30% of community pharmacies have provided 1 or more DMRs per month: 5% of community pharmacies have completed over 100 DMRs since its inception but 36% have completed less than 10 over the 27 months. Only one pharmacy has reached the full quota per year and that was in 2012/13.

Interestingly 30% of community pharmacies have not completed a DMR and of these 30% have not completed a MUR either.

The reasons for this relatively modest and variable uptake are not clear. It may be the lack of opportunity to provide the service, associated with difficulties in identifying patients suitable for DMR, or that the contractors may not want to be involved. However, the fact that some community pharmacies have completed over 100 DMRs, suggests that some of these barriers can be overcome.

The difference in service provision for community pharmacies may also be influenced by the level of engagement from community pharmacists. This is also varied, probably reflecting an individual’s personal motivation and whether there is opportunity to be involved. DMRs are often reported as being relatively time-consuming (around one hour), and sometimes difficult to manage in a busy community pharmacy. There is also evidence that some pharmacists prefer to conduct DMRs (and other consultations) face-to-face, and are reluctant to engage in telephone consultations, even though the latter are frequently used for DMRs, and patients often prefer such an approach. Some pharmacists in this study expressed concern about assessing adherence via the phone.

Another factor which may influence participation by community pharmacies is whether their local hospitals refer patients to the scheme. Some hospitals send information directly to the community pharmacy whereas others rely on the patient as the conduit - the former is regarded as more reliable by most professionals. With the patient as the conduit, it is not known how many of these DMR referrals the community pharmacists actually receive.

Similar issues with provision have been highlighted for the MUR service (see Chapter One). There may also be scope for reducing the amount of information which currently needs to be transmitted from hospital to community pharmacy – for example, some community pharmacists stated that they really only wanted information on the medicines and not the clinical information.

Options for improved communication and co-ordination of effort in both hospital and community are discussed below, and should help with these issues.
Role of Health Boards

The evidence reviewed in Chapter Two would suggest that the Wales rate of 13.7 DMRs per 1000 inpatient discharge episodes (on a resident basis) represents only a fraction of the number of patients who might benefit from a DMR. The level of DMRs vary between Health Boards, ranging from 10.5 in Powys and 11.4 in Cardiff and the Vale, to 14.6 in BCUHB and 19.0 in Hywel Dda UHB. In part this may reflect different levels of engagement from community pharmacy, difficulties in engaging with English hospital providers (in the case of Powys) and the presence of local ‘champions’. It is unlikely to reflect different case mix.

In general, hospital pharmacists reported some confusion about different aspects of the operation of the scheme, including concern about how to obtain consent for certain patients e.g. patients with dementia, and how to prioritise DMR in relation to other aspects of service provision when time constraints are significant. Community pharmacists also reported that completing the DMR2 form was cumbersome and time-consuming, requiring some information whose purpose was unclear.

All of these were linked to the fact that some Health Boards had not effectively disseminated a clear operational procedure for DMR to their staff. In practice, individual pharmacists were often having to make professional judgements on which patients would benefit from DMR, and against a background of several other tasks competing for their time and attention. Some Health Boards would welcome more detailed guidance from Welsh Government on some of the more complex operational issues, including obtaining consent.

One issue apparent in several Health Boards was the importance of appealing to hospital pharmacists’ desire to be engaged in activities which are evidence based. In many cases, hospital pharmacists did not receive regular feedback on the impact of the DMR scheme on their patients.

Perceptions of GPs and patients

Awareness of the DMR scheme amongst GPs would appear to be low. This is perhaps explained in three main ways. First, it should be set in the context of the many communication and other difficulties which beset the effective transition of patients from hospital to primary care, and for which GPs have sought effective solutions for many years. In other words, there are several other issues also to address, including the fact that many patients are still being discharged from hospital with no automatic system to ensure that the GP is immediately informed. Second, it appears to be associated with a belief amongst some GPs that the level of risk in discharge medicines management is relatively low – meaning that DMR is not a high priority. Third, there is some scepticism amongst some GPs about the practicalities of engaging with community pharmacy to address this issue, given the lack of shared medical records and patient registration with community pharmacies.

However, evidence from the evaluation – first hand, and from community pharmacists – suggests that many GPs are not opposed in principle to the scheme, and that some more could be persuaded to engage enthusiastically with the DMR scheme if it were more effectively brought to their attention.

Similarly, most patients are also unaware of the DMR scheme. It would appear that patients generally depend upon a hospital-based professional bringing it to their attention (there is a low general level of awareness amongst - putative or actual - inpatients), and will place considerable weight on the recommendation of that professional. This can present practical challenges, given
that identifying suitable patients at a time when both the ward and the patient themselves is anxious to expedite discharge, may not be conducive to an appropriate consultation with the pharmacist. Patients who have experienced a medication review following discharge as part of this scheme valued the service extremely highly, explicitly as improving their safety and also providing them with an opportunity to raise concerns and queries with a healthcare professional.

C. Ways of Optimising the Service

The following suggestions emerge from the evidence reviewed, and would merit further consideration. They include suggestions both for increasing the penetration of the scheme (generating more DMRs), and for increasing its impact (maximising the gains derived from each DMR):

1. Advice or guidance should be provided to Health Boards on a policy and best practice, which would include
   - How to obtain consent in cases where this is not straightforward (see also next suggestion),
   - The priority to be given to DMR, and
   - Active consideration to extending the range of (non-pharmacy) hospital staff who might initiate a DMR referral.

2. Separate consideration should be given to the possibility of ‘prospective’ consent by patients to the sharing of appropriate information with community pharmacists, similar to that which applies already with GP out-of-hours services.

3. Electronic Access to improved quality discharge information was highlighted by community pharmacists, hospital pharmacists and General Practitioners as the key to the smooth and safe transition of the patient from the hospital into the community. The efficient processes and therefore the uptake of the DMR scheme would be greatly enhanced by this, providing that patient consent issues have been addressed.

4. Consideration should be given to patient registration with a community pharmacy/individual pharmacist, to increase the level of individual professional accountability, thereby enhancing the ‘pull’ factors in the system.

5. An attempt to streamline the DMR paperwork should be made so it is easier and faster to complete, including an assessment of the scope for reducing the volume of information required on each referral.

6. Hospitals should give consideration to nominating and providing further support to a lead professional (pharmacist or administrator) who will take responsibility for optimising the hospital arm of the service locally.

7. Information about the beneficial impact of the DMR scheme (particularly on patient safety) should be flagged with Health Boards and GPs and their practices to ensure that stakeholders are aware of the value of the service and their participation in it.

8. Information about any relaunched DMR scheme should be widely circulated though Health Boards, hospitals and to GPs. Particular attention should be given to effective communication with patients and carers, to increase their understanding of the scheme.
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