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Collaborative Health Governance in the Greater Bay Area in China: Institutional Frameworks and Lessons for European Integration

Yuli Ye[1], Lian An[2], Qiang Li[3*]

[1]School of Transportation and Economic Management, Guangdong Communication Polytechnic, Guangdong, China
[2]Department of Economics and Geography, Coggin College of Business, University of North Florida, Jacksonville, FL, USA
[3]Faculty of Finance, City University of Macau, Taipa, Macao

*Corresponding author:
Qiang Li, qiangli@cityu.edu.mo

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ABSTRACT

Background: Cross-border health governance represents a critical challenge for integrated healthcare systems, particularly in regions with institutional diversity.

Objective: We analyzed collaborative health governance challenges and implementation strategies in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), operating under "One Country, Two Systems" with distinct healthcare systems, to derive lessons for European integration.

Methods: We employed comprehensive policy analysis examining governance paradigms, institutional frameworks, and collaborative mechanisms, synthesizing health governance theory, international comparative evidence, and regional policy documents to identify implementation challenges and evidence-based solutions.

Results: The GBA faces three principal challenges: conflicting governance paradigms, institutional constraints and regulatory barriers, and data governance and financial portability barriers. Successful collaborative mechanisms require: multi-level governance architecture with clear authority distribution; health information exchange platforms enabling interoperability and value-based payment; medical consortia with tiered care systems and integrated financing; systematic talent cultivation through joint training and licensing reciprocity; cross-border emergency coordination; and robust performance monitoring with equity-focused evaluation.

Conclusions: The GBA demonstrates that successful cross-regional health governance requires strategic embedding of administrative, market, and social mechanisms within supportive institutional frameworks emphasizing interoperability over standardization. Key lessons for European integration include: leveraging institutional diversity as innovation catalyst rather than harmonization prerequisite; implementing phased infrastructure deployment beginning with high-priority use cases; establishing clear multi-level authority delineation; prioritizing professional mobility through joint training programs; and systematically addressing financing fragmentation through joint risk pools and value-based payment.

Keywords: Cross-border healthcare; Health governance; Collaborative governance; Health information exchange; Integrated care; European health integration; Institutional quality; Health policy

1. Introduction

Cross-border health governance has emerged as a critical priority for European integration, with approximately one-third of European citizens—over 150 million people—residing in cross-border regions where administrative boundaries constitute significant obstacles to healthcare access.[1] The COVID-19 pandemic starkly revealed vulnerabilities in cross-border health coordination, with border closures disrupting healthcare access and public health responses.[2] Despite decades of European Union (EU) regulatory harmonization, persistent coordination challenges limit effectiveness. The 2019 European Court of Auditors report identified substantial implementation gaps, noting limited patient awareness, cumbersome authorization procedures, and inadequate cross-border patient flow data.[3]

The Guangdong-Hong Kong-Macao Greater Bay Area (GBA) comprises Hong Kong and Macao Special Administrative Regions alongside nine mainland cities. With 2024 GDP exceeding RMB 14.5 trillion (approximately USD 2.0 trillion) and population of 86 million across 56,000 km², the GBA constitutes the world's largest urban area while presenting unique governance challenges.[4] Unlike European cross-border regions operating within EU's common regulatory framework, the GBA functions under "One Country, Two Systems," encompassing three customs territories, three currencies, and fundamentally different healthcare systems.[5,6] This institutional complexity—arguably exceeding most European contexts—offers valuable comparative insights for understanding health governance collaboration under conditions of systemic diversity.

Population mobility within the region creates complex health challenges. Research demonstrates that migration generates health consequences for both migrants and left-behind family members, with children left behind experiencing significantly worse health outcomes despite remittances.[7,11,12] These dynamics underscore the importance of comprehensive health system responses addressing not merely acute care access but also continuity of care, family-centered services, and population health monitoring capturing migration effects. European cross-border health governance has evolved substantially following the 2011 Patient Mobility Directive and 2022 Cross-Border Health Threats Regulation, with European Reference Networks demonstrating feasibility of virtual collaboration for rare disease care.[8] Nevertheless, borders continue to represent significant obstacles despite decades of integration efforts, with public health particularly neglected in cross-border collaborations.[9,10]

This study analyzes collaborative health governance challenges and implementation strategies in the GBA, with particular attention to lessons for European integration. We examine theoretical foundations, identify specific obstacles, propose evidence-based strategies, and discuss transferable lessons—insights increasingly critical for addressing both routine healthcare needs and extraordinary challenges like pandemic preparedness.

2. Theoretical Framework: Health Governance Paradigms and Mechanisms

2.1 Evolution of Health Governance Paradigms

Health governance operates under social system paradigms recognizing health as emergent from complex interactions among ecological, political, economic, social, and cultural factors.[11] This perspective acknowledges that healthcare services constitute merely one determinant of population health, alongside income distribution, education, social cohesion, environmental sustainability, and political stability. Institutional quality, including governance transparency and corruption levels, fundamentally shapes health outcomes. Cross-national evidence demonstrates that corruption significantly increases mortality through compromised resource allocation, diminished oversight, and weakened infrastructure.[8,12] A study covering 134 nations found that a one-point increase in corruption perception (on a 10-point scale) associated with 0.26 years reduction in life expectancy, operating through multiple causal pathways.[8]

Beyond direct health impacts, institutional quality profoundly affects wellbeing. Research across 60+ countries demonstrates that corruption significantly reduces subjective wellbeing through diminished institutional trust, perceptions of unfairness, and reduced confidence in government services.[13] For collaborative health governance,

maintaining high institutional standards across participating jurisdictions becomes essential for securing public support and ensuring appropriate utilization of cross-regional healthcare services. The World Health Organization's (WHO's) social determinants framework exemplifies this expanded conceptualization, emphasizing that health equity requires addressing "the conditions in which people are born, grow, live, work and age."[14]

This contemporary understanding emerged through paradigmatic evolution. The population paradigm historically emphasized disease elimination through medical interventions, focusing on pharmaceuticals, surgical techniques, and clinical care. The regional paradigm subsequently expanded scope to environmental health determinants, recognizing that urban development, sanitation infrastructure, and environmental quality profoundly influence population health. These earlier paradigms laid groundwork for today's social system approach, though both population and regional perspectives remain important components of comprehensive governance.

2.2 Governance Mechanisms: Administrative, Market, and Social

Health governance operates through three primary mechanisms. Administrative governance emphasizes command-and-control through hierarchical authority, with government playing central roles in resource allocation, service provision, and quality regulation, as exemplified by the United Kingdom's (UK's) National Health Service. Market governance emphasizes choice and competition, with multiple providers competing for patients and payers selecting based on price, quality, and convenience, predominating in systems like the United States, though market failures necessitate substantial regulation. Social governance emphasizes commitment and compliance based on shared values and norms, relying on professional ethics, community solidarity, peer accountability, and shared commitment to collective welfare rather than hierarchical authority or market incentives.[15]

Institutional quality and transparency constitute critical enablers of social governance effectiveness. Research demonstrates that press freedom and information accessibility significantly improve population health through enabling public accountability, exposing quality failures, and facilitating informed choices.[4,16] Cross-national evidence from 173 countries over 17 years shows press freedom significantly predicts life expectancy, with a one-unit increase associated with 0.12 years increase in life expectancy after controlling for GDP, health expenditure, and other factors.[4,16] These findings underscore that governance mechanisms operate most effectively within high-quality institutional environments characterized by transparency, accountability, and low corruption.

Contemporary scholarship increasingly recognizes that optimal governance emerges from strategic embedding and mutual reinforcement of all three mechanisms. Recent European research reinforces these insights through empirical analysis. Studies of Health Innovation Clusters in England demonstrate that successful networks require governance arrangements balancing central mandates with local adaptation, with effectiveness depending critically on stakeholder engagement, clear accountability, and flexibility enabling contextualization.[17] Research on integrated care across Italy, Netherlands, and Scotland reveals that effective governance necessitates horizontal collaboration among multiple actors, vertical coordination across governance levels, and flexible financing addressing fragmented funding.[18] German Innovation Fund projects illustrate that managing tensions among diverse stakeholders constitutes a critical success factor, with transparency, shared decision-making, and balanced representation predicting sustainability.[19]

3. Challenges Facing Collaborative Health Governance in the GBA

Despite economic prosperity and geographic proximity, the GBA faces substantial obstacles to effective health governance collaboration. Regional health information sharing remains underdeveloped, healthcare talent and equipment mobility is constrained, and systematic coordination mechanisms operate primarily reactively rather than proactively building integrated systems. Three principal challenges impede progress.

3.1 Governance Paradigm Conflicts

The GBA encompasses fundamentally different governance paradigms reflecting distinct political systems and development stages. Mainland cities operate under centralized government leadership

emphasizing top-down planning and coordinated implementation across sectors. Hong Kong's approach emphasizes market mechanisms with limited government intervention, reflected in minimal public health spending (2.9% GDP versus 6.6% mainland China average) and heavy private sector reliance. Macao blends elements from both systems with recent expansion of government health services. These paradigm differences create coordination challenges extending beyond technical cooperation to fundamental philosophical disagreements about appropriate government roles, resource allocation priorities, and accountability mechanisms.

International evidence demonstrates that effective collaborative governance requires explicit negotiation and reconciliation of paradigmatic differences rather than assuming convergence. Successful European cross-border initiatives show that collaboration succeeds when participants acknowledge governance diversity and develop mechanisms accommodating different approaches while achieving shared objectives. The GBA requires similar explicit recognition that effective collaboration necessitates not paradigm convergence but rather governance frameworks enabling cooperation despite philosophical differences.

3.2 Institutional Constraints and Regulatory Barriers

The GBA faces significant institutional quality disparities affecting collaboration. Research demonstrates that corruption and institutional quality predict skilled worker migration patterns, with healthcare professionals particularly sensitive to governance quality.[2,20] Machine learning analysis reveals corruption perceptions significantly predict emigration, with professionals valuing environments permitting open discussion of quality problems, transparent investigation of failures, and honest performance evaluation—characteristics associated with press freedom and broader institutional quality.[2,4,16] For the GBA, mainland cities' talent retention challenges reflect not merely compensation differentials with Hong Kong but broader institutional quality perceptions requiring sustained governance improvement. Talent cultivation strategies must address institutional quality fundamentally, demonstrating high governance standards including transparency, fairness in advancement, low corruption, and merit-based rather than patronage-based professional advancement.

Regulatory fragmentation constitutes a second major barrier. The GBA encompasses three distinct legal systems with different medical licensing standards, pharmaceutical approval processes, healthcare facility accreditation requirements, and health insurance regulations. Hong Kong and Macao maintain separate professional registration systems from mainland, creating barriers to cross-regional practice even for qualified professionals. Pharmaceutical regulations differ substantially, with drugs approved in one jurisdiction requiring separate approval processes elsewhere. Healthcare facility standards and accreditation processes vary, complicating quality assurance for cross-border services. Insurance coverage and reimbursement arrangements remain largely jurisdiction-specific, creating significant out-of-pocket costs for patients accessing care across borders.

International experience demonstrates that addressing regulatory fragmentation requires systematic approaches beyond ad hoc bilateral agreements. European frameworks like mutual recognition of professional qualifications and coordinated health technology assessment offer instructive models. However, GBA's institutional diversity—encompassing different political and legal systems—creates challenges exceeding typical European contexts. Progress requires not merely technical regulatory alignment but sustained political commitment to enabling mobility while respecting jurisdictional autonomy.

3.3 Data Governance and Financial Barriers

The GBA encompasses three distinct data protection regimes: Hong Kong's Personal Data (Privacy) Ordinance modeled on European approaches, Macao's Personal Data Protection Law, and mainland China's Personal Information Protection Law with Chinese characteristics. These frameworks differ in consent requirements, data localization provisions, cross-border transfer restrictions, and enforcement mechanisms. Cross-regional health information exchange requires navigating these divergent regulatory environments while ensuring adequate privacy protection and enabling appropriate clinical information sharing—a complex balance currently lacking comprehensive frameworks.

Financial portability—enabling patients to access care across jurisdictions with streamlined

reimbursement—faces equally significant barriers. The GBA's three currencies (Hong Kong Dollar, Macao Pataca, Renminbi) complicate reimbursement, though currency conversion represents a technical rather than fundamental barrier. More critically, fundamentally different insurance systems create substantial obstacles. Mainland residents access healthcare through social insurance schemes (Urban Employee Basic Medical Insurance, Urban-Rural Resident Basic Medical Insurance) with government subsidies. Hong Kong residents rely predominantly on out-of-pocket payment with limited public coverage. Macao operates a hybrid system with expanding public coverage. These financing differences create significant barriers to seamless cross-border care access, particularly affecting vulnerable populations unable to afford substantial out-of-pocket costs.

4. Evidence-Based Implementation Strategies

4.1 Governance Architecture and Institutional Frameworks

Effective collaborative health governance requires multi-level architecture with clear authority delineation. We propose a three-tier structure: (1) a Regional Health Coordinating Council comprising health ministers or senior delegates from participating jurisdictions, meeting quarterly or semi-annually for strategic direction, dispute resolution, and policy coherence; (2) bilateral operational agreements between paired jurisdictions addressing specific cooperation areas (emergency response, specialized service sharing, professional mobility) with clear timelines and accountability; and (3) operational working groups for specific initiatives (integrated chronic disease care, rare disease networks, emergency preparedness) with frontline professionals empowered for implementation decisions within defined parameters.

This architecture must incorporate performance monitoring with equity-focused evaluation. Metrics should assess not merely utilization volumes but also equity of access, appropriateness of care, health outcomes, patient experience, and cost-effectiveness.[21] Regular public reporting of performance indicators creates accountability while enabling continuous improvement through identifying areas requiring additional attention. Importantly, performance monitoring must explicitly assess equity dimensions—tracking whether cross-border services benefit vulnerable populations proportionally or primarily serve more affluent, educated, or well-connected individuals.

4.2 Cross-Regional Service Models and Emergency Coordination

Medical consortia with tiered care delivery offer proven approaches for service integration. We propose establishing GBA Medical Consortia linking tertiary hospitals in Hong Kong, Macao, and major mainland cities with secondary facilities and primary care networks across the region. These consortia would implement tiered referral systems ensuring patients receive care at appropriate levels, develop integrated care pathways for high-prevalence conditions (cardiovascular disease, diabetes, cancer), establish shared clinical protocols ensuring quality while respecting local contexts, and create joint continuing education programs maintaining professional competency. International evidence demonstrates that successful consortia require: clear governance structures specifying decision-making authority; aligned financial incentives ensuring partners benefit from collaboration; shared information systems enabling care coordination; and sustained implementation support including technical assistance and change management.

Emergency coordination mechanisms require particular attention given pandemic experiences. The GBA should establish: joint surveillance systems integrating data from all jurisdictions for early outbreak detection; coordinated response protocols specifying roles, responsibilities, and triggers for joint action during health emergencies; cross-border mutual aid agreements enabling resource sharing during crises; and regular joint exercises testing coordination mechanisms and identifying improvement areas. COVID-19 demonstrated that effective emergency response requires pre-existing relationships, established protocols, and tested communication channels—elements requiring systematic investment during non-emergency periods.

4.3 Health Information Exchange and Financial Integration

Health information exchange (HIE) constitutes a foundational enabler for cross-regional coordination. We propose phased HIE implementation prioritizing:

Phase 1—Emergency records and medication histories (immediate clinical value, lower privacy sensitivity, clear safety benefits); Phase 2—Chronic disease management data and laboratory results supporting coordinated care for high-prevalence conditions; Phase 3—Comprehensive health records enabling full care continuity. This phasing enables concentrated implementation effort on limited use cases where value proposition is clearest and stakeholder resistance lowest, with success building institutional confidence and technical capacity for subsequent expansion. Critical technical requirements include: interoperability standards enabling data exchange despite different electronic health record systems; robust cybersecurity protecting patient information; consent management systems balancing patient autonomy with care coordination needs; and audit trails ensuring accountability for information access.

Financial integration requires systematic approaches addressing insurance portability and joint financing. Short-term measures include: bilateral reimbursement agreements enabling cross-border care with reasonable administrative burden; standardized claims processes reducing paperwork and processing delays; and emergency care protocols ensuring treatment access without prior authorization. Medium-term initiatives should explore: risk pool integration for specific high-cost conditions enabling cost-sharing; joint purchasing of high-cost services achieving economies of scale; and value-based payment models rewarding quality and outcomes rather than service volume. Long-term vision should consider comprehensive insurance portability enabling residents to access care across the region with seamless reimbursement, recognizing that achieving this vision requires substantial political will and sustained implementation effort.

Systematic talent cultivation through joint training and licensing reciprocity represents crucial dimensions requiring sustained investment. The GBA should establish: joint medical education programs with student exchanges and collaborative curriculum development; joint postgraduate training initiatives enabling residents and fellows to gain experience across jurisdictions; reciprocal professional licensing enabling qualified professionals to practice across the region; and continuing education programs maintaining competency while building cross-regional professional networks. International evidence demonstrates that professional mobility programs facilitate not merely technical knowledge exchange but institutional quality learning, with professionals from less transparent systems experiencing different accountability cultures potentially generating pressure for improvement.

5. Lessons for European Health Integration

The GBA's collaborative health governance development provides valuable lessons for European integration despite substantial contextual differences. Both confront fundamental challenges: coordinating diverse healthcare systems with different financing mechanisms and professional cultures; managing patient and professional mobility across jurisdictional boundaries; leveraging digital health infrastructure while protecting privacy; and balancing local autonomy with regional coordination imperatives. The GBA's institutional complexity—arguably exceeding most European contexts given different political systems, currencies, and legal traditions—generates insights applicable to European integration challenges, particularly as Europe grapples with persistent coordination difficulties despite decades of harmonization.

5.1 Multi-Level Governance and Institutional Coordination

Effective cross-regional health governance requires simultaneous coordination at multiple levels—supranational frameworks providing strategic direction, bilateral agreements addressing operational details, and local implementation mechanisms enabling frontline coordination—with clear authority delineation preventing gaps and overlaps. European governance operates across Commission frameworks, member state policies, regional authorities, and local health systems, creating coordination complexity frequently leading to implementation gaps. Research across Italy, Netherlands, and Scotland emphasizes that participants "described a disconnect between what national or regional governments aspire to achieve and their own efforts to implement this vision," with "blurred, and sometimes contradictory, lines of accountability."[18] These findings suggest that excessive centralization or insufficient local autonomy both undermine implementation, requiring balanced governance architectures.

The GBA's proposed three-tier structure offers a model balancing central coordination with local adaptation. Critical design elements include: clear authority delineation specifying decisions at each level, preventing gaps and overlaps; subsidiarity principles locating decisions at lowest effective level, ensuring local contexts receive adequate consideration; accountability mechanisms ensuring each level reports to stakeholders and faces consequences for poor performance; and coordination protocols enabling information flow while preventing excessive consultation delaying necessary decisions. European cross-border regions should establish similarly explicit multi-level structures rather than assuming coordination will emerge organically. The Netherlands' regional care groups, comprising 50-200 general practitioners with clear accountability while maintaining professional autonomy, demonstrate effective operational governance adaptable to European cross-border contexts.[22]

5.2 Professional Mobility and Licensing Harmonization

Talent mobility and knowledge exchange represent crucial dimensions requiring systematic investment beyond enabling patient mobility, yet frequently receive inadequate attention. European policy discussions often focus on patient mobility and service delivery integration while paying less attention to professional mobility, joint training programs, and systematic knowledge exchange. However, sustainable collaboration requires not merely enabling patients to access care but fostering professional networks transcending boundaries, building mutual understanding of different system logics and clinical cultures, and developing shared practices through iterative collaboration. WHO Europe's capacity-strengthening initiatives recognize that cross-regional governance depends fundamentally on professional relationships and trust that formal agreements alone cannot create.[10]

Healthcare professional retention and mobility reflect broader institutional quality factors extending beyond salary and research funding. Machine learning analysis reveals that corruption perceptions significantly predict skilled worker emigration, with healthcare professionals particularly sensitive to governance quality.[2,20] Cross-national evidence demonstrates corruption significantly increases mortality while reducing subjective wellbeing, operating through multiple channels affecting both health outcomes and professional satisfaction.[7,8,12,13] These findings carry important implications: talent cultivation strategies must address institutional quality fundamentally, not merely offer financial incentives or training opportunities. Regions seeking to attract and retain healthcare professionals must demonstrate high governance standards including transparency, fairness in advancement and resource allocation, low corruption, and merit-based professional advancement.

Research demonstrates that press freedom significantly predicts life expectancy and healthcare professional satisfaction, as professionals value environments where quality problems can be openly discussed, failures transparently investigated, and performance honestly evaluated—characteristics associated with broader institutional quality.[4,16] European cross-border regions should view professional mobility programs not merely as technical training exchanges but as opportunities for institutional quality learning and improvement, with professional mobility becoming mechanism for institutional quality diffusion alongside technical knowledge exchange—a dimension receiving inadequate attention in current policy frameworks.

5.3 Digital Infrastructure and Financial Portability

Digital health infrastructure constitutes a foundational enabler for cross-regional coordination, yet technology deployment alone proves insufficient without comprehensive data governance frameworks, stakeholder engagement, and realistic timelines. The EU Digital COVID Certificate's rapid deployment demonstrated that focused, high-priority use cases can achieve remarkable cross-border interoperability when political will, technical standards, and governance mechanisms align.[22] However, the proposed European Health Data Space's implementation challenges—divergent national GDPR interpretations, technical interoperability gaps, and sovereignty concerns—illustrate that routine health data sharing faces substantially greater obstacles.[23] Data governance constitutes a prerequisite, not afterthought, for health information exchange, requiring adequate time and resources allocated to governance framework development before large-scale technical deployment.

The GBA's phased approach offers instructive lessons. Rather than attempting comprehensive

health information exchange immediately, prioritizing emergency records and medication histories—information with immediate clinical value, lower privacy sensitivity, and clear safety benefits—enables concentrated implementation effort on limited use cases where value proposition is clearest and stakeholder resistance lowest. Success builds institutional confidence and technical capacity, creating foundations for subsequent expansion while generating political support and enabling learning before broader deployment. European initiatives should adopt similar phasing, potentially prioritizing emergency care records accessible across borders, medication histories preventing dangerous interactions, allergy and adverse reaction information protecting patient safety, and immunization records supporting outbreak response, with expansion to comprehensive sharing occurring only after foundational use cases achieve stable implementation.

Financial portability—enabling patients to access care across jurisdictional boundaries with streamlined reimbursement and minimal out-of-pocket barriers—requires equally careful attention. Interoperability rather than harmonization offers particular promise, with flexible financing arrangements enabling cross-regional reimbursement without requiring unified insurance systems. The Healthacross Initiative's success in establishing cross-border primary care centers serving Austrian and Czech populations occurred through bilateral agreements addressing specific operational issues including reimbursement mechanisms enabling Czech patients to receive care in Austrian facilities with costs covered through Czech insurance.[24] This pragmatic approach achieved meaningful integration without requiring comprehensive system harmonization, suggesting European cross-border regions can develop workable financing arrangements respecting institutional diversity while enabling practical cooperation benefiting border populations.

6. Conclusion

This study examined collaborative health governance challenges and implementation strategies in the GBA, deriving transferable lessons for European integration and broader international application. Our analysis demonstrates that successful cross-regional health governance requires strategic embedding of administrative, market, and social mechanisms within supportive institutional frameworks that emphasize interoperability over standardization. The GBA faces three principal challenges: conflicting governance paradigms reflecting different political systems and development stages; institutional quality disparities affecting talent retention and public trust; persistent innovation deficits despite economic prosperity; inter-jurisdictional competition undermining coordination; and critical barriers in data governance and insurance portability. Addressing these challenges requires comprehensive strategies spanning governance architecture, service delivery models, information technology infrastructure, talent cultivation, and financial integration.

Key lessons for European integration include: First, institutional diversity should be reframed as innovation catalyst rather than harmonization prerequisite. The GBA demonstrates that meaningful collaboration can occur despite—and potentially because of—institutional differences when governance focuses on enabling cooperation rather than requiring convergence. European cross-border regions particularly benefit from this insight where comprehensive harmonization proves infeasible. Second, phased infrastructure deployment beginning with high-priority use cases enables success with limited applications to build institutional confidence before broader expansion. The EU Digital COVID Certificate demonstrated rapid deployment potential for focused initiatives, while European Health Data Space challenges illustrate that routine data sharing requires more graduated approaches.

Third, clear multi-level authority delineation with subsidiarity principles prevents both coordination gaps and excessive centralization undermining local adaptation. Research across multiple European contexts demonstrates that balanced governance architectures prove essential for effective implementation. Fourth, professional mobility through joint training, licensing reciprocity, and systematic knowledge exchange constitutes a critical dimension requiring sustained investment. Healthcare professional retention and mobility reflect broader institutional quality factors including transparency, fairness, low corruption, and merit-based advancement—dimensions requiring systematic attention beyond merely offering financial incentives.[2,4,7,8] Fifth, financing fragmentation

requires systematic approaches including joint risk pools, value-based payment models, and flexible reimbursement arrangements enabling cross-border care access without requiring complete insurance system harmonization.

Several limitations warrant acknowledgment. First, our analysis relies primarily on policy documents, international comparative evidence, and existing research rather than original empirical investigation of GBA implementation outcomes. As proposed strategies become operational, rigorous evaluation research will prove essential for assessing effectiveness and identifying refinements. Second, our focus on GBA-Europe comparisons may overlook relevant lessons from other cross-border regions facing similar challenges. Third, rapidly evolving digital health technologies and shifting political landscapes may create opportunities or constraints not fully anticipated in our analysis. Future research should address these limitations through: longitudinal evaluation studies tracking implementation outcomes across multiple dimensions including access, quality, efficiency, and equity; comparative research examining cross-border health governance across diverse international contexts; and continued attention to emerging technologies and governance innovations that may enable new collaboration approaches.

The COVID-19 pandemic starkly demonstrated that health challenges transcend jurisdictional boundaries, requiring coordinated responses spanning administrative borders. As global population mobility increases and health challenges grow more complex, developing effective cross-regional health governance becomes increasingly critical. The GBA's experiences—addressing collaboration challenges amidst substantial institutional diversity—offer valuable insights for European integration and broader international application. Success requires not merely technical solutions but sustained political commitment, adequate resources, stakeholder engagement, and recognition that building effective collaborative governance constitutes a long-term endeavor requiring patience, persistence, and continuous learning from implementation experience.

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This study analyzed publicly available policy documents and published literature. No primary data were generated. All sources are cited in the references.

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This study involved analysis of publicly available policy documents and published literature. No human subjects research was conducted. Ethics approval was not required.

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