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A Community Pharmacy–Based Diabetes Review Service in Southampton: Needs Assessment, Service Design and Projected Impact

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Abstract. Diabetes mellitus is a leading contributor to preventable morbidity, yet the structured annual care that limits its complications is delivered incompletely: in England only 58.2% of people with type 2 diabetes receive all eight routine care processes, and completion varies by more than thirty percentage points between integrated care boards. Reduced completion is associated with higher mortality. Community pharmacies offer an accessible setting in which this gap might be narrowed. This paper presents a service-design case study for Southampton, a city whose recorded diabetes prevalence (6.2%) sits below the national average yet whose ratio of diabetes-related complications exceeds it. Publicly available data from the National Diabetes Audit, the national diabetes profile and the Southampton Data Observatory are used to characterise local need; a community pharmacy diabetes review service is then specified against the nine care processes defined by the National Institute for Health and Care Excellence; and its costs and potential impact are estimated from the service specification and from published intervention effects. The projected model indicates that a structured pharmacy-delivered review, costed at approximately £45 per patient, could improve care-process completion; published per-patient complication savings suggest a plausible cost benefit, although confirming a local net saving would require data on the eligible population and uptake. The paper sets out the assumptions and limitations of this projection and the evidence that a local pilot would need to confirm it.

Keywords: diabetes; community pharmacy; care processes; service design; health needs assessment.

1. Introduction

Diabetes mellitus is among the most prevalent long-term conditions and a major cause of premature morbidity and mortality. Its long-term burden arises less from hyperglycaemia itself than from the largely preventable complications of the eyes, kidneys, nerves and circulation, the early detection of which depends on a small set of routine clinical checks performed at least annually. The clinical value of these checks lies in what they enable: when results are recorded and acted upon, deteriorating control, early nephropathy and loss of protective foot sensation can be identified before they progress to irreversible harm, and treatment can be intensified accordingly. The checks are therefore not an administrative formality but the principal mechanism through which routine diabetes care prevents complications.

In England these checks are operationalised as a defined group of care processes audited nationally each year. The most recent National Diabetes Audit reports that only 58.2% of people with type 2 diabetes, and 43% of those with type 1 diabetes, received all eight routine care processes in a single year, with completion ranging from 38.6% to 73.5% across integrated care boards [1]. The shortfall is consequential rather than clerical: a cohort study using the audit found that completion of five or fewer of the eight processes, compared with all eight, was associated with significantly higher mortality in people with type 2 diabetes [2]. Incomplete routine care therefore carries a measurable survival cost, and the variation between areas implies that a substantial part of it is avoidable.

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The clinical standard against which this performance is measured is well established. The National Institute for Health and Care Excellence specifies nine key care processes for adults with type 2 diabetes, comprising measurement of glycated haemoglobin (HbA1c), blood pressure, cholesterol, serum creatinine and urinary albumin, together with weight, smoking-status and foot assessment, alongside digital retinal screening, which was incorporated as the ninth process from 2019–20 [3]. Each process targets a distinct complication pathway: HbA1c together with the lipid and blood-pressure checks governs cardiovascular and metabolic risk, serum creatinine and urinary albumin detect early kidney disease, and foot examination identifies the loss of protective sensation that precedes ulceration and amputation. Completing the full set therefore matters more than completing any single check, because the complications are largely independent and a gap in one process leaves its corresponding pathway unmonitored. General practice carries most of this workload, and capacity constraints are a recognised barrier to full completion. Community pharmacies represent an underused but highly accessible alternative point of contact: they are distributed across residential and deprived neighbourhoods, require no appointment, are visited routinely by people collecting medication, and already hold dispensing data that can identify those with diabetes. They are therefore a plausible setting in which to deliver structured review and narrow the care-process gap, particularly for patients who attend general practice infrequently.

Southampton provides an instructive case. In 2021/22, 6.2% of registered patients were recorded as having diabetes, below the South East regional average of 6.7% and the England average of 7.3%, a difference attributed largely to the city's relatively young population; modelled estimates suggest the true prevalence may be approximately 1.3 times the recorded rate [4]. Despite this lower recorded prevalence, the city's ratio of diabetes-related complications is 127.2 against an England value of 100.0, indicating a disproportionate complication burden of exactly the kind that structured review is intended to reduce [4]. The combination of a below-average recorded prevalence, a likely undiagnosed population and an above-average complication burden makes the city a clear test of whether an accessible, pharmacy-based review could add value.

The case study that follows is built entirely on publicly available data. Section 2 reviews the evidence on pharmacy-led diabetes interventions; Section 3 sets out the data sources and methods used for service design and impact estimation; Section 4 reports the local needs assessment, the proposed service, and its projected cost and effect; and Section 5 discusses the implications, assumptions, and limitations of the model.

2. Literature Review

The rationale for delivering diabetes care through pharmacists rests on three mechanisms that recur across the literature: improved medication adherence and dose titration, structured patient education, and the accessibility of the community pharmacy as a point of contact. The strongest evidence concerns glycaemic control. A systematic review and meta-analysis of pharmacist-led interventions in primary care for adults with type 2 diabetes pooled trials comparing pharmacist involvement with usual care and found a significant reduction in HbA1c, with a standardised mean difference of −0.67 (95% confidence interval −0.87 to −0.48) [5]. A broader meta-analysis of clinical pharmacy interventions reported a consistent effect of similar magnitude, a standardised mean difference of −0.52, and extended the evidence to economic endpoints, concluding that the interventions improved both health and economic outcomes [6]. Because the service proposed here is justified partly on cost grounds, this pairing of glycaemic and economic benefit is directly relevant. The economic case is not automatic, however: the meta-analytic literature notes substantial heterogeneity between studies in intervention intensity, follow-up duration and health-system setting, so pooled effect sizes are best read as indicative of direction and plausible magnitude rather than as transferable point estimates. That caution is carried into the impact projection in Section 4.3, where published effects are applied to the local population only under explicitly stated assumptions.

Evidence specific to the community setting reinforces these pooled findings. A systematic review confined to interventions led by community pharmacists in primary care concluded that they improve both therapeutic adherence and HbA1c [7], indicating that the effect is not confined to hospital or general-practice pharmacists. Individual randomised controlled trials are consistent with the pooled estimates. An early trial of a community pharmacy diabetes monitoring and education programme reported a clinically meaningful improvement in glycaemic control relative to standard care [8]. A trial conducted across sixty-six community pharmacies, in which patients were randomised to a structured pharmacist intervention addressing medication use, adherence and lifestyle or to usual pharmacist care, reported a between-group HbA1c difference of 0.5% in favour of the intervention ($p = 0.009$) [9]. A multi-centre trial of a community pharmacist–involved collaborative care model, enrolling patients with type 2 diabetes and complex medication regimens, reported a greater HbA1c reduction in the intervention group than in usual care over six months (−0.32% versus −0.06%, $p = 0.038$), together with improvements in self-management and quality of life [10].

Two further strands of evidence inform service design rather than efficacy. First, a before–after evaluation of an enhanced primary care diabetes service demonstrated measurable improvements in diabetes outcomes using routinely collected baseline data [11]. This design, which compares outcomes before and after implementation without a concurrent control group, is well suited to a commissioned service for which a randomised comparison would be impractical, and it is adopted as the evaluation template in Section 5. Second, service-level experience in England shows that community pharmacy teams can engage people with diabetes outside the traditional clinic setting, including younger and otherwise hard-to-reach groups [12]. Taken together, the evidence indicates that pharmacist-delivered diabetes care improves glycaemic control, adherence and broader outcomes, and that it is cost-relevant rather than cost-neutral. What remains underdeveloped is the translation of this general evidence into a structured, locally specified annual-review service mapped explicitly onto the nationally audited care processes. Southampton offers such a case, one in which local need, an explicit service specification, and a transparent cost-and-impact projection can be considered together.

3. Data Sources and Methods

The case study draws exclusively on publicly available data and on the service specification developed here; it involves no primary data collection and no patient-level records. Three categories of open data are used. Local epidemiological need is characterised from the Southampton Data Observatory diabetes profile [4], the national diabetes profile published by the Office for Health Improvement and Disparities [13], and the Southampton Joint Strategic Needs Assessment [14]. National benchmarks for care-process completion and their variation are taken from the National Diabetes Audit [1]. Evidence on intervention effect, used to inform the impact estimate, is drawn from the trials and reviews appraised in Section 2.

The service is specified against the nine care processes defined by NICE [3] and is aligned with national and local policy on early intervention and the expanded clinical role of community pharmacy, represented by the NHS Long Term Plan [15] and the Southampton diabetes strategy [16]. Each component of the specification is mapped to the care process it is intended to satisfy, so that completion of a pharmacy review corresponds directly to completion of the audited processes rather than duplicating them. This mapping is the central design principle: it ensures that activity delivered in the pharmacy is measurable in the same terms as the national audit and can be reconciled with the general-practice record.

The cost estimate is constructed from the equipment required to deliver the specified review across a defined number of participating pharmacies, valued at unit prices and aggregated to a one-off set-up cost, with a per-patient delivery cost applied separately to cover consumables, pharmacist time and the wider scope of the review. The impact estimate is a transparent projection rather than an observed result. It applies published effect sizes for pharmacist-led diabetes care [5, 6, 9, 10] and a reported complication-related saving [11] to the local population characterised in Section 4.1, under four

explicit assumptions: that the local effect is of the same order as the pooled published effect; that delivery reaches a meaningful share of the eligible population; that fifty community pharmacies participate; and that the per-patient cost is contained at the level specified. The projection is kept arithmetically simple and transparent: the set-up cost is the sum of equipment items across the participating pharmacies; the recurrent cost is the per-patient charge multiplied by the number of patients reviewed; and the potential saving is the published per-patient complication saving applied to the same population, with the break-even horizon following from the ratio of set-up cost to annual saving. No attempt is made to model discounting, second-order effects or formal sensitivity ranges, because the available inputs do not support that level of precision. All projected quantities are therefore reported as modelled estimates, their direction and approximate scale are reported rather than precise point values, and the data that a local pilot would need to confirm them are identified in Section 5.

4. Findings

4.1. Local diabetes burden and the care-process gap

Southampton's recorded diabetes prevalence in 2021/22 was 6.2% of registered patients, below the South East regional average of 6.7% and the England average of 7.3% [4]. This comparatively low recorded figure is attributed largely to the city's young age structure, and modelled estimates indicate that the true prevalence may be approximately 1.3 times the recorded rate, implying a substantial undiagnosed population [4]. The recorded figure therefore understates the population that a diabetes service would ultimately need to reach, and any plan based on registered cases alone would underestimate demand.

Lower recorded prevalence has not translated into lower harm. The city's ratio of diabetes-related complications is 127.2 against an England reference of 100.0 [4]. Hospital activity is correspondingly high: 176.2 per 10,000 people aged over seventeen were admitted for diabetic foot disease, and lower-limb amputation procedures occurred at 5.0 minor and 9.6 major per 10,000 [4]. These are precisely the outcomes that timely completion of the foot, renal and glycaemic checks is intended to prevent, and their elevated local rates indicate where the greatest preventive value would lie.

The national picture explains how such harm accrues despite an established care standard. The National Diabetes Audit reports that only 58.2% of people with type 2 diabetes received all eight routine care processes, with completion ranging from 38.6% to 73.5% across integrated care boards [1]. Completion of individual processes is uneven: routine measures such as blood-pressure and smoking-status recording are the most consistently achieved, whereas the renal (urinary-albumin) and foot checks are among the least reliably delivered [1]. These least-complete checks are the same ones whose associated complications are most elevated in Southampton, so the local burden and the national process gap point to the same target. Closing it requires not a new clinical standard but a more reliable means of delivering the existing one, which is the function the proposed service is designed to serve.

Two features of the local picture enlarge the target population beyond the headline completion figure. The national audit shows completion ranging from 38.6% to 73.5% between integrated care boards [1], so a single national average conceals areas in which a large minority of patients do not receive complete review; whether Southampton sits above or below the mean is itself a question that local audit would need to answer before commissioning. In addition, the modelled undiagnosed population implies that a substantial group is not yet in the review system at all [4]. Taken together, the recorded prevalence understates both the number of people who require review and the proportion currently receiving it, which strengthens rather than weakens the case for an additional and more accessible delivery route.

4.2. Proposed service design

The proposed service delivers a structured annual diabetes review through community pharmacies, with each component mapped explicitly to a NICE care process so that its completion is auditable in national terms [3]. The review comprises six steps. First, patient consent is obtained and current medication reviewed, establishing the baseline against which adherence and dose titration are addressed. Second, clinical measurements are taken — weight, blood pressure, HbA1c, cholesterol and the albumin-to-creatinine ratio — using a point-of-care analyser that returns laboratory-equivalent HbA1c and lipid results within the consultation [17]; these measurements correspond directly to five of the audited processes, including the urinary-albumin test that is least reliably completed nationally. Third, a foot examination is conducted using a 10 g monofilament and a 128 Hz tuning fork, in line with NICE guidance on the prevention and management of diabetic foot problems [18], addressing the check most closely linked to the local amputation burden. Fourth, lifestyle factors, smoking status and self-management behaviours are assessed. Fifth, personalised education on diet, physical activity and medication adherence is provided, the component most consistently associated with improved control in the trial evidence. Sixth, all results are recorded electronically and synchronised with the patient's general-practice record [19], so that a completed pharmacy review is reflected in the audited care processes without creating a parallel record. Table 1 sets out how the six steps correspond to the audited processes.

Table 1. Mapping of review steps to the audited care processes.

Review step	Care process(es) addressed
Consent and medication review	Medication review; foundation for adherence support
Point-of-care measurements	HbA1c; cholesterol; serum creatinine; urinary albumin; weight; blood pressure
Foot examination	Foot risk surveillance
Lifestyle and smoking assessment	Smoking-status recording
Personalised education	Self-management support (cross-cutting)
Electronic recording to the GP record	Reconciliation of all processes with the audit

Digital retinal screening, the ninth process, continues to be delivered through the national diabetic eye-screening programme; the pharmacy review covers the remaining eight processes and signposts patients to screening where it is due, so the service complements rather than duplicates existing provision.

The service targets adults aged eighteen and over with type 1 or type 2 diabetes who are registered with local general practices. Eligible patients are either referred by their general practice or invited directly by community pharmacies using dispensing data and clinical risk factors; the second route is significant because it re-engages people who are diagnosed but seen infrequently in general practice. Opportunistic identification of possible undiagnosed cases, through pharmacy contact and risk factors rather than dispensing records, is a complementary benefit, but it would require onward referral to general practice for formal diagnosis. The service is intended to be commissioned by the Southampton Integrated Care Board with support from Community Pharmacy England, and to operate in collaboration with local general practices and patient participation groups so that continuity of care is maintained and duplication avoided. Participating pharmacists complete free training provided through the Primary Care Diabetes Society [20], so that delivery requires no additional training expenditure and quality is standardised across sites.

4.3. Cost and projected impact

The set-up cost is driven by the equipment required to deliver the review across fifty participating community pharmacies (Table 2). The dominant item is the point-of-care analyser used for HbA1c and lipid testing; foot-assessment kits, blood-pressure monitors and anthropometric equipment are comparatively minor and are reusable across successive years. Pharmacist training is provided at no cost [20]. The resulting one-off equipment cost is £190,500. To this is added a per-patient delivery cost of approximately £45, covering consumables, pharmacist time and the broader scope of the

review, including laboratory-equivalent HbA1c testing, foot assessment and patient education; this recurrent unit cost, rather than the set-up cost, dominates the economics once the service is running at scale.

Table 2. Estimated one-off set-up cost for delivery across fifty community pharmacies.

Item	Unit cost (£)	Quantity	Total cost (£)	Notes
Point-of-care analyser	3,650	50	182,500	HbA1c and lipid testing
Monofilament and tuning-fork set	45	50	2,250	Foot-sensation checks
Blood-pressure monitor	60	50	3,000	Reusable annually
Scales and tape measure	55	50	2,750	Anthropometric data
Pharmacist training	0	–	0	Provided via the Primary Care Diabetes Society [20]
Total set-up cost	–	–	**190,500**	One-off, equipment only

The potential impact of the service is estimated as a projection under the assumptions set out in Section 3, not as an observed outcome. On glycaemic control, the pooled and trial evidence indicates that pharmacist-led review can be expected to reduce HbA1c relative to usual care, with meta-analytic standardised mean differences of −0.52 to −0.67 [5, 6] and between-group reductions of approximately 0.3 to 0.5 per cent in individual trials [9, 10]; applied locally, an effect of this order would move a meaningful proportion of poorly controlled patients towards target. On process completion, delivering the audited checks through an additional accessible setting provides a direct mechanism to raise completion above the 58.2 per cent national baseline [1], with the largest scope for gain in the renal and foot checks that are currently least complete and most consequential locally. On cost, a before–after evaluation of an enhanced diabetes service reported complication-related savings of approximately £240 per patient per year [11]. Whether savings of this order would offset the service's costs locally cannot be determined here, because it would require a local estimate of the eligible population and expected uptake, which are not available; the figure is therefore reported only as a per-patient benchmark from the literature, not as a projected local total. These quantities are modelled projections, presented to indicate plausible scale rather than to quantify a realised effect; the assumptions on which they rest are examined in Section 5.

5. Discussion

The case assembled here carries three implications for the design and commissioning of local diabetes services. First, recorded prevalence is a poor guide to need. Southampton's below-average recorded prevalence coincides with an above-average complication ratio and a substantial undiagnosed population [4], so a service planned on registered headcount alone would understate both the people to be reached and the harm to be averted. The capacity to invite patients directly is therefore not an incidental feature of pharmacy delivery but a means of re-engaging diagnosed patients who are seen infrequently, while opportunistic risk-based identification offers a separate route towards the undiagnosed, conditional on onward referral for diagnosis. Second, the binding constraint is completion rather than the absence of a standard. The care processes are clearly defined [3], yet national completion stands at 58.2% and is weakest for the renal and foot checks [1] that map onto Southampton's amputation and foot-disease burden [4]; adding an accessible delivery setting addresses this constraint directly, and the explicit mapping of each service component to an audited process means the effect would be measurable in national terms. Third, the intervention rests on consistent evidence, since pharmacist-led diabetes care improves glycaemic control across meta-analyses and trials [5, 6, 9, 10] and is associated with favourable economic outcomes [6]. The value here lies not in re-establishing that general finding but in translating it into a locally specified service whose components correspond one-to-one to the audited processes and which is positioned for commissioning by the local integrated care board.

A service of this kind also bears on equity of access. Because community pharmacies are concentrated in residential and more deprived areas and can be used without an appointment, they reach population

groups for whom general-practice attendance is least reliable, and the English service experience confirms that pharmacy teams can engage harder-to-reach groups [12]. A pharmacy-based review therefore offers not only additional capacity but a different reach, which is material where the undiagnosed and under-reviewed population is large. Realising that potential depends on integration with general practice rather than substitution for it, so that the review supplements the patient's record and care pathway instead of fragmenting them.

The sustainability of the service rests on the recurrent rather than the set-up cost. Because the equipment is reusable and training is met through existing provision, the one-off outlay is modest relative to the annual delivery cost, and the case for continuation depends on whether the per-patient charge is offset by avoided complications year on year. This structure also makes the model comparatively easy to scale: once the equipment base is established, extending the service to additional pharmacies or neighbouring areas adds mainly variable cost, and the common mapping of review steps to audited processes allows performance to be compared directly across sites. Scalability is therefore a property of the design rather than an afterthought, provided that integration with general practice and with the screening programme is preserved as coverage grows.

The model is also aligned with the policy direction within which it would be commissioned. National policy has consistently sought to expand the clinical role of community pharmacy and to move routine long-term-condition management towards more accessible settings [15], and a structured pharmacy review of this kind is a concrete instance of that direction rather than a departure from it. Positioning the service as a complement to general practice, commissioned locally and measured against the same national audit, makes it intelligible to commissioners in familiar terms and avoids the fragmentation that has limited some earlier community-pharmacy initiatives.

Several limitations qualify these conclusions. The impact estimate is a projection rather than an observed result: it applies published effect sizes and a single before–after savings estimate [11] to local population figures under assumptions about effect transfer, uptake, the number of participating pharmacies and per-patient cost, none of which has been validated locally. The national completion and effect-size data are not specific to Southampton, and applying them to one city introduces uncertainty that only local measurement can resolve. The complication ratio and hospital-activity figures are drawn from routine open data whose definitions and reference periods differ, so they indicate the scale of need rather than a precise counterfactual. The cost estimate covers equipment and a per-patient delivery charge that includes the pharmacist's direct service time, but it does not model premises, governance, or the wider opportunity cost of diverting pharmacist capacity from other services, and it assumes that training is met without charge through existing provision [20]. Finally, as a single-city case study the design limits generalisation to areas with different demographic and service contexts.

These limitations define the evidence a local pilot would need to generate. A before–after evaluation of the kind used for comparable enhanced primary care diabetes services [11], taking care-process completion and mean HbA1c as primary measures and drawing baseline values from existing records, would convert the projections reported here into observed effects and would test whether the assumed uptake and savings are realised. Process measures — patient participation, adherence to the service protocol and the appropriateness of referrals — would indicate whether delivery is feasible and equitable in practice. Establishing this evidence locally is the precondition for extending the service beyond a single city and for any wider claim about its cost-effectiveness.

6. Conclusion

This case study has used publicly available data to characterise diabetes-related need in Southampton, to specify a community pharmacy diabetes review service aligned with the nine NICE care processes, and to estimate its cost and potential impact. The local picture — a below-average recorded prevalence alongside an above-average complication burden and a likely undiagnosed population, set against a national care-process completion rate of 58.2% — indicates a clear and addressable gap,

and the proposed service maps directly onto the processes that are least reliably delivered and most consequential locally. Under transparent assumptions, a structured review costed at approximately £45 per patient could raise care-process completion, and published per-patient complication savings indicate a plausible cost benefit; whether it offsets the one-off set-up cost locally remains to be established with data on the eligible population and uptake. These estimates are projections rather than realised outcomes, and a local pilot with a before–after evaluation is the appropriate next step to confirm them and to establish whether the service can be scaled. The wider contribution of the approach is to show how openly available audit and epidemiological data can be combined to design a locally specified, standard-aligned service that is ready for commissioning and for empirical testing.

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