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Community pharmacy clinical services

Literature review

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Contents

Summary

In England, community pharmacy numbers have been relatively static, despite the population increasing and the increasing proportion of older people with multiple chronic conditions (who are more likely to be on multiple medications).

There is good access to community pharmacies in urban areas and a possible over-supply due to clustering. Rural areas have the worst access to community pharmacies but pharmacists and GPs are possibly more likely to work more collaboratively due to a smaller network.

Community pharmacies are delivering a diverse range of clinical services but there is limited evidence on the outcomes and cost effectiveness. Studies are often low quality and contexts vary from country to country and within countries.

Complete episodes of care
Community pharmacy services that can deliver complete episodes of care and operate in relative isolation from other parts of the health service tend to have more evidence of positive outcomes and be cost effective. However, these services could be more effective if connected to the wider system, and the availability of some evidence may just be a facet of these services being studied more than others.

Services that work well in community pharmacies include sexual health services, vaccinations and travel health services.
These services address a defined community need and sit well in the context of the community pharmacy being accessible and associated with health care. Clarity on the following aspects may have also contributed to the effective delivery of these stand-alone services: remuneration; service specification; and the offer to the public.

When services align to existing pharmacy activities, or are specifically designed for the community pharmacy context, they are more likely to have positive outcomes (e.g. emergency contraception service designed to incorporate quick-start contraception, chlamydia testing and an invitation to a sexual health clinic).

It is likely these services also work well due to the remuneration being a good return on pharmacist investment to set up and develop the service.

Lifestyle interventions
There is no evidence that vague public health messaging works, probably due to awkwardness of pharmacists and counter-staff undertaking an un-asked for brief intervention and a lack of remuneration to have what is a difficult and sensitive conversation in an area that is not private.

Smoking cessation and weight management services can be delivered through community pharmacies but further evidence is needed on outcomes and cost effectiveness.

If community pharmacy teams are to undertake brief interventions them aligning to existing consultations may be more effective (e.g. incorporating alcohol brief interventions into medicines reviews is an area of research that is ongoing).

Collaboration with GPs
There is a lack of robust evidence related to community pharmacy minor ailment services, antibiotic prescribing and independent prescribing. These pharmacy services are more likely to report positive outcomes when pharmacists work in collaboration with GPs and are connected to primary care systems and governance.

GP and pharmacist collaboration is beneficial in relation to the following services:

- **Minor ailments services**: These usually give advice and treatment for a defined set of conditions. Some are extended services that include pharmacist antibiotic prescribing for uncomplicated UTIs and Strep infections.

  Pharmacy minor ailment services are more likely to have positive outcomes when they are linked to and supported by general practice and have underpinning evidence-based protocols.

  There is no evidence that pharmacy minor ailment schemes free up GP time. A comparator is nurse-led clinics run by an independent nurse prescriber. These clinics generally sit within general practice and can improve patient outcomes, but there is no evidence that these clinics free up GP time.

  Community pharmacy minor ailment services and extended services may be particularly beneficial in areas of low GP coverage and rural areas.

- **Chronic condition services**: There is good evidence that community pharmacy medication education and counselling can improve outcomes for patients with asthma, diabetes, cardiovascular disease and hypertension.

  Extended community pharmacy roles related to chronic condition services (beyond education and counselling) could be effective in local contexts. For example, some areas of England have lower than expected levels of asthma reviews and community pharmacy could be used to provide additional asthma services to support self-management and prevent deterioration of conditions.

  Based on local contexts, community pharmacy could be used to focus on medicines optimisation and harm-prevention for high-risk patients (frail, co-morbid, recently discharged from hospital) and those on high-risk medications (specific medication and polypharmacy).

  Many of these patients will be older - more people live longer with multiple long-term conditions and the number of medicines they take often increases. This can have a significant burden on the individual managing and trying to adhere to multiple medicines regimes. It can also be harmful to the individual.

  Collaborative GP and community pharmacy interventions on medication-related problems of older adults can improve clinical outcomes and reduce adverse drug events. They are also likely to be cost-effective. Consideration should be given to engagement of hard-to-reach

groups and encouraging attendance at consultations (or have in place a route to provide services to people who can't easily access GP or pharmacies).

To note, community pharmacy can also play a role in medication education and counselling for younger people with chronic conditions. Younger people can have poor adherence rates and a lack of health literacy related to their conditions.

Areas of opportunity

It is feasible to deliver a variety of services through community pharmacies; these are outlined in the report.

- **Nicotine cessation services:** There are calls to regulate the vaping market, and community pharmacies could play an important role in dispensing vapes to adults wanting to quit smoking.

  There is an epidemic of vaping in younger people and a lack of services, particularly for younger people in schools and colleges. Community pharmacies, with their existing platform in smoking cessation and knowledge of tapering addictive substances could play an important role in addressing this growing public health concern through education (of both students, parents and teachers) and service delivery.
- **Prescribing variation and value:** Community pharmacists are ideally placed to increase their role in supporting the appropriate prescription of medications and enhancing value-based care. This could be based on collaborative working relationships with general practice and incentivised shared-saving funding models.
- **Common health concerns:** Many people go to the pharmacist first and not all pharmacists recommend the most cost-effective medications or appropriate non-pharmaceutical pathways. There is potential for community pharmacists to improve health advice and guidance, as well as recommended medications (e.g. sleep disorders).

Implementation

Barriers and enablers to provision of additional community pharmacy services are well-evidenced, and include:

- Scaling-up from pilots to national roll-out with business cases to enable investment. There is also the need to embed ongoing evaluation of services to identify what works well and any unintended consequences.
- Freeing up (5%-19% of) pharmacists' time by enabling trained technicians to do more.
- Developing premises that allow for confidential conversations at the counter and consultations.
- Addressing the inherent conflict of community pharmacies undertaking both prescribing and dispensing. There should also be consideration of conflicts of interest within existing advice and guidance provided by pharmacists (e.g. sleep medication).
- Setting clear expectations around what the public can and can't expect from the community pharmacy. Work is also needed to understand what works well in reducing customer aggression towards community pharmacy staff and ensuring staff safety.
- Having IT systems that are co-designed, user-friendly and support efficient systems and processes around: payments; health records; prescribing; clinical algorithms; and performance data collection and analysis. In addition, future-proofing IT for potential services around telehealth and telemonitoring.

- Ensuring that community pharmacies follow evidence-based clinical guidelines (beyond clinical services to also include sold items) and clinical governance.
- Ensuring continuity of pharmacy care, perhaps through registering with a pharmacy.
- Addressing competency and confidence gaps in the community pharmacy workforce, for example around: minor ailments; diagnostic assessment; communication and attitudes; chronic condition management; and mental health.
- Care and consideration should be given to changing payment models and key factors such as: political leadership; strategy; system power and influence; governance; strategic planning capabilities; stakeholder input to the design; value for money; sharing savings; flexibility; complexity; and monitoring, evaluation and revision.
- Developing a blended payment system can potentially maximise the beneficial incentives (and minimise the potential unintended consequences) of each payment approach.
    - Community pharmacies payment approach should incentivise the achievement of primary care goals and mitigate its shortcomings.
    - There is a need for incentives for community pharmacy to work in collaboration with GPs (and vice versa).
    - Payment models should not be viewed as static, but continually monitored and adapted to address priorities and emerging issues of gaming.

Community pharmacy: literature scan

Literature scan approach

The scan aimed to identify and summarise literature relating to:

- Community pharmacy services, in particularly evidence on outcomes and cost-effectiveness.
- Barriers to and enablers of community pharmacy service delivery.
- Public views on community pharmacy.
- Potential opportunities.

The literature scan was undertaken in April 2023 and focused on independent and higher-quality evidence. A broad-based initial search of PubMed was undertaken with the search term “community pharmacy.” Articles were filtered to systematic reviews and reviews-of-reviews from the last five years. The search identified 619 articles, these were filtered to around ninety relevant articles that were reviewed and relevant findings incorporated into the report.

Specific searches of PubMed for systematic reviews and randomised controlled trials (RCTs) for the last five years were then undertaken for “community pharmacy” + the following key words: “dispensing”; “pharmacy minor ailments services”; “independent prescribing”; “antibiotic prescribing”; “emergency use contraceptives”; “antenatal”; “maternal”; “child health”; “weight management”; “smoking cessation”; “vaccination”; “needle exchange”; “immunisation”; “travel services”; “diabetes”; “asthma”; “hypertension”; “cardiovascular disease”; “arthritis”; “back pain”; “cancer”; “chronic obstructive pulmonary disease”; “chronic kidney disease”; “osteoporosis”; “polypharmacy”; “care homes”; “readmissions”; “outpatient”; “payment”; “funding.”

Some relevant articles are included that past the cut-off date, particularly if more recent evidence could not be identified. Reviews related solely to low-income contexts were excluded.

Cochrane systematic reviews were searched by “community pharmacy” and “pharmacy.”

An England-specific scan of PubMed was undertaken for “community pharmacy” + “England” and articles were filtered to systematic reviews and RCTs from the last five years.

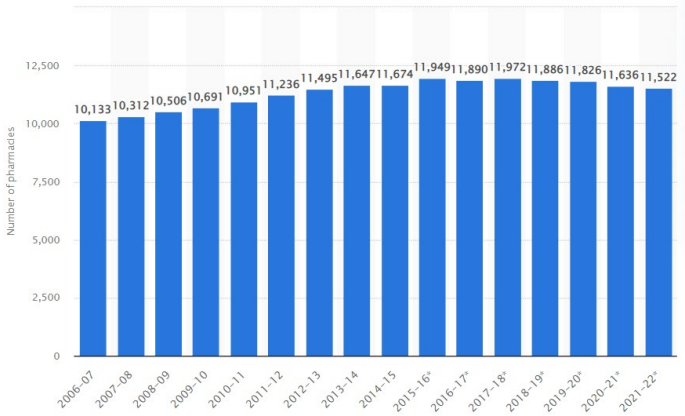
Targeted searches for UK studies were undertaken where cost effective analyses were not available within systematic reviews.

OECD and WHO websites were searched for “pharmacy.”

For areas of possible opportunity further scans were undertaken to outline context (e.g. asthma, nicotine cessation).

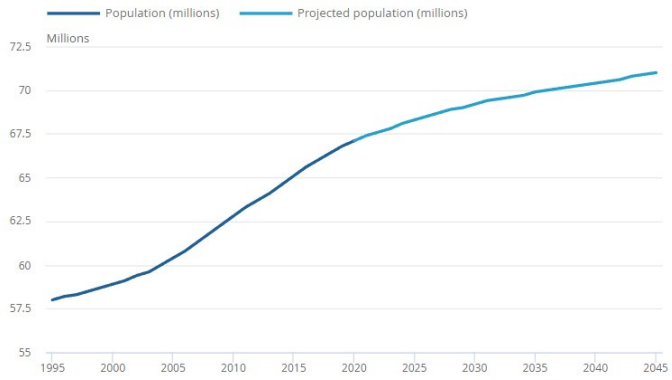
1 Community pharmacy services

Community pharmacy network trend
Over recent decades the number of community pharmacies in England has generally increased, although it has been dipping slightly in recent years. The population has also increased, particularly older adults who are more likely to take multiple medications. The population, and in particular the older age group, are projected to increase further.



Statista (2023).[1]

The population of the UK has increased steadily and is projected to increase further.



UK population estimates, mid-1995 to mid-2020, and projections to mid-2045 (ONS, 2023).[2]

The older adult age group is increasing rapidly. The number of people aged 85 years and over was estimated to be 1.7 million in 2020 (2.5% of the UK population) and this is projected to almost double to 3.1 million by 2045 (4.3% of the UK population) (ONS, 2023).[2] The English Longitudinal Study of Ageing found that 24.1% of older adults were on five or more medications and 6.4% were on 10 or more medications (English study, 2018).[3]

Access to community pharmacies is exceptionally good in urban areas, with potentially an over-supply due to clustering. Access in rural areas can be a challenge.

Although a dated study, around 90% of the population in England have access to a community pharmacy within 20 min walk. However there is variation in urban (town 98% and suburbs 80%) and rural areas (20%). In the least deprived areas 90% have access to a community pharmacy within 20 min walk, compared to 100% in areas of highest deprivation (the positive pharmacy care law) (English study, 2014).[4]

Clustering of community pharmacies in England is common. Around 75% of community pharmacies in England are in a 'cluster' (within 10 min walking distance of another pharmacy): 19% of community pharmacies were in a cluster of two, while 56% of community pharmacies were in clusters of three or more. There is a linear relationship between community pharmacy clustering and social deprivation, with clustering more prevalent in areas of higher deprivation (English study, 2018).[5]

Urban vs rural pharmacies
Compared to urban pharmacies, there is some evidence that rural pharmacists may have better relationships with GPs and that pharmacists are seemingly more willing to take on new professional roles and deliver a higher level of service (although based on limited studies) (narrative systematic review, 2020).[6]

Chain vs independent pharmacies
There is no difference in medication adherence between the users of independent and chain pharmacies. However, those with a lower income, greater medication burden, and increased age appear to use independent pharmacies more than chain pharmacies and to have greater medication adherence when doing so (systematic review, 2022).[7]

1.1 Minor ailments services

Around one in four (25.1%) women and one in five (18.4%) men reported experiencing a delay in getting health care in the past 12 months because the time needed to obtain an appointment was too long (ONS, 2022).[8] It has been proposed that some patients could be advised and treated in community pharmacies to potentially reduce some of the demand on NHS urgent care services.

Many countries are implementing different versions of a community pharmacy minor ailment service (MAS). Most of these services gather patient information and provide advice, but protocols used and information gathered varies. There is a lack of evidence related to the assessment of outcomes and cost effectiveness of these services (systematic review, 2021).[9]

A dated review found community pharmacy MASs may have low re-consultation and high symptom-resolution rates. The extent to which MASs shift demand for management of minor ailments away from high-cost settings was not fully determined. Evidence from economic evaluations was limited (systematic review, 2013).[10]

A Spanish study randomised patients seeking care or requesting a product for a minor ailment at pharmacies to either a MAS or usual care. The MAS intervention consisted of a standardised web-guided consultation. Patients were followed up by phone ten days later.

Patients under the MAS intervention were more likely to be referred to a GP and had higher re-consultation rates compared to usual care (due to referring "red flag" signals). No significant difference was found between MAS and usual care in terms of products used or symptom resolution (Spanish RCT, 2022).[11]

Another study randomised patients to MAS or usual care. The MAS included a consultation with a pharmacist trained in clinical pathways and was underpinned with communication systems mutually agreed with GPs. GPs also provided support to the community pharmacy MAS. All patients were followed up by telephone after two weeks. Patients under MAS were 1.5 times more likely to receive an appropriate referral and were five times more likely to adhere to referral, compared with usual care. 94% of MAS patients achieved symptom resolution or relief at follow-up, compared to 88% under usual care. MAS pharmacists were 1.2 times more likely to recommend an appropriate medicine and were 2.6 times more likely to perform a clinical product-based intervention, compared with usual care (Australian RCT, 2022).[12]

Cost effectiveness: There are contextual and methodological limitations in studies that have sought to assess clinical outcomes of pharmacy-based management of minor ailments (systematic reviews, 2018, 2019).[13,14] There are country specific analyses that show potential cost-effectiveness but these are unlikely to be comparable to other country contexts.[15,16]

Antibiotic prescribing

Pharmacists' provision of antimicrobials for uncomplicated urinary tract infection, acute pharyngitis and cold sores is associated with high rates of clinical improvement, low rates of retreatment, low rates of adverse effects and decreased health care utilisation. Patients accessed care sooner or more easily and were often highly satisfied with the service. The extent to which community pharmacist provision of antimicrobials was underpinned with protocols was highly variable, and there was also limited research on linking pharmacists into antimicrobial stewardship strategies (systematic review, 2021).[17]

Community pharmacies that prescribe antibiotics for sore throats sometimes use rapid diagnostic tests. Rapid testing to guide antibiotic treatment for sore throat in primary care probably reduces antibiotic prescription rates by 25% (absolute risk difference), but may have little or no impact on antibiotic dispensing (Cochrane systematic review, 2020).[18]

There is limited evidence related to community pharmacist-led interventions to optimise the use of antibiotics in primary care (systematic review and meta-analysis, 2022).[19] The intervention to delay antibiotic prescriptions can be effective in decreasing antibiotic use but with mixed effects on clinical outcomes, adverse effects and patient satisfaction (Cochrane systematic review, 2014):[20]

Independent prescribing services

Community pharmacists are in the early phase of independent prescribing (IP) and so there are a lack of systematic reviews. There is evidence related to primary care nurse IPs.

Nurse IPs are often based within the general practice and have access to GP support and IT systems. Evidence suggests that primary care nurse-led IP services probably achieve

higher levels of patient satisfaction, have longer consultations with patients and experience more frequent return attendances. The evidence of nurse-led IP clinics on freeing-up GP time is uncertain (Cochrane Systematic Review, 2018).[21]

1.2 Public health services

Given the significant variation in lifestyle risk factors across England there is a need to enable and support people to make healthy choices around diet, exercise, smoking, alcohol consumption and so on (PHE, Atlas of Variation, 2019).[22]

The English **Healthy Living Pharmacy** framework aimed at achieving consistent provision of a broad range of health promotion interventions through community pharmacies to meet local need, improving the health and wellbeing of the local population and helping to reduce health inequalities.

The evidence on the outcomes and cost effectiveness of the Healthy Living Pharmacy programme is limited. The programme lacked robust evaluation of implementation and outcomes; studies were generally low quality and small scale (systematic review, 2019).[23] Preventative approaches to disease are frequently presented as a way to reduce costs; however, the evidence is limited (NEJM, 2012).[24]

Internationally, community pharmacies are delivering a variety of public health services, however these are often not fully evaluated for patient outcomes and rarely explore impacts on inequalities (review of reviews, 2019).[25] Services related to screening are outlined under the chronic condition service section.

Health promotion (mainly education and skill training) activities in community pharmacies are highly variable. Evidence suggests that they probably have a slight beneficial effect on health-related behaviour and are likely to be cost-effective (Cochrane systematic review, 2019).[26]

Community pharmacy services for smoking cessation, weight management and vaccinations report positive outcomes, these are outlined below (review of reviews, 2019).[25] There is a pharmacy-specific alcohol intervention which is currently being evaluated which may prove effective - as yet alcohol brief interventions in community pharmacy have made no difference.

Research is ongoing to develop community pharmacy interventions to support well-being (Welsh study, 2023).[27]

Cost effectiveness: There are some economic evaluations of pharmacy-based public health interventions which report favourable economic findings, but the types of analysis are diverse and variable in quality (review of reviews, 2019).[28]

Nicotine cessation

In the UK, 13.3% of people aged 18 years and over smoke cigarettes (ONS, 2022).[8] Vaping prevalence in England for adults is around 7% (UK Gov, 2022).[29]

There is currently a lack of robust regulation in the vaping market which has resulted in an increasing vaping epidemic in younger age groups. Vaping companies have used the Tobacco Playbook to market to children (e.g. adverts and influence triggers to children, proliferation of flavours, cheap disposable devices, making vapes look attractive and so on). This in turn has led to high levels of young people being addicted to nicotine (American Lung Association, 2022).[30]

It is estimated that vaping prevalence in younger ages in England could now be as high as 15%, up from 6% in 2018, and a figure which rises to 18% for 15-year-olds. Many children start vaping despite never having smoked before, and some anecdotal evidence that some children move on to cigarettes. Children as young as 9-10 are vaping (Expert Comment, 2023).[31]

The impacts of vapes on human health are unknown. The longest follow-up of studies into the safety of vaping is two years and the number of studies was small (Cochrane systematic review, 2022).[32] Studies assessing longer term vaping are necessary (UK Gov, 2022).[29] There is emerging evidence that vaping negatively impacts the lungs (House of Commons, 2022).[33]

The diversity of brands, models, product claims, nicotine strengths, flavours and ingredients, together with variations in use from person to person, have all made assessing the public health impact and safety of e-cigarettes challenging (House of Commons, 2022).[33]

There are calls to regulate the vaping market, and community pharmacies could play an important role in a potential new regulatory system by dispensing vapes to adults wanting to quit smoking.

There is a lack of evidence related to vaping cessation services delivered through community pharmacies, which could be an area of opportunity. Given the epidemic of vaping in children and teenagers there is also an opportunity for community pharmacy to work with young people, parents, schools and colleges to support young people tapering-off nicotine (e.g. outreach to schools and colleges).

Community pharmacy smoking cessation services usually comprise of support starting before quit day and continuing with regular appointments for several weeks afterwards. The evidence suggests that community pharmacies can provide effective behavioural support to people trying to stop smoking. However, this conclusion is based on low-certainty evidence (Cochrane systematic review, 2019).[34]

The model of pharmacy smoking cessation services varies: most are face-to-face (68.8%), followed by telephone (18.8%), and both methods (12.5%). Most face-to-face appointments are between the patient and pharmacist (87.5%), followed by group sessions (12.5%). Of the face-to-face services, pharmacists provided appointment-based services half the time. Although grant funding, fee-for-service, and value-based models are in operation, overall there is a lack of assessment of business models regarding pharmacist-led smoking cessation services (systematic review, 2019).[35]

The UK Smoking Treatment Optimisation in Pharmacies (STOP) involved training pharmacy staff in motivational interviewing and communication skills as well as knowledge of smoking cessation. The pharmacy staff were positive about the STOP intervention with 90% stating that it had improved their skills; however, the intervention made no significant difference in setting a quit date, retention or quit rate (UK RCT, 2022).[36]

Cost effectiveness: Costs effectiveness studies are dated (1995 to 2011), and pre-date the mass use of vaping as a potential quit tool - these two factors make comparisons across the analyses limited. However, based on historic data, UK pharmacy-delivered interventions appear to be cost effective across a range of quit rates. Compared with a self-quit attempt, the incremental cost per Quality Adjusted Life Year was £2600 for pharmacy one-to-one counselling, and £4800 for group community-based NHS smoking cessation service. Incremental Cost Effectiveness Ratios (ICER) per additional quitter ranged from £79 to £509 for pharmacist-based behavioural support with NRT (systematic review and meta-analysis, 2016).[37]

Weight management

In the UK, only around 4 in 10 men (39.7%) and women (43.9%) have a healthy body mass index (BMI) score, ranging between 18.5 and 24.9. A greater proportion of men (37.9%) were overweight than women (29.3%), based on a BMI score ranging between 25 and 29.9.

Community pharmacy weight management interventions can be as effective as similar interventions in other primary care settings (at least in the short term) (review of reviews, 2019).[25]

Cost effectiveness: There is limited and dated cost-effective analyses for community pharmacy weight management services. Similar costs have been reported for pharmacy and GP weight loss services (£112); both settings had higher costs compared with commercial weight management programmes (£71–£77). The NHS community-based group costs fell in-between at £92. It is unclear which provider type delivered the intervention more cost-effectively; at session 12, the ICER (£ per kg per participant) cost −£8.29 through pharmacy providers (favours GP). Conversely, at the final session 15, the ICER was £2.91 through GP providers (favours Pharmacy) (systematic review and meta-analysis, 2016).[37]

Alcohol

In the UK, around 3 in 10 men (27.9%) and one in four (24.1%) women reported drinking alcohol one to two days a week; while more men reported drinking alcohol every day or almost every day than women (8.8% and 4.7%, respectively) (ONS, 2022).[8]

Research is limited, but there is currently no evidence that community pharmacies can deliver effective alcohol reduction interventions (systematic review and meta-analysis, 2016).[37]

Opportunistic brief interventions on alcohol consumption in English community pharmacies have been found to make no difference; this led to the development of a pharmacy-designed intervention (UK RCT, 2015).[38] The community pharmacy Medicines and Alcohol

Consultation has been designed to incorporate brief interventions on alcohol into existing Medicines Use Reviews and the New Medicine Service in English pharmacies. A pilot feasibility RCT has been completed and a full RCT is being undertaken.[39]

Cost effectiveness: Cost-effectiveness of community pharmacy-based brief alcohol reduction interventions cannot be ascertained due to a lack of literature (systematic review and meta-analysis, 2016).[37]

Immunisations

Pharmacist involvement as advocate and provider for immunisations has favourable effects on immunisation uptake, particularly influenza vaccines (systematic review and meta-analysis, 2022).[40]

Influenza vaccines

Community pharmacies can play a positive role in improving influenza vaccine uptake. The more successful pharmacy-based interventions are linked to regularly checking of a patients vaccine status, proactive conversations with patients and having specific days for pharmacy-based immunisations. Passive information (leaflets and posters) are less effective (systematic review and meta-analysis, 2021).[41]

There are opportunities for English community pharmacies to work in collaboration with GPs to target some of the most high-risk patients who would benefit the most from influenza vaccines. For example there is a relationship between increasing deprivation score of an area and decreasing influenza immunisation uptake among individuals with COPD, with increasing deprivation accounting for about a third of the variation (PHE Atlas of Variation, 2019).[22]

Cost effectiveness: Systematic reviews and RCT could not be identified.

A UK review of studies between 2000 and 2015 found only three were published in peer-reviewed journals. These showed no evidence of increased vaccination uptake and weak evidence of widening access to individuals who had not previously been vaccinated. There was good evidence that pharmacies were acceptable and convenient venues for vaccination. Cost-effectiveness was not assessed (UK review, 2018).[42]

Travel vaccines

The majority (94-100%) of the patients accessing community pharmacy travel services are satisfied or very satisfied with the service. Most accept pharmacist recommendations for vaccines and travel-related medications (acceptance rate of ≥75%) and there are high rates of acceptance of other non-pharmacological advice (systematic review, 2023).[43]

Cost effectiveness: Systematic reviews, RCT and UK studies could not be identified.

Needle and Syringe Programmes

There is a lack of research related to needle and syringe programmes (NSPs).[44] This is likely due to difficulties of research in this area of public health (e.g. sensitivities and difficulty of follow-up).

NICE Guidance has an explicit recommendation that there should be community pharmacy-based needle and syringe programmes. The guidance also outlines the expectation of the service and training requirements.[45]

The WHO outlines the advantages of pharmacy NSP around accessibility and convenience. However, the WHO noted that some pharmacists do not like providing the service and financial incentives are usually required to provide services and larger incentives are needed for disposal of used needles. Another reported shortcoming is that pharmacy NSPs rarely offer education and additional services to drug users (WHO, 2007).[46]

Cost effectiveness: UK analysis report that services are cost effective in preventing blood-borne infections and subsequent NHS costs.[47,48]

Sexual health services

Emergency hormonal contraceptive service

A systematic review explored UK pharmacists' and young women's views, perspectives and experiences of emergency hormonal contraceptive (EHC) service provision in community pharmacies (UK focused systematic review, 2020).[49] The findings suggest pharmacist judgementalism is an area for improvement, as well as ensuring premises support confidential requests for the service at the counter and subsequent consultations.

Perspectives from young women	Perspectives from community pharmacists
• The confidential nature of the service was seen as an important advantage. However, there can be concern around being overheard by other patients in a queue and therefore being forced sometimes to wait in the shop for quieter periods to approach the pharmacy counter. • Concerns over embarrassment and judgement of the pharmacy staff, particularly if the only option was a young male pharmacist. • Convenience and ease of access of services was a positive. • Speed with which the pharmacist dealt with the request was an advantage over going to an alternative provider. • Paying for EHC was seen as barrier.	The most frequently mentioned concern among the community pharmacists was that community pharmacy supply of EHC to young women might encourage 'irresponsible' attitudes to contraception use. • Good access and no appointment needed. • Free supply of EHC at the point of delivery was seen as facilitating uptake of the services by young women. • The confidential nature of the service was seen by pharmacists as an important advantage for young women who may not have wanted their GP or family members to find out that they had used EHC or may be too embarrassed to approach specialist sexual health services. • Training was seen as a positive, particularly with regard to ensuring that they had experience in communicating with women sensitively. • Professional satisfaction of supporting women.

Cost effectiveness: Levonorgestrel (taken up to 72 hours after unprotected sex) and ulipristal acetate (up to 120 hours after) are cost effective in avoiding additional NHS costs. The incremental cost-effectiveness ratio (ICER) of preventing one additional unintended pregnancy ranges from £183 to £500. All these costs are less than the estimated cost of an unintended pregnancy (£948) regardless of the outcome or the cost of an induced abortion (£672) (UK study, 2010).[50]

Quick-start contraceptive service

Alongside EHC provision, UK pharmacist provision of the progestogen-only pill (as a bridging interim method of contraception) and an invitation to a sexual and reproductive

health clinic resulted in a 20% increase in subsequent use of effective contraception (pragmatic cluster-randomised crossover trial, 2020).[51]

Chlamydia testing

Interventions to promote chlamydia testing through community pharmacies have a high level of patient acceptance and use. The majority of the testing programmes were aimed at people seeking EHC from community pharmacies (review of reviews, 2019).[25]

Maternal and child health services

Community pharmacists are involved in providing various maternal and child health services. These include: vitamin supplementation; pregnancy and breastfeeding related services; responding to minor symptoms; and medication related advice. There is less evidence of community pharmacists' involvement in some important areas such as nutritional advice during pregnancy and advising pregnant women about screening for chronic disease (systematic review, 2021).[52]

1.3 Chronic condition services

There are numerous systematic reviews related to the role of community pharmacists in supporting patients with chronic conditions, which are outlined below.

Community pharmacist and GP collaborative models seem more effective than stand-alone pharmacy interventions.

Screening

It is feasible to deliver screening interventions from community pharmacies, although it is not clear how these interventions impact health outcomes in terms of early diagnosis of disease. Patient satisfaction was high around screening services in pharmacies, but it is common for patients who screened positive to ignore pharmacist referral to seek further medical attention in order to confirm the presence of disease through further diagnostic testing (review of reviews, 2019).[25]

Community pharmacies could potentially deliver a wide range of point-of-care tests, such as testing for: blood glucose; cholesterol; creatinine; uric acid; liver enzymes; anticoagulation therapy; forced expiratory volume for chronic obstructive pulmonary disease; HIV and so on. Studies suggest point-of-care tests conducted and analysed in community pharmacies had satisfactory analytical quality (systematic review, 2019).[53]
A UK study on pharmacy-led diabetes screening estimated the cost per test and cost per appropriately referred patient attending follow-up. The cost per test and identification rates through community pharmacies were similar to those reported through general practice. Locating services in areas of suspected greater diabetes prevalence and working to increase the proportion of patients who follow pharmacist advice to attend their medical practice improves cost-effectiveness.[54]

It is feasible for community pharmacists to use depression screening tools to identify undiagnosed adults having symptoms of depression. However, there is little evidence around the impact of this screening on clinical and economic outcomes (systematic review, 2020).[55]

It is also feasible for community pharmacists to undertake mole scanning services in collaboration with dermatologists to triage patients for malignant melanoma. An estimated 0.7% of scans taken as part of the service led to a confirmed diagnosis of malignant melanoma (UK study, 2020).[56]

Cost effectiveness: Systematic reviews and RCT could not be identified.

New medicines service

An evaluation of the New Medicine Services (NMS) in English community pharmacies (26-week follow-up) was unable to demonstrate a statistically significant increase in adherence to medications or reduction in NHS costs (UK study, 2020).[57]

Cost effectiveness: A UK economic evaluation study suggests NMS may deliver better patient outcomes and reduce overall healthcare costs than normal practice, but uncertainty around this finding is high. There was a non-significant reduction in 26-week NHS costs for NMS: -£104 per patient. NMS generated a mean of 0.04 more QALYs per patient, with mean reduction in lifetime cost of -£113.9. The incremental cost-effectiveness ratio was -£2758/QALY. NMS has an 89% probability of cost-effectiveness at a willingness to pay of £20,000 per QALY (UK study, 2020).[57]

Medicines reviews, education and counselling

Pharmacist interventions can improve patient adherence to medications through regular reviews, education and counselling (systematic reviews, 2018, 2019, 2021).[58, 44, 45] Appointment-based pharmacy medicines reviews can improve adherence but research on health outcomes has yet to be determined (systematic review, 2017).[61]

Systematic reviews on specific age groups and conditions have found pharmacy-led education and counselling can potentially improve adherence and patient outcomes, particularly when community pharmacists work in collaboration with GPs (outlined below).

There is significant variation across England related to supporting self-care in patients with chronic conditions, suggesting gaps in some areas where community pharmacy could take a more active role in improving care (in collaboration with GPs) (PHE, Atlas of Variation, 2019).[22]

The most effective interventions to improve adherence are multifaceted, targeted and personalised. They usually had a combination of components including: education, simplification of treatment regimens, communication between patients and their health care professionals, follow-up and monitoring (systematic review, 2018).[62]

Patient medication adherence can be improved through specific community pharmacy approaches, including: identification and enrolment of patients; inclusion of a medication review and patient assessment; and the alignment of refills (systematic review, 2019).[63]

Factors associated with poor adherence include: multimorbidity; cognitive impairment; complex regimens with multiple prescribing physicians; and problems with drug storage or formulation (systematic review, 2018).[59]

Cost effectiveness: There is insufficient evidence related to cost-effectiveness of interventions (systematic review, 2018).[62]

Specific age groups and conditions

Young people (aged 10-24)

There is a lack of research related to pharmacy interventions targeted at younger people with chronic conditions. Community pharmacists have identified supporting young people with chronic conditions as a high priority (due to often poor health literacy and medication adherence issues in this group). There is a need to develop supportive and trusted relationships to enable education and counselling related to medicine management (systematic review 2019).[64]

Cardiovascular disease and hypertension

Although contexts differ and studies can be low-quality, community pharmacy medicine education and counselling can lead to positive outcomes for patients with cardiovascular diseases and hypertension (systematic reviews).[65,66,67,62,68]

A UK RCT found that written advice to patients about hypertension and its treatment provided by community pharmacists was more effective in improving patient knowledge and understanding compared to only verbal advice. However, neither written or verbal advice led to improved blood pressure control (UK RCT, 2018).[69]

Cost effectiveness: Community-pharmacist-led medication review can improve healthcare utilisation outcomes in patients with hypertension (systematic review, 2022).[70]

Economic evaluations of general medical services delivered by non-medical health professionals find that pharmacy-led services for the medicines management of coronary heart disease can be as effective as, but more costly than, GP care (systematic review, 2019).[71]

Diabetes

Although contexts differ and studies can be low-quality, community pharmacy medicine education and counselling can improve medication adherence and outcomes in patients with diabetes (reductions in haemoglobin A1c, total cholesterol, and low-density lipoprotein). When pharmacists altered medication this was usually in collaboration with the GP (systematic reviews).[72,73,65,66,74,67,62,75,70]

Cost effectiveness: In some cases community pharmacy diabetic services may decrease wider medical and health care costs (systematic review, 2020, 2022).[66,70]

Asthma and COPD

In England there is a high level of variation for emergency admissions due to asthma attacks, many of which could be prevented through supporting effective self-management (PHE Atlas of Variation, 2019).[22]

Most of the care for people with asthma is provided in primary care and there is significant variation across England around the proportion of people with asthma on registries (2.3 fold difference). There is also variation in the proportion of patients on asthma registries who received an asthma review in the last 12 months (1.4 fold difference). The quality of the review is also likely to be highly variable. Accurate diagnosis and inclusion on disease registers in primary care are essential prerequisites for structured proactive asthma care and supporting patients to self-care through education and advice (PHE Atlas of Variation, 2019).[22]

Pharmacist-led education can significantly improve asthma self-management, symptom control, quality of life and medication adherence (systematic reviews).[76,77,62] Patient outcomes (particularly inhalation technique, ED visits, and asthma knowledge) can improve when pharmacists and GPs work in collaboration to deliver asthma care (systematic review, 2019).[78]

Community pharmacist-delivered inhaler training informed by a digital technology can improve adherence and health outcomes in patients (UK RCT, 2020).[79]

Pharmacist-led educational interventions can improve medication adherence in COPD patients (Indian RCT, 2018).[80]

Cost effectiveness: Collaborative care models, when pharmacists and GPs work together to deliver asthma care can be cost effective (systematic review, 2019).[78]

One study found that pharmacy-led medicine use reviews for asthma patients can be cost-effective; adherence improved by 35.4% at 3 months post-intervention and 40.0% at 6 months. The probability of the intervention being more cost-effective than usual care was 100% at 9 months (Italian RCT, 2017).[81] Although dated, another study also found pharmacy-led asthma care was cost-effective (Australian study, 2007).[82]

Other conditions

Depression: Pharmacy interventions are not well researched in relation to people with depression and medicine adherence interventions, and the evidence available is of low quality (systematic review of RCTs, 2018, Cochrane review, 2019).[67,83]

Patients with depression had better outcomes in models of care collaboration between GPs and clinical pharmacists. After 6 months, the group under collaborative care models had significantly higher drug adherence rates than the control groups (67% vs 48%). Patient satisfaction was significantly greater in the intervention than in the control group, and provider satisfaction surveys revealed high approval rates as well (systematic review, 2021).[84]

Sleep disorders: There is a strong tendency for patients to self-medicate, 89% of people with symptoms of sleep disorders reported not seeking medical advice but did buy sleep

medications at pharmacies. This suggests pharmacists may be supplying medicines for sleep disorders without providing appropriate evidence-based health advice (which recommends non-pharmaceutical pathways as a first option) (systematic review, 2023).[85]

HIV/AIDS: Community pharmacy education can increase medication adherence in patients with HIV/AIDs (systematic review, 2020).[66] Pharmacist-managed HIV services can improve overall health outcomes and be cost effective (systematic review, 2021).[86]

TB: The inclusion of community pharmacists into TB programmes can improve the continuity of care, bridging the gaps in TB case detection and treatment monitoring. Adequate training and support are essential (systematic review, 2023).[87]

Opioids: Community pharmacists could play a role in opioid stewardship and optimising opioid therapy; however, more research is needed. (scoping reviews and systematic review, 2021, 2022).[88,89,90]

Back pain: No relevant systematic reviews or RCTs identified.

Economic evaluations of general medical services delivered by non-medical health professionals find that for managing chronic pain, pharmacy-led care is slightly more effective than GP care for increased cost (systematic review, 2019).[71]

Arthritis: No relevant systematic reviews or RCTs identified.

Chronic kidney disease: No relevant systematic reviews or RCTs identified.

Osteoporosis: No relevant systematic reviews or RCTs identified.

1.4 Pharmacy medicines services

Prescribing

NHS England, through the work of commissioners, prescribers and dispensers, is seeking to improve patient care and cost effectiveness through its Medicines Value Programme. In 2018 primary care medicines prescribed and dispensed cost the NHS £8.8 billion (NHS England, 2019).[91]

Prescriptions are increasing and there are high levels of variation in prescribing (despite adjustments for population demographics) (PHE Atlas of Variation, 2019, UK Study, 2017).[22,92]

NHS England is seeking to discourage the use of treatments it considers to be low-value and has developed guidance on items which should not routinely be prescribed in primary care (NHS England, 2019).[91] These include:

- Items of low clinical effectiveness, where there is a lack of robust evidence of clinical effectiveness or there are significant safety concerns.
- Items which are clinically effective but where more cost-effective products are available, including products that have been subject to excessive price inflation.
- Items which are clinically effective but, due to the nature of the product, are deemed a low priority for NHS funding.

Prescribing of low-value treatments in England is extensive but varies widely by treatment, geographic area and individual practice. Despite a fall in prescription numbers, the overall cost of prescribing for low-value items has risen (English study, 2018).[93]

Spend on low-value treatments was estimated to be £153.5 m in 2017, across 5.8 m prescriptions (mean, £26 per prescription). Among individual treatments, liothyronine had the highest prescribing cost at £29.6 m, followed by trimipramine (£20.2 m).[1] Annual practice level spending varied widely (median, £2262 per thousand patients; interquartile range £1439 to £3298). Proportion of patients over 65 was strongly associated with low-value prescribing, as was geographic area (English study, 2018).[93]

There is also variation of antimicrobials. For example, despite a general trend towards more optimal antibiotic prescribing, considerable geographical variation persists across England's practices and CCGs (even after accounting for demographic differences) (UK studies, 2018 and 2019). [94,95]

Prescribing variation can be addressed through effective collaborative working between commissioners, prescribers (GPs) and dispensers (community pharmacists). Collaborative working is outlined further in the implementation section.

A UK survey estimated that unused prescription medicines cost the NHS £300 million every year - 40% admitted binning unused medications, potentially wasting up to an estimated 445 million prescriptions a year (UK survey, 2021).[96]
The UK government did consult on whether to put the cost of medications on the dispensing labels. The majority of the respondents said they were not aware of any evidence related to showing prices. There were largely negative views from respondents on the proposed implementation of pricing on medicine labels due to potential unintended consequences (UK Government, 2021).[97]

One Welsh study reported that introducing cost-labels may serve to make patients feel guilty or unworthy rather than encourage them to use their medicines appropriately. Providing cost information would need to also include education to prevent misunderstanding. The study found that targeting systemic medicine waste and unnecessary prescribing could be more effective in realising savings from the medicines budget (Welsh study, 2017).[98]
A 2022 House of Commons motion to bring a Bill to implement drug cost labelling was denied. The aim was to raise awareness of medicines costs and enable patients to be part of cost-efficiency medicines programmes (HoC, 2022).[99]

[1] Liothyronine: New patients should not be prescribed this medication in primary care and individuals currently prescribed liothyronine should be reviewed by a consultant NHS endocrinologist with consideration given to switching to levothyroxine.
Trimipramine: Should not be prescribed and no routine exceptions have been defined.

Over-prescribing

The UK government published a review on overprescribing in England. It reported that NHS spending on medicines increased from £13bn in 2010-11 to £18.2bn in 2017-18. Over one billion prescription items were dispensed in primary care alone, with an estimated 10% being "overprescribed." This means that they were not needed or wanted by the patient, potentially more harmful than beneficial, or having more appropriate alternatives (DHSC, 2021).[100]

As well as a significant, and rising cost to the NHS, over-prescribing also has negative consequences for patients. A fifth of hospital admissions among adults over 65 are the result of adverse effects of prescribed drugs (DHSC, 2021).[100] The polypharmacy section outlines the impact of multiple medications on patients.

Overprescribing also has an environmental impact. Currently 25% of the NHS's carbon footprint comes from medicines (DHSC, 2021).[100]

The National Overprescribing Review (NOR) identified that systemic and cultural factors influence overprescribing, both of which require close working between GPs and community pharmacists. Systemic factors include: single-condition clinical guidelines; a lack of alternatives to prescribing a medicine; a need for on-going review and deprescribing to be built into the process of prescribing; inability to access comprehensive patient records; the lack of digital interoperability; and pressure of time. Cultural factors include a healthcare culture that favours medicines over alternatives and in which some patients struggle to be heard (DHSC, 2021).[100]

Medication dispensing

Medication dispensing with education and counselling related to taking medications can have positive outcomes on patients (systematic review, 2021).[101]

Community pharmacy medication interventions are usually targeted at high-risk patients (frail, recently discharged from hospital or multimorbid with polypharmacy) or people taking high-risk medications (anticoagulant or blood pressure lowering medication) (Cochrane systematic review, 2014).[20]

Pharmacy interventions can improve the safety and effective use of medications, through: supporting self-monitoring and self-management; simplifying dosing regimens; medicines reviews; consultations to resolve medicines problems; developing care plans; and providing follow-up (Cochrane systematic review, 2014).[20]

Practical strategies like reminders and reminder packaging can be positive, although with somewhat mixed effects on adherence. Directly observing patients taking medications is generally ineffective for improving treatment completion, adherence or clinical outcomes (Cochrane systematic review, 2014).[20]

There is limited research undertaken related to some sub-populations, including children and young people, carers, and people with multimorbidity (Cochrane systematic review, 2014).[20]

Repeat dispensing

A dated review of UK evidence indicated that patients' satisfaction with repeat dispensing was high, mainly as the service was seen as more convenient and time saving. While pharmacists considered that their relationship with patients had improved, one study found that patients did not necessarily agree and considered that pharmacists still remained in their dispensaries. The study was unable to determine the impact of repeat dispensing on medicines budgets (UK focused systematic review, 2006).[102]

Technicians dispensing

Trained technicians are key enablers for the delivery of new services in the community pharmacy through freeing-up pharmacist time (systematic review, 2021).[103]

Trained community pharmacy technicians perform as accurately as pharmacists (and hospital-based technicians) and could potentially release between 5% and 19% of the pharmacist time for clinical facing activities (systematic review 2017).[104] This is similar to hospital technicians who can free-up between 10 hours of pharmacist time per month to 1 additional hour per day (systematic review, 2011).[105]

Pharmacy technicians have demonstrated a higher level of accuracy, and a lower variation in accuracy rates than pharmacists. Pharmacist accuracy rate has been reported to be 99.27% and pharmacy technicians' accuracy rate 99.72% (meta-analysis, 2020).[106]

To note, studies compared accuracy and not the error-detecting capabilities of technicians. However, there is a low reported community pharmacy dispensing error rate (0.015), although study methodologies varied (US meta-analysis, 2018).[107]

Polypharmacy

Polypharmacy is most commonly defined as concurrently using five or more medications.[108] As more people live longer with multiple long-term conditions the number of medicines they take often increases. This can have a significant burden on the individual managing and trying to adhere to multiple medicines regimes. It can also be harmful to the individual (NHS, 2023).[109]

In England in February 2022 there were 876,317 people on 10 or more medicines (NHS, 2023).[109] The English Longitudinal Study of Ageing found that 24.1% of older adults were on polypharmacy and 6.4% were on hyper-polypharmacy (10 or more medications); the average age of participants was 68 years. Deprivation, obesity, increasing age and chronic health conditions were significantly associated with increased numbers of medications a person was taking (English study, 2018).[3]

Studies have shown that that over 50% of older people are prescribed a medicine with more harm than benefit, leading to avoidable morbidity, hospitalisation and mortality (NHS, 2023).[109] Even after adjusting for demographics, there is wide variation in the prevalence of polypharmacy suggesting variation in clinical practice (systematic review, 2021).[108]

Adverse reactions, drug-interactions and falls are some of the main risks from polypharmacy.

Adverse reactions and drug interactions: Around 6.5% of hospital admissions in England are caused by adverse effects of medicines. This rises to up to 20% in the over 65 age group. Two thirds of medicines-related hospital admissions are considered preventable. Adverse drug reactions are thought to occur in 10-20% of hospital in-patient admissions. A person taking ten or more medications is 300% more likely to be admitted to hospital because of an adverse drug reaction (DHSC, 2021).[100]

Falls: Some classes of medicines, such as those to reduce blood pressure, can increase the risk of falls amongst the frail and elderly (DHSC, 2021).[100]

In 2020 data from the English Longitudinal Study of Ageing found that the risk of hospitalisation due to a fall increased with polypharmacy which may also be an indicator of health status: falls are lowest among people reporting no medications (1.5%); 4.7% of falls among those taking 1–4 medications, 7.9% of falls among those with polypharmacy; and 14.8% among those reporting hyper-polypharmacy (UK study, 2020).[110] Falls often mean a long hospital stay and extended recovery, and may result in the patient experiencing on-going pain, loss of mobility, confidence and independence. Falls are also estimated to cost the NHS more than £2.3 billion per year (AgeUK, NICE).[111,112]

Hypertension medications: The most prevalent medications taken by older adults with polypharmacy are cardiovascular drugs (systematic review, 2021).[108]

Although the use of antihypertensive medications has led to reduction in cardiovascular disease, they can be associated with harms, especially in older people. Harms include the development of adverse drug reactions, drug-drug interactions and contribution to increasing medication-related burden.[113]

No difference in all-cause mortality and myocardial infarction was found in discontinuing antihypertensive medications compared with continuing antihypertensives in older adults. Future research should focus on populations with the greatest uncertainty of the benefit–risk ratio for use of antihypertensive medications, such as those with frailty, older age groups and those taking polypharmacy, and measure clinically important outcomes such as falls, quality of life and adverse drug events (Cochrane systematic review, 2020).[113]

Community pharmacy interventions
The introduction section summarises high-level evidence on community pharmacy interventions related to the provision of medications. The section below outlines findings from the evidence that are more closely linked to polypharmacy.

The 2021 DHSC National Overprescribing Review (NOR) outlined that reducing overprescribing can be achieved through: shared decision-making with patients; better guidance and support for clinicians; more alternatives to medicines, such as physical and social activities and talking therapies; and more Structured Medication Reviews for those with long-term health conditions (DHSC, 2021).[100]

Community pharmacy-based interventions on medication-related problems of older adults can improve clinical outcomes and reduce adverse drug events. However, medication review has not been found to significantly reduce the number of older adults who fall and require hospitalisation (systematic review, 2019, systematic review and meta-analysis, 2021).[114,115]

Evidence on the effectiveness of pharmacist interventions for improving adherence in older adults prescribed multiple medications is low quality. Behavioural only or mixed educational and behavioural interventions may improve adherence, but uncertain effects of educational only interventions. No type of intervention was found to improve adherence when it was measured as a continuous variable (Cochrane systematic review, 2020).[116]

There is a lack of high-quality evidence demonstrating the effectiveness of pharmacy-led medicines optimisation interventions for older people with frailty within primary care (systematic review, 2022).[117]

Deprescribing has been stated to enable better adherence to remaining medications. However, there is insufficient evidence to show that deprescribing of medications in individuals with polypharmacy improves medication adherence (systematic review, 2019).[72]

Collaborative GP and community pharmacy models are likely more effective. Pharmacists co-located in general practice clinics mainly focus on chronic condition medication reviews (87%) and can lead to significant improvements in blood pressure, glycosylated haemoglobin, cholesterol and Framingham risk score in intervention patients compared to control patients (systematic review, 2014).[118]

A Scottish study in 2016 found that including specialist clinical pharmacists into the practice to perform key prescribing activities released an average of 5 hours' direct GP time per practice per week. As well as freeing up GP capacity, improvements in patient safety were identified and there was a positive impact on staff morale and reductions in stress.[119]

Although there are often stated policy expectations of pharmacists in general practice freeing up GP time, the evidence-base is limited. Similarly, there is little evidence of nurse-led services freeing up GP time (Cochrane systematic review 2018).[21]

Cost effectiveness: There is likely to be an economic effect of medication interventions by community pharmacists when they included at least one follow-up (systematic review, 2020).[120]

Deprescribing of inappropriate or unnecessary medication is promising from an economic viewpoint, but more studies are needed (systematic review, 2022).[121]

Community-based pharmacists can lead deprescribing interventions and they are valuable partners in deprescribing collaborations, providing necessary monitoring throughout tapering and post-follow-up to ensure the success of an intervention. Pre-defined pharmacist-led deprescribing can contribute to financial savings. Short follow-up periods prevent evaluation of long-term sustainability of deprescribing interventions. In particular,

pharmacist-led deprescribing of people with mental health conditions can improve anticholinergic side effects, memory and quality of life (systematic review, 2022).[122]

Discharge from hospital and readmissions

The average rate of medication errors and unintentional medication discrepancies following discharge of adults from hospital is reported to be 53% and 50%, respectively. Adverse drug reaction rates occur on average in just over a quarter of patients. For paediatric patients, a medication error rate of 66.3% has been reported and an adverse drug event rate of 9%. Drug classes most commonly implicated with adverse drug events were antibiotics, antidiabetics, analgesics and cardiovascular drugs (systematic review, 2020).[123]

The most effective interventions to avoid inappropriate re-admission to hospital and promote early discharge included integrated systems between hospital and the community care, multidisciplinary service provision, individualisation of services, discharge planning initiated in hospital and specialist follow-up (systematic review 2019).[124]

There is little evidence that interventions in primary care for reducing preventable medication errors make any difference to the number of people admitted to hospital or the number of hospitalisations, emergency department visits, or mortality (Cochrane systematic review, 2017).[125]

When pharmacists and GPs work together, they can reduce medication-related hospital readmissions, although evidence is low quality (systematic review, 2022).[126] Interventions led solely by community pharmacists have not been found to reduce unplanned admissions in the older ages (systematic review and meta-analysis, 2014).[127]

Community pharmacists can apply their experience in reviewing medications, identifying and resolving drug therapy problems, and providing education to patients at care transitions (i.e. hospital discharge to community) (systematic review, 2003).[128]

A RCT measured the impact of a pharmacist-provided medication therapy management program on 30-day post-discharge readmission rates. There was no significant difference in 30-day readmission rates between intervention and control groups (11.3% vs. 10.7%). However, a large portion of patients randomised to the intervention did not attend their appointment. When comparing patients who attended their appointment to patients in the control group, there was a significant difference in 30-day readmission rates (1.6% vs. 10.7%). Pharmacists identified many interventions for patients. The transmission of patient information from the inpatient setting to the community pharmacy is key to transitioning patients successfully and encouraging patients to attend appointments / making appointments accessible to patients (US RCT, 2019).[129]

Cost effectiveness: Lack of evidence.

Residential care

There is wide variation in the medication error and error-related adverse events rates related to adults in managed care settings. Inappropriate prescribing was the most common type of error reported. The incidence of preventable adverse drug events was estimated as 15/1000 person-years, the prevalence of drug-drug interaction-related adverse drug reactions as 7%. Medication-related risks include: the number of medications used by the patient; increased patient age; the number of comorbidities; use of anticoagulants; cases where more than one doctor was involved in patients' care; and care being provided by GPs (systematic review, 2018).[130]

Pharmacists can identify and resolve medication-related problems, which results in improvements in medication appropriateness. However, evidence of a consistent effect on resident-related outcomes was not found (Cochrane systematic review, 2016).[131]

Cost effectiveness: Lack of evidence.

Outpatient care

Adverse drug events in ambulatory / outpatient care are common, with many being preventable and many resulting in hospitalisation. Inappropriate medications, omissions and lack of monitoring were the main factors linked to adverse drug events. Over 85% of harms relate to cardiovascular, analgesic, and hypoglycemic medication (systematic review, 2007).[132]

Medication reviews in ambulatory care (outpatients) can improve clinical outcomes, mainly related to the management of drug-related problems and adverse events. Patient satisfaction was highest when medication reviews incorporated conversations on adherence (systematic review, 2021).[133]

Cost effectiveness: Medication reviews in outpatients can reduce healthcare costs related to preventing drug-related problems and adverse events (systematic review, 2021).[133]

Emergency department care

Pharmacy-led (either pharmacists or technicians) emergency department medication reviews can decrease the number of medication discrepancies (systematic review, 2019).[134]

Cost effectiveness: Lack of evidence.

1.5 Pharmacy technologies

Drive-through pharmacies

Drive-through pharmacy services have been set up in several countries (at hospital and community pharmacy settings) with the aim of reducing waiting times in the pharmacies and improving the availability and provision of healthcare services for those targeted. However, the service can create a barrier to access between the patient and pharmacist (systematic review, 2023).[135]

Technology-based health tools

Community pharmacies are using a variety of technology-based health tools, for example: telephone prompts or calls; mobile health applications; remote monitoring devices; and use of photo-aging software in smoking cessation services. Public health topics that were addressed included: vaccination uptake; smoking cessation; hypertension management; and medication adherence and counselling. More studies are needed to demonstrate whether or not the use of novel technology by community pharmacies can improve public health (systematic review, 2020).[136]

Telepharmacy services evidence is too poor quality to make conclusions on safety and patient outcomes (systematic review, 2021).[137]

Among pharmacy services, medication order review is the service most targeted by AI-powered apps and tools, followed by health product dispensing, pharmaceutical interviews and therapeutic education. The development of these tools mainly involved hospital pharmacists (systematic review, 2023).[138]

Hub and spoke

The UK Government is consulting on hub and spoke models. There is limited evidence related to this model (UK Government, 2021).[97]

Locker-boxes

There is limited research into community pharmacy locker-boxes.

There was some increase in the use of locker-boxes during the pandemic. Small scale country studies suggest patients and carers support the system to collect medications due to convenience and the opportunity to save time (Singapore study, 2022).[139] However, there were notable limitations which include: locker size may not be suitable for patients with a large number of medications; issues of temperature-sensitive medications; individuals with cognitive impairment had difficulties following instructions; lack of face-to-face interaction that serves as a reminder to ensure medication adherence (Malaysian study, 2022).[140]

Automation

Community pharmacy automation can improve medication safety and productivity (approx. 4 additional items per person/hour). No reductions in workload or time savings were

reported by staff. While the perception of work stress decreased, job satisfaction remained unchanged. Significant cost savings and an increase in over-the-counter sales were also noted post-automation (systematic review, 2019).[141]

2 Implementation enablers

The following section summarises the commonly cited barriers and enablers to community pharmacy delivering clinical services. These are drawn from the evidence base and reflect findings from previous reviews of community pharmacy in England (2013, 2016).[142,143]

Pilots to national roll-out

Factors that can enable successful national implementation of innovations in community pharmacy include: robust piloting of innovations; improved engagement to increase awareness and acceptance of innovations; promoting whole-team involvement to overcome time constraints; pre-implementation evaluation to understand acceptance and appropriateness of innovations within real-world settings (systematic review, 2019).[144]

Evidence on outcomes and cost-effectiveness can enable roll-out through presenting strong business cases for new services. Unfortunately, reporting and methodological issues often prevent firm conclusions on the value of most community pharmacy services (systematic reviews, 2019, 2020).[145,146]

Pharmacists deliver a wide range of services to patients and it is important to know which pharmacist services are effective in helping patients to improve their health. Of the services that are positive there is often little or no difference between the effectiveness of interventions that were pharmacist-led compared with the same intervention being delivered by other healthcare professionals. This is an important finding in terms of role substitution, with particular implications for costs (Cochrane systematic review, 2018).[147]

Where available, outcomes and cost effectiveness analyses for individual community pharmacy services have been embedded within the report topics (above).

Remuneration and reimbursement

Adequate remuneration and reimbursement (return on investment) is a key facilitator. Adequate funding impacts all additional resourcing and ultimately the viability of the service (systematic reviews).[148,149,150,85,52,128] See payment model section for further information.

Prescribing with dispensing

Dr Bruce Warner, Deputy Chief Pharmaceutical Officer for England has stated that the NHS “can’t hide from the conflicts of interest” that arise from prescribing and dispensing within the same community pharmacy.[151]

There is a lack of research into the commercial conflicts of interests related to emerging roles of community pharmacists and pharmacies.

A useful comparison could be dispensing GPs, who both prescribe and dispense. Dispensing practices can fill an important gap where pharmacy shortages exist, but there is some evidence the dispensing role influences prescribing (systematic review, 2009).[152]

There is moderate quality evidence that doctors' interactions with pharmaceutical companies are associated with their prescribing patterns and quality. There are consistent associations between interactions promoting a medication, and inappropriately increased prescribing rates, lower prescribing quality, and/or increased prescribing costs (systematic review and meta-analysis, 2017).[153]

There was research undertaken that stated UK dispensing practices were more likely to prescribe higher cost drugs. However response to the article highlighted significant methodology issues (e.g. use of only one month's data and a month that was not representative) (UK study, 2019).[154]

Doctors can be unaware of costs and tend to underestimate the price of expensive drugs and overestimate the price of inexpensive ones. This discrepancy can have an impact on overall drug expenditures (systematic review, 2007).[155] Prescribing pharmacists are likely to be more aware of the costs of medications, which may mitigate increased prescribing costs if appropriate incentives are in place and data to monitor and act on unwarranted variation.

In terms of international research, there are some country specific articles on joint prescribing and dispensing roles. However, contexts and culture varies considerably to enable findings to be relevant.[156,157,158] For example, in many Asian contexts doctors often prescribe and dispense medications. This practice is often cited to have led to high drug expenditure and proliferation of prescriptions (e.g. particularly of antibiotics in Asia).[158]

Pharmacist capacity

Lack of pharmacist time is a fundamental barrier to expanding clinical roles. Freeing-up pharmacists' capacity is essential to enable development and the consistent delivery of extended services (systematic reviews).[135,159,149,85,52]

Technicians are key enablers for the delivery of new services in the community pharmacy and could potentially release up to 19% of the pharmacists' time (systematic review, 2021).[103] See section above on technicians dispensing.

Community pharmacy automation can also improve productivity, although evidence is limited (systematic review, 2019).[141] See section above on automation.

Pharmacy spaces

Ensuring that there is privacy at the counter and in consultations is a key service enabler. The lack of privacy is cited as an issue across multiple reviews of community pharmacy clinical service delivery (systematic reviews).[135,159,160,149,161]

Public support, awareness and expectation

Patient and public perspectives of community pharmacies in the UK are positive, but awareness of pharmacy services beyond medicines supply remains low (UK focused systematic review, 2018).[162]

Pharmacists, patients and the wider public have consistently had positive perceptions and attitudes toward pharmacists undertaking extended health improvement roles over the last two decades (if barriers are addressed and there is effective implementation) (systematic reviews, 2004, 2011, 2023).[135,159,163]

Patients' choice of pharmacy is often influenced by multiple factors, such as: the traits of the pharmacist (e.g. friendly, helpful, trustworthy, professional, competent, caring, knowledgeable, responsive, and approachable); convenience (e.g. location, hours of operation, wait time, stock availability); cost; availability of auto-refills; medication safety (e.g. detecting drug interactions); and quality indicators (systematic review, 2020).[164]

Developing the public's expectation around the role of the pharmacist, the service offer and attracting patients to specific services is an important implementation enabler (e.g. medication reviews) (systematic reviews).[135,148]

Patients' question-asking and expectations appear to be associated with and influence patient-pharmacist interpersonal communication around medication advice and guidance (systematic review, 2021).[165]

There can be an issue of customer / patient aggression towards pharmacy staff. A considerable proportion of community pharmacists experienced some form of violence (65%), verbal abuse (50%,), threats (42%) or assaults (27%). Moreover, 56% of pharmacists reported experiencing physical and/or verbal violence over the previous 12 months (systematic review, 2023).[166]

There is a need to ensure safe workspaces in pharmacy environments through implementation of appropriate policies and legislation (systematic review, 2023).[166] However, there is a lack of high quality research related to interventions that can prevent aggression towards health workers (Cochrane systematic review, 2020).[167]

Collaboration with general practice

Although there are stand-alone community pharmacy clinical services that report positive outcomes and are cost-effective, the evidence-base currently suggests that some services (MAS, chronic condition services, services targeting high-risk patients or high-risk medications) are more effective when delivered in collaboration with GPs.

National policies also require effective collaborative working between GPs and community pharmacists, such as integrating primary care and improving outcomes and value of medicines.[168,169,100]

International guidance recognises the importance of primary care providers and professionals working in collaboration to improve the public's health and delivery of care to communities (OECD,2020).[170]

There is evidence that primary care multi-disciplinary team practice is associated with improved health outcomes and quality of life (notably for patients suffering from chronic diseases), decreased length of stay and admission rates, and has demonstrated cost-effectiveness as well as improved work satisfaction in primary care (OECD,2020).[170]

Implementing MDT delivery of primary health care is not a simple undertaking given the traditional divisions of professional silos: it requires effective support from policy makers. This includes adjusting the training of health care professionals, changes in governance framework, payment approaches and in the use of digital technologies (OECD,2020).[170]

Evidence suggests that collaboration based around issues that are 'meaningful' to both professions and patients are more successful and should run from undergraduate curricula through to ongoing practice (systematic reviews).[171,135,103]

Of the evidence available, collaboration between community pharmacists and GPs are more likely to improve outcomes across numerous conditions compared to pharmacist-only services (e.g. asthma, diabetes, cardiovascular disease, depression - see above). More conditions are likely to show similar outcomes if research on collaborative care models is undertaken.

In the UK, GPs' awareness of community pharmacy services has been found to be low. GPs were more cautious than pharmacists and collaborations were often inadequate. To note, there is often a heavy weighting towards data collected from pharmacists and a relative paucity of research among GPs (systematic review of UK studies, 2019).[172]

Difficult professional relationships can be a key barrier to implementation of services that require collaboration with GPs, such as medication reviews (systematic review, 2022).[148]

Several factors influence interprofessional collaboration between community pharmacists and GPs. Factors that posed a challenge to effective interprofessional collaboration were the perceived imbalance in hierarchy and power between the professions and a lack of understanding of each other's skills and knowledge. Experience of collaboration with the other party led to greater understanding of each other's capabilities and potential role in co-delivering patient care. The physical environment was also identified as important, with co-location and other resources to facilitate clear and regular communication identified as important facilitators of interprofessional collaboration (systematic review, 2019).[173]

Information technology

Information technology (IT) evaluation frameworks have not been developed in relation to community pharmacist emerging roles or in the community pharmacy setting. A review of the evidence found that IT needs to meet the unique needs and requirements of emerging roles for pharmacists, accessibility and usability perspectives are needed from a range of stakeholders, and evaluation should be incorporated as part of the overall process of developing a system (systematic scoping review, 2023).[174]

Healthcare IT focuses on developing the following components, many of which are (or could be) relevant to community pharmacy IT systems (OECD,2020):[170]

- **Payments** linked to inputted activities to reduce the burden of submitting claims.
- **Electronic health records**, particularly those that are well structured and portable can generate clinical reminders to help track preventive and ongoing care services for patients with chronic diseases. EHRs can have major effects on patient safety and the overall quality

of the care delivered, by increasing compliance with guidelines, lowering the number of medication errors and reducing the risk of adverse drug effects.

Pharmacists can reduce medication related problems at hospital discharge, but are hampered in this role by not being notified of patient discharges and lacking access to patient records (systematic review, 2019).[128]

There are potential high-impact opportunities for community pharmacy to reduce high-cost healthcare utilisation (e.g. readmissions due to medication problems). However, this relies on information being transferred to pharmacists (with alerts to make the pharmacist aware) and patients attending the pharmacy appointment (or making available pharmacy expertise if the patient is unable to physically attend) (RCT, 2019).[129]

- **Electronic prescription** allows prescribers to write prescriptions that can be retrieved by a pharmacy electronically, to assess a patient's medication regimen at the point of care or to identify non-adherence. ePrescription programmes have been associated with a reduction in prescribing of potentially inappropriate medications and efficiency gains.

- **Clinical algorithms** bringing external and patient-derived data into the clinical decision-making process can create personalised predictions of disease status and generate more appropriate treatment, increasing the efficiency of health service delivery. Risk stratification has been used to flag patients at risk of avoidable hospital (re)admission, or to conduct specific targeted preventive actions towards disadvantaged or high-risk populations.

- **Health performance data:** Primary care performance data is often limited and focused on activities and inputs. Effective reporting information systems are needed to monitor, identify and act on variation and inappropriate and poor primary health care quality.

- **Telehealth** which includes telemonitoring, store and forward, and interactive telemedicine, may contribute in several ways to providing care in the right place at the right time, for instance, by improving the process and appropriateness of referrals. There should be careful oversight and regulation of digital services in order to maximise benefits and avoid harm, but used effectively, telemedicine makes health service delivery more efficient.

- **Home monitoring** and self-management digital applications are key levers to improving care quality and the delivery of people-centred primary health care. There is an increasing body of evidence about the effectiveness and economic assessment of mobile health applications, otherwise known as mHealth.

Evidence-based guidelines

Detailed protocols and evidence-based guidelines can ensure providers deliver quality patient care (scoping review and systematic review and, 2020, 2023).[135,175] However, evidence suggests guidelines can increase referrals to GPs in minor ailment services and services are more effective when working in collaboration with GPs (see above).

Continuity of pharmacy care

Evidence suggests that the odds of patients adhering to their medication regimen are about 1.1-2.5 times higher among those who consistently visited a single pharmacy compared to patients visiting multiple pharmacies. Additionally, the care provision with a high level of relational continuity could lower inappropriate drug use by 21-32% and the use of other costly services (e.g. GP and ED) by 12-29% (systematic review, 2022).[176]

Competence and confidence

Lack of education and confidence is a repeatably cited barrier. Training and education is needed to develop pharmacy team competencies and confidence to deliver a robust high-quality service (including communication skills) (multiple systematic reviews).[135,159,175,177,85,52]

The following were specific areas of education and training identified from on systematic reviews (the topics are biased towards conditions and services studied).

Minor ailments service: Community pharmacy training lacks uniformity and varies in terms of time commitment, cost, curricula, and assessment processes. Training is usually aimed at community pharmacists (not the wider pharmacy staff) and focuses on clinical care aspects and does not include guidance on service parameters and delivery (scoping systematic review, 2020).[178]

Diagnostic assessment: Performance of pharmacy staff diagnostic competencies was overwhelmingly reported as poor. This was the case regardless of geography, scenario used, or assessment framework adopted. However, evidence was low-quality (systematic review, 2019).[179]

Communication and attitudes: Education and training interventions using active learning techniques such as face-to-face training with role-play can improve community pharmacist communication skills (systematic review, 2018).[180]

Attitudes and subjective judgements of pharmacy staff towards service users of sexual health pharmacy services can be a barrier and could be addressed through training and education of the pharmacy team (systematic reviews, 2019, 2020).[161,49]

Smoking cessation: Education and training in smoking cessation can improve community pharmacists' self-efficacy, knowledge, and attitude toward smoking cessation, as well as pharmacists' smoking cessation practices (systematic review, 2022).[181]

Mental health: Mental health training programs increased the pharmacy team skills and confidence to deliver mental health care in community pharmacy (systematic review, 2022).[182]

Asthma: Education, training and checklists to confirm knowledge can improve pharmacist inhaler technique and improve patient outcomes (systematic review, 2020).[183]

Sleep: There is a lack of training in sleep disorders that creates a barrier to pharmacists advising patients or results in inappropriate selling of sleep medications (systematic review, 2023).[85]

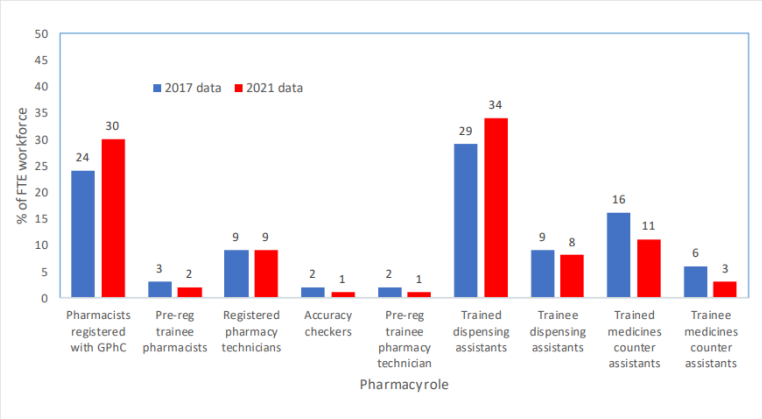
Workforce retention

The 2021 Health Education England workforce survey found that England's community pharmacy workforce was found to contain 101,108 people, filling 74,493 full-time equivalent (FTE) posts (HEE, 2021).[184]

- 27,406 pharmacists, filling 20,489 full-time equivalent posts (28% of the FTE workforce)
- 1,592 pre-registration trainee pharmacists, filling 1,573 full-time equivalent posts (2% of the FTE workforce)
- 7,768 pharmacy technicians, filling 6,327 full-time equivalent posts (9% of the FTE workforce)
  31% of these pharmacy technicians had an accuracy checking role (3% of the FTE workforce)
- 1,166 accuracy checkers (other than pharmacy technicians), filling 1,002 full-time equivalent posts (1% of the FTE workforce)

There was approx. one independent prescriber for 10 pharmacies, but a lack of geographic spread of roles.

The non-technician accuracy checkers had the highest vacancy rates of 20%.



Comparison of 2017 & 2021 community pharmacy workforce data: by FTE

In terms of pharmacists, addressing direct and indirect influences on pharmacist turnover can enable service sustainability and expansion. Organisational commitment and job satisfaction had significant influence on pharmacist turnover intention in all settings. Career commitment and perceived organisational support had direct and indirect effects on community pharmacist turnover intention (systematic review, 2021).[185]

Clinical governance

Effective clinical governance requires robust data and information about how well providers are performing and using this information systematically to identify how to improve the quality of care provided. There are a number of barriers to establishing effective clinical governance systems in primary care, including: isolation of primary care from the rest of the health system; lack of IT infrastructure; lack of capacity and capability;

dominance of medics; general mistrust; a lack of levers and incentives; and a lack of leadership and political pressure for change (systematic review of primary care, 2021).[186]

The General Pharmaceutical Council have highlighted the standards and guidance to follow when providing community pharmacy clinical services (GPhC) 2023).[187] These are likely to evolve further as services expand.

Risk management

There is reportedly variation in the use of risk analysis tools in community pharmacy dispensing. Risk tools can identify a range of patient safety issues and corrective actions (systematic review, 2021).[114]

3 Payment models

Every system is perfectly designed to get the result it gets (IHI, 2023).[188] There is no single perfect health care funding model and each approach has strengths and weaknesses and can produce unintended consequences. The importance of cultural expectations for services should also not be underestimated (Stanford University, 2016).[189]

The health care payment approach within a country and health system is contextual. Many depend on legacy systems, policy and regulatory context, relationships to other financing and payment systems, service delivery models and implementation arrangements (WHO, 2017).[190]

The mix of provider payment approaches that is best for a country, region or institution will change over time as providers adapt and respond to the incentives and as goals and challenges change (WHO, 2017).[190]

Health systems are increasingly combining payment approaches to create a **blended payment systems** of capitation (or base payment) alongside specific performance-based rewards or penalties. Payments are also being combined across providers to enable more coordinated care approaches (OECD, 2019).[191]

When well implemented, a blended payment system can maximise the beneficial incentives (and minimise the potential unintended consequences) of each payment approach. Specific performance incentives encourage providers to focus on aspects of care that are unlikely to be incentivised by the global base payment and might be prone to quality skimping or under-provision (WHO, 2017).[190]

However, current evidence suggests that expected outcomes from pay-for-performance schemes are over-stated. Financial incentives should be relatively low powered to prevent disproportionate focus on rewarded tasks and to ensure sustainability (Lancet Commission, 2022).[192]

Primary care goals

Community pharmacy and general practice are two of the main providers of primary care (alongside dentistry and optometry). There are different definitions and conceptualisations of primary care. However, core elements include: first level contact; universal coverage; multi-disciplinary; continuity; and co-ordination (WHO, OECD, 2023).[193,194]

These elements and underpinning health goals are important to consider when funding primary care providers and when changing payment approaches, incentives and performance management frameworks.

The benefits of primary care are well-documented and funding approaches should aim to support the delivery of effective care and mitigate potential shortcomings.[195,196,192,197]

Some potential shortcomings include:

- It is important to consider the **inter-connected** nature of health systems and health-seeking behaviours of individuals and communities. For example, friction and/or financial incentives can encourage patients to seek care at the appropriate level and avoid them bypassing primary care (e.g. higher co-payments for higher levels of care) (Lancet Commission, 2022).[192]
- **Preventative care funding**, particularly focused on addressing inequalities, should be sufficient as primary health care teams are in a unique position to advise patients on healthy lifestyles and behaviour, to administer screening tests, and to manage and control the progress of chronic conditions. However, international studies shows that many patients with chronic conditions do not receive the recommended preventive care (OECD,2020).[170]
- **Funding should be sufficient**, as a lack of funding can cause workforce shortages, which in turn reduces the quality and access of primary care. This can potentially lead to a cycle of decline (Lancet Commission, 2022).[192]
- The level of **out of pocket payments** in primary care (both explicit and implicit) should be monitored carefully as they can be a barrier to care after reaching a tipping point (Lancet Commission, 2022).[192]
- Funding should support effective **multi-disciplinary care** and **continuous services** that reduce the number of avoidable hospital admissions and readmissions for conditions that can be well managed in primary care (diabetes mellitus, hypertensive diseases, heart failure, COPD and asthma) (OECD,2020).[170]
- The ability of providers to **share the savings** generated if they are able to reduce costs while still meeting pre-defined quality requirements can be a positive incentive. This provides an incentive for providers to co-ordinate care to reduce health care costs (OECD,2020).[170]
- Giving providers autonomy to make decisions about how to provide primary care supports their **flexibility** to respond to incentives. In systems where providers have little management autonomy or do not have the skills to manage new procedures, the results of new purchasing and payment methods will be either be diminished or perverse (Lancet Commission, 2022).[192]
- Funding should support **value-based care**, such as value-based medicines programmes. Medicines optimisation can help patients to: improve their outcomes; take their medicines correctly; avoid taking unnecessary medicines; reduce wastage of medicines; and improve medicines safety.[198] Unsafe medication practices and medication errors are a leading cause of injury and avoidable harm in health care systems across the world.[199]

Changing funding models

Changing an individual payment mechanism within an existing complex system can carry inherent risks and should be undertaken carefully and reviewed constantly. The following considerations are adapted from evidence related to changes to primary care funding models and so are likely relevant to community pharmacy (as a key primary care provider).

Leadership and accountability

Changing a healthcare payment approach and funding level requires **political leadership**. Increasing funding for one provider type in primary care often involves reallocating existing funds in primary care or moving funds from secondary to primary care usually. This is inherently political and not just a technical challenge. Given primary care is usually under-funded (compared to secondary care counterparts), moving funds within primary care risks financial destabilisation of an often already fragile system (Lancet Commission, 2022).[192]

There are multiple reasons why primary care has been historically under-funded. The status and stature of secondary care can dominate and primary care can find it hard to gain political support in budget discussions. Primary care providers are often smaller and disparate organisations that lack a single strong voice to lobby for funding. In addition, there can often be no clear department responsible or accountable for primary care within Ministries of Health (Lancet Commission, 2022).[200]

Ministries of Health should articulate a clear, long-term **vision and strategy** for primary care (including the key primary care provider, community pharmacy) with these objectives embedded in financing models. This enables decision-makers to plan for implementation and make progress (Lancet Commission, 2022).[200]

Ensuring the goals of the health system and underpinning financial system are met will require shifts in **power and influence** at all levels (Lancet Commission, 2022).[192] The changes to power and influence underpinning the shift to preventative care will require accountability of both the purchaser and providers through effective **governance** arrangements (WHO, 2017, OECD, 2019).[191,190]

Strategic planning capabilities are also essential when changing payment models in primary care. Substantial long-term planning is needed to change financial models, estimate costs, and use prices and payment systems to reach policy goals. There also the need to align underpinning clinical guidelines, regulatory frameworks, workforce strategies and public and patient engagement and education (WHO, 2017, OECD, 2019).[191,190]

Design

Early and ongoing collaboration and including the skills and expertise from a diverse range of perspectives and stakeholders throughout the design and implementation can mitigate unintended consequences of new payment approaches and ensure an in-depth understanding of the impact of changes (Lancet Commission, 2022).[192]

Stakeholder perspectives and technical input are essential in the design and implementation of contract changes. Evidence on evaluations of pharmaceutical reimbursement policies in Europe is limited. The few pieces of research that could be identified all pointed to the importance of careful and co-designed policy interventions: this tends to be a decisive factor in the effectiveness and success of a policy measure (WHO, 2018).[201]

Setting prices

Some countries have established a separate **independent organisation** to determine costs of health care provision (away from the political exercise of negotiation on how much to pay for services). These are politically independent, have formal systems of communication with stakeholders, and freedom from conflicts of interest. While the methods for price setting vary, unilateral price setting by a regulator eliminates price discrimination and performs better in controlling growth in health care costs (WHO, 2017, OECD, 2019).[191,190]

A WHO review of the European Region **medicines reimbursement policies** identified good practice (WHO, 2018). This usually includes:[201]

- Design of policies in relation to wider health system goals, policies and structures.
- Evidence-based decision-making (e.g. using health technology assessments) and real-world data generation to inform choices.
- Transparent prioritisation of publicly funded medicines and disclosure of conflicts of interests by decision-makers. This should include patient presentation and engagement.
- Transparent and smooth payment processes.
- Vulnerable population groups considered and reflected in policies.
- Price regulation.
- Incentivisation of generic, biosimilar and further lower-priced medicines.
- Evaluations, monitoring and ongoing adjustments.

Many countries have adopted **reference and index pricing for pharmaceuticals** (Cochrane systematic review, 2014, WHO, 2018).[202,201]

Medicines considered interchangeable (e.g. with the same active ingredient or of the same chemical subgroup) are clustered into one reference group, and the public payer covers the same reimbursement amount for all medicines in that cluster. Most countries set the reference price at the level of the pharmacy retail price of the lowest-priced medicine of the reference group.

Another approach is index pricing groups of medicines and refunding pharmacies for dispensing a medicine within the group. As the pharmacy is refunded the same amount for any of the medicines in this group it is in their interest to dispense a medicine that costs less than the index price. A number of other pricing policies also exist that aim to control medicine costs. It is assumed that these types of policies can lead patients to switch to cheaper medicines and can encourage medicine producers to lower their prices (Cochrane systematic review, 2014).[202]

Most studies focus on the effect of reference pricing which can lead to an increase in 'reference medicine' prescriptions and a decrease in prescriptions for more expensive medicines (low certainty of evidence); and a decrease in the amount of money insurers spend on medicines overall (low certainty of evidence). None of the studies looked at the effect of reference pricing on people's health, their use of healthcare services, or adverse effects (Cochrane systematic review, 2014).[202]

Internationally, **who pays** for medications varies. Most European countries offer full coverage for medicines for inpatient care (no co-payment). However, community pharmacy reimbursement schemes vary. Many European countries have a medication **co-pay approach**. Only in a few countries (including the United Kingdom) is the price of medicine fully covered by the public payer (with no percentage reimbursement/co-payment applied), but other co-payments may apply (e.g. a fixed prescription charge regardless of the cost of the medication)(WHO, 2018).[201]

Co-payments and co-pay increases can result in reductions in the per capita number of prescriptions, lower public pharmaceutical expenditure, a higher financial burden for patients and reduced medication adherence (WHO, 2018).[201]

Many European countries have established coverage policies that protect defined population groups from excessive co-payments on medicines. Exemption from co-payments often include low income, defined diseases or disabilities and age (WHO, 2018).[201]

Denmark and Sweden operate consumption-based reimbursement schemes, in which patients have to pay out-of pocket for medicines up to a specific threshold of expenses, after which they share payments with the public payer. Over the course of a year the co-payments decrease, depending on patients' spending on medicines (WHO, 2018).[201]

Rather than policies targeting patients through user-charges, some research suggests that a more effective policy should focus on the incentives facing pharmaceutical companies, doctors and pharmacists as these groups bear much of the responsibility for making decisions about the availability, use, and cost of prescription drugs (review, 2008).[203]

Many European countries have developed confidential **managed entry agreement** (MEAs). These are contractual arrangements between a pharmaceutical company and a public payer that enable reimbursement of a medicine, subject to specified conditions (WHO, 2018).[201] MEAs are either finance-based (discounts or price–volume agreements) or performance-based (health outcomes); the former are applied more frequently. Common indications covered by an MEA are oncology, rheumatology, hepatitis C and diabetes (WHO, 2018).[201]

Value for money

Some countries set coverage of medication costs based on factors such as: the therapeutic value of a medicine (also in comparison to existing alternatives), medical necessity/priority, safety, cost–effectiveness and budget impact. An increasing number of countries use **health technology assessment** to inform reimbursement decisions (WHO, 2018).[201]

Most European countries have list of medicines that are fully covered (**positive lists**) or excluded from reimbursement (**negative lists**). Some countries require co-payment or full payment if a patient requests a higher cost medication above the reference cost for that group of medications(WHO, 2018).[201]

Complexity

Public financial management systems must be flexible and straightforward. Many governments' public finance management systems are notorious for their rigidity regarding the use of funds and the complexity of their accounting and financial management requirements (Lancet Commission, 2022).[192]

Monitoring, evaluation and revision

Substantial changes to the financial model will require flexibility to adjust pricing and payment methods as it is unlikely to be 'right first time'. There will be unforeseen factors both inside and outside of the control of providers (WHO, 2017, OECD, 2019).[191,190]

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