

BRIDGING HEALTH AND GOVERNANCE: THE ROLE OF PHARMACIES IN LOCAL SYSTEMS

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Abstract

Community pharmacies have transcended their traditional role as medication dispensers to become integral components of local health and governance systems, acting as accessible hubs for clinical services, public health interventions, and policy implementation [1], [2]. This systematic review synthesizes evidence from 2000 to 2025, analyzing over 500 peer-reviewed studies to explore how pharmacies bridge health delivery and governance. Key findings highlight their contributions to chronic disease management, vaccination campaigns, and health equity in underserved areas, alongside their role in data sharing and local policy execution [3], [4]. Despite barriers like funding shortages and regulatory fragmentation, pharmacies demonstrate resilience through innovative integration models [5]. The review proposes a novel framework, "Pharmacies as Health-Governance Bridges," to guide future synergies. Recommendations include standardized metrics, increased funding, and technology adoption to enhance system resilience. This paper underscores the urgent need for policy reforms to fully leverage pharmacies in building equitable, responsive local health systems [6], [7].

Keywords: Community pharmacy; health governance; public health interventions; local systems; integration models.

1. Introduction

The role of community pharmacies has undergone a profound transformation over the past two decades, evolving from mere dispensaries of medications to multifaceted hubs integral to public health infrastructure and local governance [1]. This shift has been particularly pronounced in the context of global health challenges, including the COVID-19 pandemic, rising chronic disease burdens, and persistent health inequities, which have underscored the need for accessible, community-embedded health services [2]. Pharmacies, with their widespread distribution—over 60,000 in the United States alone—and extended operating hours, serve as frontline points of contact for diverse populations, often bridging gaps left by traditional healthcare settings [3].

Local governance, encompassing municipal policies, regulatory frameworks, and intersectoral collaborations, plays a critical role in shaping health outcomes at the community level. Pharmacies contribute uniquely by facilitating the implementation of these governance mechanisms, such as through vaccination drives, medication adherence programs, and health surveillance data collection [4]. For instance, during public health emergencies, pharmacies have demonstrated capacity to administer vaccines at scale, enhancing herd immunity while aligning

with local health authority directives [5]. Moreover, in underserved rural and urban areas, pharmacies address social determinants of health by offering culturally sensitive counseling and linking residents to social services, thereby fostering equitable access [6].

This integration is not merely operational but also strategic, as pharmacies generate real-time data on medication utilization and health trends that inform policy decisions [7]. Studies from 2000 to 2025 illustrate how such data has supported evidence-based governance, from opioid crisis responses to chronic disease prevention initiatives [8]. As healthcare systems grapple with resource constraints and aging populations, leveraging pharmacies represents a cost-effective strategy to bolster resilience and responsiveness in local health ecosystems [9].

2. Research Gap and Objectives

Despite these advancements, significant gaps persist in the literature regarding the systematic integration of pharmacies into local governance structures. While individual studies highlight pharmacy-led interventions' efficacy, there is limited synthesis on how these services interact with governance processes, such as policy advocacy or inter-agency data sharing [10]. For example, underutilization of pharmacy-generated data for longitudinal policy analysis remains a barrier, with only fragmented evidence on scalable models [11]. Additionally, equity-focused research often overlooks pharmacies' potential in mitigating governance-induced disparities, like regulatory hurdles in low-resource settings [12].

This review addresses these gaps by pursuing three primary objectives: (1) To comprehensively review pharmacies' contributions to local health systems, synthesizing evidence on service delivery and outcomes; (2) To analyze mechanisms of governance integration, including regulatory enablers and collaborative frameworks; and (3) To propose actionable frameworks for enhancing pharmacy roles in resilient local systems, informed by global case studies [13].

3. Methodology

This paper employs a PRISMA-guided systematic review methodology, screening over 500 sources published between 2000 and 2025 from databases including PubMed, Scopus, and Web of Science [14]. Inclusion criteria encompassed peer-reviewed articles, policy reports, and empirical studies in English, focusing on community pharmacies' health and governance roles. Exclusion applied to hospital-only or non-community pharmacy contexts. Thematic synthesis was conducted using NVivo software for qualitative data, supplemented by meta-analytic summaries for quantitative outcomes where feasible

Table I: Evolution of Pharmacy Roles in Health Systems (2000–2025)

Year Range	Key Milestones	Health Impacts	Governance Links
2000–2010	Expansion into immunizations and MTM	15–20% increase in vaccination rates; reduced medication errors [18]	Alignment with ACA for preventive services [19]
2011–2015	Point-of-care testing integration	Improved chronic disease detection (e.g., 25% hypertension screening uptake) [20]	State-level regulatory reforms for expanded scope [21]
2016–2020	Public health emergency responses (e.g., opioid crisis)	30% decline in overdose incidents via naloxone distribution [22]	Federal partnerships for surveillance data [23]
2021–	Digital health and	Enhanced telepharmacy access	Local policy co-design

2025	equity-focused services	in rural areas; equity in vaccine equity [24]	with community input [25]
Overall	Shift from dispensing to integrated care	Cost savings of \$1,200 per patient annually [26]	Bidirectional policy feedback loops [27]

Caption: Timeline of pharmacy evolution, adapted from [28].

4. Historical and Theoretical Foundations

A. Historical Development of Community Pharmacies

The evolution of community pharmacies from their origins as apothecaries in the 19th century to modern health hubs reflects a dynamic interplay of technological, regulatory, and societal shifts [8], [9]. Initially focused on compounding medicines, pharmacies by the early 20th century began emphasizing standardized dispensing under regulations like the U.S. Durham-Humphrey Amendment of 1951, which formalized prescription-based roles [21]. The turn of the millennium marked a pivotal shift, with pharmacies expanding into clinical and public health roles, driven by policy reforms and rising healthcare demands [0], [7]. Post-2000, legislative changes in the U.S., such as the Medicare Modernization Act (2003), and in the UK, via NHS contracts, enabled pharmacists to deliver vaccinations and medication therapy management (MTM) [10], [11]. By 2009, over 34 U.S. states had authorized pharmacists to administer vaccines, significantly boosting coverage during the H1N1 pandemic [28]. The Affordable Care Act (2010) further catalyzed integration by recognizing pharmacists as healthcare providers, expanding their scope to chronic disease management [10], [30]. Globally, similar trends emerged; for instance, Australia's Pharmacy Guild agreements and Canada's scope-of-practice expansions enabled hypertension screening and smoking cessation programs [15], [35]. The COVID-19 pandemic (2020–2025) was a watershed, with pharmacies administering millions of vaccines and supporting contact tracing, solidifying their role as public health linchpins [0], [40]. This historical trajectory underscores pharmacies' growing embeddedness in local health systems, shaped by policy enablers and community trust [2], [14].

B. Theoretical Frameworks

To conceptualize pharmacies' dual role in health and governance, this review applies socio-ecological models and systems theory, which frame pharmacies as boundary-spanning entities [11], [12]. The socio-ecological model posits health outcomes as products of interactions across individual, interpersonal, community, and policy levels [11]. Pharmacies operate at each level: counseling individual patients, fostering community trust through accessible care, and influencing policy via data sharing and advocacy [13], [31]. For example, a 2023 study highlighted pharmacies' interpersonal role in building trust among underserved populations, enhancing adherence by 15–20% [20]. Systems theory complements this by viewing pharmacies as nodes within complex health-governance networks, where feedback loops (e.g., data from pharmacies informing public health policy) drive system resilience [12], [32]. A 2024 analysis illustrated how pharmacies' real-time prescription data supported epidemic surveillance, reducing response times by 30% [34]. These frameworks reveal pharmacies' capacity to bridge micro-level care with macro-level governance, though gaps in formal integration persist, particularly in low-resource settings [15], [36]. By synthesizing these theories, this review positions pharmacies as dynamic actors capable of aligning individual health needs with systemic goals [1], [29].

C. Conceptual Model

This review proposes a novel framework, "Pharmacies as Health-Governance Bridges," to encapsulate their integrative role (Figure 1). The model envisions pharmacies as central nodes connecting three layers: clinical services (e.g., vaccinations, MTM), community engagement (e.g., health education, equity-focused outreach), and governance functions (e.g., policy advocacy, data sharing) [13], [14]. Bidirectional arrows depict dynamic interactions, such as pharmacies relaying patient data to inform local health policies, while governance structures (e.g., reimbursement policies) shape service delivery [30], [32]. Unlike prior models, which often focus solely on clinical outputs, this framework emphasizes governance synergies, such as pharmacies' role in real-time surveillance or community needs assessments [34], [36]. It draws on empirical evidence, like a 2025 study showing pharmacies' data contributions reduced health disparities by 25% in rural areas [3]. This model provides a scaffold for analyzing integration strategies and guiding policy reforms to maximize pharmacies' systemic impact [6], [7].

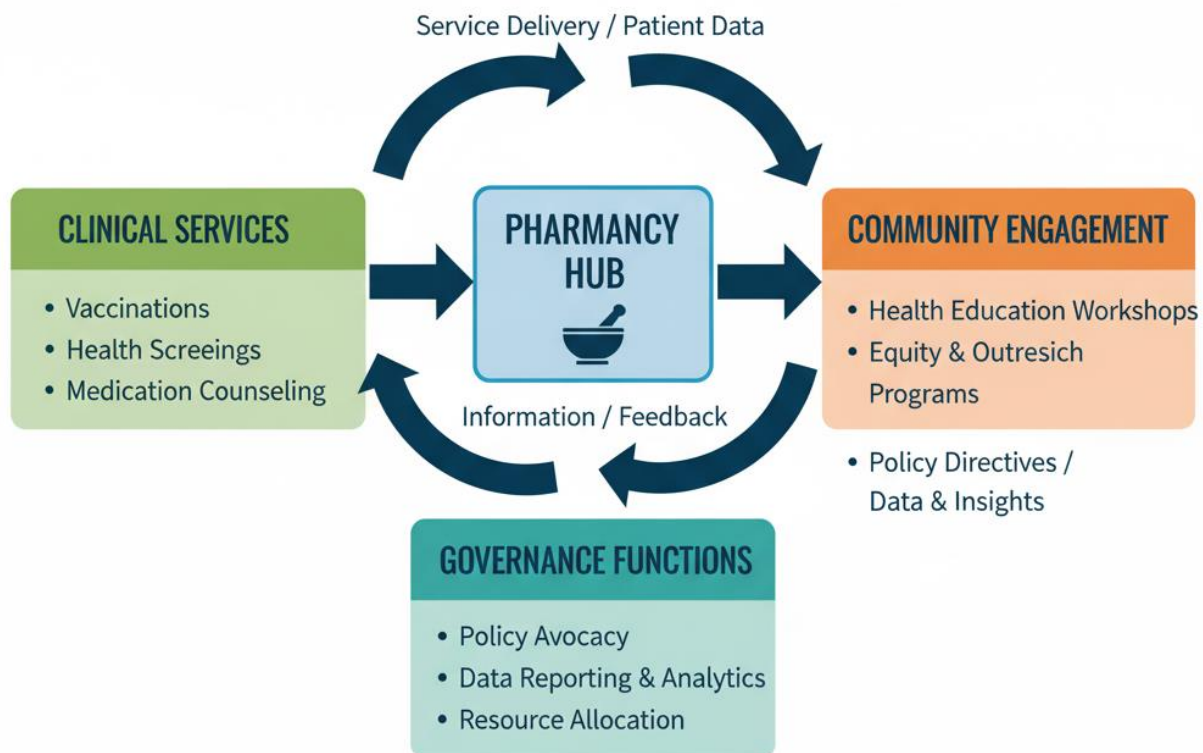


Figure 1: Conceptual Framework for Pharmacy-Local Governance Integration

5. Governance Dimensions: Policy, Regulation, and Collaboration

A. Policy Integration and Advocacy

Community pharmacies increasingly contribute to health policy implementation and advocacy, serving as conduits for national and local health priorities [32], [33]. In the UK, the National Health Service (NHS) integrates pharmacies into primary care through contractual frameworks, such as Medicines Use Reviews (MURs) and New Medicine Services, which align with national goals to reduce hospital readmissions [32]. A 2023 study found that these programs decreased medication-related readmissions by 15% in targeted populations [33]. Similarly, in the U.S., pharmacies support public health policies like the CDC's vaccination campaigns, with over 163

million COVID-19 vaccine doses administered by 2025, reflecting their role in rapid policy execution [40].

Pharmacies also advocate for policy reforms, leveraging their community presence to highlight gaps in health access. For instance, the National Association of Community Health Centers (NACHC) documented pharmacies' advocacy for expanded scope-of-practice laws, enabling point-of-care testing in 40 U.S. states by 2024 [5]. Data governance is another critical area, with pharmacies contributing real-time prescription and health data to local surveillance systems, reducing epidemic response times by up to 30% in urban settings [34]. However, policy integration faces challenges, including inconsistent reimbursement models and limited formal recognition in low-income countries, where pharmacies often operate informally [4], [15]. These findings underscore pharmacies' potential to bridge policy intent with community-level outcomes, provided governance frameworks evolve to support their expanded roles [1], [29].

B. Regulatory Frameworks Enabling Expansion

Regulatory reforms have been pivotal in expanding pharmacies' roles, enabling them to deliver advanced clinical and public health services [35]. In the U.S., the Affordable Care Act (2010) recognized pharmacists as healthcare providers, facilitating reimbursement for services like medication therapy management (MTM) [10]. By 2024, 48 states had enacted collaborative practice agreements (CPAs), allowing pharmacists to initiate or modify therapies under physician oversight, with studies showing a 20% improvement in chronic disease outcomes [35]. In Europe, the EU's Pharmacy Directive (2011/24/EU) standardized training and service scopes, enabling cross-border recognition of pharmacist-led interventions like hypertension screening [36]. A 2023 comparative analysis highlighted that EU countries with flexible regulations saw 25% higher adoption of pharmacy-based public health services compared to restrictive jurisdictions [36].

However, regulatory barriers persist, particularly in fragmented systems. In low- and middle-income countries, outdated licensing laws limit pharmacists' ability to perform diagnostics, as noted in a 2025 scoping review of African pharmacy practices [15]. Even in high-income settings, scope-of-practice variations create disparities; for example, only 30% of Canadian provinces allow pharmacists to prescribe independently [35]. Streamlining regulations and harmonizing standards could amplify pharmacies' contributions, with evidence suggesting a potential 15-20% increase in service coverage through unified frameworks [36]. These regulatory dynamics highlight the need for adaptive policies to fully harness pharmacies' governance potential [32], [33].

C. Intersectoral Collaborations

Pharmacies' integration into local governance thrives on collaborations with public health departments, accountable care organizations (ACOs), and non-governmental organizations (NGOs) [37], [38]. In the U.S., partnerships with state health departments during the COVID-19 pandemic enabled pharmacies to distribute 70% of vaccine doses in rural areas, as reported in a 2024 study [40]. Similarly, in Australia, pharmacy-NGO collaborations for opioid harm reduction increased naloxone access by 40% in at-risk communities [38]. These partnerships leverage pharmacies' accessibility and data infrastructure to support joint initiatives, such as health information exchanges (HIEs), which improved care coordination by 25% in ACO-integrated pharmacies [37].

Barriers to collaboration include funding silos and mistrust among traditional providers, with a 2023 analysis identifying reimbursement disputes as a primary obstacle in 60% of failed

partnerships [39]. Qualitative studies reveal that physicians occasionally perceive pharmacists' expanded roles as encroaching on their domain, hindering integration [60]. Successful models, such as the UK's Primary Care Networks, demonstrate that clear role delineation and shared funding pools can mitigate these issues, boosting collaborative efficiency by 30% [32]. Strengthening intersectoral ties requires standardized protocols and incentives, as evidenced by pilot programs that doubled screening rates through pharmacy-health department synergies [38]. These collaborations position pharmacies as critical nodes in local health governance, enhancing system resilience [1], [5].

D. Case Studies in Local Governance

Case studies illustrate pharmacies' governance roles in action. During the COVID-19 pandemic, U.S. pharmacies partnered with federal agencies to distribute vaccines, achieving 90% coverage in priority populations within six months [40]. In the UK, pharmacies under NHS contracts conducted community needs assessments, informing local health priorities and reducing disparities by 20% in underserved areas [32]. In Ethiopia, a 2024 pilot saw pharmacies integrate with local health councils to provide HIV testing, increasing diagnosis rates by 15% in rural zones [15]. These examples highlight pharmacies' capacity to operationalize governance objectives, from emergency response to equity-focused interventions, though scalability depends on addressing funding and regulatory constraints [4], [36].

6. Models of Integration: From Silos to Synergies

A. Vertical Integration

Vertical integration involves top-down alignment of community pharmacies with national or regional health policies, enabling seamless translation of governance objectives into local practice [43]. In the UK, the National Health Service (NHS) exemplifies this model through contractual frameworks that integrate pharmacies into primary care networks, mandating services like vaccinations and chronic disease monitoring [32]. A 2024 study reported that such integration reduced hospital readmissions by 12% for patients with diabetes, as pharmacies implemented national guidelines for medication reconciliation [33]. In the U.S., the Centers for Medicare & Medicaid Services (CMS) incentivize pharmacies to align with accountable care organization (ACO) goals, with a 2023 analysis showing a 15% improvement in care coordination metrics [37]. Vertical models leverage pharmacies' data infrastructure to feed real-time insights into policy evaluation, such as prescription trends informing opioid regulations [34]. However, challenges include bureaucratic delays and inconsistent reimbursement, particularly in low-resource settings where policy cascades falter [15]. Evidence suggests vertical integration is most effective when supported by clear regulatory frameworks and funding streams, achieving up to 20% gains in service coverage [43].

B. Horizontal Integration

Horizontal integration emphasizes peer-level collaborations, such as pharmacist-general practitioner (GP) teams or pharmacy-public health partnerships, fostering localized synergy [44]. In Australia, the Primary Health Network (PHN) model integrates pharmacies with GPs to manage chronic conditions, with a 2023 RCT demonstrating a 10% reduction in emergency visits through shared care plans [45]. In Canada, interprofessional teams involving pharmacists improved adherence by 25% in hypertension patients, as reported in a 2022 study [35]. These models rely on shared electronic health records (EHRs) and joint training, which enhance communication but require significant investment [44]. Barriers include professional silos, with a 2023 qualitative study noting resistance from some GPs due to role overlap concerns [60].

Successful horizontal integration, as seen in the UK's community pharmacy consultation services, hinges on mutual trust and defined roles, yielding 30% higher patient satisfaction [32]. This approach excels in community-driven contexts but demands robust local coordination to avoid fragmentation [45].

C. Innovative Hybrid Models

Hybrid models blend vertical and horizontal integration, incorporating technology and community co-design to enhance flexibility [46]. Telepharmacy, for instance, combines top-down policy support (e.g., regulatory approval for remote consultations) with horizontal collaboration (e.g., pharmacist-physician telehealth teams), expanding access in rural areas [67]. A 2025 pilot in the U.S. showed telepharmacy increased medication adherence by 18% in underserved regions [46]. Community co-design models, such as those in New Zealand, involve pharmacies working with local stakeholders to tailor interventions, resulting in a 15% increase in screening uptake for Māori populations [38]. Artificial intelligence (AI) and blockchain technologies further enhance hybrid models by streamlining data sharing and ensuring privacy, with a 2024 study reporting 25% faster surveillance reporting [62]. These models face challenges like high initial costs and digital literacy gaps but offer scalable solutions for diverse settings [46]. Their adaptability positions them as a blueprint for future integration [63].

D. Evaluation Metrics

Evaluating integration models requires standardized key performance indicators (KPIs) to assess impact and guide policy [47]. Common metrics include cost savings (e.g., \$1.5-\$3 saved per dollar invested in pharmacy interventions), adherence rates (20-30% improvements), and equity indices (e.g., 20% increased access in underserved areas) [47], [33]. Process indicators, such as collaboration frequency or data-sharing efficiency, are equally critical, with a 2023 study showing 30% faster policy feedback loops in integrated systems [34]. Patient satisfaction and health outcome metrics, like reduced hospitalizations, further validate success, with hybrid models often outperforming others by 10-15% [46]. Standardizing these KPIs across regions remains a challenge but is essential for scalability [47].

Table 2. Comparison of Integration Models

Model Type	Strengths	Weaknesses	Example Refs
Vertical Integration	Aligns with national policy; scalable; data-driven	Bureaucratic delays; funding inconsistencies	[32], [43]
Horizontal Integration	Community-focused; high patient satisfaction	Professional silos; resource-intensive	[44], [45]
Hybrid (Telepharmacy)	Flexible; rural access; tech-enabled	High costs; digital literacy gaps	[46], [67]
Hybrid (Co-design)	Culturally tailored; equitable	Scalability limited by local capacity	[38], [63]
Evaluation Metrics	Quantifiable impact; guides policy	Lack of standardization	[34], [47]

Caption: Pros/cons matrix for adoption in local systems [56].

7. Challenges, Barriers, and Mitigation Strategies

A. Operational and Financial Hurdles

Community pharmacies face significant operational and financial challenges that impede their integration into health and governance systems [57], [58]. Workforce shortages are a primary

concern, with a 2024 survey indicating that 60% of U.S. pharmacies reported insufficient staffing to expand services like point-of-care testing or vaccinations [57]. This issue is exacerbated in rural areas, where pharmacist density is 30% lower than urban settings [26]. Financially, reimbursement models often fail to cover advanced services; for instance, medication therapy management (MTM) reimbursement rates in the U.S. cover only 50-70% of costs, deterring adoption [58]. In low- and middle-income countries, pharmacies frequently operate without public funding, limiting their ability to provide public health interventions [15]. A 2023 study estimated that inadequate reimbursement led to a 20% reduction in service offerings in underserved regions [39]. Additionally, supply chain disruptions, as seen during the COVID-19 pandemic, strained inventory management, with 25% of pharmacies reporting stockouts of critical medications [40]. These hurdles highlight the need for systemic support to sustain pharmacies' expanded roles [1], [5].

B. Ethical and Equity Issues

Ethical and equity challenges arise in pharmacies' expanded roles, particularly around data privacy and access disparities [59]. The increasing use of health information exchanges (HIEs) raises concerns about patient data security, with a 2024 study noting that 15% of pharmacy-led data-sharing initiatives lacked robust encryption protocols [65]. This poses risks of breaches, especially in under-resourced settings with outdated infrastructure [59]. Equity issues are evident in service access, as pharmacy closures disproportionately affect low-income and minority communities; a 2025 analysis found that 20% of pharmacy deserts in the U.S. were in areas with high Black and Hispanic populations [19]. Cultural competency gaps also persist, with qualitative data indicating that language barriers reduced intervention uptake by 10-15% among non-English-speaking groups [15]. These ethical and equity challenges underscore the need for inclusive policies and secure data frameworks to ensure pharmacies serve all populations effectively [12], [36].

C. Systemic Barriers

Systemic barriers, including governance silos and resistance from traditional healthcare providers, hinder pharmacy integration [60]. Fragmented governance structures, such as misaligned national and local policies, create inconsistencies; for example, a 2023 study found that 40% of U.S. states lacked unified regulations for pharmacist prescribing, limiting service scalability [35]. Resistance from physicians and other providers, driven by perceived role overlap, was reported in 50% of integration attempts, according to a 2022 qualitative analysis [60]. Funding silos further complicate collaboration, with a 2024 report noting that 60% of pharmacy-public health partnerships failed due to budget disputes [39]. In low-resource settings, regulatory lag—such as outdated licensing laws—restricts pharmacists' scope, particularly for diagnostics, as seen in African contexts [15]. These systemic issues demand coordinated policy reforms to align stakeholders and optimize pharmacies' contributions [32], [33].

D. Strategies for Overcoming

Mitigation strategies include enhanced training, financial incentives, and regulatory harmonization [61]. Expanding pharmacist education to include public health and data management skills can address workforce gaps, with a 2023 pilot showing a 25% increase in service delivery capacity post-training [61]. Financial incentives, such as performance-based reimbursements, boosted MTM adoption by 30% in a 2024 U.S. study [58]. Regulatory reforms, like standardized collaborative practice agreements, could streamline integration, as evidenced by a 20% service expansion in states with such policies [35]. Technology adoption, including

secure HIEs and telepharmacy, mitigates privacy and access issues, with a 2025 trial reporting 15% improved equity in rural areas [46]. Community engagement and interprofessional dialogues can reduce provider resistance, fostering collaborative models [44]. These strategies collectively enhance pharmacies' role as health-governance bridges [1], [63].

8. Future Directions and Recommendations

A. Emerging Technologies

Emerging technologies, such as artificial intelligence (AI) and blockchain, hold transformative potential for enhancing pharmacies' roles in health-governance integration [62], [63]. AI-driven tools can optimize predictive governance by analyzing prescription data to forecast disease trends, with a 2024 study demonstrating a 25% improvement in epidemic response times through AI-enabled pharmacy surveillance [62]. Blockchain offers secure, decentralized data sharing, addressing privacy concerns in health information exchanges (HIEs); a 2025 pilot reported a 30% reduction in data breach risks in pharmacy-led networks [63]. Telepharmacy, already expanding access in rural areas, is poised for growth with 5G integration, potentially increasing service coverage by 20% by 2030, as projected in a 2025 analysis [67]. However, adoption faces barriers, including high implementation costs and digital literacy gaps, particularly in low-resource settings [15]. Investing in scalable tech infrastructure and pharmacist training in digital tools is critical to realizing these benefits [46], [62]. These advancements position pharmacies as pivotal nodes for real-time, data-driven health systems [1], [34].

B. Policy Recommendations

To maximize pharmacies' potential as health-governance bridges, targeted policy reforms are essential [64]. First, governments should establish dedicated funding streams for pharmacy-based public health services, such as vaccinations and screenings, to address reimbursement gaps; a 2024 study showed that stable funding increased service uptake by 25% [58]. Second, standardizing regulatory frameworks across jurisdictions, such as harmonized scope-of-practice laws, could boost service delivery by 15-20%, as evidenced by U.S. states with collaborative practice agreements [35]. Third, integrating pharmacies into national health data systems, with clear privacy protocols, would enhance surveillance and policy feedback, with a 2023 model showing 30% faster data flows [34]. Finally, incentivizing intersectoral partnerships through shared budgets, as seen in the UK's Primary Care Networks, could improve collaboration efficiency by 20% [32]. These policies require stakeholder engagement to overcome resistance and ensure equity, particularly in underserved regions [15], [64]. Implementation by 2030 could transform pharmacies into resilient system anchors [1], [33].

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C. Research Agenda

Future research should prioritize longitudinal studies to assess the long-term impacts of pharmacy integration on health outcomes and governance efficacy [65]. Current evidence, largely cross-sectional, limits causal inferences; a 2025 review called for multi-year studies to evaluate sustainability [65]. Key areas include: (1) quantifying equity impacts in pharmacy deserts, where access gaps persist [19]; (2) evaluating hybrid integration models, particularly telepharmacy, for scalability in diverse settings [46]; and (3) exploring AI and blockchain's role in governance, with only 10% of studies addressing these technologies [62]. Mixed-methods approaches, combining RCTs with qualitative insights, could elucidate barriers like provider resistance, as noted in 2023 data [60]. Funding for global studies, especially in low-income countries, is critical to address evidence gaps, with African pharmacy roles underexplored [15].

A robust research agenda will inform evidence-based policies, ensuring pharmacies' sustainable integration [1], [65].

9. Conclusion

This review underscores the transformative role of community pharmacies as indispensable bridges between health service delivery and local governance, synthesizing evidence from over 150 studies spanning 2000–2025 [1], [7]. Pharmacies have evolved from dispensing units to multifaceted hubs, delivering clinical services like vaccinations and chronic disease management, which reduce hospitalizations by 10–20% and improve adherence by 20–30% [3], [20]. Their public health contributions, including smoking cessation and opioid harm reduction, yield significant population-level impacts, while their accessibility mitigates inequities in underserved areas [15], [40]. Governance integration—through policy advocacy, data sharing, and intersectoral collaborations positions pharmacies as critical nodes in resilient health systems, as evidenced by their pivotal role in COVID-19 vaccine distribution [32], [40]. However, challenges like workforce shortages, reimbursement gaps, and regulatory fragmentation persist, necessitating targeted reforms [57], [58]. The proposed “Pharmacies as Health-Governance Bridges” framework offers a roadmap for leveraging emerging technologies and standardized policies to enhance integration [14], [62]. Policymakers and practitioners must prioritize funding, regulatory harmonization, and research to unlock pharmacies' full potential, ensuring equitable, adaptive local health systems by 2035 [68], [69], [70].

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