

Original Research

Examination of England's New Medicine Service (NMS) of complex health care interventions in community pharmacy

Asam Latif [PhD, MA](#)^{a,*}

Asam.Latif@nottingham.ac.uk

Justin Waring [PhD, MSc](#)^b

Deborah Watmough^c

Nick Barber [PhD, MRPharmS, FRSM](#)^d

Anthony Chuter^e

James Davies [PhD, M.Pharm](#)^f

Nde-Eshimuni Salema [PhD, M.Pharm](#)^g

Matthew J. Boyd [PhD, B.Pharm](#)^c

Rachel A. Elliott [PhD, B.Pharm, FRPharmS](#)^c

^aSchool of Health Sciences, Queen's Medical Centre, Nottingham NG7 2UH, UK

^bCentre for Health Innovation, Leadership & Learning, Nottingham University Business School, Jubilee Campus, University of Nottingham, NG8 2BB, UK

^cDivision for Social Research in Medicines and Health, The School of Pharmacy, University of Nottingham, University Park, Nottingham NG7 2RD, UK

^dThe Health Foundation, 90 Long Acre, London WC2E 9RA, UK

^e68 Brighton Cottages, Copyhold Lane, Lindfield, Haywards Heath RH16 1XT, UK

^fUCL School of Pharmacy, Department of Practice and Policy, Brunswick Square, London WC1N 1AX, UK

^gDivision of Primary Care, School of Medicine, University of Nottingham, University Park, Nottingham NG7 2RD, UK

*Corresponding author.

Declaration of competing interests: The authors have no competing interests to declare.

Abstract

Background

Community pharmacies are increasingly commissioned to deliver new, complex health interventions in response to the growing demands on family doctors and secondary health care services. Little is known about how these complex interventions are being accommodated and translated into the community pharmacy setting and whether their aims and objectives are realized in practice. The New Medicine Service (NMS) is a complex medicine management intervention that aims to support patients' adherence to newly prescribed medicines for a long-term condition.

Objective

This study explores the recent implementation of the NMS in community pharmacies across England. It also seeks to understand how the service is becoming manifest in practice and what lessons can be learned for future service implementation.

Methods

Structured, organizational ethnographic observations and *in situ* workplace interviews with pharmacists and support staff were undertaken within 23 English community pharmacies. Additionally, one-to-one, semi-structured interviews were carried out with 47 community pharmacists and 11 general practitioners (GPs). Observational and interview data were transcribed and analyzed thematically and guided by Damschroder's consolidated framework for implementation research.

Results

The NMS workload had been implemented and absorbed into pharmacists' daily routines alongside existing responsibilities with no extra resources and little evidence of reduction in other responsibilities. Pharmacists were pragmatic, simplifying, and adapting the NMS to facilitate its delivery and using discretion to circumvent perceived non-essential paperwork. Pharmacist understanding of the NMS was found to impact on what they believed should be achieved from the service. Despite pharmacists holding positive views about the value of the NMS, not all were convinced of its perceived benefits and necessity, with reports that many consultations did not identify any problems with the patients' medicines. GPs were generally supportive of the initiative but were unaware of the service or potential benefits. Poorly developed existing pharmacist-GP relationships impeded implementation.

Conclusions

This study identifies the multifaceted and complex processes involved in implementing a new community pharmacy service in England. Community pharmacy workflow, infrastructure, and public and professional relationships all affect NMS implementation. Greater prior engagement with the pharmacy workforce and GPs, robust piloting and a phased rollout together with ongoing support and updates, are potential strategies to ensure future implementation of pharmacy services meet their intended aims in practice.

Keywords: New Medicine Service (NMS); Complex intervention; Implementation research; Community pharmacy

Background

Globally, community pharmacists have become a focus for modernizing primary and community care services.¹ The role pharmacists play in optimizing the use of medicines and managing patients with multiple co-morbidities, have become national priorities for most health care systems.² Examples of commissioned services involving medication management include Home Medicines Review in Australia,³ Medicines Use Reviews (MURs) in the United Kingdom (UK)⁴ and New Zealand,⁵ Medication Monitoring and Optimization (MeMO) program in the Netherlands⁶ and Medication Therapy Management in the United States (US).⁷ There is growing evidence that such pharmacist-led interventions are effective at improving medicines usage and health outcomes.⁸⁻¹⁰

In the English National Health Service (NHS) policies have supported the opportunities for the pharmacy profession to move from a predominantly medicines supply focused role and the simple provision of information to patients, towards consultation-type services in partnership with patients to manage medicines for chronic conditions.⁴ This has included the delivery of more consultative education and screening services, such as MURs and, more recently the New Medicine Service (NMS). The NMS exemplifies an 'advanced' role for community pharmacists in the management of medicines use. The service was rolled out in England in 2011 to help patients manage newly prescribed medicines for a long-term condition, support medicine adherence and identify further information needs and support in relation to their new medicine or long-term condition (Appendix 1). There was also a wider intent on reducing demand on family doctors through identifying and managing side-effects, reducing hospital admissions and limiting medicine waste.¹¹ A detailed look at how new complex interventions are implemented can provide valuable insights into the barriers and facilitators to service provision and also whether the service is fulfilling its intended aims. The recent work to evaluate the NMS offered an opportunity to explore the implementation process with a view to improving the service and learn lessons for future similar interventions.¹⁰ The main purpose of this article is to investigate the NMS implementation process, how the NMS is being translated into the community pharmacy practice setting, and in turn, if and how the NMS service and pharmacy practice are transformed in practice.

Complex interventions and the NMS

A complex intervention has been defined as a '*deliberately initiated attempt to introduce new, or modify existing, patterns of collective action in health care.*'¹² The complexity of the 'intervention' is understood as arising out of the multiplicity of possible outcomes, or their variability within a target population, rather than specifically with the number of interacting components within the intervention itself.¹³ The NMS is an example of a complex intervention; the service is available to patients presenting with different disease states (e.g. asthma, diabetes, and hypertension), involves a number of patient-pharmacist interactions, a requirement for those delivering and receiving the intervention to exhibit complex behaviors, and there is flexibility for pharmacists to tailor the intervention to individual patients.

Service description

The NMS was originally based on research on doctor-patient communication about medicines.¹⁴ This and subsequent work established that problems with newly prescribed medicines appeared rapidly, were widespread and that a significant proportion

of patients on a long-term medication quickly become non-adherent. In response to these findings, a pharmacist-led intervention was designed and involved a telephone call from a pharmacist two weeks after the patient was issued a prescription for a new medicine. The service was shown to improve medicine adherence and was developed into the NMS.¹⁵

The NMS intervention itself involves patients initially being invited to the service (engagement) following presentation of a prescription for a new medicine for a long-term condition at a community pharmacy. Patients can be referred to the service by their prescriber (GP or nurse), can self-refer, or the pharmacist can invite the patient to use the service. Following the engagement phase, there are two patient-pharmacist consultations named as “intervention” and “follow-up” by the commissioners. The consultation takes the form of two semi-structured conversations (either face-to-face or via telephone) at 7–14 days (the intervention) and then the “follow-up” consultation after a further 14–21 days (Fig. 1). This means the whole episode should be complete within a maximum of 5 weeks. These are the points in the service where the pharmacist would ask about adherence. The primary aim of the consultation is the patient-centered identification of any problems with the treatment (including any adverse drug reactions) and any support or action needed. Action may include referring the patient back their prescriber to review their medication. Community pharmacies in England are provided with guidance questions to help shape their discussions with patients (Appendix 2).

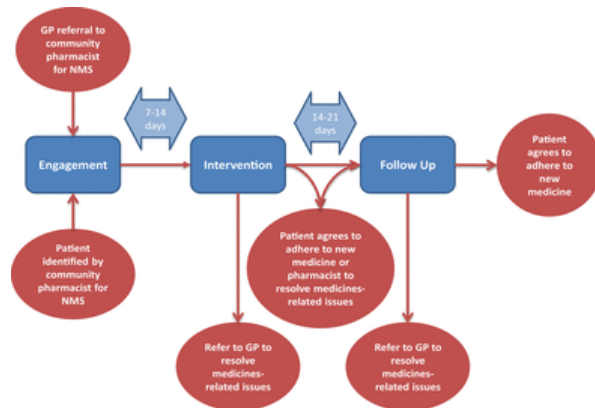


Fig. 1 The NMS.

Overview of the New Medicine Service (NMS) evaluation study

Following commissioning of the NMS in 2011, an evaluation funded by the Department of Health, was undertaken. The findings presented in this paper form part of a wider body of this work.¹⁰ This evaluation included a pragmatic randomized controlled trial (RCT) and economic evaluation to estimate the effectiveness and cost-effectiveness of the intervention to improve a patient's adherence to their newly prescribed medicine. The qualitative work program aimed to provide a detailed understanding of 'how' the NMS was implemented, organized and delivered in day-to-day practice. Patient and public involvement was integral to all aspects of the study. Antony Chuter (AC), Ember Vincent and Clancy Williams were patient and public representatives. AC was also a co-investigator. By attending meetings in person, these representatives were able to challenge and inform study design and findings, bringing their lay experience and expertise to the work.

The study was given a favorable opinion on 2nd May 2012 by the National Research Ethics Service (NRES) West Midlands – Black Country Research Ethics Committee (12/WM/0096). The study was registered with the [ClinicalTrials.gov](http://clinicaltrials.gov) trials database on 19th June 2012. Trial reference number NCT01635361 (<http://clinicaltrials.gov/ct2/show/NCT01635361>).

Method

Theoretical framework

The qualitative analysis was guided by Damschroder et al's consolidated framework for implementation research.¹⁶ This is used to guide formative evaluations of complex interventions and provides a pragmatic structure that unifies key constructs from published implementation theories.^{12,17} Broadly, the framework consists of five domains, the first of which relates to the characteristics of the intervention itself. Before any appraisal, it is suggested that consideration needs to be given to the context to which the intervention is to be delivered; in our case how the NMS is implemented and being translated in community pharmacy practice. This includes paying attention to the role of key actors or groups involved in disseminating and translating the intervention in practice. Although 'core' aspects of a given intervention are less amenable to change, there may well be scope for 'peripheral' components to be altered allowing it to be modified to the setting without undermining the integrity of the intervention. The next two domains consider the 'outer' and 'inner' context. The outer context refers to the wider institutional, political and social environment within which the intervention is implemented. The focus here is on how the NMS is being received by others and its impact within the constraints of existing professional boundaries. The inner context represents many of the organizational structures, cultures, inputs and resources, and processes and practices that characterize everyday practice and influence implementation. This paper will explore the inner context through an understanding of the day-to-day practice of community pharmacy. The fourth domain considers the sense-making, mind sets, cultures, and networks of individuals and groups within the given setting; in this respect the

pharmacist's knowledge, understanding and views of the NMS. Individuals have agency and the choices they make influence either predictably or unpredictably how an intervention may be implemented in practice. This is especially relevant in health care settings given the influence of professional cultures and boundaries on practices.¹⁸ The final domain cuts across all the above domains to consider the whole implementation processes. It is suggested that successful implementation of a complex intervention usually requires an active change process aimed at achieving individual and organizational level use of the intervention as designed.

Sampling of community pharmacies

Pharmacies were sampled from a wider pool of pharmacies recruited for the RCT, full details of which are in the NMS evaluation report.¹⁰ Of 61 pharmacies recruited across the East-Midland, South Yorkshire and London areas, qualitative research was undertaken in 23 community pharmacies between August 2012 and November 2013. These community pharmacies were purposively sampled taking into account and to reflect recognized outer and inner contextual factors that may affect service implementation, including pharmacy ownership type (independent, small and large multiples, supermarkets), geographical area and social deprivation (see [Table 1](#)).

Table 1 Demographics of pharmacies profiled (*n* = 23)

Pharmacy characteristic	Number
Pharmacy type	
Independent	7
Supermarket	1
Small multiple	7
Large multiple	8
Location	
Nottinghamshire	6
Derbyshire	1
South Yorkshire	5
Leicestershire	1
London	10
Setting	
Urban	14
Suburban	9
Co-location with surgery	
Co-located	8
Not co-located	15
Mean (range) Economic Deprivation Index for sample of pharmacies profiled ^a	25.18 (4.41–60.03)

^a Economic Deprivation Index (Score) – Score is proportional to level of deprivation. A higher score indicates an area of higher deprivation (English deprivation scores range from 0.5 to 87.8).

Observations

Community pharmacy implementation of the NMS was informed by an organizational ethnographic approach to understand the contextual factors affecting implementation. Through first-hand observations and direct engagement, organizational ethnography offered an in-depth or 'thick' description of the social world, through which analysis of the socio-cultural and organizing context was possible.^{19,20} Observational data collection comprised of two distinct phases. First, an initial phase of observations were undertaken in each community pharmacy to profile and detail how both 'outer' system and 'inner' organizational context influenced the translation and implementation of the NMS in different pharmacy settings. This 'profiling' involved observations and

situated informal workplace interviews with pharmacists and support staff to determine the organizational structures, resource profiles, routine work processes and broad workplace culture. Profiling activities were carried out by four study researchers. The main profiling observations in each pharmacy were undertaken over one day with several follow-up visits being made throughout the course of the study. A comprehensive range of observational data was recorded on a standardized template including details of the pharmacy demographics, the range and type of services offered by the pharmacy, workforce and workflow configuration, and a complete description of the implementation, organization and management of the NMS (process, division of labor, work prioritization, relationship with wider health care community). A standardized profiling template was used to guide observations and developed from tools used in similar studies²¹ and from review of the community pharmacy literature (Box 1). This strategy enabled a broad basis for comparison between study sites from which further in-depth analysis of the organization and delivery of the NMS was analyzed.

Box 1 Ethnographic-oriented observations that were made during profiling of pharmacies

- Space:
 - Description of pharmacy location (i.e. urban/suburban/rural)
 - Depiction of shop environment (i.e. size, types of retail items sold, location of health care counter, dispensary, consultation room)

- Actors/pharmacy activities:
 - Reported number of pharmacists/dispensing staff/counter assistants typically on duty
 - Average number of prescription items dispensed per month
 - Range of pharmacy services offered
 - Details of pharmacist and staff activities both reported and observed (i.e. professional prescription checks, management duties, assembly of nursing homes medicines etc.)

- NMS observations:
 - Description of system/procedure in place to implement NMS
 - Methods of patient recruitment and details of patient engagement
 - Estimated % of face-to-face/telephone interventions

- Organization & management relating to the NMS:
 - Workforce configuration & division of labor
 - Work prioritization
 - Strategic organizational priorities for NMS
 - Management roles and processes
 - Relationship with wider health care community

- Exploration of diffusion of innovations:
 - Agenda-setting (i.e. Decision making and adoption of NMS)
 - Matching (i.e. What problem or need in the organization was matched with the innovation?)
 - Redesigning/restructuring (i.e. What diffusion/dissemination strategies were used?)

- Clarifying (i.e. implementation as per protocol/policy?)
- Routinizing (i.e. Extent NMS is a routine part of workload)
- Exploration of the barriers and facilitators to the service

The second phase involved more detailed observation of how the NMS was organized and delivered as a routine service intervention. This included observation of how pharmacists provided information about the service, scheduled and undertook NMS consultations and managed patient information during and following the NMS consultation. Following written informed consent from patients and pharmacists, these observations focused on describing the situated activities and practices of the NMS in the different pharmacies in order to identify and understand how the implementation processes led to variations in service delivery. Both phases of observations provided the foundations for subsequent formal pharmacist and GP interviews.

Pharmacist and GP interviews

All study pharmacists were invited to take part in a semi-structured interview toward the end of (or after their involvement in) the RCT to explore their experience and thoughts on implementation of the NMS. Following written informed consent, two types of interviews were undertaken. Using the sampling frame, 'full-length' pharmacist interviews were conducted to ensure views were captured from a range of pharmacies. A shorter 'exit' interview was offered to all other study pharmacists involved in the RCT. In total, twenty seven 'full-length' interviews (15 female and 12 male: interview length 35–40 min) were conducted. Twenty shorter 'exit' interviews were also carried out (12 male and 8 female: interview length approximately 10 min). Topic guides for both interviews were tailored to clarify, confirm and extend the observational profile data ([Boxes 2 and 3](#)).

Box 2 Pharmacist interview topic guide (full interview)

- Locating NMS in pharmacist's work life:
 - Background (i.e. can you tell me a little about your background? Years practising and length of time working in this pharmacy? Employed or self-employed, full-time or part-time, what other jobs do you have, etc.)
 - Expectations (i.e. what do you set out to achieve during the NMS consultation(s) and overall, how well do think you achieve these aims? Do you welcome the NMS service?)
 - Training (i.e. How sufficient was the training for you to effectively deliver the service? How helpful has the NMS patient interview guide been? (*Prompt – are you still using the guide?*))
 - Purpose – How significant do you view the problem of patient non-adherence to medicines to your practice? How well do you think the NMS support adherence over and above what is currently offered?
- Pharmacist's experience during the NMS
 - Activities (i.e. what is the kind of information do you provide patients when handing out their medicines? Is this different to when they are prescribed a new medicine?)
 - Feelings (i.e. can you describe how you feel when you are having an NMS consultation with the patient? (*Prompt – comfortable, nervous?*))
 - Engagement (i.e. in what ways has the NMS changed the relationship between you and your patients?)
 - Advice-giving and support (i.e. to what extent has the introduction of the NMS facilitated advice giving and support?)
 - Necessity (i.e. do you think the NMS is necessary for patients?)
- NMS implementation and perceived benefits or drawbacks
 - Personal benefit (i.e. in what ways is the NMS personally useful to you? (*Prompt – do you benefit at all? View about enhancing professionalism*))
 - Feasibility, barriers and facilitators (i.e. how has the NMS changed your practice and routines? (*Prompt – additional workload, expanded roles and responsibilities*) What do see as the main barriers and main facilitators to the service?)
 - Professional/business activity (i.e. explore to what extent the NMS is viewed as a business/professional activity. To what extent has the NMS been affected by corporate priorities/target setting?)
 - Generalizability and replicability (i.e. what are the specific type of pharmacy setting that are most suited to offering the NMS? Explore views about conditions/therapies that are included in initial rollout of the NMS)

- Pharmacovigilance (i.e. explore awareness of patients reported side-effects/adverse effects. Can you tell me about any examples where you have acted on an adverse event as a result of an NMS? (Prompt – Have you ever filled in a Yellow-reports as a result?))

- Relationships with other stakeholders

- Inter-professional relationships (i.e. how would you describe your existing relationship with your local GP practice? Has the NMS in any way affected existing relationships with the GPs?)

Any final comments? Thank the pharmacist for their time.

Box 3 Pharmacist interview topic guide (exit interview)

- Pharmacist's experience during the NMS

- Expectation and purpose (i.e. From your perspective what is the purpose of the NMS?)
- Have you make any local changes to the way you deliver the NMS?
- Supporting adherence (i.e. how well do you think the NMS support adherence over and above what is currently offered through counseling or an MUR?)
- Interview schedule (i.e. to what extent do you use the NMS interview schedule?)
- What do see as the main barrier and main facilitator to the service? What would you change about the service?

- Patient sample recruited to the study

- Experience of recruiting patients to the study (i.e. what was easy and what was hard? To what extent did the training day prepare you to recruit patients? Did you appreciate being taken out of the pharmacy or could this be done in the pharmacy?)
- Sample of patients recruited (i.e. In your opinion, are there any differences in patient characteristics who accepted/declined to take part in the study i.e. those who 1. declined the service & decline to take part in study, 2. accept NMS but decline to take part in study, 3. accept service & accept taking part in study)
- Up skilling: explore whether the pharmacist feels that they have been 'up skilled' in any way as a result of taking part in the training – i.e. are they performing NMS the same now as they were before they started the study.

Any final comments? Thank the pharmacist for their time.

GPs whose patients were involved in the NMS evaluation study were invited to a face-to-face or telephone interview. GP interviews sought to explore advice and information provided to patients starting a new medicine for a long-term condition, their knowledge and utilization of the NMS. An interview topic guide was developed, details of which can be found in [Box 4](#). GPs were offered an inconvenience allowance of £40 for taking part in the study and all provided written consent prior to the interview. Due to the low numbers recruited ($n = 5$), a further six GPs were recruited through the Primary Care Research Network (an NHS body designed to support primary care research in the UK). The final sample comprised of seven male and four female GPs. The interviews lasted 35–40 min, with nine conducted over the telephone, two face-to-face, one at the GP practice and one at a local research office.

Box 4 GP interview guide

- Locating the GP's work life

- Background (i.e. can you tell me a little about your background? How long have you practised as a GP and have worked in this practice?)

- GP's opinions about patient adherence to new medicines

- About new medicines (i.e. what kind of information do you provide to patients who are prescribed a new medicine? (Prompt – is this verbal/written?))

- About adherence (i.e. in your practice, how prevalent is patient non-adherence to new medicines? Why do you think this occurs? In your experience what types of patients are seen to adhere less with their medicines?)

- GP views on the pharmacist's role
 - Inter-professional relationships (i.e. do you have many interactions with the pharmacists in your daily work? What are the interactions about? How would you describe your existing relationship with the pharmacy? Has the service in any way affected existing relationships with the pharmacist?)
 - About pharmacist's role (i.e. what do believe the role of the pharmacist should be once a new medicine has been prescribed by you?)

- GP's opinions about the NMS
 - Awareness (i.e. Prior to taking part in the study, had you heard about the NMS? If so, where from?)
 - Perceived purpose (i.e. what do believe is the purpose of the NMS is? How do you think the NMS could be improved for your patients and for you? Under what circumstances would you recommend that the patient take part in the NMS? Do you welcome the NMS service?)

- Feedback from others
 - Feedback (i.e. have you had any feedback from patients/referrals from pharmacists? If so what was the outcome?)

- Feasibility
 - NMS and the surgery (i.e. to what extent/in what ways has the NMS affected your practice? What do you like most about the service/what do you like the least? Should pharmacists be involved with the service? (Prompt: is this a repetitions of what is already being done? Are nurses better placed to do it?))
 - Replicability (i.e. to what extent do you agree with the DH strategy to identify these patients for NMS (asthma/COPD; HTN, diabetes and anti-coag/platelets? Do you think NMS should be extended to other disease indications?))

Any final comments? Thank GP for their time.

Data analysis

Qualitative data analysis coincided with the initial stages of data collection and proceeded iteratively so that emergent findings were incorporated into subsequent qualitative data collection, including the revision of data collection methods, such as interview topic guides. All pharmacy profile observations were recorded in handwritten field notes and subsequently typed up. All audio-recorded interviews were transcribed verbatim. The data were then imported into qualitative analysis package NVivo 9 (2010. QSR International (UK) Limited, Warrington, Cheshire, WA2 7LT, United Kingdom) for the purpose of coding and thematic analysis. This involved initial reading and re-reading of the transcribed data by multiple members of the research team to identify common codes and categories. Codes were compared for their internal consistency and boundaries. A coding framework emerged iteratively and data systematically coded according to this framework. These emergent codes were then classified and analyzed using the Damschroder's 'consolidated framework for implementation research' (Table 2). During this process, identification of disconfirming data was undertaken as well as regular detailed discussions amongst the wider research team. To enhance the consistency of analysis, all the coded data and analysis were reviewed by a separate researcher (JW) who oversaw the process. To enhance the credibility of the findings, final themes were presented to the research team for group discussion and coherence checking. The principle of constant comparison was used to test and refine the empirical conceptual consistency of codes and themes which were synthesized and narrated.²²

Table 2 Classification of thematic codes based on Damschroder's (2009) Consolidated Framework for Implementation Research (CFIR)

CFIR construct	Short description of CFIR construct	Description of code within dataset (O) = Derived from pharmacy observation dataset (P) = Derived from pharmacist interview dataset (G) = Derived from GP interview dataset
I. Intervention characteristics		

A. Intervention source	Perception of key stakeholders about whether the intervention is externally or internally developed.	Patients declining the service or service not acceptable to patients (O) Barrier to NMS – service perceived as not necessary (O) Views of significance of non-adherence/need for service? (P) Repetition of existing services (G)
B. Evidence strength & quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.	Pharmacy staff reported clientele of pharmacy (O) Pharmacist NMS training (O) Barrier to NMS – problems with identification of eligible patients (O) Barrier to NMS – NMS appointments & scheduling telephone calls (O) Barrier to NMS – Patients declining the service or service not acceptable to patients (O) Barrier to NMS – service perceived as not necessary (O) Barrier to NMS – clientele of the pharmacy not receptive (P) Significance of non-adherence/questioning the need for service (P) Inclusivity – views on NMS disease categories (P) Exclusion of seldom heard voice communities (P) View on patient medicine adherence – prevalence and reasons for non-adherence (G) Types of patients who are less adherent (G) View on disease state included in the NMS (G) Repetition of existing services (G)
C. Relative advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.	Barrier to NMS – patients declining the service or service not acceptable to patients (O) Barrier to NMS – service perceived as not necessary (O) Barrier to NMS – logistics of delivering service (P) Views of significance of non-adherence/need for service? (P) Duplication of GP work (P) Success stories as result of NMS (P) NMS makes it easier to give advice (P) Increased awareness of patients reporting side effects or adverse effects (P) GP time pressure (G)
D. Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.	What the pharmacy environment communicate to patients (O) NMS high/Low fidelity (O) NMS consultations and interview schedule (O) NMS facilitators – adaptation of NMS to suit pharmacist circumstances (O) NMS facilitators – service design (O) NMS facilitators – delivery by phone calls (O) Guidance questions and their use (P) NMS can be done at quite working periods (P)
E. Trialability	The ability to test the intervention on a small scale in the organization and to be able to reverse course (undo implementation) if warranted.	Services recently introduced/history of innovation (O) Pharmacist NMS training (O)
F. Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.	NMS routinization (O) Technology to identify patients (O) Patient identification & recruitment (O) Barrier to NMS – problems contacting patients (O) Barrier to NMS – PharmaBase usage (O) Barrier to NMS – lack access to medical records (O) Barrier to NMS – patient language barriers (O) Barrier to NMS – logistics of delivering service (P) NMS facilitators – simple to perform and record (O)
G. Design	Quality and packaging perceived excellence in how the intervention is bundled,	Pharmacist NMS training (O)

	presented, and assembled.	Barrier to NMS PharmaBase usage & not user friendly (O) Barrier to NMS – paperwork and audits (O) Barrier to NMS – PharmaBase problems (P) NMS facilitators – adaptation of NMS to suit pharmacist circumstances (O) NMS facilitators – service design (O) Need to incentivize GPs (P) Type of pharmacy settings that are suitable for delivering the NMS (P)
H. Cost	Costs of the intervention and costs associated with implementing that intervention including investment, supply, and opportunity costs.	Barrier to NMS – resource limitations to provide service (O) Barrier to NMS – service perceived as not necessary (O) Business/NMS targets (P)
II. Outer setting		
A. Patient needs & resources	The extent to which patient needs, as well as barriers and facilitators to meet those needs are accurately known and prioritized by the organization.	Pharmacy staff reported clientele of pharmacy (O) Views on the match between NMS aims and problems of medicine taking (O) Technology to identify patients (O) Engaging patients with NMS (O) Problems with identification of eligible patients (O) NMS consultations and interview schedule (O) Patients declining the service or service not acceptable to patients (O) Barrier to NMS – problems contacting patients (O) Barrier to NMS – lack of access to seldom heard community groups (O) Barrier to NMS – patient awareness (P) Barrier to NMS – patient perceive service as monitoring them so become reluctant (P) NMS facilitators – communicate to patients as a non-NHS ‘service’ (O) NMS encourages patient communication in busy pharmacy (P)
B. Cosmopolitanism	The degree to which an organization is networked with other external organizations.	Health care advice and services available (O) Technology to ID patients (O) Effect of NMS on GP’s practice (G)
C. Peer pressure	Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or in a bid for a competitive edge.	Barrier to NMS – consistency of pharmacies offering NMS (O) Barrier to NMS – Lack of motivation and influence of targets (P) NMS facilitators – two pharmacists on duty (O)
D. External policy & incentives	A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.	Business/NMS targets (P) Professionalizing for pharmacy (P) Barrier to NMS – lack of public awareness (O)
III. Inner setting		
A. Structural characteristics	The social architecture, age, maturity, and size of an organization.	Pharmacy image and cleanliness (O) Organization of non-NMS workflow (O) Operationalising the NMS (O) NMS routinization (O) Pharmacy infrastructure issues/problems (O)
B. Networks & communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.	GP lacks awareness/non supportive (O) Referrals to GP (O) Reaction of GPs/other health care professionals (P) Need to incentivize GPs (P) Awareness of NMS (G) Effect of NMS on GP’s practice (G)

C. Culture	Norms, values, and basic assumptions of a given organization.	Pharmacy staff reported clientele of pharmacy (O) What the pharmacy environment communicate to patients (O) Barrier to NMS – staffing and pharmacist lack of time to deliver NMS (P) NMS facilitators – personal motivation of pharmacist (O) NMS facilitators – willing, competent staff and good implementation plan (O) GP view of pharmacist wider involvement in medicines management (G) Inter-professional collaboration (G)
D. Implementation climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.	What the pharmacy environment communicate to patients (O) Operationalising the NMS (O) GP lacks awareness/non supportive (O) Barrier to NMS – lack inter-professional collaboration (O) Barrier to NMS – staffing, workload and convenience limitations (O) Barrier to NMS – patient awareness (P) Barrier to NMS – staffing and pharmacist lack of time to deliver NMS (P) NMS facilitators – personal motivation of pharmacist (O) NMS facilitators – pharmacist perceives NMS outcomes positively (O) NMS facilitators – two pharmacists on duty (O) Public view of pharmacist as medicine suppliers (P) NMS activities delegated to pre-registration pharmacist (P) Need to incentivize GPs (P) Inter-professional rivalry i.e. flu vaccination (P) Pharmacist is new/underdeveloped GP relationship (P) GP attitude needs to change (pharmacist undervalued) (P) GP not aware of what pharmacist does or what NMS is (P) Problems with professional boundaries (P) Remoteness of the pharmacy from GP practice (P) Effect of NMS on GP's practice (G) GP view of pharmacist wider involvement in medicines management (G) Inter-professional collaboration (G) Existing contact with pharmacist (G)
1. Tension for change	The degree to which stakeholders perceive the current situation as intolerable or needing change.	Engaging patients with NMS (O) Barrier to NMS – increase workload and time (P) NMS facilitators – pharmacist perceives NMS outcomes positively (O) GP time pressure (G)
2. Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.	Pharmacy staff reported clientele of pharmacy (O) Operationalising the NMS (O)
3. Relative priority	Individuals' shared perception of the importance of the implementation within the organization.	Barrier to NMS – poor implementation (O) GP time pressure (G)
4. Organizational incentives & rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary and less tangible incentives such as increased stature or respect.	Retail focus of the pharmacy (O) Business priorities and NMS (O) NMS improves job satisfaction (P)
5. Goals and feedback	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.	Retail focus of the pharmacy (O) Barrier to NMS – patient awareness (P) Patient relationships (P)
6. Learning climate	The degree to which goals are clearly communicated, acted upon, and fed back to staff and alignment of that feedback with goals.	NMS consultations and interview schedule (O) Up-skilling as a result of NMS (P)

E. Readiness for implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.	Pharmacy image and cleanliness (O) Views on the match between NMS aims and problems of medicine taking (O)/Not matched (O)
1. Leadership engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.	Business priorities and NMS (O) NMS facilitators – provision of infrastructure to deliver NMS (O) Professionalizing for pharmacy (P)
2. Available resources	The level of resources dedicated for implementation and ongoing operations including money, training, education, physical space, and time.	NMS facilitators – provision of infrastructure to deliver NMS (O) NMS facilitators – two pharmacists on duty (O)
3. Access to knowledge and information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.	Adequacy of NMS training to deliver NMS (P) Up-skilling as a result of NMS (P)
IV. Characteristics of individuals		
A. Knowledge & beliefs about the intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.	Views on the match between NMS aims and problems of medicine taking (O)/Not matched (O) NMS consultations and interview schedule (O)
B. Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.	Views on the match between NMS aims and problems of medicine taking (O)/Not matched (O) NMS as a means to improved patient care (O)
C. Individual stage of change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.	Patients declining the service or service not acceptable to patients (O)
D. Individual identification with organization	A broad construct related to how individuals perceive the organization and their relationship and degree of commitment with that organization.	NMS facilitators – local pharmaceutical committee training (O) Barrier to NMS – Lack of motivation and influence of targets (P)
E. Other personal attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.	NMS high/Low fidelity (O) NMS facilitators – make NMS a habit (O)
V. Process		
A. Planning	The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance and the quality of those schemes or methods.	Organization of non-NMS workflow (O) NMS planning (O) NMS communication to staff (O) Pharmacist NMS training (O) No evidence of restructuring to accommodate NMS (O) NMS facilitators – provision of infrastructure to deliver NMS (O) NMS facilitators – make NMS a habit (O) Lack of prior notice about NMS (P)
B. Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities.	Services recently introduced/history of innovation (O) Pharmacist NMS training (O) Maintenance of workflow during the NMS (O) Lack of prior notice about NMS (P)
1. Opinion leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention.	NMS facilitators – local pharmaceutical committee training (O)
2. Formally appointed internal implementation leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.	NMS planning (O)
3. Champions	Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation], overcoming indifference or resistance that the	Services recently introduced/history of innovation (O) NMS communication to staff (O) NMS facilitators – provision of infrastructure to deliver NMS (O)

	intervention may provoke in an organization.	Evidence or restructuring to accommodate NMS (U)
4. External change agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.	Services recently introduced/history of innovation (O) Pharmacy as innovator (O)
C. Executing	Carrying out or accomplishing the implementation according to plan.	NMS communication to staff (O) NMS appointments & scheduling telephone calls (O) NMS consultations and interview schedule (O)
D. Reflecting & evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.	Views on the match between NMS aims and problems of medicine taking (O)/Not matched (O) NMS as a means to improved patient care (O) Professionalizing for pharmacy (P)

Results

The themes presented here have been structured according to the five domains set out in the Damschroder model. Four of these domains are presented in these results (intervention characteristics, ‘outer’ and ‘inner’ context and the fourth domain of sense-making, mind sets, cultures, and networks of individuals and groups within the given setting). The fifth and final domain of the Damschroder model forms the basis of the discussion, bringing together the previous four domains to consider the whole implementation processes.

Domain 1: intervention characteristics and organizational setting

Three themes emerged from the data that highlighted the importance of how the dynamics of the intervention itself impacted on patients and the way the NMS was delivered by those offering the service.

These were:

1. Public awareness of the NMS and problems with patient engagement with the service
2. Pharmacists' delivery of the NMS and use of the guidance questions
3. Circumventing 'paperwork' to deliver the service and a perceived overcomplicated payment claims processes

The first theme relates to public awareness of the NMS, service aims and potential value to patients. In their interviews, pharmacists were critical of the lack of advertising to the public. Little had been seen in the general press regarding its promotion. In light of their existing identity of supplying medicines, engaging with patients about the NMS was challenging.

I think the main thing is just advertising the service ... we have leaflets and things like that but somehow the service still doesn't appeal ... there will be a percentage of people who will see pharmacists as just dispensers.

[Pharmacist 04-1, Full interview, Male, 55 years, Independent]

One main barrier would be you have to sometimes educate the patient on what it is you're actually going to be doing with them ... they sometimes think this a new trial drug? Is it actually safe? Has it been used before?

[Pharmacist 66, Exit interview, Male, 25 years, Small multiple]

Leaflets to promote the NMS were available from pharmacies. However, whereas some services, such as flu vaccinations and smoking cessation, were clearly promoted using posters, the NMS was given little promotion. According to pharmacists, poor public awareness meant that pharmacists needed to work hard at convincing patients to sign up to the service. When offering the service to patients, they tended to provide reassurance that the service was not going to be onerous for them. As a consequence, pharmacists often adapted their discourse to overcome this barrier. Around the two-thirds of pharmacists used an informal or colloquial approach, actively avoiding words like “NMS” or “service” and replacing them with phrases such as “it’s just a few calls to see how you are doing.”

Sometimes if you go through everything, it scares people away from it [NMS], and they say 'Oh I'm not signing up for it', when all you are doing is calling them up and asking for a quick chat, which is very informal, rather than trying to over formalise it.

[Pharmacist 63, Full interview, Male, 25 years, Small multiple]

The second theme centers on pharmacist's delivery of the NMS and the use of the pharmacist's guidance questions. There were important elements of the service that were re-configured by pharmacists because of existing high workload. The NMS was designed to be delivered primarily through face-to-face consultations. The reason for this was that it was thought that communication would be better, and that for inhalers, for example, it would be possible to observe inhaler technique (a common cause of ineffective treatment). However, the majority of NMS consultations were undertaken by telephone. There were several reasons for this. Pharmacists were averse to adopting an appointment based approach as patients were reportedly poor at attending.

Telephone consultations were seen by pharmacists as more convenient way to contact patients. Furthermore, pharmacists found it easier to coordinate telephone calls during quieter times of dispensing and supervision of over the counter sales. However, telephoning patients came with its own problems. Contacting patients was problematic and, if patients were called unexpectedly, participation in the discussion was perceived by pharmacists to be less useful.

I quite enjoy it; it doesn't take too much time. The most annoying thing is when you can't get hold of people and you call them like six times, they are just never in or answer the phone.

[Pharmacist 63, Full interview, Male, 25 years, Small multiple]

Also if it's an inconvenient time when you've called then you can tell by the answers. You know, "are there any problems?" "No". "Anything I can help you with?" "No". "It's very important you have a healthy lifestyle". "Yes I am". "Okay bye". And it's over in like a minute.

[Pharmacist 65, Exit interview, Male, 44 years, Small multiple]

Pharmacist use of the recommended guidance questions during NMS consultations was observed to be variable. As outlined above, national guidance provides pharmacists with an interview schedule to facilitate their consultation with patients ([Appendix 2](#)). Most pharmacists welcomed this guidance when they were learning about the service. These questions provided a useful framework for shaping their discussions with patients. However, as they became accustomed to delivering the service, most adapted and simplified the questions. This was because the guidance questions were not worded in a way that allowed a naturally flowing conversation. Also, at times some questions appeared irrelevant to pharmacists because conversations with patients brought up unexpected issues that could not be simply managed by following a scripted interview guide.

I was trying really hard to ask the questions almost the way they were worded and it wasn't making for a natural flowing conversation. I do use that format but I've tweaked it a little bit to make it more me.

[Pharmacist 01, Full interview, Female, 38 years, Small multiple]

If I read it rightly, the second [set of] questions are very much, last time we spoke we notified this problem but for some people the first event have no problems but then they could have problems the second time so, you have to, you can't say, since we last spoke, there were no problems, you know ...

[Pharmacist 06, Exit interview, Male, 40 years, Large multiple]

Further important variations in how pharmacists used the guidance questions were uncovered. It was found that pharmacists asked questions based on perceptions of their own objectives about what should be achieved during the NMS consultation. For some the NMS was a way to support patients and to resolve medication problems which would have otherwise gone to the GP.

I think it helps patients to understand the new medicine better and to try and sort out any problems that they are having without having to go back to the GP; so it hopefully frees up some GP appointments. Improves the profile of pharmacy, and gives that extra support to patients.

[Pharmacist 64, Full interview, Female, 37 years, Small multiple]

For others, the NMS was simply a monitoring or a 'checking' opportunity and to teach patients by providing further information.

It is just asking them if they know why that medicine has been prescribed; if they say 'no'; start telling them some more information.

[Pharmacist 02, Full interview, Female, 27 years, Large multiple]

These differences in understanding were important because it framed how pharmacists implemented the service. This potentially led to changes in the nature of the intervention itself from the recommended model of 'patient-generated problem solving' to simple advice giving.

The final theme considered in this domain is the way 'paperwork' associated with recording outcomes for the service was circumvented. At its launch, a national monitoring system was set up, called 'PharmaBase,' to record outcomes from NMS consultations (now known as 'PharmOutcomes'). However, this was described as being slow, difficult to navigate and not user friendly. Not being a compulsory part of delivering the service, several pharmacies simply chose to ignore the system in favor of paper records and did not use this technology to enter the NMS consultation data.

It wasn't user-friendly [PharmaBase], it was not linked to the PMR [Patient Medication Record] you literally came out of your system and then go onto the PharmaBase. It's not already populated for you ...

[Pharmacist 03 (1), Full interview, Female, 49 years, Independent]

In contrast, pharmacists from large multiples reported that they entered data routinely. However, this appeared to be as a result of following company procedure rather than adherence to the service specifications. Pharmacists also reported that payment claims for delivering the service were overly complicated. At launch, there was an expectation was that 0.5% of all prescription items dispensed by a pharmacy would be eligible for the NMS. The payment was graded and triggered by reaching 20%, 40%, 60% and 80% of targets within tiers of dispensing volume.

The banding of payment is just overcomplicated ... I don't want to be thinking about that. I just want to do the best for my patients and be paid fairly. I don't want to be thinking if I keep these 2 back this month so that they're on next month's, then I'll get my £26 ... I don't want to have to continually work the maths.

[Pharmacist 12, Full interview, Male, 43 years, Small multiple]

This payment structure was simplified a few months following the launch of the service to allow pharmacies to be remunerated for each completed NMS.

Domain 2: implementing a new service within existing professional boundaries

The second domain addressed the extent to which pharmacies were networked with other external organizations such as general practice and the effect this had on implementation. It has been suggested that insufficient integration of community pharmacy input into patient pathways due to poorly developed relationships between pharmacists and physicians can impede medicine management services.²³ This was the case in the present study, where local configuration and quality of each pharmacist's relationship with the GP was limited and constrained the NMS implementation. Examples of this were the reported number of patients referred from the GP to the pharmacist or the provision of prior information about the NMS at the point of prescribing a new medicine. It was apparent that in light of poor existing pharmacist-GP contact or lines of communication, there were few reports of collaboration. Reasons given by pharmacists for the lack of referrals included lack of GP awareness, GPs being unreceptive to what the service could offer, and general lack of understanding of the service. Pharmacists suggested that GPs were not interested in pharmacy services and viewed the NMS as potentially encroaching professional boundaries by duplicating work undertaken by the GP.

I went to a practice meeting last September/October 2012 to talk about New Medicine Service and Medicines Use Reviews. The nurse felt that we were actually duplicating and undermining the work that they were doing.

[Pharmacist 11, Full interview, Male, 33 years, Small multiple]

I don't think doctors like it ... there is that overstepping on each other's territory I think a bit but I think it's a good thing. It's like when you dispense you have two signatures on the label, two people checking it even though a pharmacist has dispensed it because none of us are sort of infallible and I think it's good.

[Pharmacist 04-2, Full interview, Female, 58 years, Independent]

This view was also reflected in the response of GPs, who were either unaware of the NMS, uncertain about its purpose, or confused the service with other more established pharmacy services such as MURs.

Have you heard about the NMS at all? [Researcher]

GP: Just remind me what it stands for? [It stands for the New Medicine Service] I mean not really no, no if I'm going to be honest ...

[GP 06, Male, 26 years qualified]

GPs reported the NMS had little, if any effect on their practice or impact on the relationship with the pharmacist, which they considered continued the 'prescribing-dispensing' pattern that existed before the introduction of the service. GPs although generally supportive of the concept of greater support for patients, were unclear as to the changes it might introduce in the division of health care labor, especially through boundaries and relationships between pharmacist and GP. The lack of collaboration between pharmacist and GP clearly impacted on how the NMS and the way patient care were managed. For example, patients were told by the prescribing GP to return for review four weeks after initiating a new medicine and then told by the pharmacist to have a discussion with them in the intervening two week period. This not only had potential to cause confusion for patients but also presented a strategy which allowed patients to unwittingly reject the pharmacist offer without even considering the benefits to them and their health.

It's not uncommon for people to say I'm seeing the doctor, I'm seeing the nurse, again in a fortnight and they can't see the added value that the pharmacist would give.

[Pharmacist 70, Exit interview, Female, 48 years, Large multiple]

A barrier to the service to be honest is mainly when the doctor and nurse or someone is going to see the patient in the next 2 weeks, because then patients say 'well do I need to come here as well?'

[Pharmacist 75, Exit interview, Male, 37 years, Small multiple]

Domain 3: inner pharmacy setting: accommodation of NMS and alignment with work practices

This domain considers implementation issues within the pharmacy's 'inner' setting. We initially consider pharmacists' initial strategy to implement the NMS and then go onto consider how the service is becoming imbedded in practice. When pharmacists were asked about their implementation plans for the NMS, few reported having made or were issued with such plans by their parent company. Several pharmacists voiced grievances that they had did not receive adequate notice of the service or full details of what the service involved:

We would have liked all the information to be available before the scheme started. We had training the week before the scheme started and the information was still not clearly available as to how the scheme would operate ... to ask anyone to operate a scheme at that sort of notice is atrocious planning really.

[Pharmacist 12, Full interview, Male, 43 years, Small multiple]

As the scheme was rolled out, pharmacists were pragmatic and adaptive, resolving early-stage problems through processes of trial and error. At face value, NMS workload was routine and had been absorbed into their daily routines alongside existing responsibilities with no extra resource and little evidence of restructuring of workload or reduction in other responsibilities. Pharmacists reported being heavily involved in the dispensing process, from receiving prescriptions from patients, preparing and labeling prescriptions, to completing the final accuracy check at dispensing. Alongside this, they also provided over-the-counter advice to patients on medicine use. In addition, pharmacists offered a range of clinical services, such as the MUR and in some cases extended private services, such as travel vaccination clinics and influenza vaccinations. In light of pharmacists' versatility to provide such services, the implementation of the NMS was not seen as overly problematic and reflected an organizational culture which was amenable and accepting of change. It was important to note, however, that accommodating the NMS was easier in pharmacies that had two pharmacists on duty as well as having perceived well-organized workflow systems.

Yes, I think time is the biggest one ... it is an additional thing that you have got to do.

[Pharmacist 64, Full interview, Female, 37 years, Small multiple]

I think if it was just one pharmacist here the day in and day out pressure would get you ... I think two pharmacists help here definitely. I think it would be too much on one pharmacist.

[Pharmacist 04-2, Full interview, Female, 58 years, Independent]

Domain 4: pharmacists' views of the NMS

In the fourth domain, the interplay between the pharmacists' subjective opinions and view about the NMS and how this affects implementation is considered. When questioned, most pharmacists viewed the NMS as an opportunity to expand their professional role and a means to improve their profile with their patients. The move away from dispensing toward more a patient-centered service contributed toward job satisfaction. Pharmacists were generally positive and supportive of the NMS, and saw this as an opportunity to support and educate patients, as well as identify and mitigate potential health risks associated with medicine use:

You're actually talking one to one you know you're not just counting medicine and dispensing because in that process it's blister packs and everything. So you're not just picking out or dispensing, yeah the fact that you're actually talking to patients about medication, about the conditions, definitely is yes.

[Pharmacist 04-1, Full interview, Male, 55 years, Independent]

Nearly all the patients thank you for the call and often the word heard is 'thank you for showing some interest' and I think that is something that might have changed, before pharmacists were just seen as a supply instrument, we're now along with the altered patients perception actually there to talk to as well and get asked questions and get information out of ...

[Pharmacist 06, Exit interview, Male, 40 years, Large multiple]

Despite pharmacists' positive views about the NMS, when asked about the perceived benefits and necessity of the service, most reported that many consultations did not identify any problems with the patients' medicines or problems with adherence. When pharmacists were asked about what the NMS provided over and above the routine counseling provided when the patient collects the new medicine from the pharmacy, views were mixed. Whereas some felt the NMS provided patients with additional support and an opportunity to tackle issues early, others felt that as pharmacists, they should automatically be providing patients with such support and advice:

It makes no difference whether you do it formally or do it anyway because that's your job ... I think I suppose NMS forces you to do what you're supposed to be doing ... I would like to think that I'm working in no different way, whether NMS is there or not.

[Pharmacist 04-2, Full interview, Female, 58 years, Independent]

In spite of what pharmacists felt about the perceived value or effectiveness of the service to identify and address non-adherence issues, they all delivered the service. Their willingness to implement a service despite some having reservations about its added value, suggested that some pharmacists did not buy into the idea of the NMS or fully grasp its underlying concept; rather they were subordinate in their response by accommodating the request to perform the NMS indicating a 'top-down' implementation as oppose to a 'bottom-up' commitment.

Discussion

Research on the implementation, diffusion or translation of innovations into health care settings has advanced considerably.^{17,24} Within the community pharmacy setting, these processes remain largely under-explored and described as complex and unique to the individual pharmacy.²⁵ Research in this area has mainly focused on the barriers that hamper implementation of new services including lack of time and resources to perform new services,^{26,27} pharmacists' motivation

and self-confidence,²⁸ lack of public awareness of new services,^{29,30} poorly developed pharmacist-GP relationships,^{23,31} and insufficient reimbursement.³² Facilitators have also been studied and include well planned pharmacy workflow systems, more sophisticated planning and performance monitoring systems, adequate remuneration schemes and appropriate changes to infrastructure and staff mix.³³ Many of these well-reported barriers and facilitators were also evident in this study. However, this study extends our understanding of how medicine management complex interventions are implemented, organized and delivered within community pharmacy day-to-day practice. The Damschroder model was particularly helpful and found that the NMS implementation process was shaped by a series of factors from public expectations of the service, through to overcoming existing 'inner' infrastructure issues and the constraints of 'outer' networking support; all of which will be expected to impact on service delivery and expected outcomes. Undertaking the NMS alongside existing work demonstrates pharmacy's readiness to absorb new complex interventions. However this research has revealed insights into the strategies pharmacies use to overcome the practical challenges associated with delivery of a new service.

It is widely recognized that new interventions or ways of working do not automatically or easily move from research to policy and then into practice, but are transformed and even inhibited by the contexts into which the change is desired. Translating the evidence-base around pharmacist-led clinical services into practice is complex and challenging and this was seen in the case of the NMS. The NMS was developed from a strong theoretical and evidential base.^{14,15,34} Furthermore, from the wider evaluative work, it has been shown that patients receiving the NMS had a significant improvement in adherence (by about 10%) when compared with those not receiving the service and there was also an increase in the number of medicine problems identified and dealt with.¹⁰ In broad terms therefore, it would appear that the NMS policy has been successfully introduced and adopted within community pharmacies. However, this study highlights the ways that this might have diverged from the proposed specification. One of the most important finding about how NMS consultations were being performed, was that not all pharmacists followed the recommended guidance questions, and used instead, their own simpler questions and prompts to engage patients. Pharmacists perceptions of what should be achieved also potentially led to changes to the nature of the intervention itself. This does not necessarily undermine the desired outcome of the service, but it does emphasize the underlying communication and inter-personal skills of the pharmacists, and while some may be entirely competent at engaging patients, others may not. Further still, the NMS was not always delivered through a dialogue between patient and pharmacist, being perceived instead by pharmacists to be more advice-giving where the underlying goal seemed to be around informing patients rather than exploring issues of patient understanding and use. The underlying principles of the NMS are simple; however there may be many reasons why pharmacists have poorly understood the underlying concept. It emerged that the aims of the service had not been clearly articulated to pharmacists. There may have also been a lack of 'buy in' to the service with pharmacist unconvinced as to the value this potentially could bring to patients. As a consequence, the potential outcomes of the service were not always being effectively interpreted or realized by those receiving or delivering the service. This may well be amenable to further training or through peer review; but it is clear that the lack of detailed piloting and robust evaluation before national rollout has made it more challenging to rectify these issues.

Lessons for future service design and implementation

This work provides several lessons for pharmacists, administrators and policy makers. The commissioners of future pharmacy service would be well minded to engage early with all stakeholders, both internal and external to the pharmacy profession, to ensure that the aims, purposes and perceived outcomes of the service are clearly articulated. The lack of early communication of the service, coupled with the burdensome remuneration structure led to avoidable concerns about the service. In light of the trend in increased prescription workload, continued commissioning of services without proper evaluation of how these would be accommodated and delivered in real-world practice could threaten the fidelity of the service aims and intentions. Another issue that caused disquiet was the outcome reporting program 'PharmaBase.' This was not only a new piece of untested software but perceived as non-user friendly leading to variable use. If service outcomes are to be monitored consideration needs to be given to the practicability and its usage within the pharmacy environment. In short, constant critical review of the service specifications by commissioners is required to ensure that implementation challenges such as these are quickly overcome. For example, early guidance to pharmacists could have been given on the importance of checking whether it is a convenient time to call patients and strategies to promote dialogue over the phone to ensure the consultation is of value. It is clear that despite the NMS being based on a strong evidence-based model, this may not be enough to determine whether a pharmacist-led intervention is appropriate to community pharmacy. Greater engagement with the pharmacy workforce, piloting within real-world practice and robust planning of the rollout are possible solutions to ensure future problems with new service implementation are overcome.

The findings of this study also indicate the need for pharmacists to enhance their consultation and communication skills to ensure that their NMS consultations are patient-centered. To support pharmacists, the Centre for Pharmacy Postgraduate Education, in collaboration with the Royal Pharmaceutical Society and Health Education England has recently released educational materials to support pharmacists' consultation skills.³⁵ Pharmacy organizations and educators may also wish to explore how mentoring and peer review of consultations could be feasibly incorporated into daily practice. The original intervention reported by Clifford et al¹⁵ allowed for feedback to pharmacists to improve service delivery. Commissioners and other stakeholders may wish to consider extra funding within the service structure to allow practitioners involved in offering the NMS to receive this feedback, mentoring and peer support.

Overall, patients and GPs were reported to be unaware of the NMS and so there is scope to enhance awareness about the service aims and intentions. Like other new services, it might be expected that it takes time for new services to become established in public understanding. GPs were generally supportive of the service but were unclear as to the changes it might introduce in the division of health care labor, especially through boundaries and relationships between pharmacist and GP. Before embarking on developing new services, careful consideration should be given to what medicine management services already exists and how any new service can be integrated into the existing infrastructure. Others have reported that where relationships with GPs and nurses were established, the NMS was an opportunity for further collaboration.³⁶ Alternatively, there may be opportunities for pharmacist to deliver the NMS directly in general practice surgeries. The Royal College of General Practitioners (RCGP) and the Royal Pharmaceutical Society (RPS) have recently issued plan for pharmacists to work together as part of the general practice team to ease current pressures in general practice and address the severe shortage of GPs.³⁷

Future research should seek to understand the ways in which time can be found for pharmacists to leave the 'dispensing bench' and enable them to provide patient-centered services. The costs and consequences of two pharmacists per pharmacy needs detailed modeling. The development of an integrated GP-pharmacist contractual arrangement could be a way to ensure a more coordinated and comprehensive medicine management service and to ensure that professional boundaries are more easily overcome.

Strengths and limitations of the study

To the authors' knowledge this is the only observational study that has explored NMS activity as it is being delivered naturally in practice. The significant observational work undertaken in the different types of pharmacies enabled a first-hand account of how the NMS was being performed and managed alongside the provision of other pharmacy services. Pharmacists and GPs interviews further validated and extended the findings from the pharmacy observations and *in situ* interviews with pharmacy staff. However, during the pharmacy observations, the effect of the researcher's presence on the pharmacy staff's behavior and what they reported is unknown. Other limitations to this study include a sampling frame that may have not been representative of all pharmacies. The sampling of the pharmacies for the qualitative work was taken from a cohort that was recruited to sign-up patients to the study's RCT. The inclusion criterion for this cohort was therefore that they needed to be actively undertaking the NMS. Further work needs to be done in pharmacies that are not currently offering the service to determine barriers to uptake. There were other limitations in data collection due to challenges of recruitment; in particular there were 11 GPs who responded to take part in an interview and so this may not be a representative view of GPs experience of the NMS.

Conclusion

This study has revealed the NMS implementation process to be multifaceted and complex. The NMS was implemented at scale throughout England, without having been piloted and within a relatively short period of time. In this respect the process can be considered a success. However, this study highlights that commissioning new community pharmacy complex interventions based solely on the evidence of intervention efficacy may not be a good indicator that the intervention will be delivered in practice as intended. Pharmacists were not homogenous in the way they delivered the NMS, but work within an overall framework, to accommodate and deliver the service according to their circumstances. As well as a review of workflow management, pharmacy teams need to be effectively supported and motivated to deliver the service. Greater engagement and collaborative planning with the pharmacy workforce prior to launch as well as a phased rollout may have forestalled some of the problems highlighted with the NMS. When implementing new services into practice, due consideration needs to be given to the operational challenges faced by the front line workforce in an already busy work environment. In anticipation that adequate time is typically needed to absorb practice change, commissioners and pharmacy organizations could have adopted a proactive approach to support implementation at grassroots level with ongoing updates to pharmacy staff, GPs and patients to re-emphasize the need and aims of the service.

Acknowledgments

The authors would like to thank all the members of the NMS evaluation team as well as all of the participants who took part in this study. We would also like to thank Ember Vincent and Clancy Williams for being patient and public representatives in this study.

This study was funded by the [Department of Health Policy Research Programme](#) (award number 029/0124). The views expressed in this publication are those of the author(s) and not necessarily those of the Department of Health.

Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.sapharm.2015.12.007>.

References

1

. P.P. George, J.A. Molina, J. Cheah, S.C. Chan and B.P. Lim, The evolving role of the community pharmacist in chronic disease management—a literature review, *Ann Acad Med Singapore* **39**, 2010, 861–867.

2

. E. Sabaté, *Adherence to Long-term Therapies: Evidence for Action*, 2013, World Health Organization; Geneva.

3

. Commonwealth Department of Health and Aged Care, *Domiciliary Medication Management—Home Medicines Review. Helping Your Patients Manage Their Medicines at Home*, 2001, Commonwealth Department of Health and Aged Care; Canberra.

4

. Department of Health, The Pharmaceutical Services (Advanced and Enhanced Services) (England) Directions, 2005, DH; London.

5

. E. Lee, R. Braund and J. Tordoff, Examining the first year of medicines use review services provided by pharmacists in New Zealand. 2008, *N Z Med J* **122**, 2009, 1293.

6

. J.F. Van Boven, A.G. Stuurman-Bieze, E.G. Hiddink, M.J. Postma and S. Vegter, Medication monitoring and optimization: a targeted pharmacist program for effective and cost-effective improvement of chronic therapy adherence, *J Manage Care Pharm* **20**, 2014, 786–792.

7

. M.J. Barnett, J. Frank, H. Wehring, et al., Analysis of pharmacist-provided medication therapy management (MTM) services in community pharmacies over 7 years, *J Manage Care Pharm* **15**, 2009, 18.

8

. J.M.P. Horgan, A. Blenkinsopp and R.J. McManus, Evaluation of a cardiovascular disease opportunistic risk assessment pilot ('Heart MOT' service) in community pharmacies, *J Public Health* **32**, 2010, 110–116.

9

. A.J. Avery, S. Rodgers, J.A. Cantrill, et al., Pharmacist-led information technology intervention for medication errors (PINCER): a multicentre, cluster randomised, controlled trial and cost-effectiveness analysis, *Lancet* **379**, 2012, 1310–1319.

10

. R.A. Elliott, M.J. Boyd, J. Waring, et al., Department of Health Policy Research Programme Project 'Understanding and Appraising the New Medicines Service in the NHS in England (029/0124)', 2014 <http://www.nottingham.ac.uk/~pazmjb/nms/downloads/report/files/assets/common/downloads/108842%20A4%20Main%20Report.v4.pdf>, Accessed 28.06.15.

11

. Pharmaceutical Services Negotiating Committee, New Medicines Service, 2011 <http://www.psn.org.uk/pages/nms.html>, Accessed 28.06.15.

12

. C. May, T. Finch, F. Mair, et al., Understanding the implementation of complex interventions in health care: the normalization process model, *BMC Health Serv Res* **7**, 2007, 148.

13

. P. Craig, P. Dieppe, S. Macintyre, S. Michie, I. Nazareth and M. Petticrew, Developing and evaluating complex interventions: the new Medical Research Council guidance, *Int J Nurs Stud* **50**, 2013, 587–592.

14

. N. Barber, J. Parsons, S. Clifford, R. Darracott and R. Horne, Patients' problems with new medication for chronic conditions, *Qual Saf Health Care* **13**, 2004, 172–175.

15

. S. Clifford, N. Barber, R.A. Elliott, E. Hartley and R. Horne, Patient-centred advice is effective in improving adherence to medicines, *Pharm World Sci* **28**, 2006, 165–170.

16

. L.J. Damschroder, D.C. Aron, R.E. Keith, S.R. Kirsh, J.A. Alexander and J.C. Lowery, Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science, *Implement Sci* **4**, 2009, 50.

17

. T. Greenhalgh, G. Robert, F. Macfarlane, P. Bate and O. Kyriakidou, Diffusion of innovations in service organizations: systematic review and recommendations, *Milbank Q* **82**, 2004, 581–629.

18

. E. Ferlie, The nonspread of innovations: the mediating role of professionals, *Acad Manage J* **48**, 2005, 117–134.

19

. N.K. Denzin and Y.S. Lincoln, The discipline and practice of qualitative research, In: N.K. Denzin and Y.S. Lincoln, (Eds.), *Strategies of Qualitative Enquiry*, 2008, Sage; London, 1–44.

20

. M. Hammersley, *What's Wrong with Ethnography?*, 1992, Routledge; London.

21

. J. Harvey, A.J. Avery, D. Ashcroft, M. Boyd, D.L. Phipps and N. Barber, Exploring safety systems for dispensing in community pharmacies: focusing on how staff relate to organizational components, *Res Soc Admin Pharm* **11**, 2014, 216–227.

22

. S. Ziebland and A. McPherson, Making sense of qualitative data analysis: an introduction with illustrations from DIPEX (personal experiences of health and illness), *Med Educ* **40**, 2006, 405–414.

23

. A. Blenkinsopp and C.M. Bond, The potential and pitfalls of medicine management: what have we learned so far?, *Dis Manag Health Out* **16**, 2008, 79–86.

24

. H. McMullen, C. Griffiths, W. Leber and T. Greenhalgh, Explaining high and low performers in complex intervention trials: a new model based on diffusion of innovations theory, *Trials* **16**, 2015, 242.

25

. T.R. Hopp, E.W. Sørensen, H. Herborg and A.S. Roberts, Implementation of cognitive pharmaceutical services (CPS) in professionally active pharmacies, *Int J Pharm Pract* **13**, 2005, 21–31.

26

. F. Bradley, A.C. Wagner, R. Elvey, P.R. Noyce and D.M. Ashcroft, Determinants of the uptake of medicines use reviews (MURs) by community pharmacies in England: a multi-method study, *Health Policy* **88**, 2008, 258–268.

27

. A. Latif, H. Boardman and K. Pollock, A qualitative study exploring the impact and consequence of the medicines use review service on pharmacy support-staff, *Pharm Pract* **11**, 2013, 118–124.

28

. M. Rosenthal, Z. Austin and R.T. Tsuyuki, Are pharmacists the ultimate barrier to pharmacy practice change?, *Can Pharm J* **143**, 2010, 37–42.

29

. A. Latif, K. Pollock and H. Boardman, Understanding the patient perspective of the English community pharmacy Medicines Use Review (MUR), *Res Social Adm Pharm* **9**, 2013, 949–957.

30

. A. Blenkinsopp, C. Bond, G. Celino, J. Inch and N. Gray, Medicines use review: adoption and spread of a service innovation, *Int J Pharm Pract* **16**, 2008, 271–276.

31

. A. Latif, K. Pollock and H. Boardman, Medicines use reviews: a potential resource or lost opportunity for general practice?, *BMC Fam Pract* **14**, 2013, 57.

32

. R.S. Newlands, M.C. Watson and A.J. Lee, The provision of current and future Healthy Weight Management (HWM) services from community pharmacies: a survey of community pharmacists' attitudes, practice and future possibilities, *Int J Pharm Pract* **19**, 2011, 106–114.

33

. A.S. Roberts, S.I. Benrimoj, T.F. Chen, K.A. Williams and P. Aslani, Practice change in community pharmacy: quantification of facilitators, *Ann Pharmacother* **42**, 2008, 861–868.

34

. R.A. Elliott, N. Barber, S. Clifford, R. Horne and E. Hartley, The cost effectiveness of a telephone-based pharmacy advisory service to improve adherence to newly prescribed medicines, *Pharm World Sci* **30**, 2008, 17–23.

35

. Centre for Postgraduate Pharmacy Education, Consultation Skills for Pharmacy Practice, 2014, University of Manchester; Manchester.

36

. B. Lucas and A. Blenkinsopp, Community pharmacists' experience and perceptions of the New Medicines Service (NMS), *Int J Pharm Pract* 2015, <http://dx.doi.org/10.1111/ijpp.12180>.

37

. M.C. Stone and H.C. Williams, Clinical pharmacists in general practice: value for patients and the practice of a new role, *Br J Gen Pract* **65**, 2015, 262–263.

Supplementary data

[Multimedia Component 1](#)

Queries and Answers

Query: Please provide professional degrees (e.g., PhD, MD) for the authors “Asam Latif, Justin Waring, Deborah Watmough, Nick Barber, Anthony Chuter, James Davies, Nde-Eshimuni Salema, Matthew J. Boyd, Rachel A. Elliott” in the author group, as it is mandatory as per journal style.

Answer: Done

Query: Please verify the article footnote ‘Declaration of competing interests’ and correct if necessary.

Answer: Yes this is correct

Query: Please provide the grant number for ‘Department of Health Policy Research Programme’ if any.

Answer: The award number has been provided

Query: Please check the layout of Table 2.

Answer: Please can you shorten the first column so that more space can be dedicated to the last column

Query: Please confirm that given names and surnames have been identified correctly.

Answer: Yes