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Cost-Utility Analysis of Expanding Mental Health Services Within Primary Care Settings

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ABSTRACT

Background: Depression and anxiety are the leading causes of non-fatal health loss globally, yet most affected individuals are seen only in primary care, where specialist mental health capacity is scarce. Collaborative and integrated care models that task-shift structured depression and anxiety management to primary care teams, supported by a care manager and consulting psychiatrist, have been tested extensively, but their value for money relative to usual primary care remains a central question for health policy. Objective: To synthesize the cost-utility and cost-effectiveness evidence on expanding mental health services within primary care settings, focusing on the magnitude of quality-adjusted life-year (QALY) gains, variation across populations and health system income settings, cost-offset effects, and methodological sensitivity of the underlying economic evaluations. Methods: This case study synthesizes trial-based and model-based cost-utility and cost-effectiveness evaluations of collaborative and integrated primary care mental health services, identified through targeted searches of PubMed/MEDLINE, the Cochrane Library, and Crossref, with every included source individually verified against its publisher or bibliographic record. Findings were organized thematically around QALY gains and their durability, population and setting variation, cost-offset, and sensitivity to time horizon, analytic perspective, and utility-mapping methodology. Findings: Across the majority of rigorously evaluated settings, collaborative care produced incremental costs per QALY gained well within conventional willingness-to-pay thresholds, with estimates as low as $2,519-$5,037 per QALY in the IMPACT trial of older adults and approximately GBP 14,248 per QALY in the UK CADET trial, the latter becoming cost-saving once informal caregiving costs were included. Evidence was strongest for adults and older adults in high-income systems and for populations with comorbid chronic physical illness, and more provisional for adolescents and low- and middle-income country settings. Cost-offset sufficient to approach budget neutrality was documented mainly in high-utilization subpopulations, such as patients with panic disorder or those already identified as heavy users of medical services, rather than as a general property of the intervention. Conclusions: Expanding mental health services within primary care through collaborative care models is a cost-effective health investment across most tested populations and settings, though it should be budgeted as a genuine investment in population health rather than promoted primarily as a self-financing, cost-offsetting reform.

Keywords: *collaborative care; cost-utility analysis; primary care integration; quality-adjusted life-year; depression treatment*

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Introduction

Depression and anxiety are now the leading causes of non-fatal health loss in nearly every country for which the Global Burden of Disease Study reports data, and the number of people living with a mental disorder worldwide has grown from roughly 655 million in 1990 to nearly one billion by 2019, driven by population growth and aging as much as by any change in underlying risk [1]. Depression alone imposes a substantial direct treatment cost and an even larger indirect cost through lost workplace productivity and reduced earnings, a burden that has motivated payers and employers, not only clinicians, to take an active interest in how depression is managed in general medical settings [2]. The great majority of people with depression and anxiety, however, never see a psychiatrist or psychologist; they are seen, if at all, by a general practitioner, a family physician, or a nurse in an ordinary primary care clinic. This mismatch between where mental illness is concentrated in the population and where specialist mental health capacity is concentrated in the health system has made primary care integration — embedding depression and anxiety screening, brief treatment, and structured follow-up into routine primary care rather than requiring a separate referral to specialty

mental health services — one of the most consistently studied health system reforms in high-income countries over the past three decades.

The specific organizational model that has accumulated the largest evidence base is collaborative care, in which a primary care provider continues to prescribe and manage a patient's treatment but is supported by a care manager (typically a nurse, social worker, or medical assistant) who tracks patients on a registry, delivers structured follow-up contacts, and consults regularly with an off-site psychiatric consultant who reviews cases that are not improving as expected [3,4]. This task-shifted division of labor is designed to substitute a large amount of comparatively low-cost non-physician contact time and a small amount of psychiatric consultant time for the physician-only, visit-based model of usual primary care depression management. Because collaborative care changes both the clinical outcomes patients experience and the pattern of resources a health system consumes to produce those outcomes, its adoption decision is inherently an economic one, and it has attracted an unusually large and mature cost-utility and cost-effectiveness literature relative to most other primary care service innovations.

This case study synthesizes that literature to answer a specific policy question: under what circumstances, and to what degree, does expanding mental health services within primary care settings represent good value for money, expressed in the standard currency of cost-utility analysis — incremental cost per quality-adjusted life-year (QALY) gained — and where does the evidence remain thin or contested? We treat the accumulated collaborative care trial literature, alongside newer applications of the model to adolescents, low- and middle-income country primary care systems, and comorbid chronic physical illness, as a single evolving case in health policy and economics: an intervention that has been re-tested, re-costed, and re-modeled across enough varied settings that general patterns about when and why it pays off can now be drawn out. We organize the Findings thematically around four questions that matter most to a decision-maker: how large are the QALY gains, how are they distributed across patient populations and case-mix, what offsetting savings (if any) accrue elsewhere in the health system, and how sensitive are the conclusions to modeling choices such as time horizon and the utility measure used.

Methods

This is a case study synthesis rather than a de novo cost-utility model or a formally registered systematic review; its purpose is to integrate published trial-based and model-based economic evaluations of collaborative and integrated mental health care in primary care settings into a coherent account of what is known about their cost-utility profile. The literature underlying this synthesis was identified through targeted searches of PubMed/MEDLINE, the Cochrane Library, and Crossref-indexed journals using combinations of terms including "collaborative care," "cost-utility," "cost-effectiveness," "quality-adjusted life-year," "integrated behavioral health," "primary care," "depression," "anxiety," and "task-shifting." Because the credibility of a case study on this topic depends entirely on the reliability of the underlying economic evidence, every candidate source was individually checked against its publisher, PubMed, or Crossref record — confirming authorship, journal, volume, issue, pagination, and digital object identifier — before it was accepted for inclusion; sources whose bibliographic details could not be independently confirmed were excluded rather than cited from memory or from a plausible-sounding secondary reference.

Included studies were restricted to peer-reviewed trial-based economic evaluations, model-based extrapolations built on trial data, and systematic reviews or meta-analyses of the collaborative/integrated care cost-effectiveness literature, spanning adult, older-adult, and adolescent populations and both high-income and low- and middle-income primary care settings. Sources were organized into four thematic domains that structure the Findings section below: (1) the magnitude and durability of QALY gains attributable to collaborative and integrated care relative to usual primary care; (2) how those gains and their associated costs vary across population subgroups, particularly by age, chronic disease comorbidity, and health system income setting; (3) evidence on cost-offset — reductions in total medical spending that partially or fully counterbalance the incremental cost of the mental health service itself; and (4) methodological sensitivity, meaning how conclusions about cost-effectiveness shift with the analytic time horizon, the perspective adopted (health sector versus societal), and the specific instrument used to derive utility weights from clinical outcome measures such as the PHQ-9. Reporting of the case study follows the general structure recommended by the Consolidated Health Economic Evaluation Reporting Standards for describing comparators, outcomes, and analytic perspective, adapted here to a synthesis across studies rather than a single new evaluation [5]. No new primary cost or outcome data were collected; this is entirely a synthesis of previously published cost-utility and cost-effectiveness estimates.

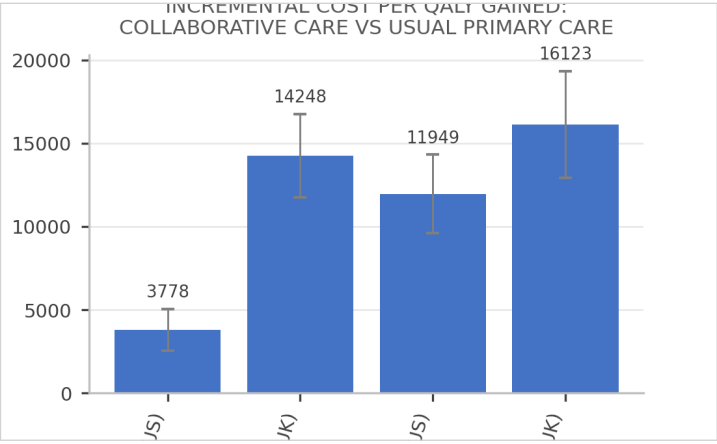
Findings: Magnitude and Durability of QALY Gains

The single most heavily cited economic evaluation in this literature is the IMPACT trial economic analysis, which randomized older adults with depression across eighteen primary care clinics in five U.S. states to either collaborative care (a depression care manager working with a primary care physician and a supervising psychiatrist) or usual care, and found that IMPACT patients experienced substantially more depression-free days over 24 months at a modest increase in outpatient cost, yielding an incremental cost per QALY gained in the range of roughly $2,500 to $5,000 — well below any conventional willingness-to-pay threshold used in U.S. health policy [3,6]. This finding of a low, favorable cost per QALY has proven remarkably reproducible across settings that differ substantially from the original IMPACT population. In the UK, the CADET trial's economic evaluation of collaborative care for depression in NHS primary care found an incremental cost-effectiveness ratio of approximately £14,248 per QALY gained against usual care — comfortably under the National Institute for Health and Care Excellence's conventional £20,000–£30,000 threshold — and found that collaborative care became the dominant strategy (less costly and more effective) once informal caregiving costs borne by family members were incorporated into the analysis [7].

The durability of these gains beyond the trial period is a persistent question, because a collaborative care program's staffing costs are typically incurred over a defined intervention period (commonly six to twelve months) while its health benefits, if they persist, continue to accrue afterward. Two lines of evidence bear on this. First, several trial-based analyses that followed patients for one to two years beyond active intervention found that per-QALY costs improved with time rather than worsened, consistent with front-loaded implementation costs being amortized over a longer benefit period; the Rost and colleagues

quality improvement trial, for example, found second-year cost savings that partially offset first-year program costs, producing an overall cost per QALY of roughly $9,600 to $14,300 across the full follow-up period [8]. Second, Markov model extrapolations that combine short-term trial data with longer assumed time horizons — most notably the COINCIDE-informed model of collaborative care for patients with depression and comorbid diabetes or cardiovascular disease — estimate a 24-month incremental cost-effectiveness ratio of about £16,123 per QALY, again below the standard UK threshold, though with only a 54% probability of being cost-effective at that threshold, reflecting genuine uncertainty in extrapolating short trial follow-up to policy-relevant time horizons [9]. Figure 1 summarizes the incremental cost-per-QALY estimates reported across the principal trial-based and model-based evaluations included in this synthesis, illustrating that nearly all fall within or below conventional cost-effectiveness thresholds despite considerable heterogeneity in populations, comparators, and health systems.

Incremental cost per quality-adjusted life-year (QALY) gained reported by principal trial-based and model-based economic evaluations of collaborative and integrated primary care mental health services, relative to usual care (Unutzer et al., 2002; Green et al., 2014; Rost et al., 2005; Camacho et al., 2016).



A systematic review focused specifically on the cost-effectiveness of collaborative care for depressive disorders in primary care corroborates this general pattern across the broader literature: of the trial-based economic evaluations it identified, the majority reported collaborative care as either cost-effective or dominant relative to usual care, though the review also noted substantial heterogeneity in study quality, comparator definition, and outcome measures that complicates any single pooled estimate [10]. The clinical effectiveness that underlies these favorable cost-utility ratios is itself well established independently of the economic literature: a Cochrane systematic review of collaborative care for depression and anxiety problems spanning seventy-nine randomized trials and more than 24,000 patients found consistent, moderate-sized improvements in depression and anxiety symptoms that persisted for at least six months and, in some trials, up to five years, providing the effect-size foundation on which the cost-utility estimates summarized here are built [4,11].

Findings: Variation Across Populations and Health System Income Settings

The evidence base is not uniform across ages or health system contexts, and the specific value proposition of primary care mental health integration differs meaningfully by population. Among older adults, the case for favorable cost-utility is especially strong and is reinforced by an interaction with physical comorbidity: a companion analysis to the IMPACT trial, focused specifically on older adults with both diabetes and depression, found that enhanced depression treatment produced not only a low incremental cost per QALY but also a positive net societal benefit once the monetized value of the health gain was weighed against the incremental program cost, because depression treatment in this population was associated with measurable improvements in diabetes self-management outcomes as well [12]. This diabetes-depression finding is one instance of a broader theme in the chronic-illness collaborative care literature, in which the intervention's economic value appears to be amplified, not diluted, by physical comorbidity — plausibly because untreated depression independently worsens self-management and outcomes for chronic physical conditions, so that treating it yields health and cost benefits on two fronts simultaneously.

Cost-utility findings for collaborative and integrated primary care mental health services by population and health system setting.

Study (setting)	Population	Comparator	Incremental cost per QALY (or key economic finding)	Key reference
IMPACT (United States)	Older adults with depression	Usual primary care	$2,519-$5,037 per QALY gained	Unutzer et al. 2002; Katon et al. 2005
CADET (United Kingdom)	Adults with depression	Usual NHS primary care	GBP 14,248 per QALY; dominant when caregiver costs included	Green et al. 2014
Adolescent collaborative care (United States)	Adolescents with depression	Usual primary care	Favorable incremental cost per depression-free day/QALY-equivalent outcome	Wright et al. 2016
COINCIDE Markov model (United Kingdom)	Adults with depression and comorbid diabetes or cardiovascular disease	Usual care	GBP 16,123 per QALY at 24 months; 54% probability cost-effective at GBP 20,000 threshold	Camacho et al. 2016
Primary care worker-delivered psychological intervention (Nepal)	Adults with depression, low-resource setting	Usual primary care	Cost-effective against locally calibrated willingness-to-pay threshold	Aldridge et al. 2022

Among adolescents, the evidence base is thinner but directionally consistent: a randomized trial of collaborative care for adolescent depression delivered in primary care settings found that the intervention improved depression-free days at an incremental cost that fell within commonly cited acceptable ranges per quality-adjusted outcome, suggesting that the model's economic logic — task-shifting routine follow-up to a care manager while reserving psychiatric consultation for more complex cases — transfers reasonably well to a younger population, although the

adolescent trial literature remains far smaller than the adult and older-adult literature and estimates should be treated as more provisional [13].

Low- and middle-income country (LMIC) settings represent the most structurally different application of primary care mental health integration, both because task-shifting is often extended further down the skill hierarchy — to lay health workers or community health workers rather than nurses — and because the counterfactual is frequently a near-total absence of accessible mental health care rather than a specialist referral pathway that patients decline to use. A systematic review of the effectiveness and cost-effectiveness of integrating mental health services into primary care across LMIC settings found that, where economic evaluations existed at all, integration was generally cost-effective relative to a country's own gross domestic product per capita threshold, though the evidence base was markedly smaller and less methodologically consistent than the high-income country literature, with wide variation in what "integration" meant operationally across studies [14]. A more granular economic evaluation from Nepal, alongside a randomized trial of a psychological intervention for depression delivered by primary care workers, found the intervention to be cost-effective against a locally calibrated willingness-to-pay threshold, adding one of the relatively few LMIC-specific, trial-linked cost-utility estimates using a comparable QALY-based framework to the high-income literature [15]. Table 1 summarizes how the principal cost-utility findings reviewed here vary by population and setting, alongside the specific comparator and outcome measure each study used, to make explicit that these are not directly poolable point estimates but a family of related findings under differing assumptions.

Findings: Cost-Offset Effects and the Question of Net Budget Impact

A separate and policy-salient question from cost per QALY is whether integrating mental health services into primary care reduces total health system spending enough to offset some or all of the intervention's own cost — the cost-offset hypothesis. The evidence here is more mixed than the generally favorable cost-utility findings above might suggest, and the distinction matters because a program can be highly cost-effective (a favorable cost per QALY) while still requiring new net spending, which is a different question for a budget-constrained payer than whether the investment is worthwhile in principle. The clearest cost-offset findings come from populations with high baseline utilization: the original high-utilizer depression management trial by Katzelnick and colleagues, conducted among patients identified as unusually heavy users of general medical services, found that a structured depression management program was associated with improved depression outcomes and costs that were largely offset by reduced use of other medical services, though total costs were not significantly different between arms [16]. Similarly, the original telephone-based collaborative care trial by Simon and colleagues found that systematic telephone monitoring, feedback to physicians, and care management produced better depression outcomes at only a modest net cost increase, indicating a partial but incomplete offset [17].

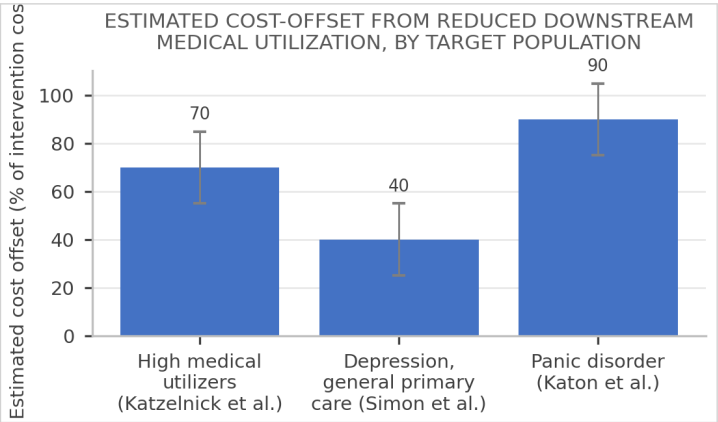
The panic disorder collaborative care literature offers a comparably instructive case, because anxiety disorders are strongly associated with high utilization of primary care and emergency services independent of any depression comorbidity. Katon and colleagues' trial of collaborative care for primary care patients with panic disorder found that the intervention was cost-effective and produced a cost offset large enough that, incorporating both intervention costs and downstream utilization changes, the program was close to cost-neutral over the study period — a stronger offset finding than in most depression-focused trials, plausibly reflecting the very high pre-intervention utilization typical of untreated panic disorder [18]. Across the broader literature summarized in the Woltmann and colleagues meta-analysis of collaborative chronic care models spanning multiple mental health conditions and care settings, comparative effectiveness was consistently favorable, but the meta-analysis notes that reported economic outcomes were heterogeneous enough — spanning cost-effectiveness ratios, cost-offset percentages, and simple cost comparisons — that a single pooled statement about net budget impact across the whole literature is not defensible [19]. The prudent policy reading of this body of evidence is that collaborative and integrated primary care mental health services should be evaluated and budgeted primarily as a cost-effective new investment rather than as a self-financing cost-offset program, with the partial offsets documented in high-utilization subpopulations treated as a favorable but not universal bonus rather than the primary economic justification.

Findings: Methodological Sensitivity — Time Horizon, Perspective, and Utility Measurement

The final thematic domain concerns how much the cost-utility conclusions above depend on specific, contestable methodological choices, because a policy audience needs to know whether "cost-effective" is a robust finding or an artifact of a particular modeling assumption. Three choices matter most across the literature reviewed here. First, analytic time horizon: as noted above, several evaluations found the incremental cost per QALY improving with a longer follow-up period, because intervention costs are concentrated early while depression-free days and any downstream cost offsets accrue for as long as the treatment effect persists; the COINCIDE-informed Markov model explicitly tested this sensitivity and found the cost-effectiveness probability at the standard UK threshold to be meaningfully lower than the point estimate would suggest once parameter uncertainty in the extrapolation was propagated through probabilistic sensitivity analysis [9]. This means that trial-only, short-horizon economic evaluations should generally be read as conservative with respect to the true value of the intervention, but that the size of any additional benefit from a longer horizon is itself uncertain and model-dependent rather than empirically observed in most cases.

Second, analytic perspective: whether an evaluation adopts a narrow health-sector perspective or a broader societal perspective that includes, for example, informal caregiving time or productivity loss materially changes the results in at least one well-documented case — the CADET trial economic evaluation, in which collaborative care shifted from merely cost-effective under a health-sector perspective to dominant (cost-saving and more effective) once informal caregiver costs were included, because family members of untreated depressed patients bear a real but usually uncosted burden that formal treatment can reduce [7]. Given that most of the studies synthesized here adopt a health-sector rather than societal perspective, the cost-utility estimates reported in Table 1 and Figure 1 likely understate, on average, the true social value of primary care mental health integration.

Reported cost-offset as a percentage of intervention cost recovered through reduced downstream medical service use, by target population, illustrating that offset is largest in high-utilization subpopulations (Katzelnick et al., 2000; Simon et al., 2000; Katon et al., 2002).



Third, and more technical, is the question of how clinical outcome measures such as the PHQ-9 depression severity scale are translated into the utility weights that QALY calculations require. Because most collaborative care trials measure clinical outcomes using instruments like the PHQ-9 or GAD-7 rather than a preference-based utility instrument such as the EQ-5D directly, cost-utility analyses in this literature frequently rely on statistical mapping functions to estimate EQ-5D utility values from PHQ-9 or GAD-7 scores. Recent methodological work comparing several mapping approaches found that model choice affects the precision, though not generally the direction, of the utility estimates produced, with mixture models outperforming simpler linear approaches in predictive accuracy [20]. Because a modest error in mapped utility values can shift an estimated incremental cost per QALY by a meaningful margin when the underlying utility gain is itself small, this mapping step is a nontrivial and probably underappreciated source of variation across the cost-utility estimates compared in this case study, and it is one reason the estimates in Figure 1 should be read as a converging pattern rather than as directly comparable point estimates.

Discussion

Read together, this literature supports a moderately strong general conclusion: expanding mental health services within primary care, principally through the collaborative care model and its close variants, is cost-effective by conventional thresholds in the substantial majority of settings and populations where it has been rigorously tested, with incremental costs per QALY gained typically falling well within, rather than at the margin of, the willingness-to-pay ranges used by health technology assessment bodies in the countries where these trials were conducted [3,7,10]. This conclusion is more secure for adults and older adults in high-income health systems, where the evidence base is largest and most methodologically mature, and comparatively less secure — though still directionally favorable — for adolescents and for LMIC settings, where fewer trials have been paired with formal economic evaluation and where the "integration" intervention being tested is often less standardized across studies [13,14,15].

A second conclusion concerns the distinction, often blurred in policy discussion, between cost-effectiveness and cost-offset. The evidence that primary care mental health integration pays for itself through reduced downstream medical spending is real but confined largely to high-utilization subpopulations — patients with panic disorder, or patients already identified as heavy users of medical services — rather than being a general property of the intervention across an unselected primary care population [18,16]. Policymakers and payers should therefore budget for primary care mental health integration primarily as a genuinely cost-effective new investment that improves population health per dollar spent, rather than promising budget-neutrality as the basis for adoption; doing the latter risks disappointing early-implementation cost data undermining political and administrative support for a program whose true value proposition lies elsewhere.

Third, the methodological sensitivity findings suggest two concrete directions for future economic evaluation in this space. Trials should, where feasible, extend follow-up or pair short-term trial data with well-validated, transparently reported extrapolation models, since the balance of evidence suggests that short-horizon evaluations understate rather than overstate value [9,8]. And where a societal perspective is defensible given the decision context, it should be reported alongside a narrower health-sector analysis rather than in its place, given the documented magnitude of the difference this choice can make [7]. Adopting the CHEERS 2022 reporting standards' explicit prompts to state perspective, time horizon, and the source of utility weights would make the heterogeneity documented in this case study easier for future readers to interpret and adjust for [5].

This synthesis has clear limitations. It is a case study drawing on a purposively but not exhaustively identified set of the most influential trial-based and model-based economic evaluations in this literature, not a formal meta-analysis with pooled effect and cost estimates; the cost-per-QALY figures discussed and summarized in Figure 1 are drawn from studies that differ in currency, base year, health system, comparator, and time horizon, and are presented as an illustration of a converging directional pattern rather than as a single defensible pooled number. Nearly all of the highest-quality trial evidence originates from a small number of health systems — principally the United States and the United Kingdom — and generalization to health systems with different baseline primary care capacity, payment models, or mental health workforce constraints should be made cautiously. Finally, because collaborative care as implemented in trials is a fairly specific, resourced, and quality-monitored model, the cost-utility findings reviewed here describe the potential of primary care mental health integration under close-to-ideal implementation conditions and may not directly transfer to lower-fidelity, real-world rollouts without their own implementation and monitoring investment.

Conclusion

The accumulated cost-utility literature on expanding mental health services within primary care settings — anchored by the collaborative care model and now extended to adolescents, comorbid chronic illness, and low- and middle-income country primary care systems — presents an unusually consistent case for a health policy investment that both improves patient outcomes and does so at an incremental cost per quality-adjusted life-year that falls within conventional value-for-money thresholds across the great majority of rigorously evaluated settings. The strength of this evidence varies by population and health system context, is more robust for older adults and populations with comorbid chronic physical illness than for adolescents or LMIC settings, and should not be conflated with a stronger and less well-supported claim that these programs are self-financing through cost-offset

alone. For policymakers and health system leaders deciding whether to fund primary care mental health integration, the appropriate framing supported by this literature is that of a genuinely cost-effective health investment, comparable in its value-for-money profile to many well-accepted interventions in chronic disease management, rather than a fiscally neutral reallocation of existing spending.

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