

THE CONTRIBUTION OF COMMUNITY PHARMACY TO IMPROVING THE PUBLIC'S HEALTH:
SUMMARY REPORT OF THE LITERATURE REVIEW
1990–2007



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Figure 1: Evidence summary of where community pharmacy can contribute to improving the public's health

Claire Anderson
 Professor of Social Pharmacy
 Division of Social Research in Medicines and Health
 School of Pharmacy,
 University of Nottingham.

Alison Blenkinsopp
 Professor of the Practice of Pharmacy,
 Department of Medicines Management,
 Keele University.

Miriam Armstrong
 Chief Executive,
 PharmacyHealthLink.

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1.0 INTRODUCTION

This report presents a summary of findings from a review of evidence published in peer-reviewed journals between 1990 and 2007 on the contribution of community pharmacy to improving the public's health. This document brings together the evidence identified from a series of literature reviews covering the periods 1990–2001, 2001–2004 and 2004–2007.¹ This summary focuses on evidence of effectiveness, quality, costs/cost-effectiveness and skill mix of potential relevance and application to community pharmacy in the UK.

2.0 METHODS

A systematic search of international peer-reviewed literature was undertaken covering the period 1 January 1990 to 31 October 2007. The aim was to review, summarise and evaluate the evidence relating to the contribution of community pharmacy to improving the public's health both in the UK and internationally. The scope of the review is described in detail elsewhere (Anderson et al. 2001) and studies included related to:

- promoting health and wellbeing (eg nutrition, physical activity);
- preventing illness (eg smoking cessation, immunisation, travel health);
- identifying ill health (eg screening and case finding);
- the maintenance of health for those with chronic or potentially long-term conditions (e.g. diabetes, asthma, hypertension).

The search strategy and search terms are listed in detail elsewhere (Anderson et al. 2001; Anderson et al. 2005). All searches included non-English language literature. Studies with English abstracts were assessed for inclusion on the basis of the abstract. Hand searches were made of the *Health Education Journal*, *Pharmaceutical Journal*, *International Journal of Pharmacy Practice*, *Journal of Social and Administrative Pharmacy*, *Pharmacy World and Science*, *Annals of Pharmacotherapy*, *British Pharmaceutical Conference* abstracts.

The quality criteria and data extraction frameworks used are described in detail elsewhere (Anderson et al. 2001). Briefly, the review used two approaches to assess the quality of evidence: (1) The Health Development Agency's Evidence Base 2000 for standards of transparency, systematicity and relevance (Health Development Agency 2000); and (2) the evidence categorization used by the Department of Health in its National Service

Frameworks (NSFs) (Department of Health 2001) and shown in Table 1.

TABLE 1. EVIDENCE CATEGORISATION USED IN THE REVIEW

A1	Systematic reviews which include at least one randomised controlled trial (RCT) e.g. Cochrane reviews
A2	Other systematic and high quality reviews which synthesise references
B1	Individual RCTs
B2	Individual non-randomised experimental/intervention studies
B3	Individual well-designed non-experimental studies, controlled statistically if appropriate. Includes studies using case control, longitudinal cohort, matched pairs or cross-sectional random sample methodologies, plus well-designed qualitative studies and well-designed analytical studies including secondary analysis
C1	Descriptive and other research and evaluation not in B (e.g. convenience samples)
C2	Case studies and examples of good practice
D	Summary review articles and discussions of relevant literature and conference proceedings not otherwise classified

All abstracts were reviewed by AB and CA and papers ordered for the studies to be included in the review. Data were extracted using a structured matrix, with a sample of reviews cross-checked to assure accuracy.

In total 196 papers were reviewed (see Table 2) and the extracted data were compiled into three matrices to show the country of origin (see Tables 3-5) for each review period.

The focus of this report is the future development of community pharmacy in the UK. The narrative therefore concentrates on studies of relevance and potential applicability to the UK. A full list of references is included at the end of this document.²

TABLE 2. NUMBERS OF PAPERS AND TOPIC AREAS INCLUDED IN THE REVIEWS³

TOPIC	1990-2001	2001-4	2004-7	Totals
SMOKING CESSATION	7	9	20	36
CVD PREVENTION	14	5	15	34
DIABETES	3	-	12	15
HYPERTENSION	-	2	3	5
WEIGHT MANAGEMENT	1	1	5	7
CONTRACEPTION (INCLUDING EHC)	4	20	13	37
SEXUAL HEALTH	-	6	6	12
FOLIC ACID IN PREGNANCY	2	4	-	6
SUBSTANCE MISUSE	8	-	8	16
OSTEOPOROSIS PREVENTION	-	5	8	13
IMMUNISATION	5	-	2	7
ORAL HEALTH	3	-	-	3
SKIN CANCER	3	-	-	3
ASTHMA	1	-	-	1
HEAD LICE	1	-	-	1
TOTAL	52	52	92	196

TABLE 3. COUNTRIES OF ORIGIN OF STUDIES INCLUDED IN THE REVIEWS: 2004–2007

TOPIC	UK	Europe	US	Canada	Australia & New Zealand	Other	Total
SMOKING CESSATION	2	2	5	4	3	4	20
CVD PREVENTION	2		3	10			15
DIABETES	1	3	3	2	3		12
HYPERTENSION			2			1	3
WEIGHT MANAGEMENT			5				5
CONTRACEPTION (INCLUDING EHC)	6	2	4	1			13
SEXUAL HEALTH	2	1	2			1	6
SUBSTANCE MISUSE	6				2		8
OSTEOPOROSIS PREVENTION			6		1	1	8
IMMUNISATION	1		1				2
TOTAL	20	8	31	17	9	7	92

¹Anderson, C, Blenkinsopp, A, Armstrong, M (2003). *The contribution of community pharmacy to improving the public's health: Evidence from the peer-reviewed literature of 1990–2001*. London, PharmacyHealthLink and Royal Pharmaceutical Society of Great Britain. www.phlink.org.uk/ (Accessed 16/3/08).

Anderson, C, Blenkinsopp, A, Armstrong, M (2003). *The contribution of community pharmacy to improving the public's health: Evidence from the UK non peer-reviewed literature of 1990–2002*. London, PharmacyHealthLink and Royal Pharmaceutical Society of Great Britain. www.phlink.org.uk/ (Accessed 16/3/08).

Armstrong M, Lewis R, Blenkinsopp A, Anderson C (2005). *The contribution of community pharmacy to improving the public's health: An overview of the evidence-base from 1990-2002 and recommendations for action*. London, PharmacyHealthLink and Royal Pharmaceutical Society of Great Britain. www.phlink.org.uk/ (Accessed 16/3/08.)

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Anderson C, Blenkinsopp A, Armstrong M (2008). *The contribution of community pharmacy to improving the public's health. Literature review update 2004–2007*. London, PharmacyHealthLink. www.phlink.org.uk/ (Accessed 16/3/08.)

²Studies are only cited in this summary when their findings are particularly relevant to this report. The previous PharmacyHealthLink reviews, or the original research articles, should be consulted for a more detailed review of the literature.

³The matrices exclude papers on factors influencing community pharmacy involvement in public health activities.

TABLE 4. COUNTRIES OF ORIGIN OF STUDIES INCLUDED IN THE REVIEWS: 2001–2004

TOPIC	UK	Europe	US	Canada	Australia & New Zealand	Other	Total
SMOKING CESSATION	3		5		1		9
CVD PREVENTION	3		1		1		5
DIABETES							-
HYPERTENSION		1		1			2
WEIGHT MANAGEMENT			1				1
CONTRACEPTION (INCLUDING EHC)	8	2	6	3		1	20
SEXUAL HEALTH	4	1	1				6
FOLIC ACID IN PREGNANCY	1	2		1			4
SUBSTANCE MISUSE							-
OSTEOPOROSIS PREVENTION	1		3		1		5
IMMUNISATION							-
TOTAL	20	6	17	5	3	1	52

TABLE 5. COUNTRIES OF ORIGIN OF STUDIES INCLUDED IN THE REVIEWS: 1990–2001

TOPIC	UK	Europe	US	Canada	Australia & New Zealand	Other	Total
SMOKING CESSATION	4	2	1				7
CVD PREVENTION	6		5	1	1	1	14
DIABETES	1	2					3
HYPERTENSION							-
WEIGHT MANAGEMENT		1					1
CONTRACEPTION (INCLUDING EHC)	3		1				4
SEXUAL HEALTH							-
FOLIC ACID IN PREGNANCY	1	1					2
SUBSTANCE MISUSE	6		2				8
OSTEOPOROSIS PREVENTION							-
IMMUNISATION		1	4				5
ORAL HEALTH	2					1	3
SKIN CANCER PREVENTION		1	1	1			3
ASTHMA	1						1
HEAD LICE	1						1
TOTAL	25	8	14	2	1	2	52

3.0 RESULTS

3.1 SMOKING CESSATION

Thirty-six papers were reviewed.

Overview of the evidence:

- Community pharmacist trained in behaviour-change methods are effective in helping clients stop smoking (B1).
- Community pharmacy-based stop smoking services are cost-effective (B1).
- Abstinence rates from one-to-one treatment services provided by community pharmacists and primary care nurses are similar. Rates are lower for specialist one-to-one advice than group interventions with specialist behavioural support. (B3).
- Training increases knowledge, self-confidence and positive attitude of pharmacists and their staff in relation to smoking cessation (B1).
- Involving pharmacy support staff may increase the provision of brief advice and recording of smoking status in patient medication records (B3).

Community pharmacy-based stop smoking services, run by trained pharmacy staff are effective and cost-effective. Abstinence rates at one year in two UK RCTs of community pharmacy-based stop smoking services were 14.3% (Maguire et al. 2001) and 12% (Sinclair et al. 1998). A large UK study using a quasi-experimental design with 1500 participants and validated abstinence found similar abstinence rates at four weeks (19%) for people receiving the service on a one-to-one basis from community pharmacists and primary care nurses, compared with 30% for those receiving a group treatment service from ‘behaviour change experts’ (McEwen et al. 2006). The authors commented that the difference may be due to the additional behavioural support given by the latter.

There is some evidence of effectiveness of the involvement of pharmacists in smoking cessation in hospital pharmacy and prison settings, and of the feasibility of using a computer programme as the basis for a community pharmacy-based smoking cessation service. A pharmacist-led smoking cessation service initiated from a hospital pharmacy and continued at outpatient visits, or in a community pharmacy, was assessed using a randomised controlled trial design (Vial et al. 2002). The 12-month abstinence rates were 38% in the hospital group and 24% in the community group. A computer-based service (Pro-Change) was tested in a community pharmacy setting with the aims of improving local access to services and to engage low income and unemployed smokers in quit attempts (Anderson & Mair 2002). Access was improved compared with a general practice-based service, and

programme users included a large proportion of people on low incomes or without work.

A US study tested the feasibility of a protocol to target specific people for questioning and giving ‘brief interventions’ (akin to giving ‘brief advice’ in the UK) about smoking in two community pharmacies (Purcell et al. 2006). The smoking status of 57% and 29% of eligible people was recorded in the two pharmacies.

3.1.1 QUALITY

Quality criteria developed in two studies could be used further to develop frameworks for UK services.

A quality criteria assessment framework developed in a Scottish study included 13 elements: cessation rates of 30% (one month); 28% (three months); 14.3% (one year); and in those not abstaining, to achieve a reduction in smoking levels; improve access to smoking cessation services; client groups from areas of inequality; client satisfied with the service; successful use of the ‘stages of change’ model; ensure ongoing written material is available; subjective estimate of reduced workload in general practice; avoid increasing time pressure on pharmacists; pharmacists satisfied with service; achieve a cost of £300 per quitter (Cramp et al. 2007). Six of the 13 criteria were achieved: improved access; clients satisfied with service; successful use of ‘stages of change’ model; one month 30% success rate; three months 28% success rate; and, in those not abstaining, achieve a reduction in smoking levels.

A quality framework for advice during sales of over-the-counter nicotine replacement therapy (NRT) developed in Norway had 12 criteria (six relating to customer service and six on content of pharmaceutical advice) (Granås et al. 2004). A mystery shopper study found a mean score of 17.3 (of a possible 45) on a first visit and 16.2 on the second visit, highlighting there were areas for improvement.

3.1.2 COSTS AND COST-EFFECTIVENESS

The cost per quitter was £525 in a Scottish study, compared with the quality criterion of £300 in that programme (Cramp et al. 2007). In other studies costs were £300 or £83 per life-year saved (Sinclair et al. 1999) and cost per life-year saved ranged from £197 to £351 for men and £181 to £722 for women (Crealey et al. 1998). A study modelling cost-effectiveness of a US community pharmacy-based service (Tran et al. 2002) found that, depending on the smoker’s age at the time of cessation, the incremental discounted cost-effectiveness was US\$720–1418 per life-year saved (the equivalent cost was US\$290–1155 in the Crealey study based on the 1997 exchange rate).

3.1.3 SKILL MIX AND TRAINING

Training, especially in behaviour change methods, was found to be essential to the success of pharmacy stop smoking services. Without training pharmacists are more likely just to respond to smokers' requests for advice rather than to proactively initiate conversations about smoking (Sinclair et al. 1998).

In a US study, the pharmacy which involved its dispensing technicians in implementing a protocol for offering brief interventions (brief advice in the UK) and recording smoking status, had recording rates and numbers of interventions roughly double those in the pharmacy that did not use technicians (Purcell et al. 2006).

There is potential benefit to be gained from a whole staff approach in community pharmacy, although there are no comparative data for when pharmacists alone have provided the service.

3.1.4 ATTITUDES AND PRACTICE

There is consistent evidence across the review period that pharmacists are apprehensive about proactively raising smoking with their customers but that after training, pharmacists' practice becomes more proactive.

Two surveys of US community pharmacists provided further confirmatory evidence of the tendency among most pharmacists to adopt a reactive approach towards smoking cessation (Kotecki & Hillery 2002; Aquilino et al. 2003). When asked whether it was important to know if a patient smoked, the vast majority of pharmacists agreed that it was. However, only one in ten had any systematic method of obtaining this information and recording it in a way that made it easily accessible when the patient next presented a prescription.

One study from Canada (Brewster et al. 2005) and another from Australia (Edward et al. 2006) explored pharmacists' attitudes, and a further study from the US (Purcell et al. 2006) investigated actual practice in relation to unsolicited questioning and advice about smoking. Most pharmacists did not routinely ask about or record the smoking status of their customers. Pharmacists in the Canadian and Australian studies were apprehensive about raising the topic of smoking cessation and expressed some concerns about alienating their customers.

3.2 CARDIOVASCULAR DISEASE PREVENTION

Thirty-four papers were reviewed.

Overview of the evidence:

- Pharmacy services are effective in reducing lipid levels and cardiovascular risk scores and the effect can be sustained one year after the intervention ended (B1).
- Evidence from an RCT of effectiveness of a pharmacy service resulted in significantly increased prescribing of anti-platelet medicines, lipid-lowering treatment, and smoking cessation treatments (B1).
- Using pharmacy medication records to identify clients at 'high risk' of coronary heart disease (CHD) is effective and can be used for instigating health promotion measures (B1).
- A workplace based cardiovascular risk reduction programme provided by community pharmacists significantly reduced blood pressure and improved lipid profiles but had no effect on weight (B2).
- A community pharmacy-based service where peer health educators measured blood pressure and completed cardiovascular risk profiles for people with hypertension was well received by patients and GPs (B2).
- There is insufficient evidence to determine whether or not 'screening' activities (e.g. blood pressure measurement) carried out in community pharmacies are an effective use of resources (B3).

3.2.1 EFFECTIVENESS

A series of Canadian studies have investigated the effectiveness of community pharmacy-based intervention in CVD risk-factor reduction focused on lipid management. An RCT tested the effects of community pharmacist intervention on lipid management in 'high risk' CVD patients (Tsuyuki et al. 1999, 2002; Simpson et al. 2001). The primary endpoint was a composite measure of a complete fasting cholesterol profile, addition of lipid-regulating medication or modification of previous lipid-regulating medication. Secondary outcomes were patient satisfaction and quality of life. Community pharmacists in 44 pharmacies held a consultation with patients identified as 'high risk' during which a cholesterol test was conducted, information was provided on risk factors and recommendations were made to the patient's doctor about medication changes. The external data committee recommended early study termination due to benefit, the primary endpoint being reached in 58% of intervention patients compared with controls ($P < 0.001$).

The second Canadian Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP Plus) trial was a 'before and after' study of the effects of pharmacist intervention in lipid management (Yamada et al. 2005). Forty-two pharmacies recruited 419 patients

to the study. The mean reduction in LDL level was 0.5 mmol/L from a baseline mean of 3.5 mmol/L, representing a 13.4% reduction in relative risk, and 27% of patients reached their target LDL level. One year after completion of SCRIP Plus, patients were followed up and their LDL cholesterol measured. The mean LDL level was not significantly different from that one year earlier showing that the improvement was sustained. Nevertheless, most patients still had not reached their target LDL level.

The Canadian Pharmacist Intervention in Risk Reduction (PIRR) trial used a 'before-after' design (Semchuk et al. 2007). Forty-one pharmacies recruited 217 patients. The primary outcome was the proportion of patients with changes in targeted medication. There was a significant increase in the prescribing of anti-platelet and lipid-lowering treatments and of smoking cessation treatments. This trial was ended early due to under-recruitment.

An RCT was conducted in a single community pharmacy with 51 patients (Nola et al. 2000). Patients were those already taking medication for hypertension and/or diabetes and were identified through the pharmacy computerised patient medication records (PMRs). Patients attended a 'screening day' where a nurse took blood samples that were tested off-site. The pharmacist advised on diet, exercise and medication. Risk factor profiles improved in the intervention but not in the control group, with 32% of patients in the former and 15% in the latter achieving target cholesterol levels.

A workplace-based cardiovascular risk reduction programme provided by community pharmacists led to significant reductions in systolic and diastolic blood pressure readings, and in LDL, but had no significant effect on weight loss (John et al. 2006). Fifty-six workers with risk factors for cardiovascular disease took part, of mean age 41 years. Thirty-seven had diabetes mellitus and 19 did not. The number of pharmacist visits per participant ranged from one to thirteen, with a mean value of seven.

In the Cardiovascular Health Awareness Programme (CHAP) in Canada, people aged over 65 years with hypertension were invited by their doctor to attend a session in their local pharmacy with a trained volunteer peer health educator (PHE) (Chambers et al. 2005). The PHE measured their blood pressure and completed a cardiovascular risk profile. A copy of the findings was given to the pharmacist and faxed to the doctor. Feedback from doctors, PHEs and pharmacists was positive and the pharmacists reported increased patient traffic and more dialogue with patients. An RCT of CHAP was recently completed and the findings are due to be published.⁴

Two audits of aspirin purchases in UK community pharmacies in 1996 and 1998 showed that 33% and 27% of patients respectively appeared to be taking prophylactic aspirin without their GP's knowledge (Horne 1998). Interviews with 128 patients purchasing low-dose aspirin or taking it on prescription found that community pharmacists were viewed as a highly acceptable source of information about aspirin and heart disease (Black et al. 1998). Just over half of the patients viewed the community pharmacy as a suitable venue to obtain information about aspirin, with the remainder expressing some concern about privacy.

3.2.2 COSTS

The costs of providing a community pharmacy-based risk reduction service were calculated (Simpson et al. 2001). The 10-year Framingham risk decreased in the intervention group by 5.2% (from 17.3% to 16.4%) during the four-month study period. The costs to the pharmacy for providing the service were \$22 (Canadian dollars) per patient and the costs to healthcare funders were \$6.40.

3.2.3 ACCEPTABILITY TO THE PUBLIC

In two small UK studies, a single community pharmacy worked in collaboration with local GPs. In one study, GP records were used to identify people who were likely to be 'at risk' and were invited to have an assessment in the pharmacy (Joubert & Choo 2003). This appears to be the first programme to have targeted people in collaboration with, and thus with the support of, local doctors. Roughly half of the people assessed were found to need referral back to the GP and the remainder received lifestyle advice. In around half of those assessed, changes in medication were recommended and implemented or initiation of new treatment was recommended and started. Unfortunately no data were reported on outcomes of the lifestyle advice provided. Another study in a single community pharmacy used risk assessment software with referral to the GP where needed (David et al. 2003). For those clients advised by the pharmacist there was a significant improvement in risk score at three months but this was not sustained at six months.

3.3 DIABETES

Fifteen studies, including two reviews, were included.

Overview of the evidence:

- There is evidence of effectiveness of diabetes management services provided from pharmacies, leading to a significantly greater reduction of approximately 1% in HbA1c compared with 0.3% in controls (A1).
- Evidence from an RCT that pharmacy-based targeting of people with risk factors for diabetes, incorporating 'point of care' blood

⁴Jones et al. (2008): paper published after the review period, but systolic blood pressure in the intervention group showed statistically and clinically significant sustained improvement.

glucose testing prior to referral, was more effective and more cost-effective than targeting and referral alone (B1).

- A diabetes screening and cardiovascular risk assessment service resulted in new diagnoses for 16% of those referred, and therapy changes in 42% (B2).
- Community pharmacy-based diabetes monitoring and information-giving shows promise in improving diabetic control, but further research is needed (B2).
- Pharmacy-based group education for people with diabetes shows promise but more evidence is needed (B3).

3.3.1 EFFECTIVENESS

A systematic review (Machado et al. 2007a) with meta-analysis of data from 2247 patients in 16 studies found a significant reduction in HbA1c levels in the pharmacists' intervention group ($1.00 \pm 0.28\%$; $P < 0.001$) but not in controls ($0.28 \pm 0.29\%$; $P = 0.335$).

Subsequent to this systematic review, an Australian study was published that tested the effectiveness of a community pharmacy-based diabetes service in controlled trials (Krass et al. 2007a); 149 patients received the intervention at 28 pharmacies. The trial showed statistically and clinically significant reductions in HbA1c of 0.97% (compared with 0.27% in controls).

Pharmacy-based screening for undiagnosed diabetes was the subject of three studies (Australia, the US and Switzerland). The US study included diabetes testing together with CVD risk assessment (Snella et al. 2006). The Australian and US studies used simple risk factor assessment as a filter prior to diabetes screening and involved testing of 1286 and 888 people respectively (Snella et al. 2006; Krass et al. 2007b). The Swiss paper reported findings from a national screening campaign in which 93,258 people were tested (Hersberger et al. 2006). Follow-up to identify subsequent diagnoses was conducted only in the Australian study, where 1.7% of those tested were diagnosed as having diabetes. In the US study 81% of those screened were referred, 15% of whom had blood glucose measurements outside the defined range. In the Swiss campaign 6.9% of those tested were categorised as 'possible diabetes'.

A community pharmacy-based group education model for people with diabetes was tested in a Swedish study (Sarkadi & Rosenqvist 1999). HbA1c levels among 39 patients who had participated in eight educational groups for at least five months were significantly lower at six but not at 12 months.

3.3.2 COSTS AND COST-EFFECTIVENESS

A cost-effectiveness analysis was done for 99 patients who had received the pharmacy-based diabetes service in the earlier of the two Australian trials (Taylor et al. 2005). Pharmacists were paid \$40 (Australian dollars, approximately £18) per hour. The mean cost of the intervention over nine months was \$383 (Australian dollars, approximately £175) per patient.

The cost-effectiveness of pharmacy-based risk assessment plus blood glucose testing ('sequential screening', SS) in generating a diagnosis of diabetes was compared with pharmacy-based risk assessment with referral to the GP for blood glucose testing in an Australian study (Krass et al. 2007b). The rates of diagnosis were 1.7% and 0.2% respectively. The SS method resulted in fewer referrals to the GP, a higher uptake of referrals and was more cost-effective.

3.4 HYPERTENSION

Five studies, including one systematic review, were included.

Overview of the evidence:

- A systematic review with meta analysis of 13 RCTs covering 2246 patients found significant reductions in systolic, but not diastolic, blood pressure (A1).
- Simply measuring blood pressure in the pharmacy may in itself have an effect on blood pressure control without additional intervention (B1).

A systematic review included 13 trials and found evidence of effectiveness of pharmacist input in significantly reducing systolic blood pressure (Machado et al. 2007b).

A randomised controlled trial in one community pharmacy tested an intervention comprising an individualised plan for action in relation to diet, physical activity, obesity and alcohol intake (Garcao & Cabrita 2002). Blood pressure control improved significantly in the intervention group. It is difficult to assess the impact of the non-drug aspect of the intervention as the pharmacists also identified and made recommendations about drug-related problems. A controlled study showed that blood pressure control improved in the intervention arm of a community pharmacy-based 'health promotion programme' (Cote et al. 2003). Computer software was used to flag study patients and prompt pharmacists to intervene. So few interventions were recorded by the pharmacists that the researchers hypothesised that simply measuring blood pressure in the pharmacy may have an effect on control.

A single community pharmacy offered free blood pressure testing to people aged 30–64 years with the pharmacist inviting individuals to take part (Hampton et al. 1990). The 70 clients were given a copy of their results to take to their doctor. The GP records of 40 clients were subsequently checked and the pharmacy blood pressure reading was recorded in 10 clients. GP attitudes were explored in interviews, where the response was noted by the authors to be 'not enthusiastic'. The authors concluded that pharmacist measurement of blood pressure and referral to a GP was unlikely to be accepted unless part of a co-ordinated programme.

3.5 WEIGHT MANAGEMENT

Seven studies were reviewed.

Overview of the evidence:

- Community pharmacy-based weight reduction programmes appear to show promise but further evidence is needed (B3).

Two of three intervention studies showed a positive effect while the third showed no significant change in weight.

A service provided in a single pharmacy in the US resulted in a mean weight loss of 3.6 kg among 216 people over a mean duration of 26 weeks (Lloyd et al. 2007). One in three people were able to decrease their BMI category, and one in four decreased their CVD risk status. Blood pressure in those with uncontrolled hypertension at baseline was more likely to be controlled. The service involved an initial consultation with the pharmacist (scheduled for 1.5 hours) followed by 15-minute fortnightly follow-ups until target weight was reached, and then a three-monthly follow-up. The service was provided free during the study period and is now offered on a fee-paying basis.

In a Swiss study, 3800 people who had participated in a community pharmacy-based diabetes screening, were invited to take part in a programme of lifestyle counselling. Of the 1370 who took part, the mean weight lost was between 0.6 and 1.9 kg at three months. People in the high-risk counselling group (245) showed weight loss of 2.25% at three months and 2.74% at one year (Botomino et al. 2007).

In addition to the specific studies on weight management, weight reduction was one of several outcome measures in a workplace health-improvement programme where community pharmacists provided education about cardiovascular disease, identification of drug therapy problems, and the importance of routine blood pressure, pulse and weight measurements (John et al. 2006). No significant effect on weight was found.

One study showed that a community pharmacy-based weight loss programme had successful outcomes at three months (Ahrens et al. 2003). In a Danish study 19 community pharmacies provided 'slimming courses' attended by 269 clients (Tubro 1999). Average weight loss (self-reported by clients measured on scales in the pharmacy) was 5.3 kg for females and 6.2 kg for males. At one-year follow-up 20% of clients who completed the course had maintained a weight loss of 5 kg or more.

3.6 CONTRACEPTION AND SEXUAL HEALTH

3.6.1 CONTRACEPTION

Thirty-seven studies were included, two of which were structured reviews.

Overview of the evidence:

- Emergency hormonal contraception (EHC) can be effectively and appropriately supplied by pharmacists (B3).
- Pharmacy supply of EHC enables most women to receive it within 24 hours of unprotected intercourse (B3).
- Community pharmacies are highly rated by women as a source of supply and associated advice for EHC on prescription, by Patient Group Directions (PGDs), or over-the-counter (OTC) sales (B3).
- A small minority (10%) of women, choose pharmacy supply of EHC in order to maintain anonymity (B3).
- Pharmacists were positive about their experience of providing emergency hormonal contraception through PGDs and over-the-counter sales (B3).
- The role of pharmacy support staff in provision of EHC services is reported by pharmacists to be important, but there are no data available to enable assessment of their contribution (B3).

During the period of the review there were legal changes and developments in NHS service provision that enabled the supply of EHC through UK community pharmacies without prescription. Latterly the community pharmacy contractual framework (introduced in England in 2005) led to a large increase in the proportion of pharmacies with a consultation area.

Pharmacy supply of EHC enables most women to receive it within 24 hours of unprotected sexual intercourse and are highly rated by women. One UK study, following the deregulation of EHC, has shown a subsequent decrease in requests for EHC in Accident and Emergency departments (Kerins et al. 2004). Training has been shown to improve pharmacists' performance in supply of EHC in accordance with protocols (Bacon et al. 2003) and mystery shopping has indicated that pharmacists supply is according to protocols in the majority of cases (Anderson et al. 2001). Pharmacists are very satisfied with delivering EHC services and

view them as a way to improve their role in patient-focused care (Bissell et al. 2006). Some pharmacists have concerns about the potential for repeated use of EHC, and the possible effect of easier access to EHC, on the incidence of sexually transmitted infections (STIs) (Bissell et al. 2001).

Making EHC available OTC did not change the level of use, but did change where women obtained it from, with more women using pharmacies as the source (Marston et al. 2005). A large US trial of advance availability of EHC found no increase in risky sexual behaviour and no significant reduction in the number of pregnancies (Rocca et al. 2007). No differences were observed in use of regular contraception or in risky sexual behaviour by women obtaining EHC from pharmacies (Raine et al. 2005), and adolescents aged younger than 16 years behaved no differently in response to increased access to EHC from other age groups (Harper et al. 2005).

Pharmacy services were in general highly rated by women. There were some concerns about confidentiality and privacy among a substantial minority of users, particularly among younger women (Anderson et al. 2005). In general, the way in which services are configured affects their use, with women preferring services that give them privacy whilst treating them in a sympathetic and non-judgmental manner. It is worth noting that many of the studies were conducted prior to the increase in availability of consultation areas in pharmacies. Some concerns were also reported by service users about the appropriateness of additional and unsolicited information and advice from pharmacists about future contraceptive use and STIs.

Repeat depot contraceptive injections were provided by 26 pharmacies in the US with pharmacists trained in injection technique (Maderas & Landau. 2007). Established depot users were offered the choice of having their injection at a pharmacy rather than at their usual clinic. The service was found to be feasible and acceptable to the public.

The majority of community pharmacists in a US survey reported dispensing prescriptions for contraception for adolescents, but over half felt inadequately trained in dealing with adolescent-specific issues. The authors concluded that most pharmacists are inadequately trained in this respect and younger adolescents, in particular, may face more barriers to care than older adolescents.

3.6.2 SEXUALLY TRANSMITTED INFECTIONS (STIs)

Twelve studies were reviewed.

Overview of the evidence:

- Public interest in the availability of advice on contraception and safe sex through pharmacies is high (B3).
- Quality and confidentiality were identified by service users as important considerations in selecting a pharmacy for advice on women's health (B3).
- Pharmacists express support for involvement in promoting safer sex and contraception, but are rarely asked for such advice, and are reluctant to offer it (B3).
- Pharmacists generally have positive attitudes towards involvement in prevention of transmission of infection (B3).
- Community pharmacy-based Chlamydia testing and treatment services increase client access (C1).

Two UK surveys (Ralph et al. 2001; Watson et al. 2003) examined pharmacists' attitudes to providing sexual health services and one US survey looked at pharmacy services for adolescents. Watson et al. (2003) surveyed 99 of the 128 pharmacists in Grampian, Scotland and found that as part of their services to drug users, nearly all stocked condoms. Fifty-seven stated that they stocked extra-strong condoms and two stocked dental dams. Lack of training, time pressures and a lack of private consultation areas were the major barriers to service provision in this survey. Most pharmacies stocked relevant leaflets, but fewer than half had a list of agencies dealing with sexual health problems.

Two papers (McAllister et al. 2002; Mackie et al. 2002) evaluated the acceptability and accessibility of a sexual health service for young people in a city centre pharmacy in Glasgow. Users of the service were either satisfied, or very satisfied with it, and the timing and location of the service were the most commonly quoted reasons for attendance.

Two pilot studies, one from the UK (Baraitser et al. 2007) and one from the Netherlands (Van Bergen et al. 2004), demonstrated the feasibility of providing Chlamydia screening through community pharmacies. The authors of the UK study conclude that the provision of Chlamydia testing in community pharmacy seemed to increase access to testing among those who would not otherwise have been tested, and could potentially reduce demand in other sexual health services, and that community pharmacies are a suitable location for Chlamydia testing and treatment. Clients valued speed and convenience in the service and a friendly, non-judgmental approach. Further work is required to encourage uptake by young men and in improving confidentiality at the pharmacy counter. The Dutch study also found a pharmacy-based Chlamydia testing service to be feasible and acceptable to service users.

3.7 FOLIC ACID AND PREGNANCY

Six studies were reviewed.

Overview of the evidence:

Pharmacy staff are positive about promoting the role of folic acid in pregnancy, but there is no published evidence of the effects of interventions on behaviour (B3).

Pharmacy staff are positive about promoting the role of folic acid in pregnancy but are likely to perceive it as a sensitive topic (Rajyaguru & Anderson 1999). A study exploring the attitudes of pharmacy staff to discussing folic acid use with customers during an information campaign, showed that staff were more likely to raise the subject with their regular customers (Anderson & Rajyaguru 2002).

One in three Dutch pharmacists reported using an additional label about folic acid when they dispensed oral contraceptives (De Jong-Van den Berg et al. 1999). Influencing factors included perceptions of the attitudes of medical practitioners and pharmacists' own concerns about 'imposing' unsolicited information on women.

An action research study showed that using a core team in participating pharmacies, and sharing feedback from staff and customers from a folic acid education campaign, resulted in refinement and development of the pharmacy-based activities (Meijer et al. 2003). Feedback from women who received information labels plus leaflets about folic acid when their contraceptive pill was dispensed showed that very few responded negatively.

3.8 SUBSTANCE MISUSE

Sixteen studies were reviewed.

Overview of the evidence:

- Most drug users value community pharmacy-based services highly (B3).
- Community pharmacy-based supervised methadone administration services can achieve high attendance rates and be acceptable to clients (B3).
- Positive attitudes among pharmacists are correlated with higher service provision for drug users (B3).
- Pharmacy-based needle-exchange schemes can achieve high rates of returned injecting equipment and are cost-effective (B3).

Several studies were surveys tracking the service provision of needle exchange and methadone-supervised administration in pharmacies in England and Scotland. Substantial increases in provision over time were found (see for example, Britton et al.

2006; Matheson et al. 2007).

For pharmacists not involved in service provision for drug misusers, the key barriers were concerns about the effects on other customers, safety, workload and remuneration (Matheson & Bond 1999). There is some evidence from a qualitative study that pharmacy customers may hold more positive attitudes about services for drug misusers than pharmacists expect (Lawrie et al. 2004). The authors of this study concluded that their participants seemed to have a clearer understanding of the need for needle exchange services than for methadone maintenance treatment and that the public wanted methadone administration to be supervised in a private area.

A study of needle exchange services in three settings found that pharmacy services were used more frequently and had a higher percentage of returned injecting equipment (Cameron et al. 2004).

3.9 OSTEOPOROSIS RISK ASSESSMENT/PREVENTION

Thirteen studies were reviewed, covering community pharmacy-based osteoporosis screening, a risk management service for patients taking long term oral corticosteroids and a falls prevention service.

Overview of the evidence:

- Community pharmacy-based services for osteoporosis risk assessment were well received, and identified women at different levels of risk (C1).
- Not all studies conducted follow-up after the assessment, but those that did found that preventive treatments had been initiated and that women reported having made lifestyle changes (C1).

Several studies described the uptake of services including assessments of osteoporosis risk and bone density measurement with advice and referral. Services were offered free of charge. Overall the results show that community pharmacy-based bone health assessments can identify people who need to be referred for further medical assessment (Elliott et al. 2002a, 2002b; Lata et al. 2002; Lai et al. 2003; Cerulli & Zeolla 2004). There is some evidence that advice given to women identified to be at lower risk may result in increased dietary intake of calcium and increased exercise. User feedback about the services was highly positive (Gray et al. 2002; Cerulli & Zeolla 2004). A cost-effectiveness evaluation found that offering such a service could be financially viable depending on the local situation (Cerulli & Zeolla 2004). The transferability of this finding from the US to the UK is unclear.

One study tested the feasibility of referral for screening by local family doctors using a list of criteria to target women who

might be 'at risk' (MacLaughlin et al. 2005). The service was well received by women in all of the studies. Where follow-up was conducted, a substantial proportion of women had new prescriptions for relevant medicines, and substantial percentages of women reported having made lifestyle changes (MacLaughlin et al. 2005; Summers & Brock 2005; Naunton et al. 2006).

A small RCT of a community pharmacy service tested the effect of pharmacist-led risk management activities in patients taking long-term oral corticosteroids (McDonough et al. 2005). Intervention pharmacies provided an educational pamphlet on osteoporosis prevention and reviewed patients' medication while controls provided usual care. Ninety-six patients participated and those in the intervention group were significantly more likely to be taking calcium supplements after nine months.

3.10 IMMUNISATION

Seven studies were reviewed.

Overview of the evidence:

- Immunisation services can be provided safely through community pharmacy (B3).
- Pharmacy patient medication records are effective in identifying and flagging 'at risk' clients to be invited for immunisation and can increase the percentage of the target group immunised (B3).
- User satisfaction with pharmacy-based immunisation services is high (C1).
- Support for non-physician delivered immunisation is greater for adult than for child immunisation (C1).

Immunisation services can be provided safely through community pharmacies (Weitzel & Goode 2000). Pharmacy patient medication records are effective in identifying 'at risk' clients who can then be invited for immunisation (Davidse & Perenboom 1995) and pharmacy-based services can extend the reach of immunization programmes (Davidse & Perenboom 2005). User satisfaction with this service is high and support for non-physician immunisation was found to be greater for adult than for child immunisation (Grabenstein 2001; Ernst et al. 2001). A UK pharmacy-based immunisation service (for influenza in particular) seems to have been reasonably well-accepted by patients, physicians and pharmacists (Hind et al. 2004).

3.11 ORAL HEALTH

Three studies were reviewed, two of which were from the UK. The most recent was published in 1999 and there is very little evidence on the contribution of community pharmacy to improving oral health. Most pharmacists say they believe sugar-free medicines are important for children, but they perceive opportunities for recommending them as limited, since most requests from customers are for named medicines (McVeigh et al. 1999). In this survey one-quarter of pharmacists reported having received formal training about oral health, which was found to increase the likelihood and effectiveness of pharmacists giving advice.

4.0 DISCUSSION

This review included 196 studies published over an 18-year period and provides substantial evidence of the positive contribution community pharmacists can make to improving the public's health. The diagram below represents pictorially the strength of published evidence of where community pharmacy has been shown to contribute.

EVIDENCE SUMMARY OF WHERE COMMUNITY PHARMACY CAN CONTRIBUTE TO IMPROVING THE PUBLIC'S HEALTH

Diabetes***			
Cardiovascular disease prevention & management**			
Hypertension**			
Lipid management***			
Weight Management*			
Smoking Cessation***			
Drug misuse***			
Sexual Health*			
Emergency Contraception***		Flu immunisation***	
Folic Acid Promotion*		Osteoporosis / Falls prevention*	
Childhood	Adolescence	Adulthood	Older age

*** Good evidence for; **Some evidence for; *Some interesting evidence but further research is needed.

4.1 EFFECTIVENESS OF INTERVENTIONS

The strongest evidence of effectiveness is for smoking cessation, lipid management, diabetes, emergency contraception, flu immunisation and drug misuse.

4.1.1 SMOKING CESSATION

UK studies have demonstrated that community pharmacy has a clear role in providing cost-effective smoking cessation services with comparable outcomes to other one-to-one services provided in primary care, however, more intensive group support services have higher quit rates (McEwen et al. 2006; Bauld et al. 2009; Boyd & Briggs 2009). Both pharmacists and pharmacy support staff, with appropriate training, can provide effective smoking cessation support. There is some evidence from UK and US studies that although pharmacists view smoking cessation advice as an important activity, they are not as proactive in their practice as they might be.

4.1.2 CARDIOVASCULAR DISEASE (CVD) PREVENTION

LIPID MANAGEMENT

Evidence of effectiveness of community pharmacy input into CVD prevention is strongest for the management of lipid levels, where a series of RCTs has demonstrated improvement that can be sustained for at least one year beyond the initial intervention.

CARDIOVASCULAR RISK FACTOR ASSESSMENT

Studies of risk factor assessment for heart disease show that members of the public will take up such services where they are offered free of charge. Research findings mainly describe the profile of risk factors found and the numbers of clients referred for medical assessment, with few data on outcomes of information and advice-giving by pharmacy staff. The economics of case-finding and risk assessment services in pharmacies in the UK remain unclear. A national Vascular Risk Assessment programme began in England in 2009 and pharmacies are a potential provider (Anonymous 2008c). Although overall there appear to be positive outcomes associated with pharmacy-based CVD risk factor assessment services, the studies conducted do not so far provide sufficient evidence to make a clear assessment. Most studies have only measured outcomes in the short term so the extent to which any changes are sustained cannot be quantified.

4.1.3 DIABETES

There is evidence from Australian studies of effectiveness of pharmacy-based diabetes management services that they lead to a significantly greater reduction in HbA1c compared with controls. An Australian RCT (Krass et al. 2007b) also showed that pharmacy-based targeting of people with risk factors for diabetes together with 'point of care' blood glucose testing prior to referral was more effective and cost-effective than targeting and referral alone.

4.1.4 HYPERTENSION

Community pharmacy-based hypertension management has potential. A systematic review (Machado et al. 2007b) reported improvements in control in trials of community pharmacy-based hypertension management. Some studies (for example, Garcao & Cabrita 2002) explicitly included non-drug approaches within the pharmacist's care plans. Disappointingly however, no studies reported on clients' uptake of this advice and as a result the contribution that non-drug approaches make to an improvement in blood pressure control cannot be quantified.

4.1.5 WEIGHT MANAGEMENT

Currently the evidence for weight management might best be summed up as 'promising and in need of further study'. In the meantime, there are opportunities to collect data on effectiveness and it is encouraging to note that a government-funded Australian study will evaluate a community pharmacy weight management service which itself is based on a critical review of the literature and the development of an evidence-based service model (Rieck et al. 2006). A recent literature review of eleven primary care studies of nursing interventions to support weight management concluded that 'at best, perhaps 10% of patients entering a nurse-led support programme may achieve a clinically significant weight loss' (Brown & Psarou 2008).

4.1.6 CONTRACEPTION AND SEXUAL HEALTH

The first NHS community pharmacy service for the initiation and supply of combined oral contraception and progesterone-only contraception was introduced in 2008 (Anonymous 2008b). Further research is needed to evaluate these emerging models of possible future sexual health services in community pharmacies in the UK.

There is a clear role, however, for pharmacists in the sale and supply of emergency hormonal contraception (EHC) and women are happy with the services provided. The extent to which pharmacists provide associated advice about STIs and future contraception to women obtaining EHC is less clear.

Research in sexual health has emanated from a wide range of countries and the role of the community pharmacist in sexual health is developing worldwide. Pilot studies have shown that community pharmacies can provide Chlamydia screening and treatment services including epidemiological partner treatment. The antimicrobial azithromycin is now available as a non-prescription medicine in the UK for the treatment of Chlamydia where a test has demonstrated the presence of infection (Anonymous 2008a).

There is evidence of a desire by the public for easy access to information on both contraception and safer sex and that they would be willing to receive this advice from pharmacists. Pharmacists themselves appear to want an expanded advisory role in sexual health. Access to training that incorporates and encourages networking with other local service providers is likely to be crucial in increasing pharmacists' confidence in dealing with these issues appropriately and effectively.

4.1.7 SUBSTANCE MISUSE

Community pharmacy-based needle-exchange schemes are cost-effective, and supervised methadone administration services achieve high attendance rates and are acceptable to clients. All these services appear to be reasonably well-accepted by clients, pharmacists and the public. Research conducted prior to the introduction of the new pharmacy contractual framework in 2005 identified a preference for more private facilities for methadone supervision, but no published research has yet evaluated the effects of the increased percentage of pharmacies with a consultation area on user feedback.

Community pharmacy plays an important role in harm reduction and these services are highly valued by users. Positive pharmacist attitudes are correlated with higher service provision for users. There is potential for more advice on preventing the transmission of infections (e.g. STIs/ blood borne viruses) to be given by pharmacists to drug service users.

4.1.8 OSTEOPOROSIS RISK ASSESSMENT AND PREVENTION

Community pharmacy-based osteoporosis prevention services are generally based around bone mineral density measurement, often used with structured questionnaires to assess other risk factors and provide the basis for individualised advice or referral to the GP. The studies provide evidence that this approach is positively received by service users and patients who need referral are identified. Doctors in the UK expressed mainly positive views about the service provided.

Only one study reported on the outcomes of advice given by pharmacy staff to clients who did not need to be referred. The findings showed that knowledge about bone health increased and there was evidence that daily calcium intake was increased. Several US studies assessed women's willingness to pay for osteoporosis risk assessment but the transferability of the findings to the UK is questionable.

4.1.9 FLU IMMUNIZATION

Extensive evidence from the US shows that community pharmacies can safely provide influenza immunisation. UK studies have shown that pharmacy patient medication records are an effective method of targeting specific patient groups to remind them about immunisation.

4.2 DELIVERING PUBLIC HEALTH SERVICES

From the studies reviewed, the following factors were shown to have an influence on the effectiveness of public health interventions in a community pharmacy-based setting.

4.2.1 SERVICE QUALITY

Two service quality frameworks for smoking cessation were identified. No other studies assessed service quality.

User feedback is critical in understanding acceptability and quality of community pharmacy services and the scope for service improvement. However in the UK, it is only in emergency contraception supply that there has been a sustained research effort to obtain user perspectives.

4.2.2 COSTS AND COST-EFFECTIVENESS

Three studies provide evidence that community pharmacies can provide cost-effective smoking cessation services. Two robust cost-effectiveness analyses of a diabetes management service and a comparison of two methods of diabetes screening were identified. More recent studies were more likely to target specific groups of people for both screening and intervention, which is likely to increase cost-effectiveness.

There was no obvious theoretical basis, nor justification, for the 'dose' of pharmacist input used in the studies we reviewed and hence cost-effectiveness of different 'doses' is impossible to determine. Monthly face-to-face consultations were common and there was no discussion in the papers about whether there might be a 'dose response curve' which could help to identify optimal input. Some recent studies have used telephone follow-ups as an alternative option to face-to-face consultations. One trial also included the possibility of follow-up using electronic communication but this was not used in practice.

4.2.3 SKILL MIX AND TRAINING

Few studies included or discussed the contribution of pharmacy staff other than the pharmacist. One study involved pharmacy technicians identifying people to receive brief advice on smoking. This was successful in doubling the numbers identified and recording their smoking status compared to the control pharmacy which did not involve their technicians. Another study reported pharmacy support staff conveying information on folic acid to minority ethnic groups in their own languages.

Several intervention studies included training for the participating pharmacists and provided further evidence of the effectiveness of training in supporting role development and changing practice. Training and education can also link pharmacists more closely

with primary care staff and local services, thus reducing their concerns about how pharmacy public health initiatives might be received by pharmacy users and other healthcare professionals.

Studies from the early 1990s showed that most pharmacists felt that their education at undergraduate and pre-registration level had not prepared them adequately for involvement in public health activities, although a recent Masters study indicated that recently qualified pharmacists feel more prepared for such roles than was the case in the past (Nicholson S, personal communication). Given the importance of training and education in delivering public health initiatives, research is urgently needed to determine current perceptions of recently qualified pharmacists on the training and education they received as undergraduates, and how this has supported their subsequent practice.

Multidisciplinary public health 'core competencies' for specialists and practitioners have been developed for all public health professionals based around the Faculty of Public Health's 10 key areas for public health practice⁵. These competencies provide a common framework, but in the longer term, consideration may need to be given to the development of standardised training for pharmacists and their staff who wish to provide public health services, but do not wish to follow a public health career path. For example, the Health Protection Agency has drafted a core curriculum and national minimum standards for immunisation training and is considering the inclusion of pharmacists under these standards.

4.2.4 PUBLIC ATTITUDES AND PREFERENCES

A recent Department of Health market research survey (Department of Health 2008) found that few members of the public currently report using health-related services offered by some pharmacies (other than regular monitoring of current health conditions and health screening for conditions such as diabetes and cholesterol) but that many were interested in doing so. The greatest users of community pharmacies for general health advice were women, respondents with young children and those in lower socio-economic groups.

According to this user profile, pharmacy could play a greater role in helping to tackle health inequalities, however, the published

studies add little to our understanding of the effectiveness of community pharmacies in engaging 'hard to reach' higher-risk clients in assessments of their health. Therefore the issue of whether services should be 'open access' and available on a walk-in basis to all (often argued to be the strength of community pharmacy setting) versus a more targeted approach, remains unresolved.

A survey conducted by the Patients Association (2008) found that almost half of the respondents said they would be 'very happy' to use a pharmacy for initial screening or diagnostics, while 25% said they would prefer the GP and 19% a nurse. The figures relating to regular monitoring tests show slightly higher acceptance of pharmacy provision with 55% happy to use a pharmacy, 19% preferring the GP and 21% a nurse. Almost 60% agreed that 'pharmacists should be allowed and should receive resources to provide a much broader range of community healthcare advice and services', indicating broad support for a wider public health role for community pharmacy, with a quarter disagreeing. However, respondents also had some concerns about privacy and confidentiality with only one in three agreeing that their local pharmacist 'always paid attention' to these aspects. Respondents also expressed concern about whether the amount of space in their local pharmacy was sufficient to allow privacy. Unfortunately the survey did not explore whether the respondent's pharmacy had a consultation area and, if so, whether they had experience of using it.

The survey conclusions also raised some areas of concern to be addressed. Patients were willing to seek a wider range of services, such as screening, from pharmacies but with the proviso 'if seen to be integrated with GP services'. The authors also concluded that 'Patients' concerns about confidentiality, privacy and expertise may be discouraging fuller use of pharmacy services'. The authors make several recommendations to the profession including:

- invest in privacy and confidentiality so that patients feel able to ask for advice, and access services;
- establish a confidentiality charter covering consultation rooms, over-the-counter services, inter-staff discussion of patients;
- work constructively with other primary care professionals to provide a safe, seamless service for their patients.

4.3 FUTURE RESEARCH

Despite the considerable interest recently shown by UK Governments in further developing the public health role of pharmacy⁶, the lack of growth of recent UK studies in many key areas of the review (with the possible exceptions of emergency hormonal contraception and substance misuse) is a matter for concern. In contrast Canada has generated a substantial body of community pharmacy-based research since the 2004 literature review update, and Australia has continued to expand its existing substantial evidence base (see Box for more information).

OUTPUTS OF A NATIONAL STRATEGY FOR PHARMACY RESEARCH IN AUSTRALIA

In Australia a strategic long-term programme of pharmacy practice research has produced a substantial evidence base to underpin proposed new community pharmacy services funded by the government. The key was collaborative working between the Australian government, the contract negotiators (The Pharmacy Guild of Australia), Schools of Pharmacy and the professional body. The Community Pharmacy Agreement Research and Development Programme helped to establish Australia as an international leader in evidence based community pharmacy services. Research and development was one of the priorities identified in the Fourth Agreement between the government and The Pharmacy Guild of Australia (2005–10). Funding of up to \$19 million (8.9 million GBP) has been allocated for the Research and Development Programme to identify research and development priority areas in community pharmacy service provision and then to fund projects with the greatest potential to deliver services with positive health outcomes for consumers and economic impacts for the health system.

An example of how research from the programme has directly influenced the planning and implementation of new services is the research on diabetes that led implementation of the pilot Diabetes Medication Assistance Service from 2007. Since September 2007, eligible patients with type 2 diabetes are able to schedule in-pharmacy appointments (with pharmacists in participating pharmacies) to receive assistance in managing their diabetes medicines, using a glucometer and self-monitoring their blood glucose. Pharmacists are also involved in the patient's lifestyle management by providing regular blood pressure and weight measurements, as well as general health and lifestyle advice. To participate in the pilot programme, pharmacists must be credentialed against a competency based training course. Pharmacies must also have a private area within the pharmacy to allow for confidential sit-down consultations with the patient.

Given the central place of pharmacy as part of a network of health service providers within the local community, the profession needs to work with other stakeholders to obtain resources to support a robust programme of targeted research. In particular there is an urgent need for further research on collaboration between community pharmacies and GP practices to determine how best to agree and implement a service plan for individual patients, and follow-up the outcomes. Further research is also required to investigate the use of community pharmacies by members of lower socio-economic groups and other disadvantaged groups. The findings of this review can be used to support this process.

⁶ Department of Health (2008). White paper. *Pharmacy in England: Building on strengths – delivering the future*. Department of Health: London.

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⁷ www.guild.org.au/ (Accessed 11/3/08).

⁸ www.guild.org.au/uploadedfiles/Research_and_Development_Grants_Program/News_and_Events/RDmarketingbooklet.pdf (Accessed 11/3/08).

⁵ See www.publichealthregister.org.uk/ for more details.

5.0 CONCLUSIONS

The evidence of effectiveness of community pharmacy public health interventions is strongest in smoking cessation, diabetes, EHC, flu immunisation and drug misuse.

Evidence in the detection and management of cardiovascular risk factors was mixed, with convincing evidence in hypertension and lipid management, but less so in risk factor assessment where data on outcomes are sparse. Many studies in key topic areas were conducted in settings that vary from those in the UK and therefore further research is required to test the transferability of their findings to a UK context. Some evidence of effectiveness was found relating to osteoporosis risk management and weight management. These areas remain promising and should be tested in pilot studies and further research.

A more systematic approach needs to be taken to the development of the public health contribution of community pharmacy if the full potential of this role is to be realised. The evidence shows that making training available to all pharmacy staff, particularly in identifying individuals 'at risk' and for behavioural support techniques, is key if effective interventions are to be delivered.

The relative influence of drug and non-drug approaches on patient outcomes (especially health inequalities), data recording and links to the wider health infrastructure should be included as part of the evaluation of future studies, so that a greater understanding of the unique characteristics of pharmacy-based public health interventions is acquired.

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