

Original Research Article

Supply-demand matching of community public services and tourism-based elderly care under population aging

Yuqing Zhang

Guangzhou Software Institute, Guangzhou, Guangdong, 528000, China

Abstract: Taking 32 communities in Chancheng District, Foshan City as the research object, this paper employs documentary analysis, field surveys, and questionnaire surveys to conduct a matching analysis between eight categories of public service facilities and the needs of the elderly. Chancheng faces both deep local aging and emerging demand for elderly care services driven by cultural tourism. The study identifies three major supply-demand mismatches: The dual deficiency in quantity and quality of medical and health facilities, the sparse distribution of elderly care facilities, and the spatial accessibility gap between the old town and peripheral areas. Two additional dimensions—Digital divide and the absence of tourism information services—Are identified. This paper proposes optimization pathways along three dimensions: Hierarchical layout, differentiated configuration standards, and socialized operation.

Keywords: population aging; community public services; supply-demand matching; tourism-based elderly care; smart elderly care

1. Introduction

The 2025 National Economic and Social Development Statistical Bulletin reports that China's population aged 65 and above has reached 15.8%, signaling an accelerated transition from mild to moderate aging ^[7]. Foshan mirrors this trend with a 65-and-above share of approximately 15.8% in 2025, the highest among the five districts of Guangdong Province ^[10]. Concurrently, Chancheng District, the historical and cultural core of Foshan, attracts a substantial influx of elderly cultural tourists annually. Yet community public service planning has long prioritized registered residents, with insufficient attention to elderly tourists care service needs.

Foshan is advancing the Hundred Counties, Thousand Towns and Ten Thousand Villages High-Quality Development Project alongside old residential area renovation ^[9]. A lack of coordination among planning, construction, civil affairs, and health authorities has resulted in fragmented responsibility for facility siting, land use, funding, and operation ^[7]. Smart elderly care technologies—Such as IoT-based health monitoring and digital service platforms—Remain in their infancy at the community level, and the digital divide among the elderly further exacerbates the supply-demand disconnect ^[6]. This paper re-examines the supply-demand matching of community public service facilities from the tourism-based elderly care perspective.

2. Literature review and theoretical framework

2.1. International research progress

Talen (1998) laid the methodological foundation for measuring spatial equity in public service facilities through the equity accessibility index ^[1]. Subsequent scholars incorporated subjective variables such as community satisfaction and neighborhood attachment into analytical models. International researchers were among the first to integrate walkability into assessment systems, employing GIS network analysis to measure walking time costs and proposing a 5-minute / 10-minute hierarchical service circle standard.

Recent studies have focused on the divergence between perceived accessibility and actual usage behavior: Even when facilities are geographically reachable, mismatches may persist if the elderly cannot access them due to declining physical function, traffic safety concerns, or information barriers. In tourism research, the tourist-community symbiosis theory (McKercher, 1999) posits that destination public services

should accommodate both residents and visitors ^[2].

2.2. Domestic research and theoretical framework

Domestic research began later but has grown rapidly. Zhao et al. (2025) compared facility configuration disparities across cities of different scales from the life circle perspective ^[3]. Chen et al. (2025) examined optimal facility allocation in Shenzhen based on an all-age-friendly perspective ^[4]. However, existing literature predominantly focuses on provincial capital cities, with relatively weak coverage at the county level in the Pearl River Delta.

This paper adopts supply-demand matching as its core framework, unfolding along three dimensions: Total volume-demand (comparing facility quantity with demand intensity), spatial accessibility (examining walking convenience), and quality-adaptation (assessing barrier-free and aging-friendly degree). Davis's (1989) Technology Acceptance Model (TAM) is introduced to explain the elderly's willingness to adopt smart elderly care technologies ^[5].

3. Study area and research methods

Chancheng District is the political, economic, and cultural center of Foshan City, covering approximately 154 square kilometers and administering three subdistricts (Zumiao, Shiwanzhen, Zhangcha) and one town (Nanzhuang), with a permanent resident population of approximately 1.35 million in 2025. The aging degrees show a gradient decline: Zumiao Subdistrict exceeds 28% (the most aged), Shiwanzhen is approximately 22%, and Zhangcha and Nanzhuang are structurally diluted to 16%–19% due to industrial park demographics.

This study employs stratified purposive sampling using the aging rate as the stratification criterion. Thirty-two communities are divided into three tiers (severe, moderate, mild), with sample sizes allocated proportionally (120, 100, 65), yielding 285 valid questionnaires. The questionnaire adopts a five-point Likert scale, forming a measurement matrix of 8 facility categories with 3–5 indicators each, totaling 32 items. Reliability testing yields a Cronbach's alpha of 0.82 for the total scale, with sub-dimensional alpha ranging from 0.76 to 0.84. The KMO test value is 0.79, and Bartlett's sphericity test is significant ($p < 0.001$).

4. Supply-demand matching analysis

4.1. Facility configuration and demand assessment

Table 1 summarizes the configuration of eight categories of public service facilities across the 32 surveyed communities. Commercial service facilities are the most numerous (12), followed by sports facilities (8), though approximately 40% of fitness equipment shows signs of aging. Within the medical category, pharmacies are relatively dense (12), but there are only 5 community health service stations—A notable gap against the National Health Commission standard of each station serving 30,000–50,000 people. Notably, none of the 32 communities had established a tourism information consultation point, which directly constrains the integrated development of tourism + elderly care.

Table 1. Facility configuration in chancheng district survey communities.

No.	Facility Category	Qty	Remarks
1	Education (kindergarten/childcare)	6	Most privately-run; public scarce
2	Public safety	2	Incomplete coverage
3	Public culture	7	3 w/o elderly activity zones
4	Medical & health (stations+pharmacies)	5+12	5 stations, 12 pharmacies
5	Sports (fitness points)	8	~40% equipment aging
6	Commercial services	12	Highest density, even distribution
7	Administrative & social services	4	Co-located with Party centers
8	Social welfare (elderly care)	3	All in Zumiao Subdistrict only

(Source: Field survey, January–March 2026)

Table 2 reports the demand assessment results. Medical and health facilities receive the highest demand rating (4.61), with pharmacies at 4.78 and health service stations at 4.55, reflecting rigid demand for daily

medication and chronic disease management. Social welfare categories rank the lowest (3.28), as most communities have not yet established elderly care service centers, leaving demand latent. A dedicated smart elderly care survey reveals that only 23% of respondents have used community digital health platforms, with inability to operate (47%) and privacy concerns (28%) as the primary barriers, revealing a digital accessibility dimension beyond traditional facility supply.

Table 2. Demand assessment of public service facilities (N=285, Five-Point Likert Scale).

No.	Facility Category	Score	Rank
1	Medical & health	4.61	1
2	Education	4.18	2
3	Commercial services	3.95	3
4	Sports	3.72	4
5	Public safety	3.51	5
6	Public culture	3.45	6
7	Administrative & social services	3.38	7
8	Social welfare (elderly care)	3.28	8

(Source: Questionnaire survey, January–March 2026)

4.2. Three major supply-demand mismatches

First, medical and health facilities suffer from a dual deficiency in quantity and quality: Five health service stations serve 32 communities. Second, elderly care facilities are sparse in coverage—Three centers are all concentrated in Zumiao Subdistrict, violating the proximity principle. Third, spatial accessibility is acceptable in the old town but weak in peripheral areas, with approximately 40% of respondents in Nanzhuang requiring more than 15 minutes to walk to a health service station. During field surveys, a newly built community in Nanzhuang was found to have a health service station marked on planning drawings but not yet operational; the elderly had to travel 3 kilometers to Zumiao for treatment. This present on paper, absent in reality phenomenon corroborates that supply-demand matching must be judged by actual travel experience rather than paper data.

5. Optimization pathways

5.1. Hierarchical layout: The dual-circle system

This paper proposes a dual-circle hierarchical layout of basic services within a 5-minute walk and comprehensive services within a 10-minute walk^[8]. The 5-minute circle (approximately 300 meters) embeds high-frequency micro-facilities such as pharmacies, meal assistance points, and parcel lockers into residential ground floors or community entrances. The 10-minute circle (approximately 500 meters) concentrates health service stations, elderly care centers, fitness points, and cultural activity rooms at community geometric centers or transit nodes, forming a community living room.

From the tourism-based elderly care perspective, embedding tourism information micro-stations within the 5-minute circle provides elderly tourists with community-level elderly care guidance, slow-travel maps, and emergency call functions, realizing a residents-visitors shared aging-friendly service space.

5.2. Differentiated configuration: Tiered standards

Current norms lack flexibility for communities with varying aging degrees. This paper proposes three tiers based on aging rates. For mild aging areas (<20%): Configure to national baseline, with health stations no less than 150 m² and elderly care centers no less than 300 m². For moderate aging areas (20%–28%): Increase facility area by 20%, mandating barrier-free access and chronic disease management zones. For severe aging areas (>28%): Raise standards by 30%, mandating community elderly care and day-care centers, exploring a diversified financing model of municipal-district finance + welfare lottery + social donations.

Smart elderly care facilities are deployed synchronously: Basic Wi-Fi and information boards in mild areas; IoT emergency call and remote monitoring terminals in moderate areas; and full electronic health

record coverage with 24-hour cloud consultation in severe areas—Bridging the digital divide within fiscal capacity.

5.3. Socialized operation

Facility completion does not equate to problem resolution; sustainable operation is the key. First, subdistrict offices should organize comprehensive assessments every six months. Second, using health service stations as the anchor, establish electronic health records for those aged 65 and above, extending services to chronic disease follow-up and medication guidance, and signing cooperation agreements with surrounding elderly care institutions. Third, organize Silver Volunteers teams, wherein younger healthy elderly provide neighborhood mutual aid—Visiting, accompanying to appointments, and meal assistance—Reducing service costs by approximately 40% compared to fully outsourced models while enhancing community social participation.

6. Conclusion

Taking 32 communities in Chancheng District as a case study, this paper identifies three major supply-demand mismatches: The dual deficiency in quantity and quality of medical and health facilities, the sparse distribution of elderly care facilities, and regional differentiation of spatial accessibility. Two additional dimensions—Digital accessibility and the absence of tourism-based elderly care services—Are incorporated. A three-dimensional optimization pathway of dual-circle hierarchical layout + differentiated configuration standards + socialized operation is proposed. From the tourism management perspective, embedding tourism information micro-stations within the 5-minute circle realizes a residents-visitors shared aging-friendly space. From the smart elderly care perspective, tiered deployment of digital facilities bridges the digital divide within fiscally sustainable limits. As Foshan advances the Hundred Counties, Thousand Towns and Ten Thousand Villages High-Quality Development Project, Chancheng is well-positioned to provide a replicable model for similar communities across the Pearl River Delta region.

7. Research limitations and future directions

This study has certain limitations. The sample covers only 32 communities in Chancheng District, without incorporating neighboring Nanhai and Shunde; the regional generalizability requires further testing in larger samples. The cross-sectional design captures only a snapshot in early 2026 and cannot track dynamic evolution of elderly demand. The depth of smart elderly care data remains insufficient—The behavioral mechanisms linking TAM's perceived usefulness and perceived ease of use to actual adoption require further empirical validation.

About the author

Yuqing Zhang (1993-), female, Han ethnicity (from Foshan), master's degree, assistant lecturer, primarily engaged in research on grassroots governance.

References

- [1] Talen E. Visualizing fairness: Equity maps for planners[J]. Journal of the American Planning Association, 1998, 64(1): 22-38.
- [2] McKercher B, du Cros H. Cultural tourism: The partnership between tourism and cultural heritage management [M]. New York: Haworth Press, 1999.
- [3] Zhao M F, Zhang L Q, Wang D G. Spatial differentiation and influencing factors of urban public service facilities allocation from the perspective of life circle[J]. Urban Development Studies, 2025, 32(8): 77-86+107.
- [4] Chen H S, Li Z, Cai Y J, et al. Optimizing the allocation of urban public service facilities based on the all-age-friendly perspective[J]. Modern Urban Research, 2025, 40(6): 119-124.
- [5] Davis F D. Perceived usefulness, perceived ease of use, and user acceptance of information technology[J]. MIS Quarterly, 1989, 13(3): 319-340.
- [6] Liu T, Hu W P. Spatial pattern, aging-friendly adaptation and equality of medical and elderly care facilities in Guangdong Province[J]. Tropical Geography, 2022, 42(12): 1993-2006.
- [7] The State Council of the PRC. The 15th Five-Year Plan for National Aging Development and Elderly Care Service System[Z]. Guo Fa (2025) No.18, 2025.

- [8] Yue L, Zhao H B, et al. Spatial inequality and shared accessibility in the fifteen-minute community life circle [J]. *Annals of the American Association of Geographers*, 2026, 116(2): 412-433.
- [9] General Office of the CPC Guangdong Provincial Committee. Implementation Plan for the Hundred Counties, Thousand Towns and Ten Thousand Villages High-Quality Development Project in Guangdong Province[Z]. 2025.
- [10] Standing Committee of Foshan Municipal People's Congress. Foshan City Elderly Care Service Regulations [Z]. 2025.