

Research on the Optimization and Management of the Primary Maternal and Child Health Service System

Wang Awei, Li Congna

Hubei University of Chinese Medicine, Wuhan, China

Abstract: The primary maternal and child health service system serves as a critical institutional foundation for safeguarding the health rights and interests of women and children. During its development, however, the system has encountered multiple challenges, including lagging construction of service networks, insufficient professional capacity, outdated management mechanisms, and irrational allocation of resources. Based on an analysis of the current development status and existing problems, this study constructs a systematic optimization pathway grounded in relevant theoretical frameworks. The findings indicate that improving the three-tier service network, enhancing professional and technical capacity, innovating management institutions and mechanisms, and optimizing resource allocation and guarantee mechanisms are key measures for promoting the high-quality development of primary maternal and child health services. This study provides theoretical guidance and practical references for building a maternal and child health service system that achieves comprehensive urban-rural coverage, sound functional integration, and efficient operation.

Keywords: Primary Maternal and Child Health; Service System; Optimization and Management; Three-Tier Network; Resource Allocation

1. Introduction

The level of maternal and child health is a crucial indicator of social development and progress. The primary maternal and child health service system plays an essential role in providing basic medical and health services to women and children. With the in-depth implementation of the Healthy China strategy and the continuous growth of public health demands, the construction of the primary maternal and child health service system has entered a critical period characterized by both significant opportunities and emerging challenges. At present, in some regions, primary maternal and child health service capacity remains relatively weak, the allocation of service resources is insufficiently rational, and management institutions and operational mechanisms require further improvement. There is an urgent need for systematic optimization and reform to enhance the quality and efficiency of primary maternal and child health service provision. Conducting in-depth research on the optimization pathways of the primary maternal and child health service system is therefore of great significance for advancing the high-quality development of maternal and child health services.

2. Theoretical Foundations of Optimization and Management of the Primary Maternal and Child Health Service System

As a vital carrier for protecting the health rights and interests of women and children, the theoretical connotations and functional positioning of the primary maternal and child health service system directly influence its service performance. Establishing a scientific theoretical analytical framework is conducive to deepening the understanding of the system's operational mechanisms.

2.1 Connotation and Functional Positioning of the Primary Maternal and Child Health Service System

The primary maternal and child health service system refers to an organizational network centered on county, township, and village-level medical and health institutions that provides women and children with life-course health services, including prevention, healthcare, medical treatment, and rehabilitation. Within this system, county-level maternal and child health hospitals serve as the leading institutions,

township health centers function as key hubs, and village clinics constitute the grassroots foundation, forming a service structure with clear hierarchies and well-defined responsibilities. The functional positioning of the system mainly encompasses four aspects: the provision of basic public health services, maternal and child health management, disease prevention and control, and health promotion. County-level institutions are responsible for technical guidance, personnel training, and quality supervision, and are required to progressively advance a tiered diagnosis and treatment system characterized by primary-level first contact, standardized health record establishment, two-way referral, and coordinated vertical linkage. Township-level institutions provide basic medical care and public health services, while village-level institutions undertake health management and primary healthcare tasks. The three-tier linkage mechanism ensures continuity and integrity of services, thereby forming a maternal and child health guarantee network that covers both urban and rural areas^[1].

2.2 Theoretical Basis and Analytical Framework for Service System Optimization and Management

The optimization and management of service systems are primarily grounded in systems theory, public management theory, and health economics. Systems theory emphasizes the organic integration and coordinated development of all constituent elements of a system, which requires systematic optimization in areas such as resource allocation, service processes, and quality control. Public management theory provides an institutional design rationale for government-led models of maternal and child health service provision, while health economics offers guidance on the rational allocation of service resources and the enhancement of efficiency. Based on the above theories, the analytical framework includes three dimensions: structure, process, and outcomes. The structural dimension focuses on the layout of service networks and the specific conditions of resource allocation; the process dimension focuses on mechanisms related to service delivery and management operations; and the outcome dimension evaluates service effectiveness and the degree of health improvement. Together, these dimensions form a scientifically robust and comprehensive evaluation system, providing theoretical guidance for practical efforts in system optimization and management^[2].

3. Major Problems in the Primary Maternal and Child Health Service System

Despite rapid development, the primary maternal and child health service system continues to face a series of constraints, including lagging service network construction, insufficient service capacity, outdated management mechanisms, and inefficient resource allocation. These problems are interrelated and collectively restrict the effective functioning of the system as a whole.

3.1 Inadequate Development of the Service Network

Deficiencies remain in the structural integrity and functional coordination of the primary maternal and child health service network. At the county level, infrastructure standards among maternal and child health institutions are inconsistent. In some facilities, the floor area of clinical buildings fails to meet required standards, and medical equipment is inadequately configured, limiting their capacity to function as regional technical guidance centers for maternal and child health. At the township level, the establishment rate of dedicated maternal and child health departments within township health centers remains relatively low. Staffing levels are insufficient, and the range of services provided is incomplete. At the village level, the maternal and child health management function of primary healthcare institutions has weakened. The workforce of maternal and child health workers is unstable, and their mastery of essential professional skills is limited. Coordination across the three-tier network is insufficient, resulting in weak collaboration mechanisms. Two-way referral systems operate inefficiently, and information transmission is fragmented, with frequent discontinuities. In remote rural and mountainous areas, service outlet coverage density is inadequate, and excessively large service catchment areas limit access to care for women and children. The absence of unified planning and standardized guidance in network construction has led to uneven development, significantly undermining the overall effectiveness of maternal and child health service delivery^[3].

3.2 Insufficient Service Capacity

A gap persists between the professional and technical capacity of primary maternal and child health service institutions and the growing service demands. National assessment data indicate that 90.14% and 97.09% of county-level hospitals have mastered emergency treatment technologies for critical obstetric

and pediatric conditions, suggesting substantial progress^[4], yet further improvement remains necessary. In contrast, diagnostic and treatment capacity for common gynecological diseases remains relatively weak. Screening technologies for cervical cancer and breast cancer are applied inconsistently, and screening coverage requires further expansion. In some regions, the establishment rate of maternal and child health departments remains low, and shortages of qualified professionals adversely affect service quality and efficiency. The implementation quality of child healthcare service programs varies considerably, with inadequate delivery of growth and development monitoring, nutritional assessment, and early childhood development guidance. Although maternal and child health management projects within the basic public health service package have achieved broad coverage, service depth remains insufficient, with a notable lack of individualized guidance. Health education services tend to rely on single formats and lack targeted, needs-based content^[5].

3.3 Need for Innovation in Management Mechanisms

The management system of primary maternal and child health services exhibits systemic deficiencies. Excessive administrative layering has resulted in prolonged decision-making and policy transmission chains, weakening the timeliness of policy implementation. Interdepartmental responsibilities are insufficiently delineated, and coordination among health authorities, women's federations, education departments, and other relevant agencies remains inadequate. Performance evaluation systems place disproportionate emphasis on quantitative indicators, while quality-based assessments receive insufficient weight, thereby limiting the effectiveness of incentive mechanisms. Personnel management systems lack flexibility, resulting in narrow career advancement pathways for professional and technical staff, and compensation structures are weakly linked to performance outcomes. Financial management practices are characterized by rigid procedures, with complex approval processes that hinder the efficient implementation of service programs. Quality and safety supervision relies on limited methods, with a predominance of post hoc oversight rather than preventive and in-process control. Information management systems suffer from functional limitations, and data collection, statistical analysis, and decision-support capabilities remain underdeveloped. Collectively, these factors constrain improvements in management capacity and service quality within the maternal and child health service system^[6].

3.4 Low Efficiency in Resource Allocation

The allocation of resources within the primary maternal and child health service system is suboptimal in both structural rationality and utilization efficiency. Human resources are unevenly distributed, with excessive concentration in county-level areas and insufficient coverage in rural communities. The professional staffing structure is imbalanced, characterized by a low proportion of senior-level professionals and an increasingly aging workforce. Medical equipment procurement is sometimes duplicative, resulting in low utilization rates, while maintenance and upkeep fail to keep pace. Investment in infrastructure construction has focused predominantly on hardware improvements, whereas investment in software development remains relatively inadequate. The performance efficiency of fiscal fund utilization requires further enhancement, and project funding allocation standards lack sufficient scientific rigor. Social capital participation in maternal and child health services remains limited, and diversified investment and financing mechanisms have yet to be effectively established. The alignment between service supply and actual demand is suboptimal, with oversupply in certain service areas and shortages in others that are urgently needed. Resource integration across institutions is insufficient, and inter-organizational collaboration efficiency remains low, ultimately diminishing the overall effectiveness of resource allocation.

4. Optimization and Management Pathways for the Primary Maternal and Child Health Service System

Based on an in-depth analysis of the existing problems within the primary maternal and child health service system, it is necessary to construct a systematic optimization pathway across four dimensions: network architecture, capacity building, management innovation, and resource allocation. Through coordinated advancement of system development, a service pattern characterized by a rational structure, sound functions, and efficient operation can be established.

4.1 Establishing a Well-Structured Three-Tier Service Network System

The establishment of a comprehensive three-tier service network requires strengthening functional positioning and collaborative linkage across all institutional levels. As illustrated in Figure 1, this system is structured with county-level maternal and child health hospitals as the leading institutions, township health centers as operational hubs, and village clinics as the grassroots foundation, forming service architecture with clear hierarchies and well-defined responsibilities. Xinmi City has developed a three-tier county-township-village coordinated management system by organizing a service workforce composed of 60 core maternal and child health professionals, 46 township-level specialized personnel, and more than 700 village health workers. Through grid-based management covering 18 townships and sub-districts and 352 administrative villages, the system provides services to over 50,000 women and children annually. As a result, the child health management rate increased from 90.03% to 92.01%, forming a successful and replicable model. County-level maternal and child health hospitals should be constructed in accordance with standards for secondary-level hospitals and above, with expanded obstetric and pediatric bed capacity and improved medical equipment configuration. A technical guidance and support mechanism for township health centers should be established. Township health centers should standardize the establishment of maternal and child health departments and allocate dedicated personnel to deliver basic medical and public health services within their jurisdictions. Village clinics should clearly define their responsibilities for maternal and child health management, stabilize the workforce of maternal and child health workers, and effectively carry out health management and health education activities. In addition, a tiered diagnosis and treatment system should be strengthened by improving two-way referral mechanisms and enhancing interconnectivity among information systems, thereby enabling service information sharing and operational coordination.

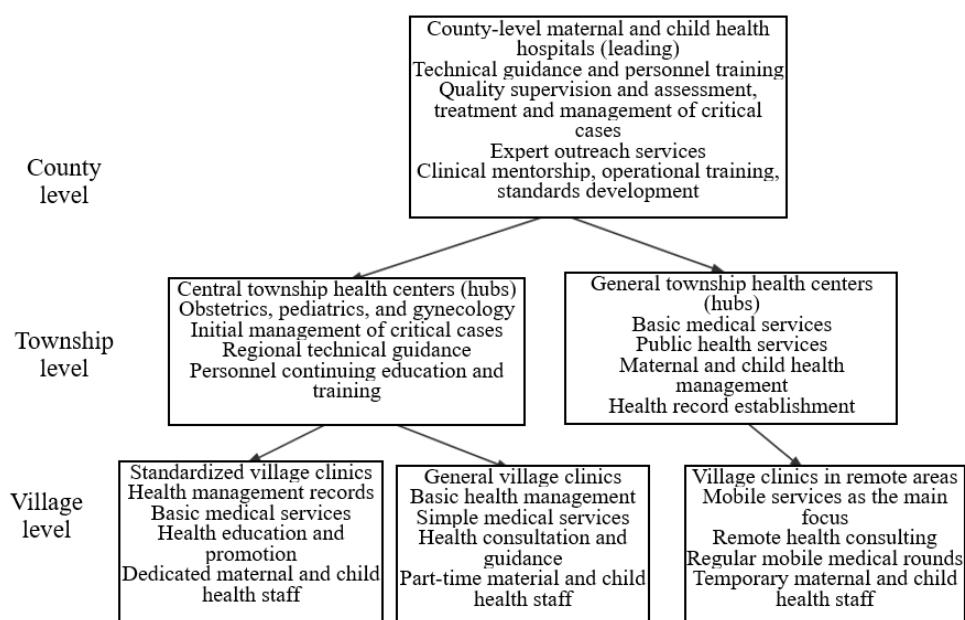


Figure 1 Structural Framework of the Three-Tier Primary Maternal and Child Health Service Network

4.2 Enhancing Service Capacity and Professional and Technical Competence

To enhance service effectiveness and professional competence, it is necessary to advance talent cultivation and technological improvement in a coordinated manner by implementing targeted maternal and child health workforce programs, particularly to strengthen training in shortage areas such as obstetrics and pediatrics. The scale of resident physician training should be expanded, together with job-transfer training and in-service education. Clinical practice training should be strengthened, with a focus on improving emergency rescue capacity for critically ill pregnant women and neonates, standardizing midwifery practices, and optimizing breastfeeding guidance. Maternal and child health service programs should be improved by standardizing management processes for pregnant women and children, thereby enhancing service efficiency, while strengthening training in cervical and breast cancer screening technologies to expand screening coverage and increase detection rates so as to safeguard women's health rights. The "Internet + Maternal and Child Health" service model should be promoted through the

application of information technology to expand service coverage and improve service convenience. Core systems for medical quality and safety management should be strengthened in strict accordance with technical specifications and clinical practice standards to reinforce quality control. Skills competitions and academic seminars should be organized on a regular basis to continuously enhance the overall capacity of the professional workforce. A continuous service quality improvement mechanism should be established through regular quality assessments and problem rectification to ensure steady improvement in service capacity.

4.3 Innovating Management Systems and Operational Mechanisms

Innovation in management systems and operational mechanisms should focus on addressing structural bottlenecks and procedural constraints by establishing a management structure with clearly defined responsibilities and smooth operation. The boundaries of responsibilities among health authorities at different levels should be clarified, and overall coordination should be strengthened to reduce administrative layers and streamline approval procedures. The performance evaluation system should be optimized by developing an assessment framework based on service quality, health outcomes, and public satisfaction, with an emphasis on quality indicators and actual performance. Personnel management models should be reformed by promoting flexible recruitment and deployment mechanisms, expanding career development opportunities for professional and technical staff, and optimizing compensation structures to ensure a positive linkage between contribution and remuneration. The quality and safety management system should be improved by establishing routine supervision mechanisms with full-process coverage, including pre-event prevention, in-process monitoring, and post-event handling. The construction of smart management platforms should be accelerated to integrate functions such as service management, quality supervision, and performance assessment, thereby improving operational efficiency and scientific decision-making^[7]. Cross-departmental coordination mechanisms should be established to strengthen collaboration among health, development and reform, finance, and human resources and social security departments, so as to form a coordinated force for the development of maternal and child health services. Incentive and restraint mechanisms should be improved through the implementation of clear reward and penalty systems, thereby stimulating the internal motivation of institutions and personnel at all levels.

4.4 Optimizing Resource Allocation and Guarantee Mechanisms

Various resource elements should be coordinated in an overall manner to improve the efficiency and practical effectiveness of resource allocation. In terms of human resources, maternal and child health personnel should be allocated scientifically based on the size of the service population and functional needs, with greater support provided to grassroots and remote areas in response to uneven regional distribution of personnel. With regard to fiscal support, investment mechanisms should be improved and relevant government policies refined to increase support for primary maternal and child health services, ensuring stable and sustained growth in fiscal input. Unified standards should be formulated for the allocation of equipment and facilities to avoid duplication of construction and resource waste, and to improve actual utilization rates. The development of medical alliances should be promoted to facilitate the downward transfer of high-quality medical resources, enabling resource sharing and complementary advantages. Diversified investment and financing channels should be established to encourage the participation of social capital in maternal and child health services. A government-led, socially collaborative investment framework should be formed, and the scope of health insurance coverage for maternal and child health service programs should be expanded to reduce the financial burden on service users. In addition, a resource allocation evaluation system should be established, with regular assessments of resource utilization efficiency and allocation rationality, ensuring that resource supply aligns with actual service demand.

5. Conclusion

The optimization of the primary maternal and child health service system is a systematic undertaking that requires overall planning and coordinated advancement. By strengthening the leading role of county-level institutions, improving the construction of rural and township service networks, and innovating management systems and mechanisms, the capacity of primary maternal and child health service provision can be effectively enhanced. Local governments should advance the development of primary maternal and child health service systems in light of local conditions, continuously improve service

quality, and better meet the growing health service needs of women and children. The optimization of the service system and innovation in management mechanisms need to be continuously explored and refined in practice, so as to lay a solid foundation for the high-quality development of maternal and child health services, promote the well-rounded development of women and children, and contribute to the goal of building a Healthy China.

Acknowledgement

This study represents a phased research outcome of the General Program of the National Social Science Fund of China in 2024, "A Study on the Practical Process and Fundamental Experience of the Communist Party of China in Leading the Development of Maternal and Child Health Services" (Project No.: 24BDJ060).

References

- [1] Yin Xing. A "Three-Pronged Strategy" to Enhance Maternal and Child Health Service Quality [J]. *Population and Health*, 2023, (11): 52.
- [2] He Qing. "Six Measures" to Enhance Maternal and Child Health Service Quality [J]. *Population and Health*, 2025, (06): 62-63.
- [3] Wu Hong. Strengthening the Foundation: Consolidating the Grassroots Maternal and Child Health Network [J]. *Chinese Health*, 2020, (08): 91.
- [4] National Health Commission of the People's Republic of China. Letter from the General Office of the National Health Commission on Notifying the 2024 County-level Hospital Medical Service Capacity Evaluation Results [EB/OL]. (May 19, 2025) [December 24, 2025]. <https://www.nhc.gov.cn/yzygj/c100068/202505/4377774b76b647bfbed6a0ba8bbf6b9d.shtml>
- [5] Yang Kaiyu, Ding Kui, Ji Yan. Practices and Experiences in Strengthening the Maternal and Child Health Service System in Qidong City [J]. *Maternal and Child Health Care of China*, 2024, 39(19): 3834-3837.
- [6] Lu Yushan, Gao Qunying, Zheng Jun. Building a High-Quality Maternal and Child Health Service System through Cross-Regional Medical Alliances [J]. *China Hospital CEO*, 2024, 20(05): 58-61.
- [7] People's Daily. Building the "Xinmi Model" for the Primary Maternal and Child Health Service System [EB/OL]. (January 14, 2024) [February 24, 2025]. <https://www.peopleapp.com/column/30048005287-500006048622>.