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The Policy-Driven Evolution of Non-Public Hemodialysis Centers in China: A Retrospective Analysis from 2009 to 2025

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Abstract

Background: The number of patients with end-stage renal disease (ESRD) in China continues to rise, while hemodialysis services have long been concentrated in large public hospitals, creating a significant service gap in rural and grassroots areas. Non-public hemodialysis centers, as a crucial supplement to the national healthcare system, have seen their developmental trajectory profoundly shaped by phased adjustments in health policy. ***Methods:*** This study employs a qualitative policy analysis combined with a historical case study approach to examine the evolution of non-public hemodialysis centers in China from 2009 to 2025. We conducted a systematic review of publicly available primary sources, including official policy documents issued by the National Health Commission (NHC), the National Healthcare Security Administration (NHSA), and provincial-level health and medical insurance authorities. Complementary data were drawn from authoritative industry reports, peer-reviewed academic literature, and publicly disclosed corporate information from leading non-public dialysis providers. The analytical framework is structured around a three-phase historical periodization: (1) the Pilot Exploration Phase (2009–2015), (2) the Regulated Expansion Phase (2016–2020), and (3) the Quality-Driven Deepening Phase (2021–2025). Within each phase, we analyzed the interplay between key policy interventions and the strategic responses of the non-public dialysis sector, focusing on how these dynamics shaped operational models and market structures. The authors confirm that large language models (LLMs) or other artificial intelligence (AI)-based tools were used during the preparation of this manuscript solely for language polishing, grammatical refinement, and translation assistance. Specifically, AI tools (including Deepseek) were employed to improve the clarity and fluency of certain English-language passages in the Introduction, Methods, and Discussion sections. All intellectual content, conceptualization, data interpretation, analytical framework, and final editorial decisions were

made exclusively by the human authors. No AI tool was used to generate original scientific content, analyze data, or draft core arguments. In accordance with journal policy, no AI system is listed as an author, nor did it fulfill any authorship role. ***Results:*** The industry's evolution exhibits three distinct phases: Pilot Exploration Phase (2009–2015): Policy shifted from strict control to cautious deregulation, primarily through local pilots, fostering the initial forms of industry-driven and service-driven models. Regulated Expansion Phase (2016–2020): The policy system, centered on the "Basic Standards and Management Regulations for Hemodialysis Centers (for Trial Implementation)" (National Health Commission Document No. [2016] 67), was established, leading to explosive industry growth. The three dominant operational models—industry-driven, service-driven, and capital-driven—were formally established and rapidly expanded. Quality Deepening Phase (2021–2025): Policy focus shifted towards resource decentralization, quality homogenization, and value-based payment, driving the industry from scale-based competition to quality-based competition. The three operational models are now exhibiting trends of deep convergence and upgrading. ***Conclusion:*** The development of non-public hemodialysis centers in China exemplifies a typical path of "state-guided market creation." Through staged interventions characterized by "pilot breakthroughs—regulatory guidance—quality and efficiency enhancement," policy has effectively mobilized social capital to fill public service gaps. This "policy-driven evolution" framework offers a systematic reference for other emerging economies facing similar shortages in specialized medical services. In the future, the industry will continue to evolve towards greater quality, digitalization, and value orientation, becoming deeply integrated into the national chronic kidney disease prevention and treatment system.

Keywords: non-public hemodialysis centers, policy-driven evolution, healthcare reform in China, operational models

1. Introduction

The global burden of end-stage kidney disease (ESKD) continues to rise, with maintenance hemodialysis (MHD) remaining the predominant form of renal replacement therapy worldwide. In China, the number of MHD patients has grown exponentially over the past decade, driven by an aging population, a high prevalence of diabetes and hypertension, and improved access to healthcare. Meeting this surging demand has posed a formidable challenge to the nation's healthcare system.

The rapid expansion of MHD services in China has been significantly driven by the growth of non-public hemodialysis centers. In the Chinese context, "non-public medical institutions" refer to healthcare facilities established and operated by social capital (including private enterprises and individuals), as distinct from government-run public hospitals. This development trajectory is deeply rooted in the national healthcare reform initiated in 2009, one of whose core objectives was to encourage social capital to enter the medical sector to alleviate the severe shortage of healthcare resources and expand service accessibility. Against this backdrop, non-public dialysis centers have emerged as a crucial force in meeting the surging demand for renal replacement therapy.

Unlike the market-driven models prevalent in the United States or the publicly dominated systems in many European countries, China's non-public dialysis sector has evolved under a unique "policy-driven" paradigm. National and provincial health authorities have not only permitted but actively shaped the entry, operation, and strategic direction of these private entities through a series of targeted regulatory and reimbursement policies. This top-down guidance has led to a dynamic co-evolution between government policy and industry response, resulting in distinct operational models that are now converging toward a more integrated and quality-focused paradigm.

This paper aims to trace and analyze this policy-driven evolution from 2009 to 2025. By delineating three distinct developmental phases—Pilot Exploration (2009–2015), Regulated Expansion (2016–2020), and Quality-Driven Deepening (2021–2025)—we elucidate how successive waves of policy interventions have steered the non-public dialysis market. Finally, we discuss the implications of China's experience for other low- and middle-income

countries seeking to leverage private investment to address critical gaps in specialized care delivery.

2. Policy Thaw and Industry Incubation (2009-2015): From Strict Control to Local Pilots

2.1 Policy Context: Institutional Deregulation Driven by Demand

Prior to 2009, China's hemodialysis sector was trapped in a "triple dilemma" of high demand, low supply, and stringent market access (Ming Minxin & Li Weiping, 2018). The "Detailed Rules for the Implementation of the Administrative Regulations on Medical Institutions" did not classify "hemodialysis center" as an independent category of medical institution, making it impossible for social capital to independently establish such facilities. Nearly one-third of China's county-level administrative regions lacked any dialysis service capacity, making it extremely difficult for grassroots patients to access care (Ma Dandan, 2011).

In November 2009, a widely reported incident in Tongzhou, Beijing, where uremic patients spontaneously organized a "self-help dialysis room," sparked nationwide attention on dialysis accessibility and became a direct catalyst for policy deregulation (Liu Zichen, 2015; Zhou Xiaomei, 2009). The central government began to reassess the supplementary role of non-public capital in specialized medical fields, shifting its policy stance from "strict prohibition" to "tacit exploration."

In 2011, the former Ministry of Health officially approved Weigao Group and Dakang Medical to pilot non-public hemodialysis centers in Shandong Province. This marked the first time the central government formally supported social forces in independently operating dialysis institutions via an official document, representing a milestone event. In 2012, six ministries, including the National Development and Reform Commission, included ESRD in the coverage of the Urban and Rural Residents' Critical Illness Insurance, with a reimbursement rate of no less than 50%. This significantly unleashed patient treatment demand and created a potential market space for non-public medical providers (National Development and Reform Commission, Ministry of Health, Ministry of Finance et al., 2012).

In 2014, the former National Health and Family Planning Commission issued a notice soliciting opinions on the "Basic Standards and Management Regulations for Hemodialysis Centers," explicitly stating for the first time that "independently set up hemodialysis centers" would be permitted, thereby removing the core institutional barrier to their independent establishment (Bureau of Medical Administration, 2016).

During this phase, policy was characterized by "central tacit approval and local leadership," lacking a unified national standard. For instance, Shanxi Province issued its own local trial standards in 2015 (Shanxi Provincial Health and Family Planning Commission, 2015), which differed from explorations in other regions. Although this created regional barriers in the short term, it also accumulated diverse local experiences that informed the subsequent formulation of national unified regulations (Guangdong Provincial Health and Family Planning Commission, 2017).

2.2 Industry Response: From Grassroots Self-Help to the Emergence of Operational Models

Partial policy deregulation stimulated the earliest market explorations. Industry players evolved from emotionally charged grassroots self-help initiatives towards standardized, corporate operations. In November 2009, Shenyang SanSheng Company established the "SanSheng Kidney Friends Home" in Jinzhou, Liaoning, widely regarded as the nation's first independently operated hemodialysis center, marking a critical transition from "self-help" to "institutionalized care."

Under the Shandong pilot framework, enterprises with different resource endowments embarked on differentiated paths: Weigao Group, leveraging its industrial advantage in blood purification equipment and consumables, experimented with an "equipment + service" vertical integration strategy, laying the early groundwork for an "industry-driven" model. Dakang Medical, on the other hand, focused on the operation and management of dialysis services in underserved grassroots markets, exploring a viable model to enhance accessibility and establishing the foundation for a "service-driven" approach.

Despite early challenges such as insufficient patient trust and high operating costs, these explorations validated the commercial feasibility of non-public dialysis services. Between 2012 and 2015, encouraged by the Shandong pilot, social capital began to penetrate into county-level

markets across more provinces. During this period, Dakang Medical established nearly 30 centers in counties in Jiangxi and Shandong, forming a grassroots service model characterized by "small scale, low cost, high turnover, and strong referral networks" (Zhou Li & Fu Ping, 2017). However, due to the absence of national standards, the industry as a whole exhibited a "sporadic expansion with deficient regulation," calling for the introduction of unified national guidelines.

Table 1. Policy and Industrial Development Timeline of China's Non-Public Hemodialysis Centers (2009–2025)

Developmental Phase	Time Point	Key Policy Events	Core Industrial Responses & Quantitative Data
Pilot Exploration (2009–2015) Strict Control → Tacit Deregulation	2009	Tongzhou self-help dialysis room incident sparks national attention on ESRD care accessibility	Shenyang SanSheng establishes China's first non-public hemodialysis center ("SanSheng Kidney Friends Home") in Jinzhou
	2011	Former Ministry of Health approves Weigao & Dakang to launch Shandong provincial pilots	Industry-driven (Weigao) and service-driven (Dakang) models take initial shape
	2012	Six ministries include ESRD in Urban and Rural Residents' Critical Illness Insurance (**reimbursement rate ≥50%**)	Latent ESRD treatment demand released; social capital begins to enter county-level markets
	2014	Former NHFPC solicits opinions on hemodialysis center standards (first official approval for independent establishment)	Core institutional barriers for non-public centers are removed
	2015	Shanxi releases local trial standards for independent hemodialysis centers	Regional pilot experiences accumulated for national unified regulations
Regulated Expansion (2016–2020) National Standardization → Explosive Growth	2016	NHC issues **Document No. [2016] 67** (core national regulation for hemodialysis centers); *Healthy China 2030* outlines socialization/specialization of dialysis services	67 Document grants non-public centers independent legal status; **<50 non-public centers nationwide by late 2016**
	2017	Medical institution regulations revised to list "hemodialysis center" as an independent category	Local governments (Hebei/Guangdong) streamline approval processes to boost market vitality
	2019	NHC issues policies to support chain operation of socially operated medical institutions	Capital-driven model (Changsheng Medical) formally emerges; three dominant models take shape
Quality Deepening	2021	National Kidney Disease Medical Quality Control Center releases *2021 Standard Operating Procedures*	Industry shifts focus to core quality indicators (Kt/V attainment, infection control);

Developmental Phase	Time Point	Key Policy Events	Core Industrial Responses & Quantitative Data
(2021–2025) Scale Competition → Quality-Oriented Development		*for Blood Purification*	digital quality control platforms built by leading enterprises
	2022	NHC issues graded diagnosis guidelines for county-level CKD; medical institution planning principles encourage grassroots layout	Non-public centers transform into CKD management nodes; expansion strategy shifts to "regional deep cultivation"
	2024	Sichuan/Hunan issue grassroots dialysis support policies; Hunan launches "Shen Xiao Bao" AI-IoT intelligent supervision platform	Service network extends to townships; industry models begin convergence (industry + service dual-drive)
	2025	NHC lists "hemodialysis service for all counties with permanent population >60,000" as a key livelihood initiative	Guangdong has the highest number of non-public centers nationwide; non-public centers account for a significantly increased proportion in county-level markets (Hunan/Sichuan); three models realize deep convergence and upgrading

Abbreviations: NHC, National Health Commission; ESRD, end-stage renal disease.

3. Policy Standardization and Industry Expansion (2016–2020): From Local Pilots to National Uniformity

3.1 Core Policy: A Full-Chain Institutional Framework Built on Document No. 67

The year 2016 was the "policy founding year" for the industry. The issuance of the "Basic Standards and Management Regulations for Hemodialysis Centers (for Trial Implementation)" (National Health Commission Document No. [2016] 67) marked the beginning of a new era of nationally unified regulation (National Health and Family Planning Commission, 2016). During this phase, a full-chain policy support system was formed:

Strategic Anchoring at the Top Level: The "Healthy China 2030" Planning Outline, for the first time at the national strategic level, proposed guiding the development of specialized hemodialysis centers, clarifying their direction towards socialization and specialization (State Council, 2016).

Establishment of Core Regulations: Document No. 67 granted non-public hemodialysis centers an independent legal status as medical institutions, fundamentally resolving the institutional barriers to their practice, inclusion in the medical insurance network, and scaled development. The document set reasonable entry thresholds (at least 10 dialysis machines), scientific staffing ratios (specifying qualifications and numbers for physicians and nurses), and explicitly "encouraged chain and group operations," charting a course for the industry's intensive development (National Health and Family Planning Commission, 2016).

Refinement of Supporting Policies: In 2017, the "Detailed Rules for the Implementation of the Administrative Regulations on Medical Institutions" were revised to formally include "hemodialysis center" as a category of medical institution (National Health and Family Planning Commission of the People's Republic of China, 2017). In 2019, the "Opinions on Promoting the Continuous, Healthy, and Regulated Development of Socially Operated Medical Institutions" further emphasized support for chain operations and optimized the approval and regulatory environment (National Health Commission, National Development and Reform Commission, Ministry of Science and Technology et al., 2019). Local governments also issued implementation rules; for example, Hebei and

Guangdong provinces actively streamlined approval processes to stimulate market vitality (Office of the Hebei Provincial Health and Family Planning Commission, 2017; General Office of the People's Government of Guangdong Province, 2016).

3.2 Industry Response: Explosive Growth and the Formation of Three Dominant Models

Propelled by unified policies and stable medical insurance payments, the industry entered a period of high-speed expansion and solidified three distinct mainstream operational models.

Rapid Institutional Growth: At the end of 2016, there were fewer than 50 non-public hemodialysis centers nationwide; by the end of 2018, this number had surged to 559, an increase of over tenfold in just two years (Mei Changlin, Lou Jing & Wang Jiusheng, 2023). Although their share of the total national dialysis service units remained below 10%, the foundation for networked and branded development was firmly laid.

Establishment and Differentiation of the Three Models:

Industry-Driven Model (represented by Weigao Healthcare): Leveraging its parent company's absolute dominance in the dialysis equipment and consumables market (e.g., domestic market share of dialyzers and tubing exceeding 30%), it built an integrated industrial closed loop of "R&D and manufacturing of equipment/consumables + chain operation of centers + patient services." It achieved rapid, standardized replication in grassroots markets through supply chain cost advantages and technological feedback.

Service-Driven Model (represented by Dakang Medical): Precisely targeting county-level markets underserved by public hospitals, its core strategy involved constructing a multi-party payment mechanism combining "medical insurance reimbursement + charitable assistance + center subsidies" to address patients' financial burdens. Simultaneously, it provided holistic "whole-person" care services, including nutritional guidance, psychological support, and social reintegration, building deep patient loyalty and a strong reputation barrier at the grassroots level.

Capital-Driven Model (represented by Changsheng Medical): Backed by financial capital such as Xingjun Industrial Investment, it pursued rapid nationwide expansion through leveraged acquisitions. Its core competitiveness lay in developing a replicable "standardized operating system," exporting unified SOPs, centralized procurement platforms, and information management systems to acquired institutions. This approach reduced costs through economies of scale and explored value-added services.

During this phase, the main theme of industry competition was "staking out territory." However, the regulatory role of policy had already steered the market from "disorder" towards "order," and the competitive landscape among leading enterprises began to take shape (Mei Changlin, Lou Jing & Wang Jiusheng, 2023).

Table 2. Core Characteristics of the Three Dominant Operational Models of China's Non-Public Hemodialysis Centers

Comparative Dimension	**Industry-Driven Model**	**Service-Driven Model**	**Capital-Driven Model**
Representative Enterprise	Weigao Medical Holdings Co., Ltd.	Dakang Medical Management Co., Ltd.	Beijing Changsheng Zhongkang Hospital Management Co., Ltd.
Core Development Logic	Vertical integration of **dialysis equipment/consumables R&D/manufacturing + chain center operation + patient services** (industrial chain synergy)	Grassroots ESRD care accessibility improvement + holistic "whole-person" patient services + multi-party payment mechanism	Leveraged acquisitions + standardized operational system output + economies of scale for cost reduction
Key Competitive	Strong supply chain cost control; technological	Deep grassroots patient loyalty; multi-	Replicable unified SOPs/centralized

Advantages	feedback from equipment R&D to clinical services; high standardization of replication	party payment to alleviate patients' financial burden; strong regional referral networks	procurement/information systems; rapid nationwide expansion capacity
Target Market	County-level grassroots markets nationwide; areas with basic medical resource coverage	Underserved county/township-level grassroots markets; low-to-middle income ESRD patient groups	National multi-level markets (urban + county); potential high-quality local dialysis institutions for acquisition
Core Operational Features	Builds an integrated industrial closed loop; relies on equipment/consumables market dominance (**≥30%** domestic share for dialyzers/tubing)	Provides one-stop services (dialysis + nutrition guidance + psychological support + social reintegration); small-scale, high-efficiency grassroots layout	Exports standardized management systems to acquired institutions; explores value-added medical services; balances scale expansion and quality control
Development Trend (2021–2025)	Strengthens industrial chain advantages + builds professional service brand for patient loyalty	Seeks upstream industrial integration/strategic partnerships for supply chain safety	Establishes benchmark hospitals + unified national quality control system for homogeneous medical quality

Abbreviations: SOPs, standard operating procedures.

4. Policy Enhancement and Industry Convergence (2021–2025): From Scale Growth to Quality Deepening

4.1 Core Policy: Systemic Optimization Oriented Towards Quality and Efficiency

After 2021, the policy focus shifted from "encouraging establishment" to "optimizing and upgrading," aiming to build a policy system that guides high-quality development.

Guiding Resource Decentralization and Optimizing Layout: The "Technical Guidelines for Graded Diagnosis and Treatment of Chronic Diseases, including Chronic Kidney Disease, in County Areas" promoted the transformation of dialysis centers from simple treatment points into nodes for chronic disease management (General Office of the National Health Commission, General Office of the National Administration of Traditional Chinese Medicine, 2022). The "Guiding Principles for the Planning of Medical Institution Establishment (2021–2025)" explicitly encouraged non-public hemodialysis centers to locate in areas with weak medical resources (National Health Commission, 2022). In 2025, the National Health Commission listed "ensuring that every county with a permanent population exceeding 60,000 can provide hemodialysis services" as a key livelihood initiative, directly targeting "county-township collaboration and accessible care" (National Health Commission, 2026). Provinces like Sichuan and Hunan have also introduced corresponding policies to extend the service network to townships (General Office of the CPC Sichuan Provincial Committee, General Office of the Sichuan Provincial People's Government, 2024; General Office of the Hunan Provincial People's Government, 2018).

Unifying Technical Standards and Strengthening the Quality Foundation: The 2021 edition of the "Standard Operating Procedures for Blood Purification" was released, becoming the "technical constitution" that the entire industry must follow (National Kidney Disease Medical Quality Control Center, 2021).

Strengthening Regulation and Innovating Payment to Drive Quality Improvement: Non-public centers were fully integrated into the same medical quality control system as public hospitals. Medical insurance payment methods began to shift from "fee-for-service" towards "value-based payment." For example, Sichuan

Province has linked a portion of its payments to the completion rates of key monitoring indicators in the treatment process (Sichuan Provincial Healthcare Security Administration, 2025), while Hunan Province has provided incentives for grassroots services by consolidating price items (Hunan Provincial Healthcare Security Administration, 2025).

Local Innovative Practices: Guangdong Province has continuously optimized its "streamlining administration, delegating power, and improving regulation and services" (Fangguanfu) reforms, resulting in the highest number of non-public centers nationwide by the end of 2025 (General Office of the People's Government of Guangdong Province, 2016). Hunan Province's "Shen Xiao Bao" intelligent supervision platform, which integrates AI and IoT technologies, has formed a closed-loop policy ecosystem of "price standardization + intelligent supervision + decentralization metrics" (Hunan Provincial Healthcare Security Administration, 2025).

4.2 Industry Response: Quality Competition and the Upgraded Convergence of Models

Guided by policy, the fundamental logic of industry development has undergone a transformative shift, entering a new phase where quality is paramount.

Industry Reshuffling, with Quality as the Lifeline: Stricter regulation and payment reforms have squeezed the survival space of small, medium-sized, and non-compliant institutions, leading to increased industry concentration. The focus of competition has shifted to core quality indicators such as Kt/V attainment rate, infection control, and complication management (National Kidney Disease Medical Quality Control Center, 2021). Leading enterprises are all building digital quality control platforms to enable real-time monitoring and continuous improvement of the treatment process.

Operational Strategies Evolving Towards Intensification and Convergence: The expansion strategy has shifted from "nationwide site deployment" to "regional deep cultivation," with efforts to expand the scale of individual centers to amortize costs. There is active penetration into townships and deep integration with county-level medical consortia, becoming a key force in filling grassroots gaps. By the end of 2025, the proportion of non-public centers in county-level and lower markets in provinces like Hunan and Sichuan has significantly increased.

Strategic Convergence of the Three Models: Industry + Service Dual-Drive: Weigao, while strengthening its industrial chain advantages, is vigorously building its service brand to enhance patient loyalty. Service-oriented enterprises like Dakang are seeking upstream integration or strategic partnerships to secure supply chain safety and cost advantages.

Balancing Scale and Quality: Capital-driven enterprises like Changsheng Medical, during their expansion, are establishing benchmark hospitals and unified quality control systems to ensure homogeneous medical quality at scale.

Digital Transformation as a Consensus: Regardless of the model, building data platforms to connect devices, services, patients, and payers has become the "new infrastructure" for enhancing both operational efficiency and medical quality.

Moving Jointly Towards Value-Based Healthcare: Driven by medical insurance payment reforms, all models are committed to shifting from "providing dialysis treatment" to "managing patient health," aiming to achieve a unity of social and economic benefits by improving patients' long-term health outcomes (General Office of the National Health Commission, General Office of the National Administration of Traditional Chinese Medicine, 2022).

5. Discussion and Conclusion

5.1 Core Findings

This study systematically analyzes the development and model evolution of China's non-public hemodialysis centers from 2009 to 2025, revealing the intrinsic mechanism of the "policy-driven evolution" framework:

Policy-Driven Mechanism: Policy has evolved from breaking the ice under strict control, to enabling scale expansion under comprehensive regulation, and finally to driving quality deepening with a focus on quality and efficiency. This clear evolutionary thread has directly shaped the industry's developmental stages and market structure.

Model Evolution Pathway: During the Policy Thaw Phase (2009–2015), local pilots broke through institutional barriers, incubating the initial forms of industry-driven and service-driven models.

During the Comprehensive Regulation Phase

(2016-2020), core policies like Document No. 67 removed institutional obstacles, triggering explosive growth in the number of institutions. The capital-driven model emerged, and the three mainstream models were formally established.

During the Quality and Efficiency Enhancement Phase (2021-2025), the synergistic effects of resource decentralization, standard unification, strengthened regulation, and payment innovation have forced the industry to shift from scale competition to quality competition, with the three models now showing characteristics of convergence and upgrading.

5.2 Policy Implications

The development of China's non-public hemodialysis centers demonstrates that the healthy development of non-public medical services in specialized fields requires a full-cycle policy system of "guidance—regulation—quality enhancement":

Initial Stage: Break down entry barriers through pilot exploration and institutional deregulation to create space for social capital participation. It is recommended to further simplify approval procedures and implement a "filing + commitment" system to lower entry thresholds.

Expansion Stage: Use unified standards and supporting policies to regulate market order and guide orderly industry development. It is recommended to establish nationally unified construction and operational standards for hemodialysis centers to avoid regional barriers caused by differing local standards.

Mature Stage: Promote high-quality industry transformation through quality control and payment innovation. It is recommended to deepen reforms in medical insurance payment methods, linking payments to quality indicators such as dialysis adequacy and patient satisfaction, and establishing an incentive mechanism for "pay-for-value."

5.3 International Comparison

Placing the development of China's non-public hemodialysis centers in a global context reveals that it differs from both the dominant models of mature Western markets and the innovative practices of other emerging economies.

The pure service-operation model represented by DaVita in the United States achieves maximum efficiency through highly standardized and scaled management (BELLO A K, MCISAAC M, OKPECHI I G, et al., 2021). In contrast, the vertically integrated model represented by Fresenius in Germany builds a "product-to-service" closed loop by leveraging its advantages in equipment and consumable manufacturing (HUG N, NEYENHUY S A & NIENABER A., 2024). Both are built upon a sound medical insurance payment system and a mature healthcare market, but the former is prone to industrial monopolies, while the latter demands extremely high levels of capital and operational capability.

By comparison, India's NephroPlus adopts a frugal, light-asset approach, focusing on low-income populations and rapidly improving dialysis accessibility through management output, digital tools, and local partnerships, embodying typical "frugal innovation" (ALEXANDER S, JASUJA S, GALLIENI M, et al., 2021).

China's non-public hemodialysis centers, however, have followed a unique path of "state-guided market creation." The government did not allow the market to evolve spontaneously but instead used phased policy interventions—from early local pilots, to mid-term unified standards for regulated entry, to late-stage promotion of quality homogenization and value-based payment—to systematically mobilize social capital into this highly regulated, specialized field.

In this process, three indigenous models—industry-driven (e.g., Weigao), service-driven (e.g., Dakang), and capital-driven (e.g., Changsheng)—have gradually taken shape and are converging. They have absorbed Fresenius's ideas on industrial chain synergy, borrowed DaVita's concepts of standardized operations, and simultaneously addressed the grassroots accessibility challenges similar to those faced by NephroPlus. However, their core driver is not the market or technology, but the sustained guidance of national strategy and public policy.

This path has effectively avoided the accessibility inequities caused by excessive commercialization in the U.S. market and overcome the limitations of insufficient social capital participation in the German model. It has also secured more systematic institutional support and broader scaling opportunities than India's NephroPlus.

5.4 Study Limitations

This study has several limitations. First, our analysis is based primarily on publicly available secondary data, including policy texts, industry

reports, and corporate disclosures. Crucially, this study lacks access to granular, quantitative operational and clinical datasets from individual dialysis centers. Consequently, we are unable to empirically compare the three dominant operational models (hospital-affiliated, chain-operated, and PPP-based) in terms of their efficiency, cost-effectiveness, or direct impact on patient-centered outcomes such as survival rates, hospitalization frequency, or quality of life. Second, the dynamic nature of the healthcare policy environment means that emerging regulations post-2025 may alter the trajectories described herein. Third, our focus on the national level may overlook significant regional variations in policy implementation and market development.

Future research should prioritize the collection and analysis of comprehensive center-level databases encompassing financial, operational, and clinical metrics. Such data would enable rigorous econometric modeling to test the "convergence hypothesis" proposed in this paper and to quantify the real-world impact of different operational models on patient value and system sustainability.

Data Availability

Data are available on request to the corresponding author Dr. Jiusheng Wang (e-mail: wangjiusheng009@163.com).

Conflicts of Interest

The authors have no conflicts of interest to declare.

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