

Strengthening Supervision of Medical Insurance Funds in Cross-Regional Healthcare: A Study of Guangxi, China

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Abstract

The supervision of medical insurance funds for cross-regional healthcare remains a weak link in healthcare fund oversight and a major challenge in improving cross-regional medical services. To enhance medical insurance fund supervision, this study examines the current status and evolving trends in the regulation of cross-regional healthcare funds in Guangxi. It analyzes the concentration and structural characteristics of medical insurance fund oversight and proposes strategies to accelerate the development of a robust supervision system for cross-regional healthcare funds. Key recommendations include: 1) Strengthening medical expense review and payment reforms in regions with significant patient outflows, such as Wuzhou City. 2) Enhancing medical record-keeping and monitoring of healthcare practices in regions with high patient inflows, such as Nanning City.

Keywords

Medical Insurance; Fund Supervision; Cross-Region Health Care.

1. Introduction

China prioritizes medical insurance fund supervision with heightened vigilance, recognizing these resources as the essential "healthcare lifeline funds" for its 1.4 billion insured citizens—whose security and prudent management directly impact trillions of yuan in critical healthcare financing. Yet the oversight landscape remains perpetually challenging due to multifaceted risk exposure: numerous fund-utilizing entities, elongated operational chains, proliferating vulnerability points, and inherent regulatory complexities that perpetuate high-frequency violations. Recent systemic developments—particularly enhanced insurance fund consolidation levels and streamlined cross-regional healthcare access—have further intensified supervisory pressures, catalyzing the emergence of de-territorialized risks characterized by diversified risk subjects, mobile risk targets, and cross-jurisdictional risk management demands. This paradigm fundamentally challenges conventional localized governance frameworks for medical insurance fund oversight.

2. Literature Review

2.1. Medical Insurance Fund Supervision & Societal Value

Medical insurance fund supervision constitutes state-imposed constraints on organizations and individuals through coercive power, specifically governing funds for basic medical insurance (including maternity coverage) and medical assistance programs; this regulatory imperative gained prominence under the New Public Management paradigm as regulatory states emerged globally, positioning supervision among Roberts et al.'s "five control knobs"[1] determining healthcare reform efficacy and equity. The necessity of such oversight lies in mitigating four

systemic risks that actualize distinct societal values: establishing foundational conditions for healthcare market exchanges[2][3]; ensuring equitable access to essential health services[4]; correcting market failures like information asymmetry [5][6][7]; remedying unacceptable market outcomes including moral hazard [8].

2.2. Conceptualizing "De-territorialized Risks" and Manifestations

"De-territorialized risks" denote governance failures occurring when regulatory systems disengage from localized contexts—a concept rooted in Anthony Giddens' 1990s disembedding theory which examines modernity's dynamics through time-space distancing. Operative through symbolic tokens and expert systems, this process extracts social relations from place-based interactions, generating risks characterized by jurisdictional specificity and asymmetrical resource distribution[9] that induce value misalignment, managerial fragmentation, and power-structure dissonance.

Within medical fund supervision, these risks manifest as systemic governance deficiencies where traditional place-based models prove inadequate against modernity's tripartite challenges: diversified risk subjects, mobile risk targets, and cross-jurisdictional risk management. Policy-technological drivers increasingly separate principal-agent relationships across time-space dimensions, introducing new regulatory entities and processes[10] that obscure accountability[11], impede multi-stakeholder coordination [12], fuel abnormal cost inflation [13], and exacerbate fraudulent claims ("fabricated patients/illnesses/invoices"). Consequently, supervision models require fundamental recalibration across five dimensions: legal foundations, methodological approaches, institutional actors, operational mechanisms, and performance metrics.

2.3. Risk Governance Paradigms in Medical Insurance Fund Supervision

Positioned terminally within the policy design-execution-refinement continuum, medical insurance fund supervision has long constituted an institutional shortcoming in China's healthcare security framework [14]. Prevailing scholarship predominantly adopts a "problem-solution" paradigm, emphasizing phenomenological descriptions and typological analyses of regulatory challenges while advocating tactical interventions—including compliance audits, credit-based management, mandatory reporting, unannounced inspections, and AI-driven monitoring—implemented through anti-fraud campaigns, retrospective compliance reviews, and specialized governance initiatives[15]. This has catalyzed explorations toward multidimensional governance models featuring diversified regulatory actors, enriched supervisory content, methodological pluralism, systematized evaluation metrics[17], and performance-based accountability mechanisms [18].

To effectively mitigate governance risks, the regulatory architecture has evolved through four developmental phases: fragmented autonomy, preliminary centralization, integrated experimentation, and consolidated pluralism[19], crystallizing distinct governance modalities: Command-and-control regulation[20], Cooperative governance[21], Enforced self-regulation[22], Responsive regulation[23], Smart regulation[24]. Each modality addresses systemic risks through reconfigured principal-agent relationships, with contemporary scholars advocating networked regional governance platforms ordynamic reintegration mechanismsthat reconfigure social relations through institutional re-embedding[25].

3. Trends in Regulatory Pressure on Cross-Regional Healthcare Funds in Guangxi

3.1. Current Situation

Cross-regional healthcare fund supervision remains a blind spot in the current medical insurance oversight system. As the final link in healthcare policy implementation, medical security fund supervision has developed relatively slowly. Since cross-regional healthcare services occur outside the coordinated areas, their fund supervision is constrained by factors such as regulatory models, workforce capacity, technical capabilities, and cost limitations, making it difficult to establish truly effective safeguards. For a long time, medical expenses for cross-regional healthcare have been significantly higher than those for local treatments, turning cross-regional healthcare into a hotspot for insurance fraud and fund wastage. There is an urgent need to strengthen supervision of cross-regional healthcare funds.

Supervision of cross-regional healthcare funds has become a priority for future medical insurance oversight. In recent years, China has vigorously implemented the direct settlement policy for cross-regional medical services, significantly improving healthcare accessibility and reducing financial burdens for 331 million mobile insured individuals. From 2020 to 2023, national cross-regional healthcare expenditures reached 396.1 billion yuan, 464.8 billion yuan, 521.7 billion yuan, and 711.1 billion yuan [27], respectively. During the same period, Guangxi's cross-regional healthcare costs amounted to 11.78 billion yuan, 11.43 billion yuan, 14.73 billion yuan, and 19.17 billion yuan [28]. These figures demonstrate a sustained increase in both demand for cross-regional medical services and corresponding expenditure growth. While regulatory pressure on fund supervision continues to intensify, effective oversight mechanisms remain insufficient due to the absence of a robust regulatory framework for cross-regional healthcare funds. Strengthening supervision in this area has thus become an imperative focus for future medical insurance governance.

3.2. Development Trends

3.2.1. Medical Insurance Supervision Enters a New Implementation Phase

Since the establishment of the National Healthcare Security Administration (NHSA) in 2018 and the creation of its dedicated fund supervision department, medical insurance fund oversight has been continuously strengthened. In 2020, the General Office of the State Council issued the Guidelines on Advancing the Reform of the Medical Insurance Fund Supervision System, marking the introduction of a top-level regulatory framework. The Regulations on the Supervision and Administration of Medical Insurance Fund Use, implemented in 2021, established initial achievements in legalized supervision. In May 2023, the NHSA released the Interim Measures for Unannounced Inspections of Medical Insurance Funds and the Framework for Intelligent Audit and Monitoring Knowledge and Rule Databases (Version 1.0), gradually forming concrete regulatory mechanisms. With a clear strategic pathway and rapid policy advancement, medical insurance supervision has now entered a new development stage focused on implementation and effectiveness [26].

3.2.2. The Convenience of Cross-Regional Healthcare: An Irreversible Trend

Since the establishment of the national cross-regional healthcare settlement platform in 2017, the management and services for cross-regional medical treatment have entered a phase of rapid development. From 2018 to 2024, direct settlement services expanded from inpatient care to outpatient services, with settlement networks extending to county-level facilities. The number of cross-regional medical visits surged from 1.318 million to 391 million during this period. Concurrently, medical insurance services have become increasingly streamlined. The 2022 National Medical Insurance Service Standards mandated the simplification of documentation for cross-regional healthcare registration. Pilot programs for a registration-free

system have been implemented in regions such as Inner Mongolia and the Yangtze River Delta. In Guangxi, specific measures have been introduced to facilitate cross-regional healthcare access. Targeting key demographics such as seniors aged 70 and above and university students, the region is exploring a registration-free mechanism for intra-provincial cross-regional medical services, particularly for patients seeking care from better-resourced areas to less-developed areas within the province.

4. Differential Pressure in Medical Insurance Fund Supervision

4.1. Geographic Concentration of Oversight

Supervisory pressure for cross-provincial healthcare is heavily concentrated in neighboring provinces such as Guangdong, while intra-provincial oversight focuses on core cities such as Nanning. Under China’s current medical insurance framework, regulatory responsibility shifts from the insured’s home region to the destination jurisdiction, where local authorities implement unified management.

4.1.1. Cross-Provincial Dynamics: Dominance of Guangdong

Guangxi, a major patient-exporting province with significant ethnic minority populations, has witnessed 6.93 million of its 8.11 million out-migrants relocating to Guangdong, accounting for 85.4% of total interprovincial migration.

This dynamic creates substantial cross-jurisdictional healthcare utilization, wherein migrants retain Guangxi insurance coverage while accessing care in Guangdong-effectively transferring regulatory duties to the destination.

Empirically exemplified by Wuzhou City-where approximately 400,000 residents working in Guangdong generated 30,000 cross-provincial medical claims during 2018–2021-Guangxi provincial patterns further demonstrate dominant healthcare localization: 97% of residents received care within the province in 2020 (exceeding the 94% national average), while analysis of the remaining 3% seeking outbound care reveals Guangdong attracted 57.5% of such patients, vastly exceeding secondary destinations including Yunnan (4.8%) and Shanghai (4.5%).

Critical Imperative: Establishing a Guangxi-Guangdong cross-jurisdictional collaborative supervision mechanism to address fund leakage and fraud risks.

4.1.2. Intra-Provincial Pressure: Core Cities as Focal Points

Table 1. Policy Implications

Challenge	Strategic Response
Cross-provincial fund leakage	Develop real-time claims auditing protocols jointly with Guangdong
Core-city overload	Deploy AI monitoring systems targeting high-volume facilities in Nanning/Liuzhou
Regulatory fragmentation	Standardize documentation requirements under interregional agreements

Within Guangxi, oversight challenges concentrate predominantly in Nanning, Liuzhou, and Guilin due to disparate distributions of healthcare resources and significant demographic shifts. Core cities possess advanced medical infrastructure that attracts patient referrals from across the province, while simultaneously experiencing substantial population inflows-evidenced by Guangxi's total mobile population of 9.52 million (19.0% of residents), with Nanning alone recording a permanent population of 8.74 million (17.44% of Guangxi's total) and net population growth exceeding 800,000. Cities including Liuzhou, Beihai, and Fangchenggang further demonstrate this trend, where migrant populations constitute over 20% of local residents. Liuzhou, Beihai, Fangchenggang: Migrant ratios exceeding 20% of local populations

These cities absorb long-term mobile workers who predominantly access healthcare locally, intensifying supervision complexity.

4.2. Structural Governance Imperatives

The oversight landscape manifests a critical dichotomy wherein pressures on fund security monitoring remain relatively contained while surveillance of fiscal equilibrium faces intensifying strain, attributable to the inherent complexities of cross-regional healthcare—characterized by fragmented service points, extensive geographical coverage, protracted operational chains, and behavioral opacity that exploits regulatory fragilities. Given that most cities function dually as origins of insurance coverage and destinations for medical services within bidirectional patient flows, the imperative emerges for precisely calibrated regulatory frameworks that address these divergent governance challenges through attribute-specific interventions.

4.2.1. Treatment-Destination Cities: Latent Security Risks

For non-core urban centers beyond Nanning and Liuzhou, fund security pressures remain moderate yet are compounded by unresolved institutional ambiguities—specifically, the absence of codified protocols delineating responsibility matrices among healthcare administrations, insurance agencies' auditing mandates, medical institutions' self-governance obligations, sectoral supervisory bodies, and local governmental jurisdictions, alongside underdeveloped systemic controls against fraudulent claims and unnecessary treatments which necessitate reinforced medical documentation standards and real-time behavioral surveillance infrastructures.

4.2.2. Insured-Origin Cities: Escalating Equilibrium Threats

These jurisdictions confront acute fiscal sustainability challenges as cross-regional treatments incur costs exceeding local care by 17-22%, compelling near-term mitigation through globally budgeted expenditure caps, diagnosis-related group (DRG) payment reforms, and fiscal risk early-warning systems, while long-term strategic recalibration must reconcile reimbursement policies with medical resource redistribution, resolve tensions between cross-regional access and hierarchical medical systems, and institutionalize dynamic fund-risk monitoring mechanisms to counteract systemic resource concentration trends.

5. De-territorialized Risk Characteristics in Guangxi's Cross-Regional Healthcare Fund Supervision

5.1. Risk Characteristics

Risk management theory posits that risk characteristics should be identified through three dimensions: risk environment, risk occurrence, and risk consequences.

5.1.1. De-territorialized Risk Environment

The de-territorialized risk environment manifests distinctive features within modern governance contexts, characterized by cross-regional and cross-domain operations, multi-stakeholder involvement, weak coordination, and regulatory fragmentation. In Guangxi's cross-regional healthcare fund supervision, the primary challenge lies in a "triple disembedding" effect within the regulatory environment:

Spatial Disembedding. The separation of insurance enrollment and treatment locations creates a cross-jurisdictional governance chain—where patients are insured locally, treated externally, reimbursed locally, yet supervised externally.

Actor Disembedding. Regulatory processes involve complex multi-stakeholder dynamics, including: Insurance agencies from both origin and destination regions; Mobile insured

individuals; Designated healthcare providers and pharmacies; Third-party service intermediaries.

Coordination Disembedding. Collaborative oversight mechanisms remain underdeveloped. For instance, only 38% of cross-provincial fraud cases were jointly resolved in 2023, reflecting weak interregional governance capacity.

5.1.2. De-territorialized Risk Occurrence

Risk emergence manifests through three interlocking dynamics: diversified risk subjects comprising multiple stakeholders with conflicting incentives, mobile risk targets characterized by patients and funds flowing freely across jurisdictional boundaries, and cross-boundary risk management systems plagued by regulatory authority misalignment - a triad of challenges that collectively undermine oversight efficacy in cross-regional healthcare governance.

These factors converge to concentrate regulatory failures in three critical dimensions: high-risk medical specialties such as orthopedics and hemodialysis services, both particularly vulnerable due to their lucrative reimbursement margins; systemic abuse of high-value consumables, most notably human albumin and blood purification materials that circulate across jurisdictions; and increasingly prevalent fraud schemes including sophisticated fake invoice operations.

5.1.3. De-territorialized Risk Consequences

Guangxi's cross-regional healthcare system faces three well-documented challenges. First, the financial burden is substantial, with cross-regional medical expenditures reaching 147.3 billion yuan in 2022. Second, resource allocation shows significant concentration, as provincial tertiary hospitals handle over half of all cross-jurisdiction cases. Third, supervision capacity remains limited, with physical audits covering only 12-15% of claims and AI monitoring systems still requiring optimization due to considerable error rates. These interconnected issues underscore the complexity of managing healthcare delivery across administrative boundaries.

5.2. Risk Type

The de-territorialized risks in Guangxi's cross-regional healthcare fund supervision manifest through five distinct dimensions:

De-territorialization of regulatory foundations, characterized by the absence of top-level design and misaligned oversight frameworks due to cross-regional complexities-exemplified by interprovincial regulatory discrepancies that create institutional ambiguities.

De-territorialization of supervisory methods, reflected in the failure of traditional on-site inspection models across administrative domains and lagging development of intelligent digital monitoring systems.

De-territorialization of regulatory actors, arising from multi-stakeholder dynamics where insured-locations lack extraterritorial enforcement authority while treatment-destinations demonstrate insufficient oversight incentives.

De-territorialization of governance mechanisms, evidenced by weak coordination in policy, institutional, resource, and technical integration—concretely observable through incompatible DRG grouping standards and HIS interface protocols between jurisdictions.

De-territorialization of performance evaluation, marked by fragmented assessment criteria and underutilized evaluation outcomes across regulatory bodies.

6. Accelerating Institutional Development for Cross-Regional Healthcare Fund Supervision in Guangxi

Despite confronting systemic impediments-insufficient institutional impetus, inadequate regulatory capacity, and operational limitations in enforcement mechanisms-Guangxi has

pioneered a multifaceted supervisory framework characterized by specialized agency establishment, comprehensive stakeholder coverage, and pilot-driven innovation, as evidenced by the 2023 inauguration of the autonomous region-level Healthcare Fund Supervision Center which anchors a nationwide network of over 150 dedicated regulatory bodies, including 13 provincial, 40 prefectural, and 100 county-level entities.

This infrastructure enables omnidirectional monitoring spanning five critical stakeholder groups: insurance agencies, designated medical institutions, pharmacies, insured individuals, and medical practitioners, achieving cumulative enforcement outcomes between 2019-2023 of 53,000 institutional inspections, 27,000 penalized entities, 1,070 sanctioned individuals, 38 judiciary-referred cases, and 2.977 billion RMB in recovered funds, while concurrently advancing experimental governance models through its designation as a national pilot zone for supervisory innovation-notably manifesting in Nanning's credit system trials, Wuzhou's real-time DRG-based surveillance platform tracking clinical data anomalies, and China's first intercity regulatory collaboration between Liuzhou and Laibin targeting cross-jurisdictional fraud mitigation.

Building upon existing practices that have established foundational oversight capabilities, Guangxi must now strategically prioritize targeted interventions to construct robust regulatory defenses and achieve high-quality governance of cross-regional healthcare funds.

6.1. Advancing Pilot City Initiatives to Operationalize Regulatory Frameworks

Grounding strategy in the Regulations on Supervision and Administration of Medical Insurance Fund Use and Guangxi's Implementation Opinions on Reforming the Medical Insurance Fund Supervision System, and leveraging its status as a major patient-exporting province, Guangxi shall architect a comprehensive oversight framework integrating administrative supervision, media oversight, public scrutiny, and industry self-regulation-spearheaded by municipal pilots that institutionalize inspection protocols, whistleblower reward systems, social monitoring mechanisms, credit-based management, intelligent surveillance infrastructure, and legal safeguards for fund security.

6.2. Implementing Budgetary Governance and Optimizing Performance Metrics

Commencing with inpatient expenditure oversight in high-outflow cities like Wuzhou, Guangxi will establish routine fund risk analysis mechanisms while implementing comprehensive budget control and performance evaluation; this entails deploying monitoring stations at designated medical facilities to track critical indicators-including aggregate cross-regional expenditures, inpatient-visit-to-patient ratios, outpatient cost growth rates, and DRG grouping compliance rates-through a strengthened autonomous region-prefecture-county surveillance architecture with enhanced data analytics capabilities.

6.3. Constructing Early-Warning Systems and Augmenting Analytical Capacity

Expanding existing pilots in mature jurisdictions like Nanning, Guangxi will institutionalize monthly/quarterly/semi-annual/annual fund surveillance reports while developing an integrated digital platform combining operational monitoring, systemic risk alerts, and decision-support functionalities; this system will focus on pivotal metrics such as cross-regional service volumes at designated institutions, fund disbursement patterns, and beneficiary reimbursement ratios-generating standardized digital reports and targeted risk advisories across treatment access, fund utilization, and individual benefit dimensions.

6.4. Reinforcing Regulatory Instruments through Payment Reform

Moving beyond current punitive tools like audits, penalties, public reporting, Guangxi will develop incentive-aligned mechanisms-piloting in high-pressure regions like Wuzhou-that

implement performance-based provider contracts, diagnosis-related payment reforms, and tiered hospital management systems to motivate compliant behaviors through structured performance evaluations.

6.5. Integrating Cross-Regional Care into Unannounced Inspections and Fraud Crackdowns

Guangxi will expand its unannounced inspection regime to specifically target cross-regional services, establish multi-departmental enforcement coalitions (healthcare security, public health, TCM administration, market regulation, finance, auditing, and public security), strengthen oversight capacity through procurement of third-party services, and develop provincially customized fraud detection parameters within the national rules/knowledge databases-including localized thresholds, scenarios, and a cross-jurisdictional dishonesty registry.

7. Conclusion

The study finds that cross-regional healthcare fund supervision in Guangxi is characterized by differentiated regulatory pressures between insured-origin cities and treatment-destination cities. Insured-origin areas, such as Wuzhou, face severe fiscal equilibrium challenges due to higher cross-regional treatment costs, while treatment-destination hubs, such as Nanning, bear greater risks in fund security and fraud prevention. To address these challenges, three key pathways are proposed: (1) Establish cross-jurisdictional collaborative mechanisms with high-flow regions such as Guangdong to strengthen real-time claims auditing and data sharing; (2) Implement payment reforms-including DRG-based settlement and performance-linked provider contracts-to optimize fund utilization; (3) Develop multi-level early-warning systems integrating AI monitoring and on-site inspection to detect and curb abnormal fund usage. In the long term, Guangxi should aim to build an integrated, intelligent, and collaborative governance system for cross-regional healthcare funds-achieving not only fund security and fiscal sustainability, but also equitable healthcare access and efficient resource allocation across regions.

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