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Standardized Reconstruction of the Long-term Care System for the Elderly in Macau: A Pathway Study Based on Hong Kong's Integrated Experience

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Abstract: Based on policy instrument theory, this article systematically analyzes the structural challenges faced by Macao's long-term care system for the elderly, such as fragmentation, lack of standardization, and shortages of professional manpower. Through a comparison of Hong Kong's integrated governance framework and the United States' InterRAI-based precise closed-loop management technology, this study proposes an innovative pathway tailored to the characteristics of Macao's micro-economy. This pathway builds on the InterRAI standardized assessment tool to construct a data-driven closed-loop management mechanism that covers the entire process from "needs screening—care planning—resource payment—quality benchmarking—system optimization." The aim is to explore a new sustainable elderly service governance model characterized by "government leadership, data-driven processes, and market collaboration", providing a practical blueprint for restructuring the Macao system and offering both a theoretical reference and practical paradigm for other regions facing challenges of super-aged societies.

Keywords: Long-term care service system; InterRAI; Standardized restructuring; Environmental policy instrument.

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1. Introduction

With the intensifying global trend of population aging, the traditional fragmented and reactive long-term care service systems are increasingly unable to meet the continuously rising and complex care needs [1]. Issues such as resource misallocation, uneven service quality, and fiscal sustainability pressures highlight the urgency of advancing the standardized reconstruction of the service system. Against this backdrop, the international community generally seeks guidance from New Public Management theory and pursues reforms characterized by marketization, decentralization, and performance orientation to enhance service efficiency [2]. The "Integrated

Care" model promoted by the World Health Organization emphasizes breaking departmental boundaries, optimizing management mechanisms, and financing arrangements through systematic reforms [3]. Member countries of the Organisation for Economic Co-operation and Development (hereinafter referred to as "OECD countries") have widely adopted standardized tools such as InterRAI, transforming assessment data into quality indicators and resource utilization groups, thereby achieving precise alignment of performance management and resource allocation. This reflects the market-oriented principle of "funds follow the person", with service voucher mechanisms serving as key tools. By granting elders the right to choose, market vitality is stimulated, while institutional support for the development of the silver economy is provided [4].

In contrast, Hong Kong, as a high-density city with socio-cultural similarities to Macao and facing similar land and manpower constraints, has explored a more adaptive development pathway. Hong Kong's long-term care system has addressed issues of service fragmentation and lack of standards through the division of "supervision—market supply", service voucher mechanisms, and the unified InterRAI assessment tool [5]. Compared with the universal pathway of standardized tools promoted by OECD countries, Hong Kong's successful practice provides Macao with a highly feasible "institutional transplantation" approach.

This study, rooted in policy instrument theory—particularly from the perspective of environmental policy instruments—analyzes the institutional adaptability of international experience and proposes a standardized pathway modeled on Hong Kong's integrated system. This pathway emphasizes establishing cross-departmental collaboration mechanisms, unified standards, and intelligent platforms as environmental instruments to lay a foundation for cultivating a competitive service market, ultimately providing a "small but big market" sustainable governance paradigm for micro-economies facing super-aged societies.

2. Current situation and problems of the long-term care service system

The Macao Special Administrative Region is undergoing a demographic transition. In 2024, the proportion of seniors aged 65 and above in Macau is 14.6%, and it is expected to exceed 21% by 2029 [6–7]. This trend, accompanied by a declining birth rate (the total fertility rate is 0.79), means the current old-age dependency ratio is 26.1%, equating to one elderly person requiring care for every four working-age people [8]. In this context, the existing long-term care service system faces structural challenges.

2.1. Integration and resource allocation of the service system

The elderly service system is divided among several departments, resulting in a fragmented pattern of service supply [9]. The Social Welfare Bureau leads elderly care facilities and community support services, while the Health Bureau is responsible for medical and rehabilitation services; there remains room for improvement in coordination between these two main systems [10]. Multiple assessment reports indicate that the interface between different service systems is one of the main challenges for optimizing services, reflecting room for improvement in cross-departmental integration mechanisms.

In terms of resource allocation, there remain issues such as unequal regional service coverage and insufficient linkage of service types. In 2024, the Islands District accounts for about 20% of Macau's total population [11]. There are currently 5 health centers/stations, 4 residential homes for the elderly, 3 home care service teams, and 3 elderly day centers in the area. The proportion of institutional services to community services is unbalanced; the ratio of residential care home beds to day center care services is 22:1. The structural fit with the "aging-in-place"

policy goal needs to be improved. Currently, the average waiting time for admission to a residential care home for the elderly is about 18 months, which is shorter than in neighboring Hong Kong, but still poses certain pressure for long-term caregivers [12].

In terms of service delivery, the coordination mechanism between hospitals and care homes needs further improvement; the interconnectivity of healthcare information could be further enhanced, and some elderly people may encounter obstacles during the referral process [13]. This results in the problem of poor service integration when the elderly transition from community care to institutional care. Furthermore, legal regulations regarding liability for accidents occurring outside care homes have yet to be clarified, which may lead to potential disputes between service institutions [14].

2.2. Current situation of standardization development

The standardization of long-term care services in areas such as service assessment, quality supervision, and payment mechanisms still has room for further development. In terms of service assessment, a unified assessment tool for elder needs has not yet been established across Macao. There are also compatibility issues between assessment tools across the medical and social systems, which may cause differential ratings for the same elder in different systems [15].

Regarding service provision standards, there remains a need to establish detailed service quality standards and operational norms. There are disparities in service quality among different providers. For instance, in dementia care, there is a lack of uniformity in assessment tools and in the recognition of professional standards, as well as varying content and methods in nursing staff training [16].

In terms of regulatory mechanisms, current laws and regulations mainly specify hardware standards such as space and fire protection facilities, but mandatory requirements for soft indicators like service quality and staff ratios need improvement. The Social Welfare Bureau has completed the “Macau SAR Nursing Home Care Service Assessment Tool” and promoted the “Nursing Home Service Optimization Program” [17]. However, the legal effectiveness of the regulatory basis and the binding force over private homes can be further strengthened.

2.3. Current situation and development of professional talent teams

The elderly care service system faces challenges in building a nursing workforce, mainly reflected in human resource structure, inter-professional training, and professional development. In 2024, the number of doctors and nurses per 1,000 population in Macau was 2.9 and 4.4, respectively, both lower than the OECD average of 3.8 and 9.5 [18].

The demand for nursing personnel is particularly prominent in the context of an aging society. Elder care is a labor-intensive industry, and due to the special nature of the work, salary structure, and promotion prospects, there is a high turnover rate and a need to increase recruitment intention. At the same time, the professional level of nursing staff is continuously improving. The training system separates “medical” and “social service” development tracks. The high turnover rate is related to factors such as salary competitiveness, social recognition, and professional development pathways. There are currently 1,493 full-time employees in Macau’s elder service industry [19]. Currently, there are 38 unfilled elderly care service positions. Among them, 42.1% and 47.4% of the vacancies require professional qualifications and higher education, respectively, reflecting a certain level of social demand for professional and highly educated care staff [20].

2.4. Realization and optimization of closed-loop processes

Through rigorous process design, Hong Kong's long-term care system achieves closed-loop management from needs assessment to service delivery. The process begins with the application for long-term care services and a unified assessment stage; the elderly or their families submit applications through referral offices designated by the Social Welfare Department [21]. Subsequently, the elderly need to undergo assessment under the "Standardized Care Needs Assessment Mechanism for Elderly Services" to determine their service needs and priority order.

The service matching stage relies on the central waiting list system. The system allocates resources through a combination of automatic matching and manual adjustment according to the assessment results and available service resources. The central waiting list links separate community care and residential care services into an integrated, progressive, and complementary whole, while connecting with other welfare policies and pilot projects to optimize deficiencies in the long-term care service system [22].

During the service delivery stage, contract management is used to monitor service quality, while academic institutions provide continuous theoretical support in key areas such as assessment tool development, process optimization, and system validation, including the setting and revision of service quality standards. The key to the closed-loop process is the feedback and adjustment mechanism: elderly persons can apply for reassessment as their needs change, and caregiver support services strengthen the supplementary role of families in the system, creating a complete, dynamic service ecosystem.

3. Integrating Hong Kong's framework and U.S. closed loop: Optimization pathway for Macau's long-term care system

Building upon the preceding comparative analysis, the optimization of Macau's Long-Term Care (LTC) system must be grounded in local realities while undertaking a systematic institutional synthesis. The core of this strategy lies in integrating the "macro-level institutional integration" characteristic of Hong Kong's government-led framework with the "micro-level operational drivers" found in the United States' data standardization and fiscal incentive mechanisms. It is imperative for Macau to establish a mandatory linkage between assessment outcomes and resource allocation through specialized legislation, supported by a cross-departmental coordinating body. This systemic trajectory aims to facilitate a fundamental paradigm shift in Macau's LTC services—moving from an empirical, atomized model toward one defined by precision and long-term sustainability via a continuous "screening–planning–benchmarking–optimization" feedback loop.

3.1. Strengthening government-led top-level design and strategic synergy

The refinement of Macau's elderly service system necessitates the reinforcement of a government-led top-level architecture to serve as the institutional bedrock for systemic reform. While the current Ten-Year Action Plan for Elderly Services has established foundational directions such as unified assessment, its institutional design remains "project-oriented", lacking the top-level power configuration and operational protocols required to mandate the integration of assessment, payment, and quality supervision. Members of the Social Affairs Bureau's Elderly Affairs Committee have noted that the primary constraint lies in the failure to institutionalize a "data-driven decision-making" loop through legislation. Consequently, Macau should advance specialized legislation to authorize the establishment of a cross-departmental "LTC Data and Resource Coordination Agency." This body should be vested with the statutory authority to utilize standardized assessment results as the legal basis for budgetary allocation and service oversight, thereby ensuring precision in resource distribution and systemic

sustainability at the institutional level.

3.2. Constructing a data-driven management system centered on InterRAI

In response to the current systemic deficiencies in Macau's assessment mechanisms—specifically the misalignment between resource allocation and heterogeneous needs—Macau should draw on international and Hong Kong experiences to introduce and localize the InterRAI Assessment System. This transition represents a shift from "gatekeeping screenings" toward "precision governance." Standardization and Transparency: Current assessments for facilities such as the "Elderly Apartments" tend to emphasize eligibility criteria rather than need-oriented personalized care. By adopting InterRAI, Macau can utilize automatically generated Clinical Assessment Protocols (CAPs) to trigger evidence-based interventions (e.g., linking depression risk to social work involvement), ensuring scientific rigor and distributive justice.

Quality Improvement Loops: By leveraging the quality indicators (QIs) inherent in the InterRAI system, the government can establish objective criteria for fiscal subsidies and institutional accreditation. This fosters a "screening–planning–benchmarking–optimization" management cycle. Furthermore, the internal smart platforms of elderly care facilities should be utilized to eliminate information silos. In terms of implementation, Macau may adopt a "pilot-then-scale" methodology, similar to the Long-Term Care Insurance trials in Mainland China, to develop a framework that is both internationally aligned and contextually appropriate for Macau.

3.3. Building seamless closed-loop processes and strengthening professional workforce development

Building upon the establishment of a robust assessment framework, Macau must further integrate the American experience of deeply coupling InterRAI data with healthcare payment systems to optimize resource efficiency. The U.S. model utilizes federal legislation to link assessment-derived Case-Mix Models with fiscal reimbursement, creating a powerful "assessment-driven payment" incentive that provides a vital reference for Macau's transition from "universalistic" subsidies to "calibrated precision" funding. To realize this optimization, a "Triple Helix" synergy between government, industry, and academia is required: the government must lead policy design and legislative protection; the industry should drive the R&D of smart care technologies and management systems to enhance market efficiency; and academia must undertake the localization of assessment tools and empirical research on service outcomes. However, as this system requires high-level professional execution, Macau must simultaneously address the deficit in local expertise. It is recommended that Macau introduce professional qualification benchmarks similar to Mainland China's "Elderly Caregiver" certifications or Hong Kong's "Standardised Care Need Assessment Mechanism." By establishing authoritative certification and training regimes, Macau can cultivate a core professional team proficient in InterRAI assessment and data analytics, providing the essential human capital required for the high-efficiency operation of the closed-loop system.

Disclosure statement

The author declares no conflict of interest.

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