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REVIEW ARTICLE

Building Sabah's Smart Ageing Nation: From Policy Gaps to Sustainable Systems

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ABSTRACT

Sabah is advancing toward aged-state status by 2040, yet national ageing policies remain predominantly Peninsular-focused and insufficiently aligned with East Malaysian conditions. This paper synthesises empirical literature, ageing policy documents, and international models to examine how regional disparities shape ageing preparedness in Sabah. Evidence highlights structural deficits in geriatric care, rehabilitation access, digital infrastructure, and inter-agency coordination, with rural and indigenous communities facing the greatest exclusion. Using a qualitative conceptual approach, the study develops a Smart Ageing and Wellness Framework comprising three pillars: policy integration, workforce and care-economy readiness, and data-governance infrastructure. The analysis demonstrates that ageing governance in Sabah requires territorially sensitive strategies that reflect its geographic dispersion, infrastructural limitations, and cultural diversity. Although conceptual, the study contributes a region-specific lens often absent in Malaysian ageing discourse and provides a foundation for future empirical work on ageing policy, health equity, and the spatial organisation of care and services in East Malaysia.

Contribution/Originality: This paper advances Malaysian ageing scholarship by foregrounding Sabah as a distinct ageing territory rather than as a peripheral extension of national averages. It contributes a conceptually integrated framework that links policy integration, care economy readiness, and state level data governance, thereby clarifying the structural conditions needed for equitable ageing preparedness in East Malaysia.

1. Introduction

Malaysia is undergoing a decisive demographic transition. By 2025, twelve states had crossed the formal threshold for ageing status, defined as having more than seven per cent of the population aged 65 years and above (Bernama, 2025). In response, the Federal

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Government introduced new ageing policy directions, including the National Senior Citizens Action Plan 2026–2030 (PTWEN) and the Senior Citizens Action Plan 2023–2030, which strengthen long-term care governance, expand social protection, and align ageing interventions with national movement toward an aged society (Ministry of Women, Family and Community Development, 2023, 2025). Malaysia's ageing trajectory is among the fastest in Asia, with projections indicating a substantial rise in the share of older persons by 2040. Even with this national shift, regional disparities remain pronounced. In East Malaysia, demographic transition is unfolding unevenly, and state-level profiles suggest Sabah is approaching ageing thresholds earlier than many Peninsular counterparts (Department of Statistics Malaysia & United Nations Population Fund, 2023). Despite this acceleration, public welfare and institutional long-term care provision remains territorially uneven, with federal facility distribution and programme concentration continuing to favour more developed Peninsular corridors (Chang et al., 2020).

Sabah's earlier demographic transition is further shaped by improvements in life expectancy alongside steady outmigration of younger cohorts. National demographic projections also show uneven ageing across ethnic groups, with Malaysian Chinese ageing faster due to sustained fertility decline and longer life expectancy, which reinforces the need for culturally adaptive ageing policies (Hamid, 2016). As Hamid (2016) observe, Malaysia's ageing experience is characterised by deep sociocultural, economic, and health inequalities, especially across ethnic and regional lines, thus requiring nuanced and context sensitive policy responses.

In Sabah, population ageing unfolds within conditions of uneven infrastructure, where health services, digital access, and eldercare capacity remain limited and largely concentrated in urban centres. Recent assessments report that basic physiotherapy, sarcopenia screening, and geriatric rehabilitation, which are increasingly routine in Peninsular Malaysia, are still unavailable or severely restricted across many Sabah districts (Ministry of Health Malaysia, 2023; Department of Statistics Malaysia, 2023). Numerous districts lack geriatric services, aged housing schemes, or community-based support systems. Although national strategies such as the National Policy for Older Persons (2011), (Ministry of Women, Family and Community Development, 2011), the Senior Citizens Action Plan 2023 to 2030, and the Health White Paper provide overarching direction, foresight assessments consistently show that preparedness differs sharply across states. Sabah and Sarawak remain behind in policy cohesion, data integration, and infrastructure adaptation for ageing populations (Foresight Division, Ministry of Economy Malaysia, 2023).

Economist Dr Firdausi Suffian (New Straits Times, 2024) has warned that without structural planning and dedicated state level policy instruments, Sabah may reach aged region status by 2040 while remaining systemically underprepared. This position aligns with national foresight analyses that document low planning maturity and sizeable demographic readiness gaps in East Malaysia (Foresight Division, Ministry of Economy Malaysia, 2023). His call highlights a deeper governance concern, namely the absence of anticipatory governance, understood as foresight informed and cross sector policy design that prepares institutions for inevitable demographic change (Foresight Division, Ministry of Economy Malaysia, 2023; Foresight Division, Ministry of Economy Malaysia, 2025).

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Parallel research on ageing in place demonstrates that older Malaysians overwhelmingly prefer to remain within their homes and communities rather than relocate to institutions or distant urban centres (Ismail et al., 2024). This preference aligns with Malaysia's Five Dimensions Framework, which emphasises healthy ageing, productive ageing, supportive environments, spirituality, and cultural anchoring (Hamid, 2016). In Sabah, attachment to land, kinship networks, and ethnic identity further intensifies place-based ageing preferences. Studies on inclusive cities also show that successful ageing transitions depend on more than healthcare provision, because mobility systems, housing suitability, social environments, and local design play equally central roles (Beard et al, 2016; WHO, 2007). However, in contrast to Peninsular Malaysia's broader coverage of institutional care centres, *Pusat Aktiviti Warga Emas* or PAWE hubs, and home support services, Sabah's eldercare infrastructure remains limited, unevenly distributed, and weakly coordinated (Chang et al., 2020).

This paper addresses these compounded gaps by proposing a Sabah specific Smart Ageing and Wellness Framework that integrates current national policy directions with on the ground evidence of structural constraints in long term care, community rehabilitation, preventive health access, and rural support systems. By synthesising evidence across policy, health, labour, technology, and governance, the study shows how demographic ageing necessitates reforms that strengthen structural design and community level service systems.

2. Literature Review

The rapid rise of ageing populations worldwide has stimulated a paradigm shift in social policy, healthcare, urban planning, and economic development, with international organisations urging more integrated and system wide ageing governance (World Health Organization, 2015). The World Health Organization defines healthy ageing as the process of developing and maintaining functional ability that enables well-being in older age, thereby emphasising integrated health systems, supportive environments, social connection, and lifelong learning (Ministry of Health Malaysia, 2023). For Sabah, the key challenge is not adopting global principles but operationalising them within a setting marked by infrastructural unevenness, limited geriatric coverage, and fragmented policy coordination (Foresight Division, Ministry of Economy Malaysia, 2023).

2.1. Ageing and policy fragmentation in Malaysia

Malaysia's main ageing policy instruments, including the National Policy for Older Persons (Government of Malaysia, 2011), the Senior Citizens Action Plan 2023–2030 (Ministry of Women, Family and Community Development, 2023), the Health White Paper (Ministry of Health Malaysia, 2023), and PTWEN 2026–2030 (Government of Malaysia, 2011; Ministry of Health Malaysia, 2023; Ministry of Women, Family and Community Development, 2025), signal national recognition of demographic ageing and the need for more systematic support for older persons. These frameworks emphasise principles such as healthy and productive ageing, community participation, social protection, and better integration of health and social care. Yet empirical and policy reviews consistently conclude that implementation on the ground remains fragmented, urban centred, and uneven across states. Analyses of Malaysian ageing policy and welfare provision show that services tend to cluster in better resourced urban corridors, while rural regions experience gaps in access to health, social care, and transport support (Abdullah et al., 2024). Commentary from health policy platforms also highlights that coordination

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between ministries is weak, long-term care remains underdeveloped, and preparation for an aged society is still largely reactive rather than anticipatory (CodeBlue, 2023; United Nations Development Programme (UNDP), 2024).

Within this national picture, East Malaysian states, particularly Sabah, are often situated at the margins of policy design and resource allocation. Reviews of public long-term care and social protection systems show that federal institutional care facilities such as *Rumah Ehsan* and *Rumah Sejahtera* operate only in Peninsular Malaysia and are not available in Sabah and Sarawak, which means that low-income older persons in these states have fewer options for publicly funded institutional support (Chang et al., 2020; Fadzil et al., 2023). The same reviews note that transport programmes and outreach services that support older persons in accessing hospitals and day centres are much more developed in Peninsular regions than in Borneo states, despite similar or rising proportions of older residents (Department of Social Welfare Malaysia, 2020; Department of Statistics Malaysia, 2019). These patterns reinforce structural inequity in access to long term care, rehabilitation, and social support, and they illustrate how a formally unified national policy architecture can still generate territorially uneven outcomes when implementation is filtered through existing development and infrastructure gaps.

Scholarship that focuses specifically on Sabah has begun to document the cultural, spiritual, and communal dimensions of ageing, particularly in rural and indigenous communities where family networks, religious practice, and village level solidarity play a central role in later life well-being (Ismail et al., 2024). However, institutional and systems level analyses of ageing governance in Sabah remain limited. Much of the available evidence on systemic gaps comes from national survey reports, social protection reviews, and media or expert commentary rather than from state specific policy evaluations. Foresight work continues to stress that East Malaysian states lag in planning maturity, data integration, and geriatric service development (Foresight Division, Ministry of Economy Malaysia, 2023; United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP), 2022). In Sabah, these concerns have translated into explicit warnings from economists and ageing policy commentators that the state is likely to reach aged region status around 2040 without adequate institutional scaffolding for long term care, rehabilitation, and community based support, unless state anchored governance structures and anticipatory planning mechanisms are established well in advance (New Straits Times, 2024; Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023). Taken together, this literature suggests that Malaysia's ageing policy regime is formally comprehensive yet substantively fragmented, and that Sabah occupies a particularly vulnerable position within this fragmented landscape because territorial equity has not yet been fully embedded in national ageing governance.

2.2. Community based and inclusive ageing

Recent scholarship increasingly emphasises the importance of community grounded approaches to population ageing, particularly those that enable older adults to remain in familiar environments and maintain independence for as long as possible. The World Health Organization's Decade of Healthy Ageing framework underscores that ageing in place is most successful when communities provide responsive housing, safe neighbourhoods, accessible infrastructure, and opportunities for participation and social connection (World Health Organization, 2021). These principles resonate strongly with Malaysian contexts, especially Sabah, where settlement patterns, cultural norms, and kinship networks significantly influence how older adults experience ageing.

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The Generational Ageing in Place Preferences Study by Ismail et al. (2024) offers important insights into how Baby Boomers and Generation X make decisions about their preferred living arrangements in later life. The study highlights that older Malaysians consider a wide constellation of factors when deciding whether to remain in their homes or consider alternative living arrangements. These factors include physical accessibility such as the presence of ramps and safe walkways, proximity to family members who provide emotional or practical support, familiarity with neighbourhood surroundings, and perceived safety within the community. These findings have particular relevance for Sabah, where ageing preferences are shaped not only by functional needs but also by deep cultural and geographic attachments. In Indigenous Kadazan-Dusun, Bajau, Murut, Rungus, and coastal communities, identity is closely intertwined with ancestral land, village networks, and communal traditions. As a result, many older adults prefer to remain in semi-rural or rural settlements where they can sustain social bonds and cultural continuity (Ismail et al., 2024).

Within this landscape, generational differences also emerge. Generation X in Sabah appears more open to assisted living models, provided that such arrangements are embedded within familiar communities and incorporate culturally sensitive design. Baby Boomers, on the other hand, tend to prioritise autonomy and continuity, often expressing a strong desire to age in homes that reflect decades of cultural, spiritual, and familial meaning. These preferences are further reinforced in tightly bonded rural areas, where kinship norms, communal reciprocity, and proximity to extended family significantly influence decisions about later life living arrangements. Research shows that these cultural expectations not only support emotional well-being but also function as informal social protection systems in the absence of institution-based long-term care facilities (Ismail et al., 2024).

International and regional frameworks highlight that inclusive ageing is fundamentally dependent on strong local planning systems and neighbourhood scale interventions. The WHO Global Age-Friendly Cities Guide, first introduced in 2007, remains a foundational reference for translating global ageing principles into practical design elements. The guide identifies eight interconnected domains that shape older adults' lived experiences, including outdoor spaces, transportation networks, housing, social participation, civic engagement, communication, community support, and health services (WHO, 2007). These domains emphasise that communities must adopt holistic strategies that enhance mobility, improve safety, enable intergenerational interaction, and ensure that essential information and services are accessible to older persons.

Similarly, the policy framework presented in An Inclusive Community for Ageing in Place 2023 (Ministry of Women, Family and Community Development, 2023) encourages local governments to integrate elder-inclusive planning principles into municipal development strategies. The framework calls for the provision of flexible housing options that can accommodate changing care needs, the revitalisation of public spaces to support intergenerational interaction, and the enhancement of transport equity so that older persons can reliably access healthcare facilities, markets, and community centres. The document also stresses that these interventions must be informed by continuous community consultation and supported by data on demographic profiles, mobility patterns, and evolving needs.

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Lessons from these frameworks suggest that successful ageing systems depend on three essential conditions, namely the availability of reliable local data, sufficient decentralised authority to adapt policies to local contexts, and institutional capacity to tailor services to neighbourhood level realities. These conditions, however, are not yet fully established in Sabah. National assessments report that Sabah continues to face fragmented datasets, limited data sharing mechanisms, and inadequate spatial mapping of older populations, which collectively constrain the state's ability to design and implement responsive ageing-in-place strategies (World Health Organization, 2021). Media and expert analyses further indicate that local governance in Sabah is often constrained by uneven administrative capacity and restricted fiscal autonomy, limiting its ability to roll out ageing-friendly neighbourhood designs or invest in community-based elder support systems (Foresight Division, Ministry of Economy Malaysia, 2023).

Consequently, although Sabah demonstrates strong cultural foundations that support community-based ageing, the absence of comprehensive local planning mechanisms and systemic resource constraints prevent these strengths from being fully translated into sustainable ageing infrastructures. International evidence consistently shows that ageing-in-place strategies succeed when local governments can combine cultural assets with modern governance tools. This suggests that strengthening local data systems, empowering district-level authorities, and enhancing inter-agency collaboration are essential steps for enabling community-based and inclusive ageing within the diverse geographic and cultural settings of Sabah.

2.3. Ageing, technology, and data systems

Digital infrastructure has become an essential pillar of contemporary ageing support systems because it facilitates a wide range of technology enabled interventions such as telehealth consultations, remote monitoring of chronic conditions, and integrated geriatric care pathways. The global shift toward digital health is driven by the recognition that older adults increasingly experience multiple chronic illnesses, mobility constraints, and reduced access to in person healthcare, which creates a growing need for more flexible, home based and community centred care solutions (World Health Organization, 2021). Within this broader movement, Noor and Yamin (2022) highlight the emergence of Smart Health models that integrate remote monitoring devices, automated medication reminders, and interoperable electronic health records to strengthen continuity of care and reduce the burden on overstretched health systems. Their work emphasises that digital systems can enhance early detection of health deterioration, improve treatment adherence, and support ageing in place when supported by adequate infrastructure and digital literacy.

Despite this potential, empirical studies across Malaysia reveal that digital ageing interventions disproportionately exclude lower income, rural, and technologically marginalised older adults. Ahmad et al. (2023) found that many older Malaysians face significant digital literacy barriers, including difficulty navigating smartphone interfaces, lack of familiarity with mobile applications, and limited awareness of digital health services. Hepburn et al. (2025) similarly report that health technology uptake among older Malaysians is significantly shaped by socioeconomic status, education level, and digital exposure, with rural residents least likely to access or use telehealth services. These challenges are amplified in Sabah, where broadband penetration remains inconsistent, and device ownership is substantially lower in interior districts compared to major urban centres such as Kota Kinabalu and Sandakan. As a result, key digital ageing

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interventions, such as teleconsultation, remote physiotherapy sessions, and app-based medication management, face substantial implementation constraints (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023).

The consequences of this divide are particularly evident in remote districts such as Pitas, Nabawan, Tongod, and Beluran, where residents frequently experience unreliable connectivity, long travel distances to health facilities, and limited availability of digital health training programmes. These structural factors create compounded disadvantages for older adults, and they significantly reduce the feasibility of adopting digital solutions for geriatric monitoring, post stroke rehabilitation, or chronic disease management. Without substantial investment in digital inclusion, Sabah risks widening health inequities among older people, especially those living in geographically isolated and infrastructure poor communities.

Mobile health tools such as EZmedZA and emerging ageing support platforms such as AGATHA illustrate promising innovations within Malaysia's digital health landscape. These platforms have the potential to support appointment management, symptom tracking, home based rehabilitation exercises, and personalised health reminders (Hepburn et al., 2025). However, their effectiveness depends heavily on stable internet connectivity, accessible user interfaces, and locally coordinated implementation. Ahmad et al. (2023) argue that digital health applications must be co designed with older users in order to improve usability, foster behavioural trust, and reduce dropout rates. Co design approaches ensure that digital tools are aligned with older adults' cognitive, physical, and linguistic capabilities, thereby increasing adoption and long-term engagement.

Ab Rahman et al (2023) further propose expanding Malaysia's Pusat Internet Desa into elder focused digital literacy hubs that provide structured training in smartphone use, health application navigation, online safety, and digital communication. These hubs, if resourced and systematically integrated into local ageing initiatives, could bridge intergenerational digital gaps and support older persons to participate more fully in digital health ecosystems. Yet in Sabah, these models remain largely aspirational because the state continues to face substantial limitations in broadband reach, digital infrastructure investment, and inter-agency coordination. Media reports indicate that many rural Pusat Internet Desa centres lack adequate staffing, elder friendly programmes, and stable connectivity, which prevents them from functioning as effective digital inclusion platforms for older adults (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023).

Furthermore, Sabah does not yet possess an interoperable geriatric data system or a state level digital health governance framework capable of linking community level data with clinical information systems. The absence of integrated digital health architecture limits the ability of health professionals to monitor older adults' health status, track longitudinal outcomes, or coordinate referrals across primary care clinics, district hospitals, and community outreach services. These gaps mirror broader national challenges in Malaysia's digital health landscape, where siloed data, inconsistent digital literacy programmes, and uneven technology adoption continue to undermine efforts to build comprehensive and equitable ageing support systems (Ministry of Health Malaysia, 2023; United Nations, Economic and Social Commission for Asia and the Pacific, 2022).

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Taken together, the evidence suggests that the digital transformation of ageing in Sabah must be grounded in three pillars: expanded digital infrastructure, inclusive technology design, and coordinated data governance. Without these foundations, digital ageing solutions will remain unevenly distributed and risk reinforcing rather than reducing existing health and social inequalities among older adults in Sabah.

2.4. Workforce gaps and the emerging care economy

Malaysia's eldercare workforce is characterised by chronic understaffing, uneven geographical distribution, and limited professionalisation, and these challenges are intensified in East Malaysian states such as Sabah. National health system reviews show that most geriatricians, rehabilitation physicians, physiotherapists, and occupational therapists are concentrated in major Peninsular cities, while rural and remote areas consistently report critical shortages (Ministry of Health Malaysia, 2023). This inequitable distribution is further evidenced in Sabah, where media and expert reports reveal that several districts do not have consistent access to geriatric care, structured rehabilitation programmes, or physiotherapy services (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023). The state's health system depends heavily on rural clinics that frequently operate with limited staff and resources, and this reliance creates substantial service gaps in physiotherapy access, sarcopenia management, post stroke rehabilitation, dementia screening, and long-term care coordination. These systemic shortages reduce the capacity of older adults in rural Sabah to access preventive care or recover effectively from functional decline, thereby increasing dependency and long-term disability (Abdullah et al., 2024).

Within the Malaysian context, care provision for older adults continues to occur primarily within informal settings, and this is especially pronounced among low-income households where women disproportionately shoulder the responsibilities of caregiving. Rashid et al. (2022) highlight that unpaid family caregiving remains the default care arrangement in Malaysia because formal eldercare services are limited, expensive, or geographically inaccessible. Kong et al. (2021) similarly demonstrate that caregiving roles are deeply gendered and often taken on by middle aged or elderly women who lack formal training, which contributes to physical strain, financial burden, and psychosocial stress. These findings are particularly relevant for Sabah's semi-rural and Indigenous communities, where family-based care traditions continue to be strong but are increasingly strained by outward migration of younger adults to urban and industrial areas. As a result, older persons may be left with insufficient caregiving support, and ageing spouses or siblings may assume roles for which they have limited training or resources.

International models of community-based eldercare demonstrate alternative approaches that could inform Sabah's ageing transition. In South Korea, the Silver Human Resource Centres employ older adults as part time community workers who provide peer support, daily living assistance, and wellness activities, thereby promoting active ageing while reducing the caregiving burden on families (Kim & Choi, 2019). Japan's community cooperatives and neighbourhood support networks similarly mobilise older residents as caregivers, knowledge holders, and mentors, while also offering structured training programmes to build community competency in elder support (Weiss et al., 2005). These innovations illustrate that older adults can be positioned not only as care recipients but also as contributors to local care ecosystems when adequate training, incentives, and institutional structures are available.

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Global economic analyses have increasingly framed ageing as a potential development frontier through the emergence of what is commonly termed the "silver economy." The World Bank (2020) argues that population ageing, when supported by appropriate labour market policies and social innovation, can stimulate new economic sectors such as home-based care services, assistive technology markets, elder friendly tourism, and community wellness enterprises. The Khazanah Research Institute (2021) similarly notes that Malaysia has substantial untapped potential in ageing related industries, particularly in community care services, rehabilitation support, and technological solutions that enhance functional independence. These insights are especially relevant to Sabah, where the care economy remains underdeveloped and where workforce shortages present both a challenge and an opportunity. If strategic investments are made in workforce development, skill enhancement, and elder focused entrepreneurship, Sabah could cultivate a care economy that supports rural employment, empowers older adults, and strengthens local resilience in the face of demographic change.

Overall, the literature suggests that Sabah's ageing challenges cannot be solved solely through expansion of formal medical services. Instead, the state must simultaneously strengthen formal eldercare workforce pipelines, professionalise community-based care roles, and cultivate new economic opportunities within the broader care ecosystem. Such an approach aligns with international evidence showing that diversified caregiving models, community participation, and inclusive labour policies are fundamental to building resilient ageing systems in regions with limited institutional capacity.

2.5. Policy futures and anticipatory planning

Recent national foresight analyses indicate that Malaysia's existing ageing policies, while comprehensive in intent, continue to operate within a reactive governance paradigm that does not fully anticipate the long-term implications of demographic change. The report *Transitioning Futures, Anticipating Change* (Foresight Division, Ministry of Economy Malaysia, 2023, 2025) argues that Malaysia's ageing governance remains constrained by short term planning cycles, fragmented institutional coordination, and limited cross-sector integration. This critique is particularly salient for East Malaysian states, especially Sabah, where institutional capacity for ageing governance is structurally weaker and where data fragmentation, geographic dispersion, and administrative limitations heighten vulnerability to demographic pressures (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023). The report emphasises that without forward-looking policy instruments and state anchored planning frameworks, Malaysia risks entering aged nation status with insufficient mechanisms to support long term care, geriatric services, and community-based ageing systems.

To address these governance gaps, the foresight report recommends the adoption of anticipatory governance principles that foreground long term scenario modelling, policy simulations, demographic risk forecasting, and participatory multi-stakeholder planning. These tools can help governments envision plausible future trajectories and design policy responses that are proactive, adaptable, and territorially sensitive. The recommendations align closely with the principles embedded in the National Senior Citizens Action Plan 2026 to 2030, commonly known as PTWEN, which calls for decentralised readiness, cross ministerial coordination, and strengthened state level policy leadership in ageing governance (Ministry of Finance Malaysia, 2025). PTWEN recognises that demographic ageing cannot be addressed through isolated sectoral interventions and instead requires

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integrated planning across health, welfare, housing, labour, digital infrastructure, and local government systems.

International organisations echo these concerns. The United Nations Economic and Social Commission for Asia and the Pacific (United Nations Economic and Social Commission for Asia and the Pacific [UN ESCAP], 2022) emphasises that ageing must be mainstreamed into national development planning not merely as a social issue but as a multidimensional territorial and economic process affecting productivity, spatial development, public expenditure, and community resilience. UN ESCAP argues that countries with decentralised governance structures require state and local authorities to develop context specific ageing strategies because demographic pressures are unevenly distributed across regions. This recommendation is highly relevant for Malaysia, where rural and Indigenous communities in East Malaysia face significantly different ageing challenges compared to urban Peninsular regions.

In Sabah, strategies promoting anticipatory governance remain largely untested, and several structural barriers inhibit effective long-term planning for population ageing. The state does not have a dedicated Ageing Foresight Unit capable of conducting scenario analyses, producing geriatric readiness projections, or coordinating policy responses across sectors. Sabah also lacks an integrated geriatric data system that can provide disaggregated district level information on the health, socioeconomic conditions, care needs, and spatial distribution of older persons. Without such a system, planning processes remain highly constrained and dependent on national level datasets that do not adequately reflect Sabah's geographic realities or Indigenous demographic patterns (Department of Statistics Malaysia, 2023). Furthermore, the state currently has no statutory framework governing long term care, no clearly defined institutional lead agency for ageing, and no formal mechanisms for inter-agency coordination between health, social welfare, and local government authorities. These gaps leave ageing policy responses reactive rather than anticipatory, and they significantly hinder Sabah's ability to prepare for the projected shift into aged-region status by 2040 (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023).

The absence of anticipatory structures in Sabah contrasts sharply with international best practices. Countries such as Japan, South Korea, Ireland, and Singapore have established demographic foresight units, ageing policy councils, and whole-of-government frameworks that utilise predictive analytics and scenario modelling to anticipate service needs and allocate resources effectively (Organisation for Economic Co-operation and Development, 2020; World Health Organization, 2015). These examples demonstrate that resilient ageing governance depends on long term planning cultures supported by institutionalised foresight capacity. For Sabah, the integration of such tools could enable more targeted allocation of resources, more efficient planning of rehabilitation and long-term care services, and stronger alignment between demographic trends and local development strategies.

Collectively, the literature and international guidance highlight that Sabah's demographic transition demands a shift from short term planning to anticipatory governance based on foresight, robust data, and decentralised institutional capacity. Without such a shift, the state risks exacerbating existing disparities in health access, long term care provision, and community well-being as the ageing population continues to grow.

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3. Methodology

This study adopts a qualitative desk research methodology designed to identify the structural, institutional, and territorial policy gaps that shape Sabah's preparedness for demographic ageing. Desk research is a well-established approach in public policy studies when empirical datasets are incomplete, uneven, or inaccessible, which is a prevailing condition in East Malaysia where ageing related evidence remains fragmented (Chang et al., 2020). This method is particularly suitable for examining governance structures, policy alignment, and systemic service disparities because it enables comprehensive synthesis across multiple sources without reliance on individual-level data. It also provides a strategic view of the policy landscape, which is appropriate given the study's objective of mapping structural readiness rather than evaluating programme outcomes or individual ageing behaviours.

3.1. Research Design

The research adopts a qualitative, document-based design that systematically synthesises multi-source evidence to map Sabah's ageing policy environment. Desk research is frequently employed in ageing governance studies because ageing systems involve multiple sectors, including health, welfare, labour, housing, and digital infrastructure, making it necessary to integrate diverse forms of evidence (UN ESCAP, 2022). This approach also aligns with international practices in regions where demographic and geriatric data systems remain incomplete or inconsistent, as is the case in Sabah.

The design incorporates peer reviewed empirical studies, national policy documents, subnational demographic reports, international frameworks, and media analyses. The triangulation of these sources allows the study to capture both formal policy directions and practical implementation challenges. It also enables examination of how multi-level governance, spatial inequality, and institutional capacity influence ageing preparedness across the state.

3.2. Data Sources

The evidence base for the study comprises five categories of documents. First, peer reviewed empirical studies such as Ahmad et al. (2022), and Hepburn et al. (2025) were reviewed to understand contemporary debates on healthy ageing, digital exclusion, and geriatric system gaps. Second, national policy documents including the National Policy for Older Persons (2011), the Senior Citizens Action Plan 2023 to 2030, the Health White Paper (MOH, 2023), and the National Senior Citizens Action Plan 2026 to 2030 (PTWEN) were analysed to assess federal strategic directions and institutional commitments. Third, Sabah-specific demographic and health infrastructure sources, including the Department of Statistics Malaysia (2023), UNFPA population assessments, Ministry of Health Malaysia (2023) and New Straits Times (2024), provided contextual grounding on East Malaysian disparities and rural health access.

Fourth, global ageing frameworks such as the WHO Age-Friendly Cities Guide 2007 (World Health Organization, 2007), WHO Healthy Ageing Framework (World Health Organization, 2015, 2021), UN ESCAP's regional ageing guidance (2022), and the World Bank's (2020) silver economy analyses were reviewed to contextualise Malaysia's trajectory within international ageing governance standards. Fifth, national foresight and anticipatory planning assessments from the Foresight Division, Ministry of Economy

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Malaysia (2023) and Transitioning Futures 2025 (Foresight Division, Ministry of Economy Malaysia, & United Nations Development Programme, 2025) were integrated to identify gaps in long-term policy modelling, governance design, and demographic risk forecasting.

Collectively, these sources enable the identification of policy fragmentation, institutional blind spots, geriatric service inequities, digital readiness constraints, and territorial disparities that hinder Sabah's readiness for ageing.

3.3. Analytical Procedures

The study employed thematic content analysis to organise and interpret the collected documents. All sources were coded into five analytical themes aligned to systemic components of ageing governance.

The first theme examined policy fragmentation and institutional blind spots, focusing on Peninsular-centred programme distribution and the absence of federal long-term care institutions in Sabah, consistent with the findings of Chang et al. (2020).

The second theme explored eldercare and workforce gaps, with attention to uneven geriatric coverage, shortages in physiotherapy and rehabilitation services, and labour constraints, which are persistent issues highlighted by Foresight Division, Ministry of Economy Malaysia (2023), Tan et al., (2021), and Kong et al. (2021).

The third theme addressed digital and data governance capacity by analysing broadband inequality, digital literacy gaps, and the lack of interoperable geriatric data systems, reflecting concerns raised by Ahmad et al. (2022), and Hepburn et al. (2025).

The fourth theme focused on ageing in place preferences, incorporating cultural, ethnic, and spatial influences derived from Ismail et al. (2024), Ismail et al. (2024) and WHO (2007) to understand how settlement patterns shape ageing needs in Sabah.

The fifth theme analysed anticipatory governance and policy futures, including the absence of an Ageing Foresight Unit in Sabah and the need for long term scenario planning, as emphasised by UN ESCAP (2022) and OECD (2020).

The structured coding process allowed cross-comparison of demographic, policy, spatial, and institutional evidence and enabled identification of macro-structural gaps rather than treating each issue as an isolated sectoral concern.

3.4. Justification of Method

The qualitative desk research approach is justified on several grounds.

Firstly, Sabah lacks publicly accessible district-level datasets on geriatric health, ageing profiles, and long-term care utilisation, which makes statistical modelling or quantitative sampling unfeasible (Department of Statistics Malaysia, 2023; United Nations Population Fund, 2022).

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Secondly, federal long-term care institutions such as *Rumah Ehsan* and *Rumah Seri Kenangan* do not operate in Sabah, which restricts opportunities for programme evaluation and institutional benchmarking (Chang, Pazim, & Mansur, 2020).

Thirdly, national foresight reports explicitly highlight fragmented datasets, inconsistent digital infrastructure, and the exclusion of East Malaysian states from ageing-readiness modelling frameworks (Chang et al., 2020).

Fourthly, conceptual synthesis is widely recognised as a valid methodological strategy in ageing policy research, particularly when structural governance gaps and territorial disparities are the primary analytical focus rather than individual behaviours or health outcomes (UN ESCAP, 2022).

Given these constraints, a qualitative synthesis offers the most appropriate, feasible, and contextually accurate method for constructing a Sabah-specific ageing governance framework.

3.5. Research Trustworthiness and Methodological Limitations

To ensure robustness, the study applied methodological triangulation by integrating peer reviewed publications, policy documents, media reports, and international frameworks. This triangulation strengthens the credibility of findings and reduces overreliance on any single type of evidence (Bowen, 2009). Reflexive interpretation was applied throughout the analysis to avoid normative bias, especially when assessing regional disparities and governance shortcomings.

However, the study is limited by the absence of primary data such as interviews with policymakers, healthcare personnel, or older adults in Sabah. Data availability remains constrained by structural gaps in Malaysia's ageing information systems, particularly the lack of district-disaggregated geriatric health indicators. Additionally, official policy documents may not fully reflect implementation realities, and media sources may carry interpretive bias, although they offer valuable insights into local perceptions and reported service gaps. The study's conclusions should therefore be interpreted as a strategic framework rather than an operational evaluation.

3.6. Output of the Method

The synthesis generated three interrelated pillars that underpin the Smart Ageing and Wellness Framework: policy integration, workforce and care-economy readiness, and data and governance infrastructure. These pillars arise directly from the thematic coding and align with international best practices in ageing governance, particularly in regions experiencing uneven demographic transitions or infrastructural disparities.

4. Smart Ageing and Wellness Framework

To prepare Sabah for the projected demographic shift by 2040, this paper proposes a Smart Ageing and Wellness Framework built on three interconnected pillars. The framework responds to structural gaps including the absence of federal long term care institutions such as *Rumah Ehsan* and *Rumah Seri Kenangan*, which remain concentrated in Peninsular Malaysia (Chang et al., 2020; Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Women, Family and Community Development, 2025).

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4.1. Pillar 1: Policy integration

Ageing policies in Sabah must be localised and culturally adaptive. Urban centres such as Kota Kinabalu require age friendly transport, accessible digital services, and supported housing options, whereas rural districts including Nabawan, Tenom, and Pitas require mobile health clinics, intergenerational caregiving cooperatives, and village-based wellness hubs. These differences show why Sabah needs geographically and culturally specific ageing policies rather than uniform national guidelines.

Sabah does not yet have a dedicated state level ageing policy, and federal frameworks retain a Peninsular emphasis without explicit attention to rural heterogeneity, Indigenous ageing norms, or geographic fragmentation in Sabah's settlement structure (Foresight Division, 2023). PTWEN reinforces the importance of state alignment to prevent widening geriatric access gaps between Peninsular and East Malaysia. Accordingly, this study proposes the establishment of a Sabah Ageing Masterplan embedded within the Sabah Maju Jaya development framework, supported by district specific priorities in rapidly ageing or infrastructure poor districts such as Sandakan, Nabawan, and Beaufort. Legislative mandates should require elder well-being integration into municipal plans and budget cycles, and age friendly planning codes should be adopted from WHO guidance and Malaysia specific frameworks to embed universal design, modular neighbourhood planning, and participatory ageing interventions (WHO, 2007; Ismail et al., 2024). Each local council should institutionalise an Ageing Liaison Officer who coordinates policy translation and inter agency reporting across social welfare, public health, and municipal planning. These measures align with whole of government principles and address Sabah's lack of federal eldercare facilities and uneven rural access (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023; Chang et al., 2020).

4.2. Pillar 2: Workforce and care economy resilience

National foresight frameworks identify a vocational blind spot in ageing related training and weak planning for informal caregiving systems (Foresight Division, 2023). Sabah faces an even more critical situation because many districts lack basic geriatric, physiotherapy, and rehabilitation services (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023). This uneven distribution creates structural inequity between Peninsular states that have geriatric wards and rehabilitation centres and Sabah which does not.

To strengthen resilience, Sabah should introduce eldercare certification and digital ageing management within its technical and vocational education colleges, particularly those serving rural districts. Micro credential pathways should recognise and professionalise informal carers, especially women in rural and faith-based communities. Care based entrepreneurship could be stimulated through incentives for cooperatives and NGOs to deliver mobile care services, elder day care centres, and social enterprises that employ active seniors, which aligns with Silver Economy recommendations (Khazanah Research Institute, 2021; World Bank, 2020). Policies should also support lifelong learning and digital upskilling to enable older adults to remain economically active, while business incentives should encourage retention and hiring of older workers in sectors such as crafts, tourism, caregiving, and agro processing.

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4.3. Pillar 3: Data and governance infrastructure

Sabah's most critical preparedness gap is the absence of reliable district level and age disaggregated data, which restricts service targeting, risk modelling, and cost-effective planning (Department of Statistics Malaysia, 2023; Foresight Division, 2023). The study proposes a Sabah Ageing Data Dashboard that tracks demographics by district, ethnicity, income, and health status, supported by privacy governed integration with platforms such as MySejahtera and local clinic systems. Geo mapping of ageing risk zones using GIS should overlay health access, disaster risk, and mobility gaps to guide targeted interventions. Community ageing profiles should be developed through partnerships with NGOs and village leadership to record housing status, family proximity, and care preferences. Digital equity infrastructure remains essential, including broadband expansion, elder oriented digital literacy programmes, and mobile outreach in interior districts, as digital empowerment improves health monitoring and reduces isolation (Ab Rahman et al., 2023). A biannual State of Ageing in Sabah Report should integrate dashboard analytics with community feedback and feed into scenario planning and budget advocacy, consistent with anticipatory governance recommendations (UN ESCAP, 2022; Transitioning Futures, 2025).

5. Discussion

Sabah's demographic trajectory toward an ageing society by 2040 positions it at a critical policy juncture. While Malaysia's federal frameworks acknowledge ageing as a national concern, Sabah remains structurally underprepared due to fragmented governance, rural service disparities, and institutional neglect of age-specific planning. This section interprets the findings of the Smart Ageing and Wellness Framework in light of regional benchmarks and localised needs, offering a grounded path forward. This aligns with recent commentary noting that Sabah lacks federal long-term care institutions such as *Rumah Ehsan* and *Rumah Seri Kenangan*, which remain concentrated in Peninsular Malaysia (Chang et al., 2020).

5.1. Ageing in Sabah as a distinctly rural challenge

National scenario analyses caution that rural and Indigenous older adults will remain excluded if ageing interventions are not rebalanced towards territorial equity (Foresight Division, 2023). In Sabah, geriatric rehabilitation and mental health services are scarce across rural areas, which leaves elders vulnerable to preventable conditions such as sarcopenia, falls, and post stroke complications (Abdullah et al., 2024; Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023). Ministry of Health Malaysia (2023) notes severe specialist shortages and weak rehabilitation capacity, reinforcing the urgency of mobile outreach and community-based care designs. International rural ageing systems, including village health volunteer models in Vietnam and Thailand, demonstrate the viability of decentralised and culturally embedded care networks, which Sabah could adapt through Kadazan Dusun, Bajau, Murut, and other village structures (UN ESCAP, 2022).

5.2. Policy gaps and institutional invisibility

Sabah's limited representation in national planning reflects persistent federal state coordination gaps. Core frameworks such as the Health White Paper and the Senior Citizens Action Plan do not specify East Malaysian implementation pathways, which

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leaves Sabah without clear institutional mandates or budget anchoring for ageing needs. PTWEN emphasises decentralised readiness, yet Sabah lacks state level governance structures to operationalise this direction. The continued absence of federal long term care facilities in Sabah further illustrates institutional neglect (Chang et al., 2020).

5.3. Care economy potential and labour policy blind spots

Sabah's development strategies prioritise tourism, agriculture, and infrastructure, but population ageing presents a significant care economy opportunity. International evidence shows that eldercare entrepreneurship and senior labour reskilling can become formal economic sectors when supported by workforce pipelines and incentives. In Sabah, a lack of TVET pathways for eldercare and accelerating youth outmigration increase reliance on informal carers, mainly women, while professional geriatric and rehabilitation services remain minimal (Foresight Division, Ministry of Economy Malaysia, 2023; Ministry of Health Malaysia, 2023). Without targeted investment, risks of chronic illness, care dependency, and social isolation will intensify (WHO, 2015; Abdullah et al., 2024). Community based rehabilitation models such as mobile units and neighbourhood outreach should therefore be prioritised.

5.4. Ageing in place and environmental design gaps

Age friendly planning requires integrated mobility, walkability, safety, and social connectivity. Evidence indicates that older adults are more likely to remain at home when neighbourhoods are accessible, safe, and close to key amenities (Ismail et al., 2024). In Sabah, local planning guidelines rarely incorporate universal access or elder friendly standards, particularly in peri urban and rural towns. International case studies in the WHO guide show the feasibility of compact pilots such as clinic centred age friendly zones, which Sabah's smaller municipalities could implement with lower cost than mega city retrofits (WHO, 2007).

5.5. Digital ageing without infrastructure risks exclusion

Smart ageing interventions assume a minimal digital baseline. Sabah's digital divide, especially in interior districts, limits telehealth adoption and reduces the usability of apps such as EZmedZA (Ahmad et al., 2022). Asian Development Bank (2021) confirms low digital readiness among rural seniors due to both connectivity deficits and limited literacy support. Sabah therefore requires foundational broadband rollout, elder friendly training, and intergenerational mentoring models before digital care systems can be equitable.

5.6. Governance and data integration failures

Static, siloed, and aggregated ageing data constrains Sabah's planning precision (Foresight Division, 2023). Effective governance requires geo tagged and cross sector datasets that connect demographic change with disease burdens, income profiles, transport gaps, and service uptake. International templates such as South Korea's Ageing Index Mapping and British elder vulnerability indices indicate how predictive analytics can guide localised interventions (Buffel et al., 2018, Kim & Choi, 2019). However, Sabah still lacks a state data coordination mechanism, leaving it dependent on national systems that do not capture local realities despite PTWEN's call for data integration.

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6. Limitations and Future Research

This study is primarily conceptual and policy oriented, relying on qualitative desk research that synthesises open access literature, national policy documents, media reports, demographic data, and comparative international models. While this approach is appropriate for strategic framing and for identifying structural, territorial, and institutional gaps in Sabah's ageing preparedness, several limitations must be recognised. The reliance on secondary sources reflects the broader fragmentation of ageing data in Malaysia, a challenge highlighted in national reviews which note that state-level ageing indicators, particularly for East Malaysia, remain sparse, uneven, and inconsistently updated (Chang et al., 2020). This constraint limits the precision with which Sabah's district-level, ethnic-specific, and rural ageing realities can be analysed, and it reinforces the need for improved data systems and field-based enquiry to advance the evidence base.

A major limitation of the study is the absence of primary field data. This phase did not incorporate interviews with policymakers, health professionals, community leaders, older adults, or caregivers, and it did not include ethnographic observation or community-based mapping exercises. These omissions restrict the study's ability to validate how different ethnic groups, rural communities, and coastal populations in Sabah experience ageing within their social, cultural, and environmental contexts. Hamid (2016) notes that ageing patterns in East Malaysia are strongly shaped by cultural identity, family structure, and land-based attachments, and without community-level perspectives, these nuances cannot be fully integrated into the proposed framework. Future research should therefore adopt participatory action research methods that involve older persons, village heads, local NGOs, and service providers across interior and urban districts to generate grounded insights that complement the policy-level analysis.

A second limitation relates to the absence of cost modelling and infrastructure feasibility analysis. Although this study outlines strategic recommendations such as mobile health clinics, digital literacy hubs, and geriatric rehabilitation infrastructure, it does not examine the financial implications of such interventions. Sabah's fiscal constraints, coupled with its limited access to federal long-term care institutions that exist only in Peninsular Malaysia, necessitate careful modelling of capital and operational costs to ensure realistic implementation (Chang et al., 2020). Future studies should incorporate budget scenario analyses aligned with the Sabah Maju Jaya development blueprint and state-level health and social welfare priorities to assess the fiscal sustainability of proposed ageing interventions.

Another limitation concerns the lack of validated health outcomes. The Smart Ageing and Wellness Framework assumes that integrated services, improved governance, and enhanced community support structures will generate positive effects on health, functional ability, and quality of life. However, Sabah currently has limited empirical data regarding rehabilitation outcomes, digital health uptake, functional decline trajectories, or ageing-in-place metrics. Reports indicate that many older adults in Sabah lack access to rehabilitation and geriatric services, but outcome-oriented studies remain scarce (Abdullah et al., 2024). Future research should therefore implement small-scale pilot programmes such as mobile physiotherapy units or digital monitoring kiosks, and pair these initiatives with longitudinal tracking of indicators such as hospitalisation rates, mobility outcomes, cognitive function, digital engagement, and self-reported well-being.

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Cultural diversity presents an additional analytical challenge that requires deeper ethnographic investigation. Sabah's pluralistic society comprises multiple ethnic groups, including Kadazan-Dusun, Murut, Bajau, Rungus, and Chinese communities, each of which possesses distinct norms, caregiving patterns, and expectations for ageing. As Hamid (2016) emphasises, cultural context significantly influences ageing attitudes, family support structures, and preferences for institutional versus community-based care. Without district-level qualitative data, it is not yet possible to determine which components of the Smart Ageing and Wellness Framework require cultural adaptation. Future research should therefore employ ethnographic fieldwork, cultural mapping, and community dialogues to ensure that policy recommendations are culturally resonant and socially accepted across Sabah's heterogeneous communities.

Finally, while this study references international models from Japan, South Korea, Thailand, Ireland, and Canada, the comparative analysis remains illustrative rather than systematically benchmarked. The absence of formal comparison reduces the analytical strength of cross-national learning. Consistent with the recommendations of the Foresight Division (2023), future research should integrate structured comparative methodologies such as Delphi expert panels, ageing-readiness scoring systems, or scenario modelling to test the feasibility, scalability, and contextual transferability of international practices to the Sabah context. Such methods would strengthen the empirical robustness of regional policy adaptation and support the development of a more precise anticipatory governance model for East Malaysia.

Overall, these limitations do not diminish the value of the study's conceptual contributions, but they indicate the need for future research that incorporates primary data, ethnographic depth, fiscal modelling, outcome validation, and systematic international benchmarking. These additional layers of analysis will be essential for transforming the Smart Ageing and Wellness Framework into an empirically grounded, locally adaptive, and operationally feasible policy roadmap for Sabah's demographic future.

7. Policy Implications

The findings of this study reveal a series of structural policy implications that are critical for shaping Sabah's ageing preparedness as the state moves toward aged-region status by 2040. The evidence demonstrates that demographic ageing in Sabah is shaped by intersecting territorial, cultural, infrastructural, and institutional factors that differ substantially from those in Peninsular Malaysia. These regional characteristics have created systemic blind spots within national ageing frameworks, which were primarily designed with Peninsular assumptions regarding population density, service coverage, and infrastructural readiness. As a result, policy mechanisms that function effectively in Peninsular Malaysia may not translate directly to Sabah's rural, geographically dispersed, and culturally diverse conditions, thereby necessitating territorially differentiated strategies that specifically address East Malaysia's demographic realities.

A key implication concerns the need for territorial equity in ageing policy design. National ageing frameworks such as the National Policy for Older Persons (2011), the Senior Citizens Action Plan 2023–2030, and PTWEN 2026–2030 were developed as uniform national strategies and did not explicitly account for the socioeconomic and geographic heterogeneity of East Malaysia (Ministry of Finance Malaysia, 2025). This oversight has resulted in policy prescriptions that inadequately address Sabah's spatial challenges,

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including its dispersed settlement patterns, limited transportation networks, and distinct ethnic and Indigenous demographic structures. As noted by UN ESCAP (2022), ageing policies must be locally adaptive to be effective in regions where demographic transition interacts with territorial inequity, indicating that Sabah requires a differentiated approach that reflects local realities rather than a standardised model.

Another significant implication relates to the importance of localised geriatric and rehabilitation infrastructure. Evidence from Chang, Pazim and Mansur (2020) and media analyses from Asian Development Bank (2021) consistently highlight that specialist geriatric wards, rehabilitation units, and long-term care facilities remain concentrated in Peninsular Malaysia, leaving Sabah without the foundational healthcare infrastructure required to manage its rapidly ageing population. This uneven distribution perpetuates longstanding health system inequities and limits Sabah's capacity to support preventive, rehabilitative, and long-term care needs. Without targeted investment in geriatric services, rural and semi-rural elders remain at heightened risk of functional decline, unmet health needs, and dependency.

Workforce and care economy alignment also emerges as a critical policy consideration. Sabah faces extensive youth outmigration to Peninsular Malaysia and neighbouring countries, reducing the availability of younger labour that typically supports formal and informal caregiving roles. This demographic shift intensifies reliance on untrained family caregivers, particularly women, who disproportionately shoulder the burden of eldercare (Rashid et al., 2022). As the ageing population expands, the combined effects of labour shortages and informal caregiving norms will constrain service availability unless strategic interventions such as reskilling programmes, community-based care cooperatives, and silver economy initiatives are introduced. These findings align with international evidence showing that the care economy must evolve in parallel with demographic change to ensure sustainable eldercare systems (World Bank, 2020).

The findings also indicate that ageing-in-place strategies require contextual adaptation to Sabah's built environment. While ageing-in-place is a central principle of the WHO Age-Friendly Cities model, municipal planning practices in Sabah do not yet incorporate universal accessibility standards, age-friendly design codes, or mobility-supportive neighbourhood planning (Chang et al., 2020; WHO, 2007). This gap is particularly problematic in semi-rural and Indigenous settlements where housing structures, terrain, and land tenure systems differ substantially from urban Peninsular contexts. To be effective, built environment interventions must therefore be recalibrated to reflect Sabah's settlement patterns and cultural landscapes.

Digital care systems represent another important policy domain. Smart ageing frameworks rely heavily on digital infrastructure, including broadband coverage, mobile device availability, and digital literacy among older adults. However, rural Sabah continues to face limited broadband penetration and persistent digital divides. Studies by Ahmad et al. (2022) and Hepburn et al. (2025) show that without foundational technological access, digital health tools such as telemedicine, remote monitoring, and mobile health applications risk exacerbating exclusion rather than reducing disparities. Effective digital ageing strategies must therefore prioritise infrastructure development and elder-focused digital literacy initiatives before large-scale technological interventions can be deployed.

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The integration of ageing-related data emerges as a fundamental governance requirement. Sabah currently lacks interoperable, district-level datasets that document the distribution, health status, functional needs, or socio-economic conditions of its older population. This absence significantly limits the state's ability to conduct forecasting, allocate budgets, design targeted interventions, or participate meaningfully in national foresight modelling (Foresight Division, 2023). The development of geo-referenced data systems and interoperable digital platforms is thus essential for supporting anticipatory governance in Sabah's ageing sector.

Finally, cross-sector coordination plays a decisive role in determining policy effectiveness. Ageing governance in Malaysia is currently distributed across multiple ministries and agencies, including the Ministry of Health, Ministry of Women, Family and Community Development, local governments, and social welfare departments, with limited mechanisms for horizontal or vertical integration. Institutional fragmentation weakens policy coherence and often results in duplication, service gaps, or inefficiencies. Strengthening coordination across health, social welfare, digital infrastructure, labour, and local government systems is therefore crucial for ensuring that ageing policies are implemented effectively and equitably across Sabah's diverse regions.

Taken together, these policy implications emphasise the need for a territorially responsive, institutionally coordinated, and strategically integrated approach to ageing governance in Sabah. Without such reforms, demographic ageing is likely to exacerbate existing inequalities and strain already limited state capacities.

8. Conclusion

Sabah's movement towards an aged society by 2040 exposes significant blind spots in Malaysia's ageing governance. Although federal plans increasingly acknowledge demographic ageing as a national priority, evidence reviewed here shows that Sabah faces a distinctive combination of structural constraints, including geographic dispersion, uneven service distribution, digital and health access gaps, and the absence of localised geriatric infrastructure. These conditions differentiate Sabah from Peninsular states and show why uniform national strategies are insufficient for East Malaysia.

The Smart Ageing and Wellness Framework proposed in this paper integrates global literature, national policy directions, and Sabah specific demographic and infrastructural evidence into three pillars, namely policy integration, workforce and care economy readiness, and data governance infrastructure. The framework does not prescribe a single programme but rather clarifies that ageing preparedness depends on coherence across these pillars and on aligning demographic realities with institutional capacity.

As a conceptual and desk-based analysis, this study identifies structural patterns rather than evaluating specific interventions. Even so, it demonstrates that Sabah's ageing trajectory cannot be understood without attention to rurality, cultural heterogeneity, and spatial inequalities in health and digital infrastructure. These factors will shape the feasibility, inclusiveness, and sustainability of any ageing intervention.

Ultimately, this work supports a growing scholarly position that Malaysia's ageing governance must move beyond uniform national templates towards territorially differentiated approaches. By outlining Sabah's readiness gaps and their systemic drivers, the paper provides a grounded foundation for future empirical research, including district

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level fieldwork, policy simulations, and participatory consultations, to strengthen Sabah's capacity for anticipatory and context sensitive ageing policy development.

Ethics Approval

Ethics approval is not applicable to this study because the research relies exclusively on secondary data sources, including publicly accessible policy documents, government reports, academic literature, and international frameworks. No primary data were collected, and the study did not involve human participants, interviews, observations, or the handling of sensitive or identifiable information.

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Conflict of Interest

The authors declare that there are no conflicts of interest, whether financial, institutional, or personal, that could have influenced the conception, analysis, or interpretation of this study. All assessments, critiques, and interpretations were carried out objectively in accordance with established academic standards for public policy research.

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