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Evaluation of Community pharmacy based case finding COPD screening and support service

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[Undertook literature review, collation of raw data from interviews, analysis of interviews with patients and pharmacists, draft of the initial report (for which Paul Bennett and Jayne Longstaff provided comments and clarifications) and production of the final report]

Project team

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AstraZeneca The AstraZeneca logo, featuring a stylized graphic of four overlapping circles in yellow, blue, and grey.

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EXECUTIVE SUMMARY

Key findings

Service reach and delivery

A total of 223 patients were screened, 39 patients attended follow-up visits and eight patients diagnosed with COPD received support. Advice on lifestyle was provided to all those screened and smokers were strongly encouraged to stop smoking. Estimated figures for referral for full spirometry testing of patients potentially undiagnosed with COPD and identified to be at high risk of COPD was 17.4% while the referral rate for the sample of patients surveyed by telephone was 23.3%.

These findings broadly mirror those found in previous similar studies *i.e.* Castillo et al (2009, 2015). The referral rate was lower than that of Harper (2013) and Wright et al (2015) who had a referral rate of approximately 57%.

Using the same theoretical model as Wright et al (2015) which was based on Atsou et al (2011), applied to all pharmacies in England, a referral rate for further investigation of 17.4% applied to all community pharmacies in England would save the NHS £74.4m.

Experience of patients (n=30)

When asked their overall satisfaction with the COPD screening service two thirds (n=20) said it was 'excellent' and one third (n=10) said it was 'good'. All patients (n=30) said that they had received clear information all the time, that they had been treated with respect all the time and that said they would recommend the service to others.

Referred and non-referred patients become more aware of the consequences of continuing smoking and of the importance of taking better care of their health and many took active steps towards achieving this. Screening for COPD provided an incentive to stop smoking and/or an opportunity to make positive health related changes for their future.

More than half the qualitative comments focussed on the benefits of smoking cessation deemed necessary by both diagnosed and undiagnosed patients because they wanted to take active steps to improve their health.

Patients really appreciated the opportunity to be screened for COPD sooner rather than later because they would never have gone to their GPs with their symptoms as they did not think these were extreme enough to warrant a visit to their GP.

Views of pharmacists (n=7)

On being asked their views about community pharmacy services for (opportunistically) screening for COPD in general and whether this type of service was suitable in community pharmacies, five out of seven pharmacists had either had negative (n=2) or conflicting (n=3) views. Reasons ranged from the small size of a pharmacy and difficulty in recruiting patients, disinterested patients, target population too narrow and a lack of sufficient time to undertake COPD, lack of consultation with pharmacists before embarking on the project, service being duplicated and lack of collaborative approach between pharmacists and GPs.

However, most pharmacists described some extremely grateful patients and the fact that some patients came in asking to be screened because they had heard of the service.

Communication with GPs was deemed poor by four of the seven pharmacists interviewed (57%), fair by one (14%) and good by two (29%). Referring patients was often perceived as difficult and a struggle particularly because of a lack of understanding by GPs about what the project was about and the lack of a structured platform for communication between GPs and community pharmacists.

There was evidence of an emerging idea of community of practice (Lave and Wenger 1991) with two pharmacies benefitting from the input of specialist respiratory nurses and a 'buddy network' of pharmacists' counter staff agreeing to supporting each other.

Key recommendations

1. Conduct robust economic evaluation
2. Maximise engagement of community pharmacies
 - Community pharmacies should be made 'research' or 'evaluation ready' before a similar project is implemented. Area managers should be contacted in future to seek their explicit support.
 - During the training and upskilling of pharmacy staff, there should be an emphasis on: how to recruit patients; potential barriers to be faced by the team undertaking the project and how to overcome these; the importance of collecting and recording data and maintaining the integrity of the data.
 - Too long a gap between training and the start of the project should be avoided as it can dampen enthusiasm and create unnecessary barriers.
 - Feedback from pharmacists in relation to all training sessions held should be systematically collected and analysed.
3. Minimise the potential unavailability of data, particularly data necessary to make reliable health economics calculations i.e. on smoking cessation and referrals to GPs
4. Make sure to collect data on referral for further investigation rates, confirmed diagnoses as well as alternative diagnoses as this constitute a clear gap in the literature on community pharmacy based COPD case finding.
5. Develop a toolkit for projects involving community pharmacies. This would be helpful to maximise the success of future projects.

1. INTRODUCTION

1.1. Literature review and context

In the UK, there are an estimated 2.8 million undiagnosed people with Chronic Obstructive Pulmonary Disease (COPD) predicted to cost the NHS £3.22 billion in treatment and care. Approximately half of those have a predicted ten-year survival from diagnosis (BLF, 2007). In England, around 835,000 people are currently diagnosed with COPD and an estimated further 2.2 million are undiagnosed. A similar picture exists locally, suggesting that work is needed to try overcome current barriers to early diagnosis (DH, 2011a). In England, the estimated prevalence of COPD is 13.3% of those aged over 35 years (McKee, 2014) indicating the need to try to overcome the current barriers to early diagnosis and treatment (DH, 2011a).

Health outcomes for patients living with respiratory conditions in England fall some way behind those achieved by the best-performing countries, in part due to their often late diagnosis (DH 2011). Most people with COPD are unaware they have the condition. COPD is a progressive degenerative disease, the outcome of which can be improved, if the underlying cause (for example, smoking) is removed. Early diagnosis and hence reduction in disease progression are likely to result in beneficial healthcare savings (DH 2011).

The National Clinical Guideline Centre's COPD guidelines, commissioned by the National Institute of Health and Clinical Excellence (NICE), advocate opportunistic case-finding as a relatively cost effective strategy and the use of community pharmacies as a suitable location for provision of such opportunistic services as they are accessible, convenient and well established within their local communities (NICE, 2010).

Screening people at risk of COPD using a symptom questionnaire (Martinez et al, 2008) and spirometry test to evaluate lung function (GOLD, 2013) has been successfully used for early detection case finding by GPs in the UK (Falzon et al, 2013) and in community pharmacy settings in the USA (Fuller et al 2003), Australia (Burton et al, 2004; Armour et al, 2007; Harper, 2013), Spain (Castillo et al, 2009, 2015) as well as in the North West of England (Wright et al, 2015, 2015a).

A recent systematic review of evidence over the last decade found that pharmacist care was associated with a significant reduction in the risk of hospital admission (Han et al 2014) and that there was scope for community pharmacists to play an effective role in delivering chronic respiratory screening and management interventions but that future research should focus on development of a patient delivery model incorporating a screening protocol

followed by targeted management interventions (Fathima et al, 2013). Another systematic review of community pharmacy based screening intervention for various conditions concluded that more studies were needed to compare effectiveness and cost-effectiveness of pharmacy-based screening with screening by other providers (Ayorinde et al, 2013)

1.2. Background of the study

Many community pharmacies already provide locally commissioned services that can support patients with COPD and other respiratory conditions such as stopping smoking services and medicine use reviews (DH, 2011, p50).

The project was a collaboration between AstraZeneca, Wessex Academy of Health Sciences Network (Wessex AHSN) and Hampshire and Isle of White Local Pharmacy Committee (LPC) working together to improve respiratory outcomes in Hampshire and more specifically to pilot a community pharmacy based COPD screening and support service. Representatives of the three stakeholders were responsible for scoping out the project's feasibility and for monitoring and evaluating the project in respect of benefit to patients and the success of the overall project.

This funding for the project was shared amongst AstraZeneca and Wessex AHSN. These included: purchasing up to 30 hand-held spirometry devices and up to 30 licences for PharmOutcomes (secure web-based platform); upskilling of pharmacy staff (backfill costs of 45 pharmacists to attend training/refresh sessions); and service payments for 100 screenings and support for 15 patients at each of the 30 pharmacies.

In terms of operational management and accountabilities, two representatives of the LPC were Project Lead (governance of the operational programme and for service payments) and Project Support (project design, communication with and engagement of community pharmacies, training, design and delivery and implementation of the project, and providing Community Pharmacy support) (See Appendix 1, pp36-39)

Wessex AHSN also provided additional Project Support through the involvement of the Senior Manager of the overall Respiratory Programme and the involvement of the Wessex Centre for Implementation Science based at the University of Southampton.

2. AIMS

The project aimed to pilot a community pharmacy COPD case finding service to identify undiagnosed COPD patients in Hampshire by offering targeted screening of “at risk” populations within a community pharmacy setting by trained pharmacy staff.

Phase one aimed to improve the identification and timely diagnosis of COPD sufferers by offering targeted screening of “at risk” populations within the community pharmacy setting.

Phase two aimed to improve outcomes for patients with COPD by the structured provision of a comprehensive package of medicines support, including enhanced medicines use reviews (MURs), follow-up MURs and new medicines service [NMS] (at) interventions. This will support medicines optimisation and self-management in this patient group.

3. OBJECTIVES

The objectives for phase one were:

1. To facilitate the upskilling of 28 community pharmacies to deliver a respiratory care package
2. To improve early accurate diagnosis of COPD disease
3. To ascertain service delivery, reach and impact
 - 3.1. To improve patients' access to, and experience of, care
 - 3.1.1. To increase effective self-management, patient education and quality of life
 - 3.1.2. To improve referral routes and access to specialist services across Wessex
 - 3.1.3. To reduce inequalities and variation in patient services
 - 3.2. To develop pharmacists with special interests within the community to act as local leaders in the future roll out of this service to other community pharmacies

The objectives for phase two were

1. To provide a referral of those diagnosed COPD patients to pharmacy respiratory support service for those diagnosed with COPD
2. To provide an enhanced MUR follow-up MUR and NMS services as of part-structured support to patients

A common objective for phase one and phase two was to provide a focussed analysis of phase one and phase 2 to help guide future commissioning decisions.

4. KEY OUTCOME MEASURES

Phase one

1. Number of pharmacies signed up to provide service
2. Number of pharmacists with enhanced respiratory knowledge and skills
3. Number of pharmacy staff trained for screening
4. Number of lung function screening tests performed
5. Number of people tested who achieve a FEV1 less than 80% of predicted
6. Number of people tested referred to specialist smoking services
7. Number of people tested referred to their GP for fuller spirometry testing
8. Number of people who are identified as having “red flag” symptoms and referred to their GP for investigation
9. Number of patients followed up 3 months post-intervention
10. Number of patients with confirmed COPD diagnosis and treatment following referral
11. Number of people tested who report stopping smoking
12. Number of people tested who report an alternative diagnoses e.g. asthma, lung cancer
13. Stakeholder feedback (patients and pharmacists)

Phase two

1. Number of structured respiratory MURS and NMS provided
2. Changes in patient Cat Scores (COPD Assessment Test Scores)
3. Stakeholder feedback

5. METHODS

Patients aged 35+ who visited their community pharmacy and were also smokers and/or users of cough medicines were invited to answer a short survey and, if appropriate, invited to be screened for COPD by fully trained pharmacy staff using validated tools, including hand-held spirometry.

Patients were asked to confirm they were over 35 years of age, whether they had ever smoked and how many cigarettes they smoked each day, and how many years they had smoked for. They were also asked whether they suffered from a long lasting cough, were producing phlegm or sputum regularly, were feeling short of breath or wheezing and suffered from frequent coughs, colds or chest infections.

Although the questionnaire did not follow the precise format of validated questionnaires used in previous studies (e.g. Martinez et al, 2008 or GOLD, 2013), the questions were

similar, but simplified as they were included on the leaflets, which had a detachable patient questionnaire and consent form that patients were asked to complete.

As the study was a service evaluation, it did not require Health and Research Authority [HRA] ethical approval. HSC [Health and Social Care] management permission (also referred to as R&D approval) was provided by the LPC who were also involved as key stakeholder leading the project and who recruited the participating pharmacies each of which had signed a *screening service specification* indicating under clause 4.6 that *the pharmacy will participate in an audit of the service and will provide feedback on the project as organised by the LPC*.

The leaflet/questionnaire included name, date of birth, phone number, GP details as well as recorded FEV₁..... % of predicted rate FEV₁ ..., lung age, and to whom the patient had been referred [GP or specialist nurse in Totton only] and the pharmacy date stamp. Those patients with spirometry readings achieving FEV₁ less than 80% predicted were referred to their GP.

Advice on lifestyle was provided and smokers, whether or not referred to their GP or specialist nurse for full spirometry, were strongly encouraged to stop smoking and were offered the opportunity to be referred to smoking cessation, which is the best way of reducing the chances of developing COPD and/or slowing down its progress (DH, 2011).

The outcome measures for phases one and two (see under 4. Outcome Measures p6) were to be recorded by pharmacies in PharmOutcomes, a secure web-based platform that can provide descriptive numerical analysis and statistics of outcome measures.

A total of 30 patients took part in a short telephone survey administered by a researcher from the Wessex Centre for Implementation Science between August and October 2015. A total of seven pharmacists undertook a semi-structured survey questionnaire administered by a researcher from the Wessex Centre for Implementation Science in July 2015. The nurse mentor who provided on-going support to 85 pharmacy staff throughout the project also collected the views of patients and pharmacists, which have been included in this report.

Four pharmacists and four counter staff were also interviewed in depth by Dr A Dewey, which is reported separately. Three of the pharmacists interviewed by Dr A Dewey were also among the seven who took part in the semi-structured telephone survey.

6. DELIVERY AND REACH

6.1. Key points

- A total of nine community pharmacies undertook 227 COPD screenings over 17 months. Four pharmacies performed 203 screenings (89.4%). The top pharmacy delivered 119 screenings (52.4%).
- Taking into account those who were screened more than once, a total of 223 patients were screened. Just over half the patients were screened [n=115 or 51.5%] by one Portsmouth-based pharmacy.
- Four pharmacies conducted a total of 39 follow up appointments with those who had been identified of being at high risk of potentially undiagnosed COPD.
- A total of eight patients diagnosed with COPD received support in two pharmacies.
- The best overall pharmacy screened 31 patients (13.6% of all patients screened), conducted 12 follow up appointments (30.7% of all follow-up appointments) and provided support to 7 patients diagnosed with COPD (87.5% of all support).
- Advice on lifestyle was provided to all those screened and smokers were strongly encouraged to stop smoking.
- The gender profile for 175 (out of 223 patients) screened between May 2014-July 2015 and (78.4%) was 54.8% men (n=96) and 44.2% women (n=77) with 1.1% of patients (n=2) for whom gender was unknown.
- The referral rate to GP or specialist respiratory nurse was estimated to be 17.4%

6.2. Number of patients screened

The figures have been compiled from data on emailed Excel spreadsheets spanning November 2014 to October 2015 and data from paper spreadsheets spanning May 2014 to July 2015. Five pharmacies undertook 211 out of 227 screenings (92.5%). The top four pharmacies performed 203 of the 227 COPD screenings (89.4%). The top pharmacy delivered 119 screenings (52.4%). The figures (See table 1) include four patients screened twice [19 March 2015 and 16 July 2015; 9 July 2014 and 14 November 2014; 20 November 2014 and 15 January 2015; and March and May 2015].

Table 1**COPD screenings performed and timeframe, by individual pharmacies**

Pharmacy geographical area	% of total number of screenings (N)	Timeframe
1. Portsmouth 1	52.4 (119)	Jul 2014- Oct 2015
2. Totton 1	14.1 (32)	Nov 2014- Mar 2015
3. Andover	13.6 (31)	Nov 2014- Feb 2015
4. Farnborough	9.2 (21)	May 2014 - Mar 2015
5. Portsmouth 2	3.5 (8)	Jan 2015 – Apr 2015
6. Basingstoke 1	2.6 (6)	Dec 2014- Mar 2015
7. Portsmouth 3	1.7 (4)	Oct 2014- Mar 2015
8. Portsmouth 4	0.9 (2)	Jan 2015 - Jan 2015
9. Totton 2	0.9 (2)	Nov 2015-Nov 2015
10. Basingstoke 2	0.4 (1)	June 2014
11. Basingstoke 3	0.4 (1)	July 2014
TOTAL	227	

A total of 223 patients were screened. Portsmouth 1 performed 119 screenings (52.4%) (See table 1), but only screened 115 patients (51.5% of total) as four were screened twice.

Table 1a**COPD screenings performed by geographical areas**

Pharmacy	% of total number of screenings (N)
Portsmouth 1	52.4 (119)
Portsmouth 2	3.5 (8)
Portsmouth 3	1.7 (4)
Portsmouth 4	0.9 (2)
Total Portsmouth	58.5 (133)
Totton 1	14.1 (32)
Totton 2	0.9 (2)
Total Totton	14.9 (34)
Basingstoke 1	2.6 (6)
Basingstoke 2	0.4 (1)
Basingstoke 3	0.4 (1)
Total Basingstoke	3.4 (8)
Andover	13.6 (31)
Total Andover	13.6 (31)
Farnborough 1	9.2 (21)
Total Farnborough	9.2 (21)
GRAND TOTAL	227

The greatest number of screenings (58.5%) were performed in Portsmouth (n=133) followed by Totton (14.9%) (n=34), Andover (13.6%) (n=31), Farnborough 1 (9.2%) (n=21) and Basingstoke (3.4%) (n=8). (See table 1a)

6.3. Gender profile of patients screened

Information relating to gender was only available for patients screened between May 2014-July 2015 [n=175 out of the total number of 223 (78.4%)]. The gender profile therefore excludes 14 patients screened in August-October 2015. It also excludes 34 patients from Totton (See table 2).

Table 2
Gender of patients screened overall and by individual pharmacy

Pharmacy	Total	Women % (N)	Men % (N)	Unknown % (N)
1. Portsmouth 1	101	39.6 (40)	59.4 (60)	1 (0.9)
2. Andover	31	64.5 (20)	35.4 (11)	0
3. Farnborough 1	21	38.0 (8)	61.9 (13)	0
4. Portsmouth 2	8	37.5 (3)	50.0 (4)	12.5 (1)
5. Basingstoke 1	6	16.7 (1)	83.3 (5)	0
6. Portsmouth 3	4	50.0 (2)	50.0 (2)	0
7. Portsmouth 4	2	50.0 (1)	50.0 (1)	0
8. Basingstoke 2	1	100 (1)	0	0
9. Basingstoke 3	1	100 (1)	0	0
TOTAL	175	44.2 (77)	54.8 (96)	1.1 (2)

The overall percentage of men was 54.8% (n=96) and the percentage of women 44.2% (n=77) with 1.1% of patients (n=2) for whom gender was unknown.

The gender profile by pharmacy was very variable and, in pharmacies with more than one patient screened, ranged from 16.7% to 64.5% women.

6.4. Follow-up appointments and support provided

Portsmouth 1 performed the majority of the COPD screenings with 119 out of 227 (52.4%), but conducted only 11 follow-up appointments (32.3%). (See table 3). The best overall pharmacy [Andover-based] delivered 31 screenings (13.6%) and 12 follow up appointments (35.2%) followed by Farnborough 1 with 21 screenings (9.2%) and 6 (17.6%) follow-up appointments. Portsmouth 2 screened 8 patients (3.5%) and conducted 2 follow-up appointments (5.8%). Portsmouth 3 screened 4 patients (1.7%) and undertook three follow up appointments (8.8%) (See tables 1 and 3).

Table 3
Follow up appointments by individual pharmacy

Pharmacy	Follow-up N (%)	Timeframe
Andover	12 (35.2)	Mar 2015 - Jul 2015
Totton	5 ¹ (1.2)	Mar 2015- Jul
Portsmouth 1	11 (32.3)	Jan 2015 - Jun 2015
Farnborough 1	6 (17.6)	Nov 2014 - Jul 2015
Portsmouth 3	3 (8.8)	May 2015
Portsmouth 2	2 (5.8)	March 2015
TOTAL	39	

Table 4
Diagnosed patients recorded as having received COPD support service

Pharmacy	Support N (%)	Timeframe
Andover	7 (87.5)	Feb 2015- Apr 2015
Portsmouth 3	1 (12.5.)	Feb 2015
TOTAL	8	

Only two pharmacies offered support to patients diagnosed with COPD (See table 4 and also Appendix 6, p47 for an overview). It is not known whether these patients had been diagnosed as part of this study or had already been diagnosed.

¹ No data were available in respect of follow-up visits from Totton based pharmacies. However, the pharmacist informed the nurse mentor who provided on-going support that at least five patients referred for further investigation had had a confirmed diagnosis of COPD, giving a minimum number of five follow-up visits.

6.5. Referral to GP or specialist respiratory nurse

Data available covering the period November 2014 to October 2015 refer to 39 follow-up appointments (out of 223 patients screened), from which it can be inferred that the patients attending follow up appointments had in fact been referred to their GPs, giving a minimum referral rate of 17.4% since many patients referred for further investigation may not have returned to the pharmacy for a follow-up appointment (See table 5).

Table 5

Percentage of patients screened who had follow-up appointments by individual pharmacy as proxy for minimum referral rate

Pharmacy	Patients Screened (N)	Follow-ups (N)	Minimum referral rate %
Portsmouth 1	115	11	9.5
Andover	31	12	38.7
Farnborough 1	21	6	28.5
Totton 1	32	5	15.6
Portsmouth 2	8	2	25.0
Portsmouth 3	4	3	75.0
Other 5 pharmacies	12	0	0
TOTAL/AVERAGE	223	39	17.4

The rate of follow-up appointments or minimum referral rate, as not all patients referred for further investigation will make follow-up appointments, varied greatly. Apart from five pharmacies with a referral rate of zero, all of which had only performed one or two screenings, except one with 6 screenings, the referral rate varied between 9.5% for Portsmouth 1 and 75% for Portsmouth 3 (See table 6).

7. EXPERIENCE OF PATIENTS

7.1. Key points

- More than four fifth of the sample interviewed by telephone (86.7%) (n=26) attended Portsmouth based pharmacies: Portsmouth 1 (60%) (n=18); Portsmouth 2 (10%) (n=3); Portsmouth 3 (3.3%) (n=1). Just over a quarter attended Farnborough 1 (26.7%) (n=8).
- At least seven of the 30 interviewees (23.3%) had been referred to their GP for further investigation. No data was available for 5 interviewees. The seven referred to their GP had been screened at Portsmouth 1 (n=5) and in Farnborough 1 (n=2). A male patient referred to his GP by Portsmouth 1 said that his GP had dismissed the referral.
- When asked their overall satisfaction with the COPD screening service provided by the local pharmacy two thirds (n=20) said it was 'excellent' and one third (n=10) said it was 'good' (See table 7).
- All patients (n=30) said that they had received clear information all the time, that they had been treated with respect all the time and that said they would recommend the service to others (See table 7)
- One very positive aspect of the screening experience was that it had provided an incentive to stop smoking. Many patients experienced the screening as an opportunity to make positive health related changes for their future.
- More than half the qualitative comments focussed on the benefits of smoking cessation deemed necessary by both diagnosed and undiagnosed patients because they wanted to take active steps to improve their health.
- In particular, patients appreciated the opportunity to be screened for COPD sooner rather than later because they would never have gone to their GPs with their symptoms as they did not think these were extreme enough to warrant a visit to their GP.

7.2. Profile of patients who took part in telephone survey

A total of 30 patients took part in a short telephone interview (August-October 2015). Seven of the 30 patients who took part in the telephone survey had been screened between May 2014 and October 2014. The other 23 were screened between November 2014 and October 2015.

In relation to gender profile, the two samples differed markedly. The profile of the overall sample for whom data were available² (n=175) was 44.2% female (n=77), 54.8% male (n=96) and 1.1% unknown (n=2) (See table 5). The gender profile of the sample surveyed by telephone was 87.7% male (n=26) and 13.3% female (n=4) (See table 7).

Table 6
Demographic profile of patients surveyed

Item	Total % of surveyed sample (N)	Women % if applicable (N)	Men % if applicable (N)
Gender	100.0 (30)	13.3 (4)	87.7 (26)
Pharmacy attended			
a. Portsmouth 1	60 (18)	(2)	(16)
b. Farnborough 1	26.7 (8)	(1)	(7)
c. Portsmouth 2	10 (3)	(1)	(2)
d. Portsmouth 3	3.3 (1)	(0)	(1)
Referral to GP or specialist nurse			
a. Yes	23.3 (7)	(1)	(6)
b. No	60 (18)	(3)	(15)
c. No data available	16.6 (5)	(0)	(5)
Referral to GP by individual pharmacy			
· Portsmouth 1	(5)	(0)	(5)
· Farnborough 1	(2)	(1)	(1)

In terms of pharmacy attended, the sample of those who took part in the semi-structured telephone survey broadly matched the overall sample of patients screened. Portsmouth 1 counted the greatest number of patients screened (n=115 or 51.5%) and the greatest number of interviewees (n=18 or 60% of sample) (See table 6). Except for Portsmouth 1, the pharmacy that counted the greatest number of patients who took part in the telephone survey was Farnborough 1 (n=8 or 26.7% of sample) followed by Portsmouth 2 (n=3 or 10% of sample) and Portsmouth 3 (n=4 or 3.3% of sample) (See table 6).

Regarding the referral rate to GP or specialist respiratory nurse, the interviewed sample differed slightly from the overall sample. The minimum referral rate for the overall sample of patients screened (n=223) was 17.4% (See table 5). The minimum referral rate for the sample of patients surveyed by telephone was 23.3% (See table 6). The seven patients

² Data was only available for patients screened between May 2014 and July 2015 excluding 14 patients screened between August and October 2015 and 34 patients who attended two pharmacies in West Totton [AR Pharmacy] and Totton respectively [Lloyds Pharmacy].

referred for further investigation included only one female [Farnborough 1]. Five of the male patients were screened by Portsmouth 1 and one by Farnborough 1 (See table 6).

7.3. Views of patients who took part in telephone survey

Overall satisfaction with COPD screening service

When asked via an open-ended question about the service they had received, patients expressed a high level of satisfaction: 12 (40%) said it was really good/excellent and 16 (53.3%) said it was 'good' while 2 (6.6%) said it was 'alright' and 'quick and interesting' respectively (See table 7).

When asked their overall satisfaction with the COPD screening service provided by the local pharmacy 20 (2/3) said it was excellent and 10 (1/3) said it was good (See table 7). All patients (n=30) said they would recommend the service to others and that they had received clear information all the time and that they had been treated with respect all the time (See table 7)

Table 7
Satisfaction with COPD screening service

Question	% of total surveyed (n=30) (N)
Tell us about the [CPPD screening and support] service you received [qualitative/open-ended] a. really good/excellent b. good c. alright/interesting	40.0 (12) 53.3 (16) 6.6 (2)
Overall rating of [COPD screening and support] service provided by local pharmacy a. Excellent b. Good c. Fair d. Poor e. Don't know	66.6 (20) 33.3 (10)
Were you treated with respect? a. Yes all of the time b. Yes some of the time c. No	100 (30)
Were you given clear information a. Yes all of the time b. Yes some of the time c. No	100 (30)
Would you recommend this service to others a. Yes b. No c. Don't know	100 (30)

Overall experience of the COPD screening service

The patients who made comments underlined having had a very positive experience:

The service was brilliant [Male, not referred to GP, Farnborough 1]

Oh it was absolutely amazing [Male, not referred to GP, Farnborough 1]

Excellent – it was first class [Male, not referred to GP, Farnborough 1]

Quick and interesting [Male, not referred to GP, Portsmouth 1]

Very good, very informative, very supportive], gave me a lot of information on how to give up smoking [Female, not referred to GP, Portsmouth 1]

I think it was a really good one – I went in there and I [was] offered a breathing test. [Male, referred to GP, Farnborough 1]

Oh it was really good. I have got all my medication [now] and I am taking them [Female, referred to GP, Farnborough 1]

Well I didn't know what to expect, so it was interesting [Male, not referred to GP, Portsmouth 1]

Very satisfied, I don't have any complaints [...] the service was really good [Male, not referred to GP, Farnborough 1]

Very satisfied, I went in there to collect my prescription and the chap in there offers the test to me. I was pleased with the result. I took the result to my doctor [Male, not referred to GP, Farnborough 1]

Very helpful – everything they did was on point [Male, Farnborough 1]

Greatest benefits of/most useful thing about COPD screening service

Typical comments were very positive:

The immediacy really [Male, referred to GP, Portsmouth 1]

The test gave me peace of mind [Male, Portsmouth 1]

They came to my workplace and did the test, so it was good [Female, not referred to GP, Portsmouth 1]

Only one interviewee who commented could not identify a positive benefit:

None really because when I did the test I was told I have the lungs of an 80 year old but my GP said that my lungs did not look like the lungs of a smoker My GP said that I should not worry about it, because he did not believe the test and he said that COPD was very uncommon for my age [Male aged 40, referred to GP, Portsmouth 1]

7.4. Views of patients collected by the respiratory nurse who provided on-going support to pharmacy staff

Smoking cessation and positive changes for better health

On being referred and subsequently diagnosed with COPD, a man revealed that he had been quietly worried about how he was beginning to notice breathlessness. He saw this as an opportunity to make positive changes for his future by stopping smoking

To be honest, I will be walking out of here quite pleased as I now know I have to keep off the cigarettes. I have the chance to see my golden wedding anniversary in 3 years' time and enjoy my retirement. You have allayed my fears. Will you follow this up? Will I see you again?

Indeed, for many interviewed, the screening for COPD had provided an incentive to stop smoking

If I hadn't had the test, I might not worry about carrying on with smoking

That's it. I'll never touch another cigarette again

I never knew cannabis could harm me so much. I had stopped smoking tobacco regularly a while back, but kept this as it seemed harmless. I stopped drinking years ago, so cannabis is my only vice and I won't be doing that anymore. When people talk about the harm of it (cannabis) they talk about your mind – never your lungs

I'm using my e-cigarette like a dummy – I can't stop sucking on it

I have stopped smoking (pause) well unless you count vaping

So what you are saying is I have a chance to stop this irritation in my small airways developing into lung disease if I stop smoking now? I know I can't go back, but I could help myself for the future?

An opportunity for early diagnosis

One patient said that but for the pharmacy based COPD screening he would never have been diagnosed:

Are you going to keep offering this (service)? I would never go to my GP with these symptoms as they don't seem bad enough. It seems like a good thing to give people the chance for this test sooner rather than later.

It is clear that many patients are reluctant to bother their GP with symptoms that they do not consider sufficiently serious; hence the great number of undiagnosed COPD cases.

8. EXPERIENCE OF THE PHARMACISTS

8.1 Key points

Education, learning and development

- A total of 27 out of 29 pharmacists received mandatory training delivered in five sessions to which they added individual study and looking up published papers. Some also received cascade training from the respiratory nurse mentor. Feedback from those who attended the training sessions highlighted a demand for smaller groups with a greater focus on individual needs and a simplified model of training to include key information about when and how to set up the service and how to recruit patients. A total of 85 pharmacy team members also received on site support and additional one to one training from the nurse mentor.

Recruiting patients

- Some pharmacies found it difficult to recruit patients. However, the screening service was felt to be really beneficial to the public and pharmacists described some extremely grateful patients and the fact that some patients came in asking to be screened because they had heard of the service. However, many patients agreed to return to be screened but never came back.

Referrals to GPs

- Communication with GPs was deemed poor by four of the seven pharmacists interviewed (57%), fair by one (14%) and good by two (29%). Referring patients was often perceived as difficult and a struggle particularly because of a lack of understanding by GPs about what the project was about and the lack of a structured platform for communication between GPs and community pharmacists. Many patients failed to make an appointment to see their GPs.

Negative and conflicting views of the COPD screening service

- On being asked their views about community pharmacy services for (opportunistically) screening for COPD in general and whether this type of service was suitable in community pharmacies, five out of the seven pharmacists surveyed had either had negative (n=2) or conflicting (n=3) views. Reasons ranged from the small size of a pharmacy, disinterested patients, target population too narrow and a lack of sufficient time to undertake COPD, lack of consultation with pharmacists before embarking on the project, waste of money, service being duplicated and lack of collaborative approach between pharmacists and GPs

Community of practice

- There was evidence from the data collected by the nurse mentor of an emerging idea of community of practice (as defined by Lave and Wenger 1991). Two pharmacies benefitted from the input of specialist respiratory nurses who helped with referring patients to their GPs. Three pharmacists and three counter staff in three different localities agreed to support any other local pharmacist with both of their services and two pharmacists used this support. A pre-registration pharmacy student developed a card for advertising the service to recruit patients which was disseminated to all pharmacies within the monthly LPC pharmacy newsletter.

8.2 Background Information

Seven pharmacies took part in telephone interviews covering 7 out of 223 patients screened and three out of 39 follow-ups visits (See table 8).

Table 8

Patients screened and follow-up visits for pharmacies that took part in the telephone semi-structured survey

Pharmacy	Number of patients screened	Number follow up visits
Portsmouth 3	4	3
Basingstoke 2	1	0
Portsmouth 4	2	0
Portsmouth 5	0	0
Totton 2	0	0
Farnborough 2	0	0
Eastleigh	0	0
TOTAL	7	3

Despite numerous attempts, pharmacists in 3 pharmacies [Portsmouth 1, Basingstoke 1 and Andover] [totalling 152 patients screened and 23 follow up visits] could not be successfully contacted (See table 9). One of the pharmacies that could not be successfully contacted, Andover, included seven out of the total of eight patients diagnosed with COPD who had received support. Two pharmacies that were successfully contacted which counted nine patients screened and two follow-up appointments declined to participate [Basingstoke 3 and Portsmouth 2] (See table 9)

Table 9
Pharmacists that undertook screenings but did not take part in semi-structured telephone survey

Pharmacy	Attempts at contact	Number of patients screened	Number follow up visits
Portsmouth 1	9 unsuccessful attempts at contact	115	11
Andover	10 unsuccessful attempts	31	12
Basingstoke 1	8 unsuccessful attempts at contact	6	0
Total patients screened and follow up visits		152	23
Basingstoke 3	Contacted but not interested	1	0
Portsmouth 2	Contacted but not interested	8	2
Total patients screened and follow up visits		9	2
Farnborough 1	Not contacted	21	6
Totton 1	Not contacted Views via nurse mentor	32	5
Totton 2	Not contacted	2	0
Total patients screened and follow up visits		55	11
Andover 2	pharmacist had left	0	0
Yateley	pharmacist had left	0	0
Aldershot	pharmacist had left	0	0
	TOTAL	216	36

Four pharmacies were not contacted that counted 55 patients screened and 11 follow-up appointments [Totton 1, Farnborough 1 and Totton 2,] (See table 9).

However, the views of the Totton 1 pharmacist (32 screenings and at least five follow-up appointments) were collated via the nurse mentor while the views of pharmacy staff from Portsmouth 1 that counted the greatest number of patients screened were shared with Dr A Dewey who also interviewed three other pharmacists that took part in the telephone survey.

8.3. Views of pharmacists who took part in the telephone survey

Education, learning and development

Six of the seven pharmacists had attended training in COPD support. The one who indicated that they had not attended such training had not screened any patients. Only two pharmacists said that they had attended training in COPD case-finding/spirometry, neither of whom subsequently screened any patients.

One pharmacist mentioned having received cascade training from the nurse mentor [Portsmouth 3] and one pharmacist also referred to in-house training [Portsmouth 4].

On a scale 1-5 with 1 excellent, 2 good, 3 average, 4 fair and 5 poor, the quality of the training was deemed excellent by five pharmacists [Portsmouth 3, Portsmouth 4, Farnborough 2, Eastleigh and Basingstoke 2 and good by two pharmacists [Totton 2 and Portsmouth 5]

Five pharmacists said no when asked if they could suggest any change to the training. One underlined that it was *very comprehensive* [Portsmouth 3] and one pointed out that the *time was not sufficient for the training* [Portsmouth 5]

Recruiting patients

Only 2 pharmacists [Portsmouth 3 and Portsmouth 4] said that they had been able to offer COPD screening, each to two patients. The other five pharmacists had not practised spirometry on any patients. Two of them underlined that they had practised spirometry on pharmacy staff members [Basingstoke 2 and Farnborough 2]³

³ Data provided by the LPC showed that City screened 4 patients and that Lloyds in Basingstoke screened one patient. The additional three screenings may have been performed after pharmacists were interviewed or by another pharmacist or counter staff.

Two pharmacists whose pharmacies had not screened any patients acknowledged difficulty in recruiting patients for the COPD screening service.

I have found it difficult to recruit clients. I identified patients but nothing came out of it [Totton 2]

Ninety-nine percent of the patients have already been diagnosed [Eastleigh]

No pharmacist mentioned that suitable patients had refused COPD screening or that there had been a need to delay screening some patients because of contra-indications. The two pharmacists [Portsmouth 3 and Portsmouth 4] who had screened patients did not report difficulties in explaining the service, completing the consent form or discussing referrals.

Four pharmacists, only one of whom had screened any patients, said they had no difficulty using the mini-spirometry device, whether on patients or on staff. Two pharmacists who screened zero [Basingstoke 2] and two patients [Portsmouth 3] each respectively said they had a few difficulties. One pharmacist said the question was not applicable to them as they had not screened anyone [Totton 2]

COPD screening/case-finding

When asked their opinions about community pharmacy services for (opportunistically) testing for COPD in general and their views as to whether this type of service was suitable in community pharmacy, only 2 pharmacists had definite positive views and thought it was *pretty good* [Eastleigh] or *a good idea* [Portsmouth 3], none of whom had screened any patients. The other five pharmacists had negative (n=2) [Totton 2 and Portsmouth 5] or conflicting (n=3) views [Portsmouth 4, Basingstoke 2 and Farnborough 2] about community pharmacy COPD case finding.

We have a small pharmacy and patients were not interested [Portsmouth 4, two patients screened]

The target population was too narrow for us [Portsmouth 5, zero patients screened]

Great – if it is focussed on repeat prescription and existing patients [Basingstoke 2 and Farnborough 2, zero patients screened]

I don't think pharmacy is the right place for this service. It is however a great idea and I don't think we had enough time to get really involved. [Totton 2, zero patients screened]

I think patient would have benefited from it a lot if we had sufficient time [Portsmouth 3, two patients screened]

On a scale 1-5 with 1 excellent, 2 good, 3 average, 4 fair and 5 poor, five pharmacists thought the design of the community pharmacy COPD screening service good and two fair. The two pharmacist with the less positive views had not screened any patients.

On being asked whether the eligibility criteria were suitable, one pharmacist commented that *the target population was too narrow* [Portsmouth 5, zero patients screened]

There is no data on whether pharmacists found the written materials useful and what they thought of the recording system (i.e. PharmOutcomes) used in the service. Only two of the pharmacists surveyed had actually screened any patients and only two each [Portsmouth 3 and 4].

Asked about the impact of the COPD screening service and suggestions for improvement, pharmacists had mixed views

The team enjoyed the training and patients are happy to discuss the service with us [Portsmouth 3, two patients screened]

I would have liked to be more involved. The service is a good idea but due to locality patients were not interested [Portsmouth 4, two patients screened]

Talk to the people in the frontline about their opinion before embarking a project like this. I think it is a waste of money [Totton 2, zero patients screened]

If you continue with the project, there has to be collaborative approach between the GPs and us. I think the service is being duplicated [Eastleigh, zero patients screened]

Communication with GPs

Pharmacists had mixed views about communication with GPs. On a scale 1-5 with 1 excellent, 2 good, 3 average, 4 fair and 5 poor, four pharmacists said communications with GPs were poor, all of whom had screened zero patient [Totton 2, Eastleigh, Farnborough 2, Portsmouth 5]. One pharmacist said communications with GPs were fair [Basingstoke 2, zero patient screened] and two pharmacists said relationships with GPs were good, both with two patients screened [Portsmouth 3 and 4].

GPs cannot be bothered. They do not have time [Totton 2, zero patients screened]

We have struggled to refer patients to them [Portsmouth 5, zero patients screened]

Leaving the pharmacy is impossible because we are so busy and there has been no communication between us and the GPs [Farnborough 2, zero patients screened]

An additional reason for poor communications was, as previously indicated in response to other questions, that GPs had a *lack of knowledge about the project* and that they were also engaged in case finding and early diagnosis of COPD which meant that *the service is being duplicated* [Eastleigh, zero patients screened].

8.4. Views of pharmacists collected by the nurse mentor

Education, learning and development

A total of 27 out of 29 pharmacists received mandatory training delivered in five sessions to which they added individual study and looking up published papers. Some also received cascade training from the respiratory nurse mentor. A total of 85 pharmacy team members also received on site support and additional one to one training from the nurse mentor. Feedback from those who attended the training sessions highlighted a demand for smaller groups with a greater focus on individual needs and a simplified model of training to include key information about setting up the service and recruiting patients.

Recruiting patients/Referrals to specialist nurses

Pharmacies in Totton benefitted from the input of specialist respiratory nurses who helped with referring patients to their GPs.

The pharmacist from Totton 1 stated that from Nov 2014 until March 2015, a total of 31 patients were screened which resulted in a number of referrals and

At least five people with confirmed COPD. [...] We had a dedicated team of respiratory nurses in our area which made it really helpful when referring on.

Communication with GPs

Many pharmacists suggested that the lack of a structured platform for communication between GPs and community pharmacists was a barrier to communication and that GPs did not understand what the project was about. Another problem was that many patients failed to make an appointment to see their GPs.

COPD screening/case finding

The pharmacist from Totton 1 expressed extremely positive views:

We found the service to be really beneficial to the public and patients [and this] makes it a shame it that has been decommissioned.

The patients were *extremely grateful* especially those subsequently diagnosed with COPD, *with all coming in and thanking Lyn who performed the COPD screenings.*

Overall we were really pleased with the service and we hope that this will be commissioned again in the near future as we feel this is the start of something that can lead to a full COPD screening and management service being delivered through pharmacy.

Patients seeking early diagnosis

The pharmacist from Totton 1 underlined that some patients had heard of the service and came in asking to be screened. *They were actually asking us for the test rather than us approaching them because they had heard of the service.* However, on the other hand, some pharmacists pointed out that many patients agreed to return to be screened but never came back.

Community of practice

Within and between some pharmacies, there was evidence of an emerging idea of community of practice (as defined by Lave and Wenger 1991). Three pharmacists and three counter staff in three of the different localities agreed to support any other local pharmacist with both of their services as part of a 'buddy network'. Two pharmacists used this support. A pre-registration pharmacy student developed a card (with the support of the nurse mentor) for advertising the service to recruit patients which was disseminated to all pharmacies within the monthly LPC pharmacy newsletter.

The pharmacist from Totton 1 emphasised

We are also ready and willing to act as mentors for other pharmacies to assist them in delivering the service.

One of the objectives of the study had been to develop pharmacists with special interests within the community to act as local leaders in the future roll out of this service to other community pharmacies. This shows that while some pharmacists had negative views of the COPD case finding service, others not only had very positive views, but wanted to help other pharmacies in delivering the service.

9. CONCLUSIONS

223 screened by 11 pharmacies with at least 39 at high risk of COPD or 17.4% referral rate

This project aimed to identify undiagnosed COPD patients and improve respiratory care for patients with COPD. The objectives can be summarised as improvement of early accurate diagnosis of COPD disease, increased effective self-management and patient education, reduced inequalities and variation in patient services, improvement of patients' experience of care, improvement in patients' quality of life, improved referral routes and access to specialist services across Wessex and improved medicines optimisation/self-care which will reduce avoidable hospital admissions and improve patient outcomes.

A total of 223 patients were screened, 39 patients attended follow-up visits and eight patients diagnosed with COPD received support. Estimated figures for referral for full spirometry testing of patients potentially undiagnosed with COPD and identified to be at high risk of COPD was 17.4% (See table 6) while the referral rate for the sample of patients surveyed by telephone was 23.3% (See table 7)

Findings broadly mirror the findings of some other similar studies

These estimated figures very broadly mirror those found in previous similar studies of COPD case finding by community based pharmacies. Castillo *et al* (2009) in a pilot feasibility study (prospective, cross-sectional, descriptive, uncontrolled) found that out of 161 patients screened for COPD in 13 urban community pharmacies, only 21 (13.0%) demonstrated airflow limitation [FEV1/FVC ratio < 0.7] and were offered referral to a hospital respiratory clinic for further assessments. Castillo *et al* (2015) in a much larger follow up study found a slightly higher percentage of potentially undiagnosed COPD. Out of a sample of approximately 1,456 patients, a total of 282 (19.8%) showed airflow limitation [FEV1/FVC ratio < 0.7] and 244 (16.7%) were advised to contact their GP for further clinical evaluation and conventional spirometry.

Other studies, such as that of Harper (2013) had a much higher referral rate with 57% of people screened identified as being at higher risk of COPD. Wright *et al* (2015) reported a similar referral rate. Out of 238 clients screened by 21 pharmacies in Wirral across all socio-demographic areas, 135 (56.7%) were identified as being at higher risk of COPD [n=85 FEV ratio <80%, n=39 FEV <70 and n=71 from GOLD questionnaire].

If applied to all pharmacies in England, the referral rate for further investigation of 17.4% would have saved the NHS £74.4m

Using the same theoretical model as Wright et al (2015) who found that if 50 % of screenings resulted in referrals to GP and this was applied to all community pharmacies in England (n=11,100), then the NHS would save £214 million. With this model, even a 1.74% referral rate which equates to just under four referrals would bring about NHS savings of £7.4 million if applied to all community pharmacies in England. One referral in each of 11,100 community pharmacies in England would save the NHS £1.8 million. The estimated minimum 17.4% referral rate in this study would save the NHS £74.4m.

Wright et al (2015) calculated that savings per patient screened by community pharmacies could be estimated to be £392.67. Applying this assumption to the present study and to the 223 patients screened would give savings of £87,565.41. However, it is acknowledged that these economic models are based on assumptions that may not reflect reality (Atsou et al 2011 quoted in Wright et al 2015).

Early diagnosis and better care of health

COPD case finding by community pharmacies provides health benefits such as early diagnosis and hence reduced healthcare care costs. The views of the 30 patients surveyed about their experience of the COPD case-finding service were extremely positive. In particular, patients who would not have gone to their GP with their symptoms had access to a COPD screening service, with 17.4% referred for further investigation and an unknown percentage of these subsequently diagnosed with COPD. Referred and non-referred patients become more aware of the consequences of continuing smoking and of the importance of taking better care of their health and many took active steps towards achieving this.

Greater cost effectiveness in areas of higher prevalence

Undertaking COPD case finding in community based pharmacies may be more cost effective in areas of high prevalence of COPD. It is to be noted that 133 of the total 227 screenings (58.5%) took place in four Portsmouth based pharmacies and that the pharmacy with the greatest number of patients screened [n=115] was based in Portsmouth. (See table 1a).

According to Hill et al (2009) South Central Strategic Health Authority have a lower than average recorded and estimated prevalence of COPD. However there were high rates in Portsmouth and Southampton City Primary Care Trusts. The potential underestimation of COPD was especially high in Portsmouth and Southampton City.

10. LIMITATIONS OF THE STUDY

Health economics and cost effectiveness not included as specific objectives and outcomes

The project aimed to gain data to demonstrate how high quality, cost effective respiratory care can be provided in the community. However, the framework agreement, project initiation document and evaluation plan did not include health economics and a cost-benefit analysis under its stated objectives and outcomes. In the framework agreement under information on cost effectiveness and value for money, it was stated 'not applicable'.) (See appendix 1)

Shortcomings in availability of data

The only data available for service delivery and service reach consisted of the total number of patients screened by each pharmacy covering the period November 2014 to October 2015 (n=196) and the total number of follow up appointments for the same period (n=39) as well as the number of patients screened between May 2014 and October 2014 by pharmacy which totalled 223.

A total of 28 pharmacies were signed up to provide the screening service. They had responded to a call asking pharmacies in Hampshire and Isle of Wight to come forward and register an expression of interest if they were interested in taking part in the project.

Pharmacists from 27 pharmacies attended the mandatory training and acquired enhanced respiratory knowledge and skills. The total number of staff trained for screening is unknown as is the precise content of the training sessions and how many sessions were attended and by whom. Participant feedback was only available for one out of the three training sessions that took place, a planned fourth training session having to be cancelled because nobody has signed up for it.

Despite screened patients being asked their date of birth and GP details and hence the postcode their GP when they signed the consent form, no demographic data is available from PharmOutcomes in relation to age, gender of patients and postcode of GP. Wright et al (2015) found that the 238 patients screened for COPD in 21 community pharmacies in the Wirral region had a mean age of 51.2 years and that 141 out of 238 patients screened were women (59.2%).

No data was available from PharmOutcomes in relation to

1. the number tested who achieve a FEV₁ less than 80% of predicted value
2. their lung age

3. whether they were referred to their GP (or to a specialist nurse for pharmacies in Totton) for fuller spirometry testing
4. the number of patients who accepted the offer of smoking cessation and were referred to specialist smoking services
5. the number of patients who stopped smoking
6. the number of patients identified as having “red flag” symptoms
7. the number of people tested who reported an alternative diagnoses e.g. asthma, lung cancer
8. the number of confirmed diagnoses for COPD

Items 1-4 were included in the patient leaflet/questionnaire, so should be more available than item 5 that required systematically following up the patients. Items 6-7 have not been used as outcome measures in previous similar studies so would be more difficult to obtain as they require following up patients even more systematically.

The only data available for phase two of the study, which pertained to the support service for patients diagnosed with COPD, is that eight patients were recorded as having received support (seven in Superdrug in Andover and one in City Pharmacy Portsmouth). There is no available data about the number of structured respiratory MURs [Medicines Use Reviews] and NMS [New Medicine Service] provided and changes in patient CAT Scores [COPD Assessment Test Scores].

Data about gender had to be derived from the names of patients with only two patients in the overall sample for whom the name did not indicate with a reasonable degree of certainty the gender of the patient. The gender profile of the overall sample (n=175) excluded 48 patients for which data was not available.⁴ The gender profile of the patients who took part in the telephone survey was markedly different from the gender profile of the overall sample. The gender profile of the overall sample was 44.2% women 54.8% men and 1.1% unknown (See table 5) while the gender profile for Wright et al (2015) was 59.2% women and 40.8% men. The gender profile for the sample of 30 patients who took part in a telephone survey was 87.7% male (n=26) and 13.3% female (n=4) (See table 7).

No data were available about the age of the patients who took part in the telephone survey. Collecting this data (as well as data about gender and ethnicity) was included in the first version of the survey questionnaire, but not in the final version.

⁴ Data was only available for patients screened between May 2014 and July 2015 excluding 14 patients screened between August and October 2015 and 34 patients who attended two pharmacies in West Totton and Totton

Assumptions had to be made in relation to referrals to GPs

As it can reasonably be inferred that the patients attending follow up appointments had in fact been referred to their GPs, a minimum referral rate of 17.4% was calculated (See table 6). Many patients referred for further investigation may not have returned to the pharmacy for a follow-up appointment and may not have actually made an appointment to see their GP despite being identified as high risk of COPD, hence a 'minimum' referral rate.

Harper (2013), Wright et al (2015) and Castillo et al (2009, 2015) only indicate the number and percentage of patients referred for further investigation and not the number and percentage of confirmed diagnoses or the number and percentage of those who did not make an appointment with their GP. This study aimed to find out the number and percentage of confirmed COPD diagnoses as well as alternative diagnoses which would have provided meaningful data and generated greater insights into the cost-effectiveness and benefit of COPD case finding by community pharmacies in Hampshire.

Data about referral to GP was not available for five of the 30 patients who took part in the telephone survey. Regarding the referral rate to GPs, the profile of the overall sample and that of the patients surveyed by telephone differed, but not very markedly. The minimum referral rate for the overall sample of patients screened (n=223) was 17.4% (See table 6). The minimum referral rate for the sample of patients surveyed by telephone was 23.3% (See table 7) which is broadly similar to Castillo et al (2009) and Castillo et al (2015) with 13% and 16.7% respectively, but very different from Harper (2013) Wright et al (2015) who described referral rates of 57% and 56.7% respectively.

Small sample sizes

The number of pharmacies that undertook screenings was relatively small (n=11) with a smaller number (n=6) that undertook follow-up appointments. Four pharmacies [Portsmouth 1, Totton 1, Andover, Farnborough 1] screened all but 24 patients. Also, one pharmacy [Portsmouth 1] screened just over half (51.5%) the patients (n=115 out of 223).

The number of patients who took part in the telephone survey was relatively small (13.4%) (n=30 out of 223). The number of pharmacists that took part in the telephone survey (25.9%) was very small (n=7 out of 27 pharmacies that undertook the mandatory training). Two out of the seven pharmacists surveyed by telephone had screened two patients [Portsmouth 3 and 4] each and other five had screened no patient.

11. RECOMMENDATIONS

Conduct robust economic evaluation

More studies are needed to compare effectiveness and cost-effectiveness of pharmacy-based screening with screening by other providers (Ayorinde et al 2013). However, a robust economic evaluation is required to be included in all studies in order to make warrantable claims about health economics rather than using models that may not be based in reality, which has been a shortcoming in many studies (e.g. Atsou et al 2011; Wright et al 2015).

Minimise the potential unavailability of data

It was always been known and acknowledged that there would be risks associated with the project, such as false positives/negatives from COPD screening, failure to engage GPs and respiratory care teams, pharmacists signing up to the service and not being able to deliver, failure to target appropriate patients, failure to engage with patients and patients lost to follow up. The lack of data captured on PharmOutcomes was not anticipated to be a risk as the LPC was the key stakeholder leading the project, yet it is the major shortcoming of the study. A minimum data set included in the patient leaflet/questionnaire and consent form such as date of birth, location of GP practice, smoking status and interest in smoking cessation was not available, making it impossible to meaningfully evaluate the project and compare the findings with other similar studies e.g. Harper (2013), Wright et al (2015) and Castillo et al (2001, 2015).

There is a clear need to take steps to minimise the potential unavailability of data, particularly data necessary to make reliable health economics calculations i.e. on smoking cessation and referrals to GPs i.e. how many referrals, whether patients did make an appointment with their GI and whether patients identified as high risk of COPD were subsequently diagnosed with COPD or with another respiratory condition i.e. asthma and lung cancer. Such data not only enables comparison with other similar studies, but can also add meaningfully to the relatively little amount of what is known about the effectiveness of COPD case finding and support by community pharmacies.

Maximise engagement of community pharmacies

More effort should be spent in future to maximise engagement of the community pharmacies involved in the project. The study was undertaken in a 'live' practice environment with the many pressures that practitioners face. Future studies need to accommodate for this. Community pharmacies should be made 'research' or 'evaluation ready' before a similar project is implemented.

Despite signing the Service Level Agreement that specified under 4.6 *the pharmacy will participate in an audit of the service and will provide feedback on the project*, only seven pharmacists took part in the semi-structured telephone survey. Staff turnover was such that in three instances, pharmacists had left by the time they were contacted for interview.

Since the structural framework in which community pharmacies operate relies on the leadership from area managers, in future the latter should be contacted to seek their explicit support with community pharmacy based projects.

During the training and upskilling of pharmacy staff, there should be an emphasis on: how to recruit patients; potential barriers to be faced by the team undertaking the project and how to overcome these; the importance of collecting and recording data and maintaining the integrity of the data. Too long a gap between training and the start of the project should be avoided as it can dampen enthusiasm and create unnecessary barriers.

Feedback from pharmacists in relation to all training sessions held should be systematically collected and analysed.

Ensure better control of the ownership of the data

The Hampshire and IoW LPC was not a named signatory to the framework document. However, the two representatives from the LPC were project lead and main project support respectively. The participating pharmacies clearly benefitted from the study in terms of equipment purchased, up-skilling of pharmacy staff and the opportunity to act as local leaders should the service have been rolled out, not to mention receiving service payments for screenings performed.⁵

Notwithstanding a better strategy to maximise the engagement of pharmacies, anonymised data (such as spirometry readings, lung age, age of patients, smoking status, intention to stop smoking and hence referral to smoking cessation service) is essential to compare the findings with those of similar projects. In future, how the data is to be owned, collected, collated and handled should be explicitly described. Patient information leaflets would benefit from being phrased in a less restrictive way to facilitate access to the data. Patients should be advised when they consent to participate that anonymised data they provide might be used by the project team for the purpose of evaluating the service.

⁵ Training costs for participants were recognised in the funding that was made available. For example, backfill costs of 45 pharmacists to attend training/refresh sessions, 30 licences paid for PharmOutcomes and service payments were to be given (100 screens and support for 15 patients at each of the 30 pharmacies). The project also facilitated the upskilling of 30 engaged community pharmacies to deliver a respiratory care package and added additional capacity for early diagnosis and self-care with the aim of developing pharmacists with special interests within the community to act as local leaders in the future roll out of this service to other community pharmacies, yet there was no data, beyond that underlined in this report, made available for the evaluation of the project (See Appendix 1, pp37-40)

Ensure better accountability of key stakeholders involved

As AstraZeneca, Wessex AHSN and Hampshire & IOW LPC worked together to improve respiratory outcomes and improving case finding of COPD in primary care, then all three stakeholders should have been signatories to the framework document, and the resources committed to the project made available in a timely manner.

Pharmacists from three pharmacies (total of 55 screenings and 11 follow-up visits) were seemingly not contacted for the semi-structured telephone interviews (See table 9 page 20).

Make sure to collect data on referral for further investigation rates, confirmed diagnoses as well as alternative diagnoses

Unlike previous published research such as that of Harper (2013), Wright et al (2015) and Castillo et al (2009, 2015), this study aimed to find out the number and percentage of confirmed COPD diagnoses and alternative diagnoses, which would have provided highly meaningful data and generated greater insights into the cost-effectiveness and benefit of COPD case finding by community pharmacies in Hampshire. Harper (2013), Wright et al (2015) and Castillo et al (2009, 2015) provide smoking cessation referral rates and the number of those who have stopped smoking, which were also outcome measures for this study. This too would have generated greater insights and enable to make more warrantable claims about cost effectiveness.

Any future COPD case finding study should ensure that data about confirmed cases of COPD or other alternative diagnoses e.g asthma and lung cancer are collected and collated as the lack of such data in published studies constitute a clear gap in the literature on community pharmacy based COPD case finding.

Develop a toolkit for projects involving community pharmacies.

This would be helpful to maximise the success of future projects.

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APPENDICES

Appendix 1

FRAMEWORK DOCUMENT SIGNED BY ASTRAZENECA AND WESSEX AHSN [Summary]

Community Pharmacy Respiratory Disease Screening and Support was intended to be a joint working project between Wessex AHSN and AstraZeneca

The estimated total costs were £145,617. Some of the costings for this project are calculated to understand the resourcing needed for planning and implementation of the project to ensure equitable resource from both parties and no monies will be exchanged.

DIRECT AND INDIRECT RESOURCES /COST COMMITMENTS BY EACH JOINT WORKING PARTNER

For AstraZeneca:

- Dedicated project support (time allocation) from NHS Relations Lead
- Delivery of clinical mentoring support in up to 30 pharmacies

For AstraZeneca, this project will require an estimated

- 15 NHS Relations Lead days
- 36 Clinical Nurse days
- 10 Account Manager days

The clinical and project management for AstraZeneca can be estimated at approximately £28,896.

AstraZeneca has also provided £10,000 sponsorship to support with Phase II of the project. The combined clinical, project management and sponsorship costs for AstraZeneca can be estimated at approximately £38,896.

For Wessex AHSN:

- Programme Management Office support from RQIP Lead
- The programme management for Wessex AHSN can be estimated at £33,696

For Wessex AHSN, this project will require

- Dedicated project support (50 days)
- Equipment (30 devices)
- Training including backfill of 45 pharmacists to attend training/refresh sessions

- PharmOutcomes (30 Licenses)
- Service payments (100 screens and support for 15 patients at each of the 30 pharmacies)

The combined project management and implementation costs for phase I and phase II can be estimated at approximately £106, 721.

Regular review of resourcing and costs would take place at steering group meetings and WAHSN Advisory Board meetings. Information on cost effectiveness indicates that 'cost effectiveness' and 'value for money' were 'not applicable' for this project.

The contract is dated May 2014. The contract owner is Dan Evans, Head of Government and NHS affairs, at AstraZeneca the lead representatives are Rachel Dominey Senior Projects Manager Respiratory Quality Improvement Programme (Wessex AHSN), Rachel Ainsworth, NHS Relations Lead (Astra Zeneca) and Amin Deiry, Account Manager (Astra Zeneca).

Objectives

1. Improvement of early accurate diagnosis of COPD disease
2. Increased effective self-management and patient education
3. Reduced inequalities and variation in patient services
4. Improvement of patients' experience of care
5. Improvement in patients' quality of life
6. Improved referral routes and access to specialist services across Wessex

Outcomes

For the Patient:

- The project will gain data to demonstrate how high quality, cost effective respiratory care can be provided in the community.
- It will improve respiratory health for patients and reduce inequalities in respiratory care
- Improved medicines optimisation/self-care will reduce avoidable hospital admissions and improve patient outcomes
- Patients will be able to receive care at a location and time convenient to them through improved access (patient choice)

For the Institution:

- The project will facilitate the upskilling of 30 engaged community pharmacies to deliver a respiratory care package
- The project will add additional capacity for early diagnosis and self-care

- It will develop pharmacists with special interests within the community to act as local leaders in the future roll out of this service to other community pharmacies
- It will develop and pilot a commissioning model for respiratory disease screening and support from community pharmacy

For AstraZeneca:

- Working in partnership with Wessex Academic Health Science Network and Hampshire & Isle of Wight Local Community Pharmacy to improve patient care to demonstrate AstraZeneca's commitment beyond our medicines.
- A successful project with proven outcome measures will allow us to share best practice across the UK.
- Improvement of AstraZeneca corporate reputation and trust with the NHS and patients.
- More appropriate use of all relevant medicines according to NICE guidelines including those of AstraZeneca.

Outcome measures

- Number of pharmacies signed up to provide service
- Number of pharmacists with enhanced respiratory knowledge and skills
- Number of pharmacy staff trained for screening
- Number of lung function screening tests performed
- Number of people tested who achieve a FEV1 less than 80% of predicted
- Number of people tested who are referred to specialist smoking services
- Number of people tested who are referred to their GP for fuller spirometry
- testing
- Number of people who are identified as having "red flag" symptoms and
- referred to their GP for investigation
 - Number of patients followed up 3 months post intervention
 - Number of patients with confirmed COPD diagnosis and treatment following
- referral
 - Number of people tested who report stopping smoking
 - Number of people tested who report an alternative diagnoses e.g. asthma, lung cancer

Under the governance arrangements of the framework agreement, it is specified that the parties consulted prior to initiating the joint working project were representatives of AstraZeneca, Wessex AHSN and Hampshire and IOW LPC and it is also specified that the project was a collaboration between AstraZeneca, Wessex AHSN and Hampshire and IOW LPC *working together to improve respiratory outcomes.*

The governance arrangements refer to the creation of a joint working reference group and makes certain specifications in relation to the decision making process within the joint working project (to be open and transparent). The joint working reference group will consist initially of

- Rachel Dominey: Wessex AHSN Senior Research Manager for Respiratory Quality Improvement Programme
- Sarah Billington: LPC Chief Officer and Project Lead
- Felicity Mitchell: LPC Communications Lead and Project Support
- Rachel Ainsworth: NHS Relations Lead [AstraZeneca]
- Amin Deiry: account manager/integrated communications support [AstraZeneca]

The framework agreement specifies that the joint working reference group is responsible for scoping out the project feasibility and for monitoring and evaluating the project in respect of benefit to patients and evaluating the success of the overall project.

The section on operational management and accountabilities underlines that

Sarah Billington, Project Lead, is the overall lead for the operational workstream of the Community Pharmacy Respiratory Disease Screening and Support, responsible for the governance of the operational programme and for service payments.

Felicity Mitchell, Project Support, is responsible for the project design, for communication with and the engagement of community pharmacies, for training, design and delivery and implementation of the project, and for providing Community Pharmacy support.

The Wessex AHSN Project Initiation Document for Pharmacy Respiratory Disease Screening and Support indicates that Sarah Billington LPC Chief Officer is the Project Lead and that Felicity Mitchell LPC Communications Lead is the Project Support and that Wessex AHSN will also provide Project Support.

Appendix 2

Evaluation Plan [summary]

Aims

- To assess the extent to which pharmacy teams have identified undiagnosed COPD patients (screening) and improved respiratory care and lung health across Hampshire
- To provide a focussed initial analysis that will help guide future commissioning decisions and shape and support the delivery of community pharmacy services in Wessex and beyond.

Objectives

1. To facilitate early accurate diagnosis of COPD by making access to hand held micro-spirometry easier and quicker to improve local prevalence.
2. To support patients to stop smoking including by improved referral routes and access to specialist smoking cessation services and to improve patient quality of life
3. To establish collaborative working relationships between healthcare professional to improve lung health
4. To suggest improvements for future adaptions of such interventions

Timeframe: phase 1 [Apr 2014-March 2015] and phase 2 [Sept 2014-Aug 2015]

Scope: 28 pharmacies

Data collection instruments/key outcome measures:

Phase 1 [mostly Apr 2014-March 2015 except for 'follow up' items]

Service delivery:

- number of pharmacies and type and location and Health Living Pharmacy status [FM]
- number of lung function tests performed [FM]

Service reach:

- number screened achieving FEV less than 80% predicted
- demographics and details of clients [FM]

Service impact [FM/participating pharmacies]

- number of pharmacy team members attending training and/or networking events [anecdotal comments and feedback at end of such]

- referrals for further investigation [count, % of all screened, referral to: GP, nurse led spirometry and assessment service or urgent referral for red-flag symptom]
- number of clients diagnosed [count, COPD, asthma, lung cancer, ENT condition, under investigation, other] [follow up] July 2014-June 2015
- referral to specialists smoking cessation services [in house, external, comparison with previous years]
- 4 week quit rates [in house, external, comparison with previous years] [follow up] July 2014-June 2015
- Local COPD prevalence rate [rates at GP? practice level and comparison with previous years]
- Local hospital admissions rates for first presentation of COPD [rates at GP? practice level and comparison with previous years] [FR]

Participants' views and experience:

- Structured/semi-structured phone interviews of clients who had benefitted from the intervention [comfortable with venue and staff, satisfied with content and delivery, feel service is valuable and relevant*] [CIS/CP/LPC/FM] April-July 2015
- Structured/semi-structured phone interviews with pharmacy teams [impact on knowledge and awareness, views on service including appropriateness, delivery and impact and effects on collaborative working [CIS/CP] April-July 2015
- Reports from nurse mentor during on-site support visits [FM] July 2014-July 2015

Phase 2 [mostly Sept 2014-Aug 2015]

Service delivery [FM/participating pharmacies]

- number of pharmacies and details type and location and Health Living Pharmacy status [FM]
- number of consultations delivered
- number of patients dropped out of service
- number of additional interventions delivered to clients [MURs, NMS, 'flu vaccination', smoking cessation]

Service reach [FM/participating pharmacies]

- number of clients registered with the service
- demographics and description of clients [age, gender, location, diagnosis date, smoking status/history, BMI, anxiety and changes following intervention]
- stage of disease of clients

Service impact [FM/participating pharmacies]

- number of pharmacy team members attending training and/or networking events [anecdotal comments and feedback]
- number of clients with diagnosis confirmed by spirometry [+ changes following intervention]
- client reported CAT score [+ changes following intervention]
- referrals to other services [specialist smoking cessation, pulmonary rehab, IAPT services, GP]
- Smoking cessation [how many]
- Number with up to date vaccinations [+ changes following intervention]
- Number of clients who attended PR course [maintenance class and changes following intervention]
- Number of clients who attended annual COPD review in last 12 months [+ changes following intervention]
- Number of clients with identified medication issues [medication type and changes following intervention]
- Number of clients with SMOs/rescue medication score [+ changes following intervention]
- Patient reported rates of exacerbations [self-management, GP, hospital admission]
- Local hospital admissions rates for exacerbation of COPD [comparison with previous year] [FR]

Participants' views and experience

- Structured/semi-structured phone interviews of clients who had benefitted from the intervention [comfortable with venue and staff, satisfied with content and delivery, feel service is valuable and relevant*] [CIS/CP/LPC/FM] Apr-July 2015
- Structured/semi-structured phone interviews with pharmacy teams [impact on knowledge and awareness, views on service including appropriateness, delivery and impact and effects on collaborative working] [CIS/CP] Apr-July 2015
- Reports from nurse mentor during on-site support visits [FM] July 2014-July 2015

Appendix 3

PATIENT QUESTIONNAIRE [Final version]

What is the survey about?

This survey is about your experience as a patient at your local pharmacy.

You are invited to take part in a survey about the service you received in your local pharmacy where you received a lung function / breathing test (the patient may not be aware it was for chronic obstructive pulmonary disease COPD). Your feedback is very important in helping us to understand the care you received and for future service improvement.

Participation in the survey is voluntary and it should take about 15-20 minutes to complete. If you choose not to take part, it will not affect the service you receive from your local pharmacy in future. The pharmacy will not know if you respond, and all answers are **entirely confidential**.

Your personal data are held in accordance with the Data Protection Act 1998 and our Confidentiality Code of Practice.

If you would like more information or have any questions please call [.....]

Response grid

- A poor
- B fair
- C average
- D good
- E excellent

Tell us about your visit

1. Which pharmacy did you visit?
If don't know prompt from s/sheet of pharmacies
2. Please tell us about the service you received from your local pharmacy during this visit (the one they had the breathing / lung test)?
3. Please tell us how satisfied you were with the screening service provided to you by the pharmacist? If answered b or c, can you tell me why
4. How helpful was the service you received during your last visit?
(4a) What was the most helpful part of the service?

(4b) What was the least helpful part of the service?

5. Were you treated with respect
6. Were you referred to your GP
7. Were you given clear information
8. In your opinion, what are the benefits of having this service at your local pharmacy?
9. Overall, on the scale of 1-5 (with 1 = Poor and 5 = Excellent) how satisfied were you with the service provided by your local pharmacy?
10. Would you recommend this service to others?
11. What other service or services would you like your local pharmacy to offer?
12. Any other comments about this service?

Thank you very much for your help

Appendix 5

PHARMACIST QUESTIONNAIRE

Name of Pharmacy:

Name staff member:

1. What training did you received before starting these services in your pharmacy?
2. What do you think of the training your received?
3. Can you suggest any changes to the training which might better prepare you to deliver these services?
4. Please describe your opinions about community pharmacy services for (opportunistically) testing for COPD in general. For example do you think this type of service is suitable in community pharmacy?
5. Have you been able to offer this screening test to anyone?
6. Were there any instances where you needed to delay or refuse screening due to contraindications, or where suitable clients refused screening?
7. How did you find communicating with clients about the service? Please describe. For example, did you have any difficulties explaining the service, completing the consent form discussing any referrals?
8. How did you find using the [COPD] mini-spirometry device? Please describe.
9. What do you think about the design of the community pharmacy COPD screening service? For example, do you think the eligibility criteria are suitable, did you find the written materials useful, what is your opinion of the recording system (i.e. PharmOutcomes) used in the service?
10. Please describe your general opinion about community pharmacy services offering enhanced support for patients with COPD. For example, do you think this type of service is suitable in community pharmacy?
11. Have you been able to off the COPD support service to anyone? Please describe your experiences of recruiting patients to the service.

12. What do you think about the design of the community pharmacy COPD support service? For example, do you think the eligibility criteria are suitable, did you find the written materials useful, what is your opinion of the recording system (i.e. PharmOutcomes) used in the service?

13. How have you found communicating with local general practice team about these services? Please describe your experiences

14. Do you have any other comments about this [these] service[s], including, for example the impact you felt the service has had, the strengths and weaknesses of this [these] service[s] or any further suggestions for changes, enhancements or improvements?

Appendix 6

Table 6
Overview of screenings, follow-up appointments and support provided

Pharmacy	Screened % (N)	Follow-ups % (N)	Support % (N)
10. Portsmouth 1	52.4 (119)	11 (28.2)	0
11. Totton 1	14.1 (32)	5 (1.2)	0
12. Andover	13.6 (31)	12 (30.7)	7 (87.5)
13. Farnborough 1	9.2 (21)	6 (15.3)	0
14. Portsmouth 2	3.5 (8)	2 (5.1)	0
15. Basingstoke 1	2.6 (6)	0	0
16. Portsmouth 3	1.7 (4)	3 (7.6)	1 (12.5)
17. Portsmouth 4	0.9 (2)	0	0
18. Totton 2	0.9 (2)	0	0
19. Basingstoke 2	0.4 (1)	0	0
20. Basingstoke 3	0.4 (1)	0	0
TOTAL	227	39	8