

A Review of Regulations and Standards for Long-Term Care Facilities: A Case Study of Thailand

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Received 21/12/2024 Revised 14/1/2025 Accepted 21/5/2025

Abstract

The ageing population is significantly elevating the demand for long-term care facilities for older people. Beyond health care services, the environment is important to improving the quality of life for elderly individuals. Long-term care facilities can be classified into various categories, including day care centers, assisted living, nursing homes, and hospices. Developed countries generally possess regulations and standards specific to various models, however Thailand has a singular, comprehensive regulation applicable to all facility types. The aim of this project aims to develop environmental standards specific to Thailand's contexts. The study entailed the examination and comparison of regulatory structures and environmental standards from ten developed nations, concentrating on twenty-three government-issued documents. The results indicate that standard documents offer more detailed and comprehensive information than regulatory writings and can be classified into six main categories. Thai regulations mostly focus on basic safety and are deficient in several detailed elements seen in international standards that advocate for comprehensive well-being. The study advocates for the improvement of Thailand's standards by augmenting current legislation to establish more comprehensive and interpretative rules. We expect that raising these criteria will markedly improve the quality of life for senior residents in long-term care institutions, providing them with conditions that promote privacy and dignity in their everyday existence.

Keywords

Long-term care facilities; Nursing homes; Regulations, Standard; Environment

1. Introduction

By 2030, 30% of Europe's population will be aged 60 or older, with individuals aged 80 and above representing the fastest-growing demographic (Honinx et al., 2019). Similarly, Asia is projected to become the world's most aged region, surpassing 4.9 billion elderly individuals. This demographic shift is supported by advancements in technology, the expansion of healthcare services, and improved access to high-standard medical facilities (Jayawardhana et al., 2023). Long-term care facilities for older people increasingly are important as they focus primarily on preserving and enhancing quality of life. Both the physical and social environments play a crucial role in the success of these facilities and the overall well-being of their residents (Kearney &

Winterbottom, 2006). Long-term care facilities are defined in this study as establishments that offer personal assistance with daily living activities, medical and nursing care for elderly residents, and round-the-clock services, operating every day of the week (Honinx et al., 2019).

Long-term care facilities vary widely in type due to differences in healthcare systems (Honinx et al., 2019). In the United States, there are various types of long-term care facilities, including nursing homes, residential care and assisted living, and intermediate care facilities for the developmentally disabled (Harrington et al., 2005). In Hong Kong, long-term care facilities are categorized into four types, which include nursing homes, care and attention homes, aged homes, and self-care hostels (Social Welfare Department, 2024). In Singapore, long-term care services include day care services, nursing homes, inpatient hospice palliative care services, and respite cares (Ministry of Health Singapore, 2025). The Thai regulations categorize care facilities according to the ministerial regulation on elderly or dependent care services, B.E. 2563, issued by the Ministry of Public Health. These are divided into three types: day care, residential homes, and nursing home (The Ministerial Regulation on the Designation of Elderly or Dependent Care Services as Other Businesses in Health Establishments B.E. 2020, 2020a). The environment in which individuals live affects their ability to live a healthy life (Tuckett et al., 2018).

This study examines the regulations and standards regarding the environment of long-term care facilities for elderly individuals with an Activities of Daily Living (ADL) score of 0-11 who require specialized medical and nursing care. It also considers the environment that supports the health and functioning of residents, promotes quality of life, enables staff to provide necessary care, and supports family satisfaction (Committee on the Quality of Care in Nursing Homes, Board on Health Care Services, Health and Medicine Division & The National Academies of Sciences, Engineering, Medicine, 2022). Table 1 illustrates that developed countries in various regions of the world, many already transitioned into aging societies, have established specific laws or standards concerning the environmental conditions for long-term care facilities of this type. These regulations also extend to other types of long-term care facilities, such as day care centers and residential homes. In contrast, Thailand has only a single standard in place, which applies universally to all three types of care facilities.

This creates an opportunity for research, enabling the exploration of global methods that could offer valuable perspectives on tailoring details to Thailand's circumstances, enabling senior citizens to lead fulfilling lives that align with their capabilities (The Ministerial Regulation on the Designation of Elderly or Dependent Care Services as Other Businesses in Health Establishments B.E. 2020, 2020a).

Table 1. The Regulations and Standards of Each Nation

Country	Population Ages 65 and Above (% of total population) 2023 (United Nations Population Division, 2024)	Types of Long-term Care Facilities	Regulations / Standards	Organization / Author
Singapore	13.1	Day care	Guidelines for Centre-Based Care	Ministry of Health
		Residential Home	Homes for the Aged Regulations	Ministry of Social and Family Development
		Nursing Home	Guidebook on Nursing Homes	Ministry of Health
Northern Ireland	19.24	Day care	Day Care Settings Minimum Standards	Department of Health, Social Services and Public Safety
		Residential Home	Residential Care Homes Minimum Standards	
		Nursing Home	Care Standards for Nursing Homes	
United States	17.43	Day care	Subject 111-8-1 Rules and Regulations for Adult Day Centers	Georgia Department of Community Health
		Residential Home	Subject 111-8-62 Personal Care Homes	
		Nursing Home	Subject 111-8-56 Nursing Homes	
Thailand	14.72	Day care	Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons, 2020	Ministry of Public Health
		Residential Home		
		Nursing Home		

2. Literature Review

Nursing facilities are an essential part of the long-term care continuum providing a setting where older adults and persons with disabilities receive critical services and support (Millar et al., 2024). Although Thailand has had long-term care facilities operating for several centuries, there are still no established care standards or a registration system for long-term care facilities (Sasat et al., 2017). It was not until 2020 that the Thai Ministry of Public Health began to enforce The Ministerial Regulation on the Designation of Elderly or Dependent Care Services as Other Businesses in Health Establishments of 2020 to ensure that long-term care facilities are regulated and supervised under the law (The Ministerial Regulation on the Designation of Elderly or Dependent Care Services as Other Businesses in Health Establishments B.E. 2020, 2020a). To ensure that care operations meet the required standards, the Ministry of Public Health simultaneously enforced The Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020.

Additionally, The Department of Public Works and Town & Country Planning, Ministry of Interior enforced the Ministerial Regulation Prescribing Facilities in Buildings for Persons with Disabilities and the Elderly (No.2) of 2021, an amendment to the original Ministerial Regulation Prescribing Facilities in Buildings for Persons with Disabilities and the Elderly of 2005. This regulation specifies the characteristics of building facilities for the elderly and persons with disabilities, such as parking spaces, ramps, stairs, restrooms, and more. The 2021 amendment further mandates that facilities providing care for the elderly must comply with this regulation.

It can be observed that environmental laws for long-term care facilities in Thailand come from various sources and have only recently been introduced; they also lack specific details to apply to long-term care facilities and various types of public buildings. If operators lack a thorough understanding of the environment in long-term care facilities, it would be difficult to determine the scope of interpretation and how to apply the regulations. Furthermore, Thailand does not yet have established environmental standards for long-term care facilities as a guideline for operators, unlike developed countries such as England, which has enforced the Care Homes Regulations since 2001 and 2002. England also published the National Minimum Standards for Care Homes Regulations in 2003.

Therefore, this study focuses on two types of environmental requirements for long-term care facilities: legal regulation documents; and standards documents. Table 2 displays the collection of documents from government agencies in several developed countries. It was found that legal regulation documents are open to interpretation, and most managers have a certain degree of discretion in their application (Cloutier et al., 2016). Conversely, legal regulations issue standards documents, which feature more detailed requirements. Depending on the type of document, preliminary categories can be identified as follows:

Type of Document: Legal Regulation

- 1) General
- 2) Registered Persons
- 3) Conduct of the Nursing Home
- 4) Premises
- 5) Management
- 6) Miscellaneous

Type of Document: Standards

- 1) Choice of Home
- 2) Planning for Individual Needs and Preferences
- 3) Quality of Life
- 4) Quality of Care and Treatment
- 5) Staffing
- 6) Conduct and Management of the Home
- 7) Concerns, Complaints, and Protection
- 8) Physical Environment

Environmental requirements focus on providing facilities that are suitable for the elderly. Both the exterior and interior of the buildings must be safe, clean, hygienic, and comfortable, in line with the key domains of quality of life as defined by Kane (2001), which include safety, security, and orderliness. The reviewed sources cover various environmental aspects that promote the good health of the elderly. We will analyse these requirements to identify useful issues and make recommendations for standards in Thailand.

Table 2. Long-Term Care Facility Regulations and Standards

Title	Type	Organization/ Author	Year	Country	Details
(A) Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020	Regulation	Department Of Health Service Support, Ministry of Public Health	2020	Thailand (THA01)	3 Categories 61 Items
(B) Ministerial Regulation Prescribing Facilities in Buildings for Persons with Disabilities and the Elderly of 2005	Regulation	Department of Public Works and Town & Country Planning, Ministry of Interior	2005	Thailand (THA02)	10 Categories 106 Items
(C) Ministerial Regulation Prescribing Facilities in Buildings for Persons with Disabilities and the Elderly (No. 2) of 2021	Regulation	Department of Public Works and Town & Country Planning, Ministry of Interior	2021	Thailand (THA03)	80 Items
(D) Healthcare Services (Nursing Home Service) Regulations 2023	Regulation	Ministry of Health	2023	Singapore (SGP01)	7 Categories 284 Items
(E) Guidebook on Nursing Homes	Guideline	Ministry of Health	2002	Singapore (SGP02)	16 Categories 414 Items
(F) Licensing Terms and Conditions on Nursing Homes Imposed Under Section 6(5) of the Private Hospitals and Medical Clinics Act (Cap 248)	Regulation	Ministry of Health	2015	Singapore (SGP03)	3 Categories 296 Items
(G) Code on Accessibility in the Built Environment	Code	The Building and Construction Authority	2019	Singapore (SGP04)	8 Categories 1,100 Items
(H) The Care Homes Regulations 2001	Regulation	The Secretary of State	2002	England (ENG01)	7 Categories 510 Items
(I) National Minimum Standards Care Homes Regulations	Standard	Department of Health	2003	England (ENG02)	7 Categories 963 Items
(J) The Nursing Homes Regulations (Northern Ireland) 2005	Regulation	Department of Health, Social Services and Public Safety	2005	Northern Ireland (NIR01)	6 Categories 460 Items
(K) Care Standards for Nursing Homes	Standard	Department of Health, Social Services and Public Safety	2022	Northern Ireland (NIR02)	5 Categories 1,131 Items
(L) The Nursing Homes Registration (Scotland) Regulations 1988	Regulation	The Secretary of State	1988	Scotland (SCT01)	17 Categories 170 Items
(M) National Care Standards Care Homes for Older People	Standard	Social Care and Social Work Improvement Scotland	2007	Scotland (SCT02)	4 Categories 309 Items
(N) The Care Homes (Wales) Regulations 2002	Regulation	The National Assembly for Wales	2002	Wales (WLS01)	7 Categories 497 Items
(O) National Minimum Standards for Care Homes for Older People	Standard	Minister for Health & Social Services	2004	Wales (WLS02)	8 Categories 404 Items
(P) 42 CFR Subpart B - Subpart B— Requirements for Long Term Care Facilities	Regulation	Department of Health and Human Services	1989	United States of America (USA01)	25 Categories 1,192 Items

Table 2. Long-Term Care Facility Regulations and Standards (continue)

Title	Type	Organization/ Author	Year	Country	Details
(Q) 105 CMR 150.00: Standards for Long-term Care Facilities	Regulation	Massachusetts Department of Public Health	2018	United States of America (USA02)	90 Categories 1,275 Items
(R) National Framework for High-Quality Care and Services for Older People	Guideline	Ministry of Social Affairs and Health	2001	Finland (FIN01)	5 Categories 11 Items
(S) National Aged Care Design Principles and Guidelines	Guideline	Department of Health and Aged Care	2024	Australia (AUS01)	4 Categories 221 Items
(T) Design Guidelines for Queensland Residential Aged Care Facilities	Guideline	Queensland Health	1999	Australia (AUS02)	3 Categories 316 Items
(U) The Strengthened Aged Care Quality Standards – Final Draft	Standard	Department of Health and Aged Care	2023	Australia (AUS03)	7 Categories 337 Items
(V) Code of Practice for Residential Care Homes for the Elderly June 2024 Revised Edition (2)	Code	Social Welfare Department	2024	Hong Kong (HKG01)	16 Categories 938 Items
(W) Standard of Scheduled Nursing Home	Standard	Department of Health	2019	Hong Kong (HKG02)	14 Categories 363 Items

3. Methodology

This study employed a qualitative research approach to address questions that require an understanding of the meanings and dimensions of human life experiences (Fossey et al., 2002). Qualitative research also facilitates the development of knowledge in healthcare areas that are poorly understood or complex (Buston et al., 1998). We utilized a document-based study method, collecting data from certified sources or documents produced by governments that are regulatory, strategic, or standard-orientated in nature (Hande et al., 2021). The focus specifically was on care in long-term care facilities.

The document search encompassed materials from Singapore, England, Northern Ireland, Scotland, Wales, the USA, Finland, Australia, Hong Kong, and Thailand. Figure 1 outlines the inclusion and exclusion criteria for the studied documents. The content was reviewed using key terms, including long-term care facilities, nursing homes, regulations, standards, environment, and older adults, which narrowed the scope to 23 documents. The definitions of the key terms used in the content review are as follows:

Long-term care facilities: Refers to facilities providing lifestyle-based care options designed to meet the care needs of older adults throughout the aging process, with the capacity to provide services for at least three months or more (Sasat et al., 2013).

Nursing homes: Refers to care facilities for older adults with chronic illnesses. These facilities typically provide skilled nursing care around the clock, as well as support for activities of daily living for older adults with physical and/or cognitive impairments (Sasat et al., 2013).

Regulations: Refers to legally binding documents, such as Acts, Regulatory Rules, or Directives issued by relevant authorities, which include specifications related to the environmental conditions of care facilities.

Standards: Refers to documents developed to establish guidelines or requirements for best practices, which include specifications for the environmental conditions of elderly care facilities, typically issued by governmental agencies.

Environment: Refers to the physical context that influences the well-being and health of older adults residing in care facilities, as well as the working conditions of staff. This may include aspects of spatial design.

In summary, this study focuses on collecting and analyzing information from government-issued documents in the form of regulations and standards related to the environmental conditions of long-term care facilities, specifically nursing homes, which primarily provide care for older adults.

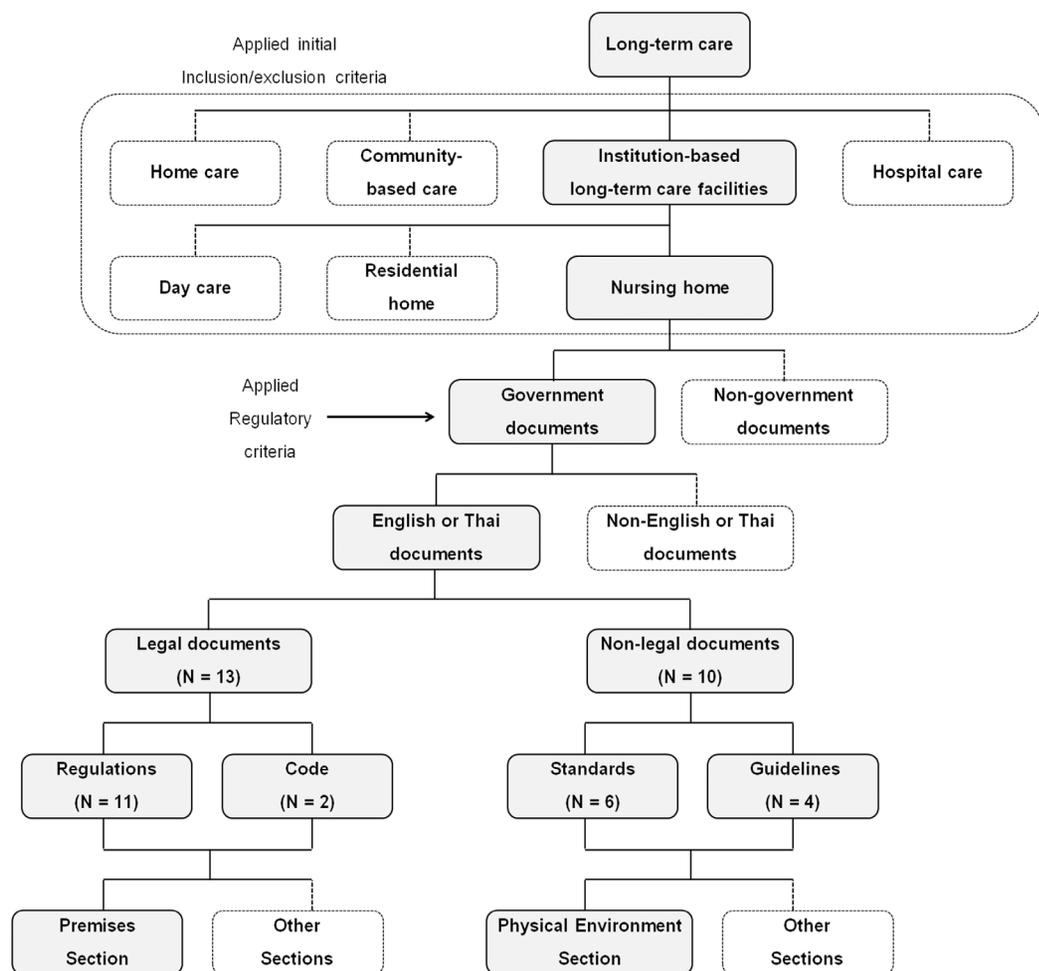


Figure 1. Inclusion and exclusion criteria

We categorized the regulatory texts and standards described above into two groups: the “environment section” and the “other sections.” Traditional content analysis was employed to establish codes, categorize themes, and define terms (Juangtrakool & Wongprasith, 2019) as shown in Table 3. Subsequently, a summative content analysis was conducted to interpret latent meanings embedded in the content or messages, focusing exclusively on interpretations supported by the textual data (Hande et al., 2021). The analysis also involved counting the number of environmental domains based on predefined codes, using an Excel spreadsheet (Hande et al., 2021) .

After the coding process was completed, the study highlighted the differences among the documents and reflected the prioritization of each domain identified within them. The findings were then analyzed and summarized to provide preliminary insights, which served as a foundation for guiding the development of future regulations and standards.

Table 3. Domains of Environment Section and Other Sections

Domains	Detail
Environment Section	
1. Location and Premises	Location, site, accessibility, utilities, public infrastructure
2. Building and Interior	The building characteristics, interior environment, and building components all are important factors to consider.
3. Share Facilities	Residents share common areas, which include dining areas, lounges, activity spaces, outdoor spaces, healthcare service areas, and bathrooms specifically located within or near these areas. This also includes equipment and furniture used collectively by residents in these shared spaces.
4. Accommodation	The facility offers a variety of resident bedrooms, encompassing single, double, and shared rooms, along with bathrooms situated either within the bedrooms or in an alternative location.
5. Service Area	Staff workspaces for resident services, such as offices, kitchens, infection control areas, laundry rooms, sluice rooms, dirty utility, storage and equipment rooms, and staff amenities.
6. Building Systems	Various building systems, such as elevators, emergency alert systems, nurse call systems, fire alarm systems, communication systems, lighting systems, and ventilation systems.
Other Sections	
1. General	Objectives, introductions, definitions
2. Registered Persons	Eligibility of registrants and appointment of managers
3. Conduct of the Nursing Home	Requirements for ensuring the quality of nursing and other services
4. Management	Project management and administration
5. Quality of Life	Approach to wellbeing where residents' social, emotional, spiritual, and psychological needs are met.
6. Quality of Care and Treatment	Care delivered in nursing homes must be of the highest quality, including general health care, recognition of the signs of dementia, and palliative care.
7. Staffing	Staff management in projects: qualifications and training
8. Concerns, Complaints and Protection	Complaints regarding services from residents and their relatives that must be addressed by the operator immediately
9. Miscellaneous	Price transparency, disclosure of costs, and penalties

4. Results

The literature review revealed that only three building-related authorities issued 23 documents: two documents from Thailand, namely the Ministerial Regulation Prescribing Facilities in Buildings for Persons with Disabilities and the Elderly of 2005, Ministerial Regulation Prescribing Facilities in Buildings for Persons with Disabilities and the Elderly (No. 2) of 2021, and one document from Singapore, the Code on Accessibility in the Built Environment. Most of the domains in these documents focus on building components, such as parking spaces, ramps, stairs, corridors, and facilities for the elderly and disabled. There is no mention of the Service Area domain.

As for the other 20 documents, although they provide fewer details on the environment compared to other areas (below 50%), they still comprehensively address environment domains, except for one Finnish document, which only mentions the Building and Interior domain. Figure 2 shows that approximately half of the documents (Hande et al., 2021) (10 in total) focus the most on the Service Area domain, often specifying areas related to infection control, cleanliness, and hygiene. For example, Singapore mandates the provision of an isolation room for symptom observation (Chuan, 2002). England requires that sluicing facilities be separate from the bathroom used by older adults (Department of Health, 2003). Meanwhile, the United States stipulates that laundry rooms must be distinct from areas designated for food storage, preparation, or serving (Department of Public Health, 2023).

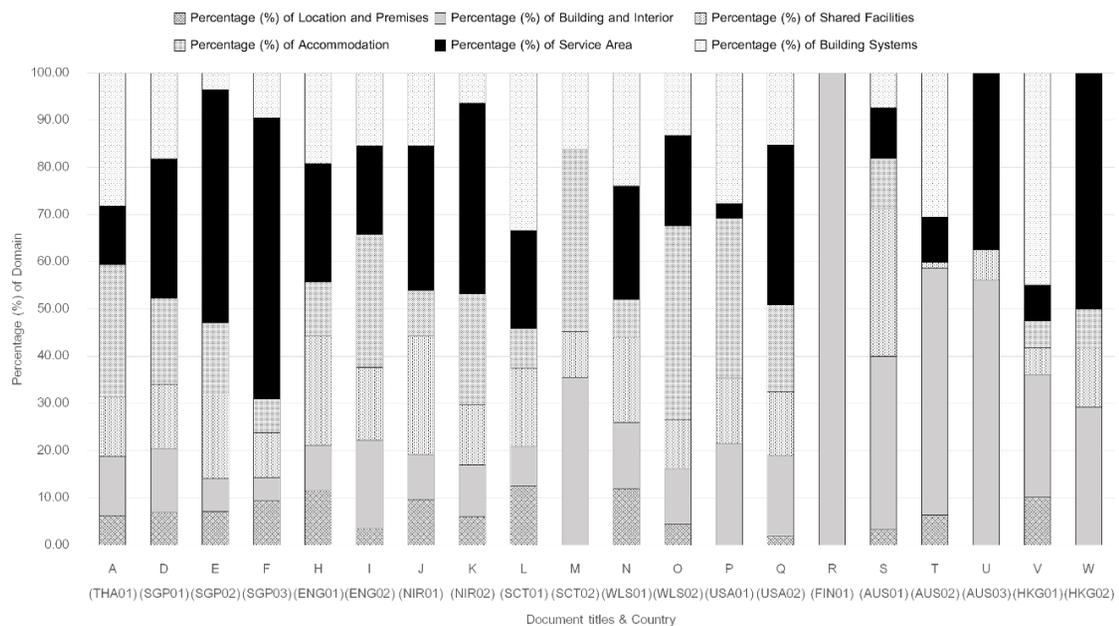


Figure 2. Percentage of domain in environment sections Note: for the document titles, see Table 2.

Furthermore, Figure 2 reveals that the Building and Interior domain (14.84%), which reflects the physical safety of the building, easy access to areas, and a suitable environment for the elderly, ranks just below Service Area (16.96%). In Scotland, it is mandated that a home is run in a way that protects residents from any avoidable risk or harm, including physical harm and infection (Scottish Government, 2007). In Australia, standards ensure free access to various spaces both inside and outside the building, including for elderly individuals with disabilities. The environment is designed to encourage movement, participation, and social interaction (Department of Health and Aged Care, 2023) while striving to avoid institutional features. It should reflect a homelike environment to facilitate the privacy of older adults (Queensland Health, 1999).

The Building Systems domain (11.87%) defines the building systems that promote safety for the elderly. The most commonly found specifications in the documents refer to fire safety. In Hong Kong, it is stipulated that if the total area of the building is less than 230 m², a fire detection system shall be provided for the Residential Care Home for the Elderly (RCHE). Smoke detectors or multi-sensor detectors shall be provided for the entire floor if any part of the floor is used for sleeping accommodation (Social Welfare Department, 2024). Additionally, nurse call systems are highly emphasized. In the United States, such systems are mandated to be installed beside each resident’s bed, as well as in bathrooms and shower rooms (Public Health, 42 C.F.R. Part 483 Subpart B, 1989).

The remaining domains are mentioned sparingly in the reviewed documents, particularly the Location and Premises domain, which pertains to the location of long-term care facilities. In England, it is stipulated that the location and layout of the home must be suitable for its stated purpose, and that it is accessible, safe, and well-maintained (Department of Health, 2003). It is rare for the documents to state that the facility should be located near public utilities or infrastructure, particularly hospitals. Only Singapore specifies that the facility should be easily accessible by public transportation (Chuan, 2002), while Australia states that it should be close to shops or connected to the nearby community (Department of Health and Aged Care, 2024).

The environmental domains reviewed not only address basic safety care standards (Hande et al., 2021) but also include the independence, dignity, and privacy of the elderly. For example, England, Northern Ireland and Hong Kong have specific requirements regarding the use of closed-circuit television (CCTV), restricting its use to entry (Department of Health, 2003) and exit areas, public spaces, and interview rooms (Social Welfare Department, 2024), with usage subject to compliance with legislation, guidance, and best practices in information management and human rights (Department of Health, Social Services and Public Safety, 2022). For the United States, in the case of shared rooms, they must accommodate no more than four beds, and each bed should have a curtain hanging from the ceiling to ensure complete visual privacy (Public Health, 42 C.F.R. Part 483 Subpart B, 1989). Similarly, Singapore mandates that sufficient bed partitions must be provided to protect the privacy of each patient (Healthcare Services (Nursing Home Service) Regulations 2023, 2023). Additionally, Wales allows elderly individuals to bring personal items, sentimental belongings, or furniture to decorate their private or common areas (Wales Statutory Instruments, No. 324 (W.37), 2002). Furthermore, Singapore specifies that toilets and bathrooms must have doors and partitions made from suitable materials to ensure adequate privacy (Chuan, 2002), while the United States requires that the number of toilets and bathrooms be appropriate to the size and needs of the facility (Department of Public Health, 2023).

Additionally, the communal spaces themselves are areas for meaningful activities that promote relationships and spiritual well-being, which are important for quality of life, especially for the elderly (Tsai et al., 2022). In the United States, Australia, and England, it is stated that various social, cultural, and religious activities can be organised (Department of Health, 2003), such as dining areas and lounges (Department of Health and Aged Care, 2024), group and individual activity spaces, and family visiting areas (Department of Public Health, 2023). This also includes outdoor spaces that are accessible to wheelchair users or individuals with mobility issues (Department of Health, 2003).

On the other hand, Figure 3 shows that only 14 documents fully identify environmental domains, consisting of nine legal documents and five standards documents. Among these, one is a Thai document, which identifies only 32 domains, similar to Scotland (24 domains). This stands in stark contrast to the other 10 documents, each identifying 50 or more domains, of which five are standards documents. This result reflects that standards documents tend to provide more detailed information on environmental domains.

Figure 3 reveals that the Thai documents prioritize the Accommodation domain, with eight out of nine domains detailing bathroom characteristics. Only one domain pertains to the sleeping area, requiring a minimum width of 90 cm between beds. In comparison, United States documents of the same type clearly specify 76 details for the Accommodation domain. Similarly, Singapore's standards documents set a minimum of 13 details. Examples include side clearance of at least 1.20 m from the bed, prohibition of opposite-gender residents sharing a room, and provision of basic amenities such as beds, mattresses, pillows, chairs, and appropriate lockers (Chuan, 2002). Additionally, for the Service Area domain, Thai documents lack a specific

area designated for staff. This suggests that Thai documents could incorporate more environment domains to enhance their comprehensiveness, facilitate easier interpretation and application, and better meet the needs of elderly individuals, staff, and visitors.

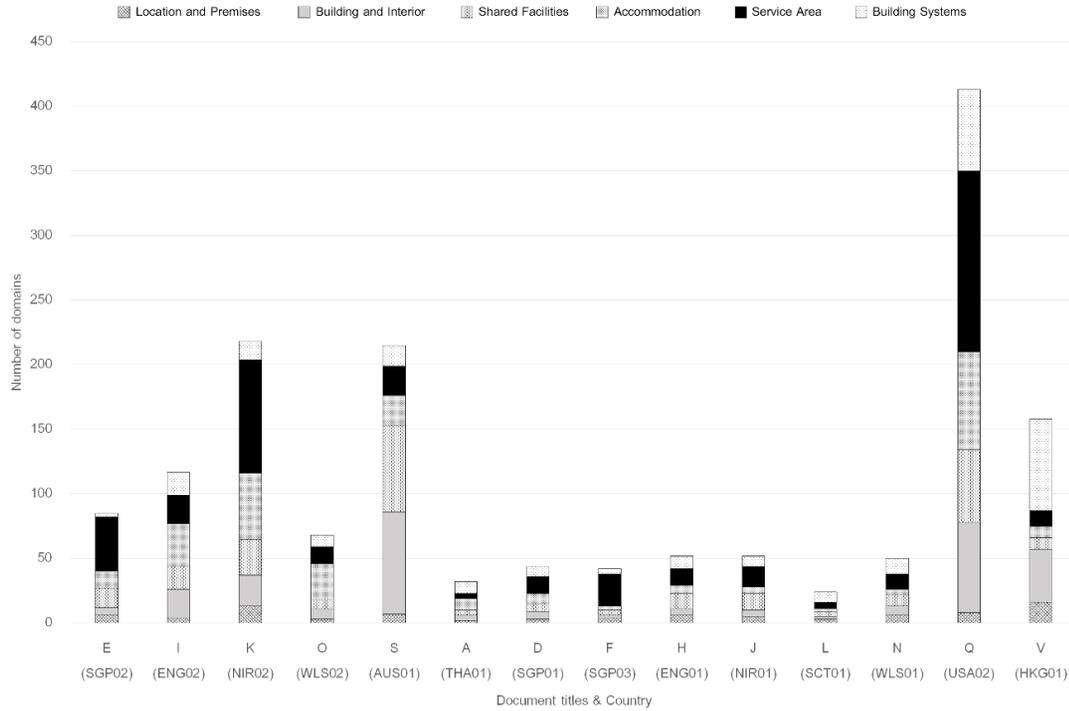


Figure 3. Number of environment domains Note: for the document titles, see Table 2.

However, the review of all documents shows that environmental domains are just one of many domains defined in the documents, as shown in Figure 4. The field of long-term care facilities consists of multiple areas of knowledge that work together to promote a better quality of life for the elderly. For Thailand, which has recently implemented the Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020, this marks the beginning of developing environmental standards to become more comprehensive, following the example of many other countries.

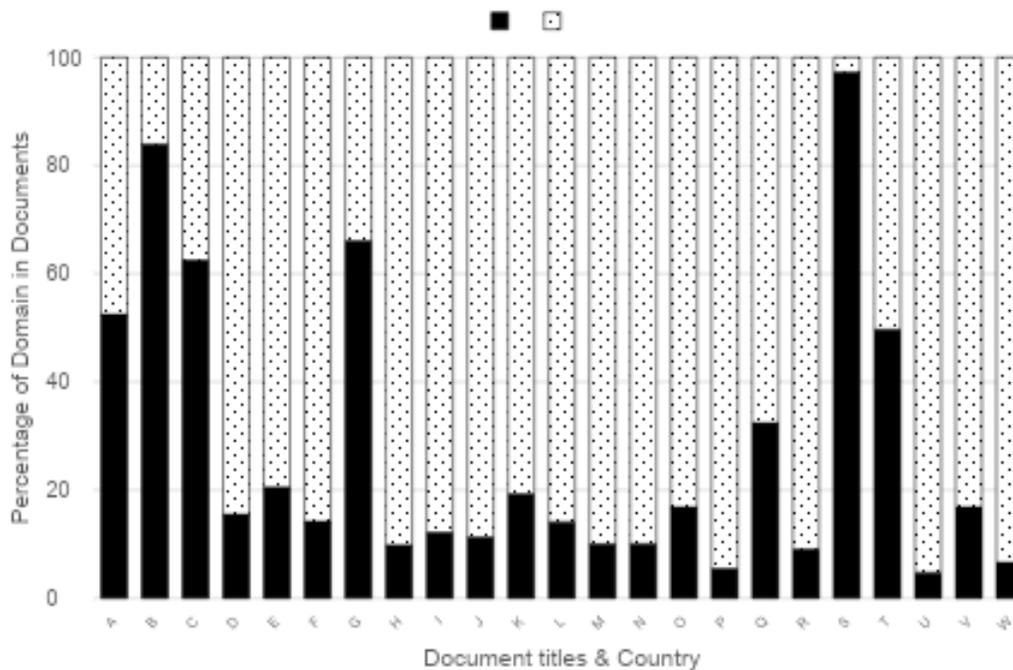


Figure 4. Percentage of domain in documents Note: for the document titles, see Table 2.

5. Discussion

Our review of the academic literature emphasizes that the context of environment domains has specific characteristics, such as safety, hygiene, and privacy, which are essential in settings where vulnerable individuals reside (Hande et al., 2021). However, the environment domain is just one of many domains included in regulation and standard documents, particularly in Thai documents. Therefore, it is necessary to develop the domain further. Our detailed analysis of the existing domains revealed that a promising framework of standards already exists, negating the need for a fresh start.

For our objectives, establishing standards could be a guideline for stakeholders in preparing an environment suitable for the elderly. However, it is not just about codifying the environment domains found in the laws or standards. Although we found regulations that cover all aspects of the environment domain, the analysis revealed that environment requirements in regulation documents often are vague or limited, usually addressing only basic environmental standards. These typically focus on safety and overlook factors affecting the quality of life, leading to environments that are overly institutionalised and severe (Zimmerman et al., 2001). Physically, nursing homes resembled hospitals, incorporating design features such as a nursing station, shared bedrooms and bathrooms, and staff in uniforms (Eijkelenboom et al., 2017).

In contrast, the requirements in standards documents are more explicit and detailed. This is clearly evident in the documents from England and Northern Ireland, where the environment domains in standards are 2.25 and 4.19 times greater, respectively, compared to those in regulation documents. These detailed standards provide clearer guidelines for environmental considerations, covering dimensions beyond safety. For example, Australia's standards documents avoid institutionalised environments and focus on creating a home-like setting. The primacy of "home" is central to residents' positive adaptation to living in a care home. This involves having the right to make choices about their lives and to take risks. Respecting people's basic human rights to dignity, freedom, and respect underpins good quality health and social care (O'Neill et al., 2020) .

We believe that if Thailand had environment standards documents similar to those of many other countries, it could effectively enhance the quality of life for the elderly. We suggest starting by examining the domains of developed countries, which could serve as a guide for adding more comprehensive details to each domain. Figure 5 compares Thai regulation documents with the standards documents of countries that fully cover all environment domains, highlighting the need for Thailand to develop environment standards in all aspects by building upon the existing regulation documents.

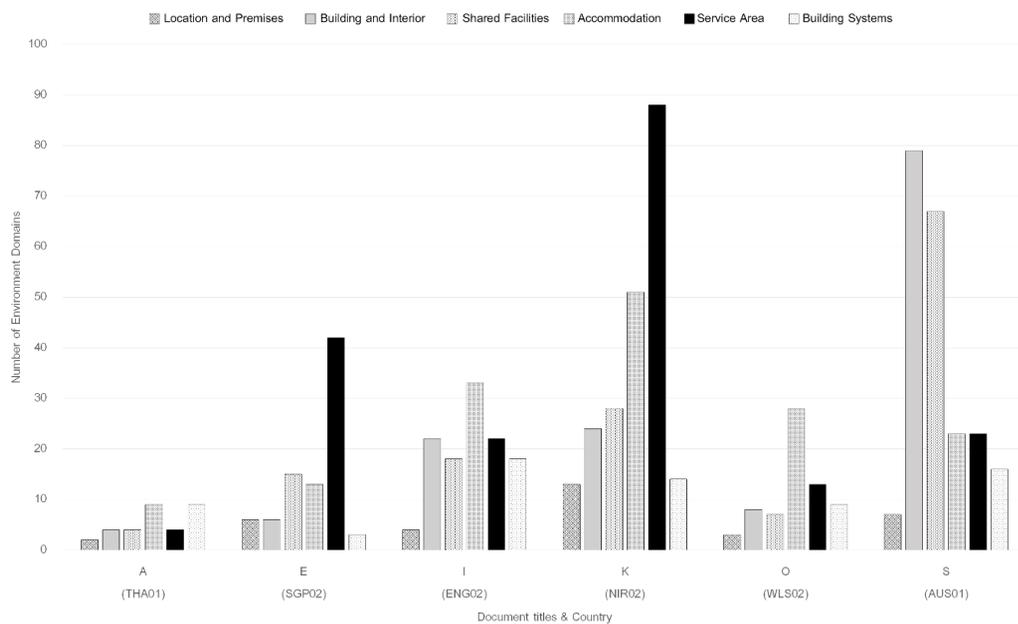


Figure 5. Comparing Thai regulation document with international standards Note: for the document titles, see Table 2.

Location and Premises: Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020 stipulates that facilities must be located in safe areas, free from nuisances, with convenient access, and designed to be appropriate for service recipients. Additionally, the facilities must comply with building regulations. These requirements align with international documents, such as The Care Homes Regulations of 2001 from England, which specify that the physical design and structure of facilities must meet the needs of service recipients, ensure structural stability, and be well-maintained.

Further considerations can be elaborated on specific aspects of these standards. Each facility shall be located on a site approved by the Department of Public Health. Sites should be away from nuisances such as large commercial or industrial developments or similar activities that produce high levels of noise or air pollution (Department of Public Health, 2023). Furthermore, they should be connected to nearby communities (Department of Health and Aged Care, 2024) to facilitate visits by relatives. Whenever possible, facilities should be situated in areas that allow for prompt hospital transfers in case of emergencies.

Building and Interior: Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020 specifies that hallways must have a minimum width of 90 cm, service areas must be clearly delineated, and cleanliness must be maintained. These requirements align with several international documents, such as the Healthcare Services (Nursing Home

Service) Regulations 2023 from Singapore, which state that facilities should provide sufficient space, wide hallways, and separate treatment areas from other zones to ensure convenience, safety, and privacy for older adults.

Further considerations include ensuring that elderly residents should have convenient access to both communal and private areas. Floors should be level and even with ramps and elevators provided. Handrails should be installed in hallways and areas prone to falls. The interior atmosphere should resemble a home, avoiding visually distracting floor and wall patterns as well as complex corridor layouts.

Shared Facilities: Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020 mandates the provision of communal spaces for diverse activities or recreational purposes. This aligns with the Healthcare Services (Nursing Home Service) Regulations 2023 of Singapore, which require at least one designated area for dining or recreational activities.

Additional considerations should be designated shared facilities separate from private rooms, including a dining area that also can serve as a social space, since dining involves diverse psychological, cognitive, and physical activities (Moore, 2005). A lounge area for relaxation and a private space for family visits also should be provided to accommodate increased family interactions (Wong et al., 2023). Physical spaces and equipment should be suitable for elderly residents and the activities offered. Additionally, there should be outdoor areas for the elderly to engage in activities.

Accommodation: Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020 specifies a minimum distance of 90 cm between beds and certain bathroom features, such as the installation of grab bars and toilets with a height of 45 cm. The specified bed spacing is comparable to the Guidebook on Nursing Homes from Singapore, which recommends a bed spacing of 1.20 m. The bathroom features align with the Code on Accessibility in the Built Environment from Singapore, which provides detailed guidelines on the design of bathrooms and shower facilities.

Additional considerations include ensuring there is at least two sides of free space adjacent to each bed to facilitate accessibility and care provision. Shared rooms must ensure privacy for elderly residents. Essential furniture, such as a bed, drawers, chairs, and a table, should be provided, with encouragement for residents to use personal belongings. Bathrooms must be provided in sufficient proportion and should not be shared with staff or visitors. Both bedrooms and bathrooms require a high degree of privacy, as this promotes physical health and psychological well-being (Kane & Cutler, 2015).

Service Area: Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020 stipulates that there must be units responsible for coordination, emergency alerts, facilitation, and other services. Proper management of waste, refuse, sewage, and other environmental health concerns must comply with relevant regulations. Additionally, there should be a pest control system based on hygiene principles and adequate infection control measures. Some of these requirements align with the 105 CMR 150.00: Standards for Long-Term Care Facilities (United States), which mandates proper sanitary procedures and equipment for managing all waste and refuse.

Further considerations include clearly distinguishing between clean and dirty areas to control the spread of infection. For example, clean linen storage, dirty laundry sorting, and washing areas (sluice room), should be considered and these areas should be located away from kitchens where food is prepared. There also

should be designated areas for staff, including both operational and rest spaces, as physical environments not only serve the needs of long-term services and support (LTSS) consumers but also promote desirable behavior and attitudes from workers, ultimately improving the well-being of the LTSS workforce.

Building Systems: Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020 requires adequate lighting and ventilation, safe electrical systems, and fire alarm systems. These regulations are in line with several international documents, such as the Code of Practice for Residential Care Homes for the Elderly of June 2024 Revised Edition (2) from Hong Kong, which specifies that facilities must have adequate lighting, heating, ventilation systems, and fire safety systems.

In addition to ensuring electrical safety, appropriate lighting for elderly residents should be prioritized. We recommend artificial lighting with a high Colour Rendering Index (CRI > 85) and a warm colour temperature of approximately 3300K (Department of Health and Aged Care, 2024). Ventilation systems should incorporate both natural and mechanical designs. Where possible, sound-absorbing materials should be used to minimise noise disturbances. Indoor temperatures must be maintained at a level comfortable for elderly residents. Additionally, nurse call systems should be installed near beds and in bathrooms to enhance safety and accessibility.

Comparing the documents from Thailand with those from several other countries reveals that Thailand's environmental standards need to be developed further to be more comprehensive. There are important challenges, particularly in ensuring the privacy of older adults within their rooms, bathrooms, and communal areas. Additionally, safety measures go beyond the installation of grab bars in bathrooms or the use of slip-resistant tiles; the focus also should be extended to controlling the transmission of infections from ill older adults to the healthy. Establishing observation rooms or designated areas could be one approach worth considering.

Moreover, specification of the number or size of various spaces in long-term care facilities is clearly outlined in several international documents, such as the number of bathrooms per bed or the size of communal spaces per person, to ensure they meet the needs of older adults. This poses a considerable challenge for Thailand, as many long-term care facilities existed prior to the enforcement of regulations, and many were converted from other types of buildings, such as single-family homes or row houses, which face more environmental limitations compared to newly constructed buildings. Therefore, environmental standards should differentiate between standards for new buildings and those for converted structures, as is the case in Northern Ireland (Department of Health, Social Services and Public Safety, 2022).

We anticipate that the development of this environmental standard will help stakeholders better understand the environment of long-term care facilities and enable them to prepare suitable environments and facilities. It is essential to consider whether the environment facilitates higher functioning or creates obstacles, as elderly residents, staff, and family members all share the same space (Cutler, 2007). This consideration will contribute to improving the quality of life for residents by keeping the "person" at the centre, which is a new trend in long-term housing development (Jarutach, 2023). However, this standard must be developed in a way that aligns with Thailand's context. If the standards are too stringent, it may result in high investment costs for operators, which could affect the elderly residents, many of whom rely on fixed incomes from social security, pensions, or retirement savings, that may not be enough to cover the rising costs of living, healthcare, and other unforeseen expenses (Tontisirin et al., 2024) .

6. Conclusion

This study highlights the importance of environmental standards in long-term care facilities, which serve as a crucial factor directly influencing the quality of life for older adults and affecting the well-being and efficiency of caregivers. Environmental standard frameworks in developed countries emphasize the importance of privacy, safety, and spatial adequacy in facility design—principles that could be adapted for implementation in the Thai context.

However, current Thai legal documents lack sufficient detail regarding environmental standards, focusing primarily on basic safety measures. The study reveals that regulatory frameworks from developed countries are more comprehensive, encompassing not only safety aspects but also promoting both physical and psychological well-being.

Therefore, this study underscores the urgent need for Thailand to develop standardized environmental guidelines for long-term care facilities. These standards would provide a framework for stakeholders to create environments better suited to the needs of older adults while aligning with the country's context. Key factors that should be incorporated into such standards include considerations for resident privacy, accessibility and comfort for older adults, homelike environments, infection control, and designated spaces for both caregivers and staff relaxation.

The development of these standards should be spearheaded by relevant governmental bodies, particularly the Department of Health Service Support, Ministry of Public Health, which issued the Ministerial Regulation Prescribing Standards for Physical Environment, Safety, and Services in Health Care Facilities for the Elderly or Dependent Persons of 2020. The formulation process must involve collaboration among various stakeholders, including long-term care providers, geriatric experts, architects, and residents themselves, to ensure that facilities effectively meet the needs of older adults. Moreover, a balance must be struck between regulatory requirements and the economic constraints of facility operators, ensuring that the standards are feasible and do not impose excessive financial burdens on the elderly population.

Ultimately, the establishment of comprehensive environmental standards for long-term care facilities in Thailand will contribute to enhancing the quality of life for older adults, improving the quality of care services, and fostering an environment that supports dignified aging. Future research should focus on differentiating standards between newly constructed facilities and renovated buildings to align with Thailand's unique physical and infrastructure constraints. Addressing these challenges will pave the way for better-designed facilities that maximize the potential of both residents and care staff, ultimately fostering an environment conducive to aging with dignity and quality care provision.

7. Acknowledgments

This project is funded by National Research Council of Thailand (NRCT) (N42A660999) and Center of Excellence in Universal Design, Faculty of Architecture, Chulalongkorn University.

Authors Contributions

Conceptualization, C.Y. and T.J.; Methodology, C.Y. and T.J.; Formal analysis, C.Y. and T.J.; Investigation, C.Y.; Investigation, C.Y.; Resources, C.Y. and T.J.; Data Curation; C.Y.; Writing - Original Draft, C.Y.; Writing - Review & Editing, C.Y. and T.J.; Visualization, C.Y.; Supervision, T.J.; Project administration, C.Y.; Funding acquisition, T.J. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

Parties interested in obtaining the data used in this research should submit a formal request to the Center of Excellence in Universal Design, Faculty of Architecture, Chulalongkorn University, Thailand.

Use of Generative Artificial Intelligence (AI) and AI-Assisted Technologies

During the preparation of this manuscript, ChatGPT and Quillbot were used to check the grammatical accuracy of the text. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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