

CADTH Health Technology Review

The Small House Model to Support Older Adults in Long-Term Care

Authors: Whitney Longstaff, Jody Filkowski, Melissa Severn

Acknowledgement: Bert Dolcine

ISSN: 2563-6596

Disclaimer: The information in this document is intended to help Canadian health care decision-makers, health care professionals, health systems leaders, and policy-makers make well-informed decisions and thereby improve the quality of health care services. While patients and others may access this document, the document is made available for informational purposes only and no representations or warranties are made with respect to its fitness for any particular purpose. The information in this document should not be used as a substitute for professional medical advice or as a substitute for the application of clinical judgment in respect of the care of a particular patient or other professional judgment in any decision-making process. The Canadian Agency for Drugs and Technologies in Health (CADTH) does not endorse any information, drugs, therapies, treatments, products, processes, or services.

While care has been taken to ensure that the information prepared by CADTH in this document is accurate, complete, and up-to-date as at the applicable date the material was first published by CADTH, CADTH does not make any guarantees to that effect. CADTH does not guarantee and is not responsible for the quality, currency, propriety, accuracy, or reasonableness of any statements, information, or conclusions contained in any third-party materials used in preparing this document. The views and opinions of third parties published in this document do not necessarily state or reflect those of CADTH.

CADTH is not responsible for any errors, omissions, injury, loss, or damage arising from or relating to the use (or misuse) of any information, statements, or conclusions contained in or implied by the contents of this document or any of the source materials.

This document may contain links to third-party websites. CADTH does not have control over the content of such sites. Use of third-party sites is governed by the third-party website owners' own terms and conditions set out for such sites. CADTH does not make any guarantee with respect to any information contained on such third-party sites and CADTH is not responsible for any injury, loss, or damage suffered as a result of using such third-party sites. CADTH has no responsibility for the collection, use, and disclosure of personal information by third-party sites.

Subject to the aforementioned limitations, the views expressed herein are those of CADTH and do not necessarily represent the views of Canada's federal, provincial, or territorial governments or any third-party supplier of information.

This document is prepared and intended for use in the context of the Canadian health care system. The use of this document outside of Canada is done so at the user's own risk.

This disclaimer and any questions or matters of any nature arising from or relating to the content or use (or misuse) of this document will be governed by and interpreted in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein, and all proceedings shall be subject to the exclusive jurisdiction of the courts of the Province of Ontario, Canada.

The copyright and other intellectual property rights in this document are owned by CADTH and its licensors. These rights are protected by the Canadian *Copyright Act* and other national and international laws and agreements. Users are permitted to make copies of this document for non-commercial purposes only, provided it is not modified when reproduced and appropriate credit is given to CADTH and its licensors.

About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

Questions or requests for information about this report can be directed to Requests@CADTH.ca

Table of Contents

Abbreviations	5
Key Messages	6
Context	6
Objectives	7
Research Questions	7
Methods	7
Literature Search	8
Synthesis Approach.....	9
Findings	9
Objective 1: Key Characteristics	9
Objective 2: Key Differences Compared With the Traditional Model	12
Objective 3: Outcomes	14
Objective 4: Issues, Challenges, and Lessons Learned	15
Limitations	17
Conclusions	18
Key Characteristics.....	18
Key Differences Compared With the Traditional Model	18
Outcomes.....	19
Issues, Challenges, and Lessons Learned	19
Final Remarks	19
References	20

List of Tables

Table 1: Inclusion Criteria	8
Table 2: Comparison of the Small House Model With the Traditional Model of Long-Term Care.....	9
Table 3: Differentiating Characteristics of the Small House Models.....	10

Abbreviations

ES	Environmental Scan
LTC	long-term care
QoL	quality of life

Key Messages

- The small house model of long-term care (LTC) is identified internationally by several model names. Although some differences exist between the characteristics of these models (e.g., number of residents, degree of resident freedom, facility design), there are 3 recurring components: functional units with a small group of residents, replication of familiar domestic routines, and some form of decentralized staff.
- The key philosophic difference between the small house model and the traditional LTC model is the heavy focus on person-centred care. This approach to care in the small house model is firmly rooted in freedom of choice and autonomy for the residents.
- Small house models eliminate the strict delineation of roles; staff at all levels are included in the decision-making process. Self-managed and universal work teams are prominent features of the small house model. Frontline staff with strong interpersonal skills are essential for successful implementation.
- No strong trend emerges from the literature with respect to the impact of the small house model on resident-centred outcomes compared with more traditional models of LTC. This is likely due to lack of consistency in the outcomes that are measured and variability among the different small house models. This finding is consistent with other reviews on the topic.
- Literature exploring the Canadian experience with small house models is limited. The majority of identified studies used data from the US or European jurisdictions, which potentially limits its generalizability to the Canadian context.

Context

The LTC industry has experienced a global culture change movement over the past 25 years.¹ This culture change, driven by concerns over quality of care, lack of personalization in operational procedures, and strictures on life for the residents in the traditional approach to LTC, has been accelerated by the recent COVID-19 crises, in which more than 59% of Canadian deaths were for residents of LTC facilities.² Through this movement, several alternative models of care have emerged to replace the traditional approach that used an institutional, medical model. Common themes of culture change models include individualized care; creating home-like environments; promoting close relationships among staff, residents, families, and communities; empowering staff to respond to resident needs and work collaboratively with management to make decisions about care; and the continuous improvement of quality.¹ Canada's population is rapidly aging and the proportion of residents older than 65 years is expected to increase by more than 60% in the next 20 years, and the proportion of those older than 75 years is expected to double.³ In light of this demographic shift, several jurisdictions are intensifying their efforts to evaluate the existing approach to care and identify areas for improvement. The "small house model" has been proposed as a potential solution to what are seen as the current pitfalls of traditional LTC facilities. Although there are several different names by which the small house model is referred, these all typically incorporate the common themes of culture change through a specific built design, functional units with fewer residents, and a person-centred approach to care. This Environmental Scan (ES) was conducted to help inform the decision-making on the adoption of the small house model in Canadian jurisdictions.

Through a review of the literature, this ES aims to gather and synthesize information on the small house model. This includes both Canadian and international examples in which the model has either been implemented or is being considered, as well as comparisons of the small house to the traditional model.

Objectives

The key objectives of the ES are as follows:

- identify examples of the small house model of LTC implemented in Canada and internationally and describe their key characteristics, including overall design, number of residents per home, philosophy and approach to care, services provided, staffing level, and funding approach
- summarize the key differences between the small house model and the traditional model of large LTC facilities, including benefits and disadvantages associated with these models
- summarize the main outcomes associated with the small house model for residents
- summarize the key issues, challenges, and lessons learned in implementation of the small house model in Canada and internationally.

Research Questions

This report aims to inform and address the following questions:

1. How is the small house model being implemented in Canada and internationally in the context of LTC for older adults?
2. What are the key characteristics of identified small house approaches (i.e., general design, approach, services provided to residents, and staffing level)?
3. How are existing small house approaches funded?
4. What are key differences, including benefits and advantages, between the small house model and the traditional LTC care model?
5. What are the main outcomes reported for residents associated with the small house model?
6. What are key issues, challenges, and lessons learned in the implementation of the small house model in Canada and internationally?

Methods

This ES was informed by a limited literature search using the inclusion criteria outlined in Table 1.

Literature Search

A limited literature search was conducted by an information specialist on key resources including MEDLINE, Embase, CINAHL, the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were models of care and LTC homes. No filters were applied to limit the retrieval by study type. The search was also limited to English-language documents published between January 1, 2016, and October 1, 2021.

Screening and Study Selection

One author independently screened 643 titles and abstracts for eligibility according to the inclusion criteria. Articles that were published in a language other than English were excluded. Study selection focused on identifying literature describing any of the small house models of LTC. The small house model of LTC is identified internationally by several model names. Accordingly, no exclusions were made on the basis of small house model type. Literature regarding any adult population requiring LTC was included; literature regarding LTC facilities for children was excluded. Literature on more traditional models of LTC was also excluded unless it provided comparison with the small house model of care. No exclusions were made on the basis of study design or jurisdiction. Ultimately, 70 publications were included. These publications reported information that was relevant to at least 1 of 7 domains that characterize the small house model: design, philosophy, organizational structure, funding, resident outcomes, staff outcomes, or model implementation. Many publications reported information across multiple domains.

Among the included publications, 6 separate small house models of care were identified: Butterfly (n = 10), clustered domestic (n = 4), Dementia Village (n = 4), Green Care Farm (n = 5), Green House (n = 25), shared housing agreement (n = 3), and “small house” (n = 31). Nearly half of the publications did not provide information on 1 specific model, but rather referred to the small house model more generally (generic perspective such as “small-scale,” “house-like,” “household,” and “small house”). Among the publications dedicated to a specific model, some models were addressed more comprehensively than others. Owing to a special issue of *Health Services Research* dedicated solely to the Green House model, nearly one-third of the included publications reported on this specific model. Note that no identified peer-reviewed information was identified on the Butterfly model; all information on this model came from grey literature sources.

Table 1: Inclusion Criteria

Component	Value
Population	Older adults who require long-term care
Intervention	“Small house” model of long-term care
Settings	Residential long-term care
Types of information	Literature search

Synthesis Approach

Findings from the literature search were summarized narratively. When summarizing the key characteristics of the small house approach outlined in objective 1, relevant findings were separated based on naturally occurring categories of information (i.e., design, philosophy, organizational structure, and funding). Findings related to subsequent study objectives were grouped similarly for consistency. As noted, the included literature referred to a variety of small house models of care; the term *small house model* was used throughout this ES for consistency. Individual models are named specifically in stand-out instances.

Findings

Objective 1: Key Characteristics

The small house model for LTC emerged from the culture change movement in the LTC industry.¹ This movement seeks the transition of LTC homes away from an institutionalized, medical model to a model based on a caring and compassionate living environment. The overarching goals of the small house model are to eliminate the institutional character of LTC homes, to encourage social interactions between care staff and residents, and to promote resident participation in daily living activities. The small house model aims to do this through careful consideration of the built design and philosophy of approach to care.⁴⁻⁷ Key aspects of the general small house model approach — with respect to design, philosophy, organizational structure, and funding — are itemized in Table 2 and discussed subsequently.

As noted previously, 6 separate small house models of care were identified. From the identified literature, there appear to be a few differentiating characteristics among these models; the key differentiators are summarized in Table 3. They all focus on a small number of residents living within a functional unit that strives to provide person-centred care to an aged population of residents. Notably, the Dementia Village and Butterfly models exclusively serve dementia residents. For the Green House and Butterfly homes, use of the model name is dependent upon paying a fee to an accrediting organization rather than enacting structural

Table 2: Comparison of the Small House Model With the Traditional Model of Long-Term Care

Model	Traditional model	Small house model
Number of residents	≥ 20 (residents per operational group)	6 to 20
Care model	Institutional or operational model	Person-centred model
Philosophy of care	Medical model	Quality-of-life model
Decision-making model	Top-down	Flattened hierarchy
Outdoor access	Usually prohibited or tightly controlled	Accessible to all residents
Approach to dining	Cafeteria style	Decentralized, resident inclusive
Living areas	Typically at the end of long corridors	Typically surrounded by bedrooms
Staff workstations	Centralized, well-defined, used to delineate institutional wards	Desks built into living areas of household

Source: Adapted from *Design Guide for Long-term Care Homes* 2018 Edition.⁸

or operational practices that significantly deviate from other nonregistered facilities.^{9,10} Uniquely, Dementia Villages and Green Care Farms set out to re-create living on a fully integrated societal level rather than just a house level.¹¹⁻¹³

Design

The common design tenet among the models is a residential ambience including private bedrooms and bathrooms, with common kitchen and living spaces contained in a unit that houses a small number of residents.⁷ Although the target number of residents varies between specific small house models and individual homes (see Table 3), publications reported resident counts from 5 to 20.^{9,11,13-16}

More resolved features of the small house model include a compact floor plan and layout; no long corridors; inconspicuous placement and out-of-sight storage for staff work areas (e.g., nursing stations), medical supplies, and equipment; and the use of personal furnishings and decor choices in private resident bedrooms.^{7,17,18} To further mimic a residential atmosphere and promote social interactions, the design should incorporate hierarchies of space with a mix of private, semiprivate, and public spaces.¹⁸ Additional environmental attributes, such as colour; lighting; and visual, tactile, and acoustic stimuli, should also be considered. For example, lighting intensities that do not interfere with circadian rhythms and sound decibels that are akin to residential levels, have been shown to have a positive impact on mood, behaviour, social interactions, and quality of life.^{8,19}

Another recommended feature of the small house models is access to outdoor spaces.^{7,20} These may be as diverse as having access to the required land and resources to perform agricultural activities, as demonstrated by the Green Farm and Dementia Villages models,^{11,13} to outdoor patios that may be adjacent to a cottage-style residence,²¹ to rooftop terraces on multistory facilities.²² If outdoor access is not possible, it is recommended that windows face the outdoors and plentiful natural light be incorporated.²² Finally, these LTC facilities are commonly embedded within existing residential neighbourhoods among houses,

Table 3: Differentiating Characteristics of the Small House Models

Model	Jurisdiction of implementation ^a	Number of residents	General characteristics
Butterfly	UK, Canada	8 to 12	Provides care for small groups of dementia residents
Clustered Domestic	Australia	≤ 16	Residents grouped in home-like settings
Dementia Village	Netherlands	6 to 8	Creates an entire society for dementia residents
Green Care Farm	Netherlands	6 to 8	Offers access to agricultural activities
Green House	US	10 to 12	Residents housed in small groups, often associated with a traditional legacy home
Shared housing agreement	Germany	6 to 10	Residents live in apartments, instead of LTC facilities
Small house ^b	Various	5 to 20	NA

NA = not applicable.

^aBased on jurisdiction of publication, unless otherwise stated.

^bMany publications did not report on a specific small house model, but rather reported from a generic perspective such as “small-scale,” “house-like,” “household,” and “small house.”

parks, schools, shopping, and so forth, to affirm that residents are still valued members of society.^{4,5,11,22}

Although these additional characteristics support the residential-like character of the small house model, practical restraints, such as space or budgets, often may dictate what design aspects are ultimately implemented. For example, the renovation of larger traditional homes may maintain a layout with a corridor, or new builds may use multistory buildings that limit access to outdoor space for residential units located on higher floors.²² As pointed out in 1 publication, the interpretation of subjective descriptors such as “home-like” or “residential character” may lead to different physical manifestations of built design between different models or even individual LTC of a single model.⁸

Philosophy

Small house models strive to provide resident-centred or resident-directed care; the central theme in this approach is maximizing the freedom of choice for, and autonomy of, the resident.^{4-6,23} The model eschews the rigid routines and instead favours flexibility that allows, and encourages, residents to engage in their daily living activities at will.^{5,24} Resident input is solicited as much as possible so that discussions around preferences occur.²⁵ For example, residents of small house models have the freedom to choose their own waking, bathing, eating, and sleeping schedules.^{4,21,26} They are afforded the opportunity to make their own dietary choices and participate in meal planning.^{21,25} Spontaneity is also encouraged with respect to the types and timings of social activities available to residents.⁴ The model fosters the development of strong personal relationships between residents and caregivers, which in turn, re-enforces the ideal of person-centred care.^{5,23,26,27} The overarching goal of this approach is to care for older adults with compassion and dignity, empowering them to be meaningfully engaged and take ownership of their care.^{11-13,24,28}

Organizational Structure

The small house model aims to provide a holistic approach to care including housekeeping, dietary, and clinical services.^{11,14,28} The medical and clinical services intend to match those provided by traditional care facilities; however, there is some indication that providing complex medical care within a setting designed to drive relationships and home-like care may be difficult.²⁹

Some models provide additional ancillary services outside of just person-centred care and medical support. The Dementia Villages of the Netherlands aim to re-create an entire cross-section of Dutch society. In these villages, resident cottages are placed among an assortment of other business such as markets, cafés, salons, and movie theatres, for example. Residents, their families, and other visitors can all use these services.^{11,12} Similar to Dementia Villages, Green Care Farms offer a more vertically integrated approach to care with the establishment of agricultural operations that involve residents in crop production.¹³

The caregiving staff of small house models are expected to provide living support over and above any health-related responsibilities (e.g., cooking, cleaning, grocery ordering, social engagement).^{4,30,31} Although the staff profile includes the usual positions – nurses, nursing assistants, housekeepers, and cooks – staff are typically cross-trained so that each is capable of executing a range of tasks.^{25,32} The exact staffing levels vary between the different facilities and locations and are influenced by the total number of residents in a home unit, the resident acuity, and any prevailing industry regulations.^{6,14,23}

Funding

Most publications that discussed the funding of the small house model were based in the US. These residents were usually privately funded; however, Medicaid programs provided at least partial funding for some residents.^{4,26} One study reported daily rates of US\$246 to US\$495 for accommodations in a small house facility.³³

Objective 2: Key Differences Compared With the Traditional Model

The small house model differs from the traditional large-scale model in terms of built design, number of residents, philosophy of care, organizational structure, and resident outcomes. Differences concerning the design, resident number, and philosophy of care are summarized subsequently; differences with respect to resident outcomes are described under objective 3.

Design

The physical design is arguably the most distinct difference between the models — small house models strive to create a home-like setting complete with house layout and features, whereas the traditional model more closely resembles a clinical institution.^{7,17,18} As an example, 1 qualitative study conducted in Belgium investigated the effect of architectural design of the small house model on residents and staff. Residents reported having easier access to all areas, increased movement, and more pleasant social dynamics due to the compact design of the small house model. Staff reported this design created a more relaxed and pleasant atmosphere, and that the compactness and fewer residents made it easier to manage their job (i.e., more flexibility, less stress, less haste).⁷ However, the closed unit and few number of people to interact with can also create a sense of isolation for residents or aggravate conflict.^{22,25} For example, it can be more difficult for disagreeing residents to avoid one another.³⁴ Additionally, staff have reported an increased emotional demand while working in the small house model.³⁵ Relationships between staff and residents may become so strong that new staff members have difficulties gaining acceptance among the residents.⁶

Philosophy

The key philosophic difference between the small house model and traditional LTC model is the heavy focus on person-centred care.^{4-6,23} Traditionally, LTC has followed an institutional-centred approach to care with a well-defined hierarchy and entrenched protocols.^{5,23,36} Person-centred care is firmly rooted in freedom of choice and autonomy for the residents.⁷ Therefore, the prescriptive routines are mostly removed, and residents become an empowered and active participant in their own care routines.²⁵ However, the degree of freedom must be carefully balanced with the needs of staff, safety, as well as the practical, logistical and operational constraints of running a complex facility.³⁴ For example, outdoor access frequently requires some degree of staff supervision. Since the ratio of residents to staff is always greater than 1, there may be instances in which a resident's choice for outdoor activities creates a safety concern for themselves or other residents.^{5,22,34} As another example, a mixed-methods, cross-sectional study that interviewed staff at a Green House home described a situation in which the lack of set scheduling caused inefficient use (i.e., wasted time) of highly skilled staff resources such as clinical therapists.⁴ Finally, the lack of dietary planning in 1 small house home caused food budget overruns due to inefficiency and waste.¹⁰

An additional consideration of complete resident empowerment in the small model is eliciting a proportional response from individual residents. Disparities between personality strengths, trust levels, and willingness to vocalize one's opinion may lead to some residents feeling ostracized while feeling that others have overpowered the household.²⁵

Organizational Structure

To support a shift to person-centred care, the small house model has had to re-envision the organizational structure of LTC.^{10,11,30,31} Traditionally, LTC homes installed a management hierarchy with set protocols and well-defined roles for individual staff members. Decision-making was exclusively led by management. In 1 instance, staff described the traditional LTC model as too restrictive and unethical to the care of the residents.²³

Small house models eliminate the strict delineation of roles; staff at all levels are included in the decision-making process.^{31,37} Staff in the small house model have reported having more job autonomy and feeling more empowered, more flexibility with less time pressure to complete their job,^{7,28,35} and a significantly lower workload and job demands compared with caregivers in the traditional model.^{30,31,35,38,39} However, whether this translates to higher job satisfaction and lower turnover for small house model staff is inconclusive because some studies report better outcomes for the small house model whereas others did not identify a significant difference.^{35,40,41} In the 2 studies that reported on wages — conducted in the US and Australia — wages did not differ significantly between the small house models and the comparator traditional LTC homes.^{32,42}

Although the homes based on the small house model are staffed with the same assortment of caregivers (i.e., job descriptors), numerous studies reported that a higher proportion of staff hours in the smaller homes tended to be from those in positions requiring less formal training (i.e., a higher proportion of certified nursing assistants providing care as opposed to registered nurses).^{14,32,42-44} In a direct comparison of 4 Australian domestic-clustered homes with 13 traditional LTC facilities, Harrison et al. (2018) found that care providers in homes based on the small house model spent significantly fewer hours per resident per day compared with the traditional model: degree- or diploma-trained nurses (mean = 0.23 [SD = 0.10] vs. mean = 0.85 [SD = 0.17]; $P < 0.01$) and allied health staff (mean = 0.02 [SD = 0.01] vs. mean = 0.15 [SD = 0.1]; $P = 0.042$). The authors also reported that personal care attendants provided more hours per resident per day in the domestic-clustered homes compared with the traditional LTC homes (mean = 2.43 [SD = 0.29] vs. mean = 1.74 [SD = 0.46]; $P < 0.001$). Similarly, the ratio of personal care assistants to nurses was higher in the domestic-cluster model the traditional model (mean = 91.91 [SD = 4.06] vs. mean = 66.02 [SD = 10.73]; $P = 0.003$). However, this difference did not seem to negatively impact level or quality of care because residents of the small home model received slightly more care hours per resident per day than residents in the traditional LTC homes (mean = 2.66 [SD = 0.35] vs. mean = 2.58 [SD = 0.44]; $P = 0.006$).⁴² This finding is in line with another study that reported that small house model staff outperformed staff from larger homes, spent 3 times to 6 times more time in personal care situations, and spent significantly more time in task-oriented interactions than traditional home staff.²⁶

Funding

Nearly all identified studies that discussed funding were based in the US. One study reporting on financial differences indicated that resident rates were cheaper in the traditional LTC homes than Green House comparators (mean = US\$7,588 [range, US\$5,100 to US\$12,020] vs. mean = US\$7,958 [range, US\$5,100 to US\$15,060]).⁴ Green Houses had more private paying residents (mean = 58.6% [range, 15% to 90%] vs. mean = 44.2% [range, 20% to 77%]) with a smaller percentage receiving Medicaid (mean = 40.7% [range, 0% to 78%] vs. mean = 54.0% [range, 23% to 75%]).⁴ One study that investigated the impact of small house model adoption on Medicaid spending and found a decrease of US\$509 per quarter in homes that had adopted a Green House model. This difference was caused in part by the fewer number

of skilled nursing-days and lower acute hospital spending reported by the Green Houses.⁴³ Overall, Medicaid Part A annual spending decreased by US\$7,746 per resident in the Green House, but this decrease did not occur in 1 specific area of Medicaid spending and was partially the result of an increase in costs at the comparator traditional LTC home.⁴³ The reduction in operational costs was further supported by another study that determined Green Houses are US\$80 less per bed-day due to the flattened hierarchical organization and lower requirement for skilled positions.⁶

The only non-US based studies came from Australia. One reported on funding, comparing the operational costs of 4 clustered domestic living models with a comparator standard model (n = 13). This cross-sectional analysis found that unadjusted crude costs between the models was similar, but after adjusting for resident characteristics and differences between the individual homes, the costs for the clustered domestic living model was significantly lower (–AU\$14,270 per annum or –16%) than the standard model.¹⁵ The other Australian study offered perspective on training costs, reporting higher training costs for a small house model compared with a traditional facility (mean= AU\$1,492 [SD = AU\$259] vs. mean = AU\$989 [SD = AU\$928]; P < 0.001).⁴²

Although it is expected that the build costs for the small model homes are higher due to the larger footprint and required area,^{33,45} an Australia publication reported the cost is comparable to that of a traditional larger LTC home when presented as a ratio of gross floor area.⁴⁶ One opinion article originating from Canada championed the use of small house models in future LTC development, claiming that operational costs are lower and projects currently under construction in Manitoba have half the costs of traditional home builds. However, this article provides no references or specific details (e.g., actual dollar values, breakdown of costs, reasons for cost differentials).⁴⁷

Objective 3: Outcomes

A total of 31 publications provided study data or commentary related to resident outcomes. This included qualitative (n = 10),^{2,6,7,21-23,31,42,48,49} quantitative (n = 16),^{13-15,17,19,26,44,45,50-57} and mixed (n = 1)⁴ study designs, as well as reviews (n = 4).^{11,18,41,58,59} Interviews with staff were the most common instrument used for the qualitative studies, while the quantitative studies typically used validated quality of life (QoL) instruments. The range of outcomes reported was broad. These outcomes included (but were not limited to) broad physical, cognitive, or behavioural outcomes; falls; hospitalizations or medication consumption; rest-activity rhythms; pacing; and social engagement.

No obvious trend emerged from the literature with respect to the impact of the small house model on resident-centred outcomes. Some studies reported positive outcomes on resident QoL, while others did not note any significant difference either between residents of small house model and large LTC facilities or those that transitioned from a traditional to small house model.^{19,28,40,53,59} It is possible that the inconsistency may be the result of the heterogeneity between model designs and operations.^{4,49} Although there are guiding principles about how the model should be implemented, there is no guarantee of how the principles are interpreted and instituted by a specific LTC facility. Therefore, there can be significant operational disparities between individual small house–modelled homes, which reduces the generalizability of results from any direct comparison with a traditional model of care – the characteristics of which were also heterogeneous between included studies.

This finding echoes that of a scoping review by Ausserhofer et al. (2016), who concluded although an observed trend in the direction of improvement was present for many performance indicators of QoL, none showed that the small house models were definitively better than larger-scale controls (review included 14 studies that compared traditional LTC homes with large-scale Eden Alternative homes or small house models with a dementia-specific or non-dementia aged population).⁴¹ When another study partitioned QoL into separate domains, the small house model generally demonstrated better outcomes with respect to environment, autonomy, and caregiving.⁵¹ Some studies also reported that the small house model may slow the decline in physical functioning (e.g., activities of daily living), lead to better mood and behaviours, decrease the amount of psychotropic medication used, and increase nutritional intake of residents.^{19,28,40} One difference-in-difference study found that although there was no difference in all-cause or avoidable hospitalizations among the 15 homes that adopted the Green House model and 223 matched traditional LTC homes (that had not adopted the model), there was a 5.5% decline in 30-day readmissions and a 3.9% decline in avoidable readmissions in the Green House homes.⁵² Additionally, there were significantly fewer residents in the Green House homes who were bedfast, catheterized, or had pressure ulcers (in low-risk residents) than in the traditional LTC homes.⁵² One publication that used US national data reported that COVID-19 infections and associated death rates were lower in the small house facilities than in the larger homes.² Specifically, infection rates were 2 times to 9 times higher in the traditional models than small house models; there were one-half to one-third fewer deaths related to COVID-19 in small house-modelled homes than larger traditional LTC homes.²

Ausserhofer et al. (2016) reported residents of small house facilities were significantly more satisfied with their QoL and care.⁴¹ In a qualitative study that directly solicited resident input (one of the few studies that reported from the perspective of the resident), residents preferred the small house model because of the increased freedom to act, move, and choose, as well as the social dynamics.⁷ Another study found that residents of Green Houses considered the model to be more advantageous for staff response times.⁴ Similar to residents, family members of those who lived in the facilities consistently expressed a higher satisfaction with the small house model.^{41,51}

Most perceptions of staff on resident care and QoL favoured the small house model; however, these results may be biased to opinions of staff who chose to continue to work under the model. A study that analyzed the impact of a model shift from traditional to small house model 21 months after implementation found significant concerns from nursing staff around areas of adequate staff training, rewriting care plans, the approach to dining, resident confusion and/or safety, and the new organizational approach.²⁵ However, all nursing staff supported the model through their actions and admitted that the change process took time and that conditions leading to their concerns improved with time.²⁵

Objective 4: Issues, Challenges, and Lessons Learned

Design

Operating as a single unit, the small house model loses the operational economies of scale that are realized by larger facilities. To recapture these efficiencies, functioning units are usually built together in clusters with several homes located on a single campus.^{11,13,15} In some instances, they are aligned with an adjacent legacy home that operates some variation of the traditional model. In both these instances, there is a shared, more economical use of administrative resources, supply chain logistics, and access to specialized care.^{4,10}

One design challenge of the small house model is the requirement for a large area of space, ideally within developed neighbourhoods.^{29,46} Access to the necessary land may be cost-prohibitive in some regions.^{33,45}

Philosophy

A qualitative study investigating the sustainability of culture change in 11 Green House homes found that erosion of the model is common.¹⁰ Frequently, staff revert to practices of the traditional model. Although the small house model strives to afford residents freedom of choice and autonomy, 100% free choice is not possible due to safety and practical implications. Interviews with staff on the tensions and resolutions that arose during the shift to a small house model revealed that effective implementation requires a balance between preserving as much individual resident autonomy while ensuring a safe and high-quality of care for all residents.³⁴

Staffing

Self-managed and universal work teams were prominent features of the small house model; thus, frontline staff with strong interpersonal skills are needed to contribute to the implementation of and adherence to the model.^{10,36} The model requires that staff be willing to complete a range of interactive and noninteractive tasks and be afforded the autonomy in problem-solving to meet resident needs and preferences.⁴ Top-down management and decision-making have been identified as threats to model adherence.²⁵ There was less erosion of the model when leadership had a strong buy-in and included staff in the discussions and decisions around problem-solving and the creation of solutions and their implementation.^{6,10,28} One study identified that key adherence to the model depends on the approach to problem-solving. That is, it must be what is defined as a “coached collaborative” or “management-supported” approach as opposed to a “management-led” or hierarchical approach.¹⁰

The literature indicated that including explicit descriptions of the approach to care in recruitment materials and increased training helps to ensure that people with the requisite aptitudes, personalities, and skill fill the caregiver roles.^{25,26,31} With respect to training, Rill and Gonzalez (2019) found that staff at a Green House model home received an additional 128 hours of training in the areas of food preparation, cardiopulmonary resuscitation, team building, and coordinated care compared with a traditional home.³¹ Although the added training was a significant cost during the implementation process for a small house model, it is possible that the additional on-the-job training allows for the higher proportion of less formally trained (nursing) staff.³⁷ Furthermore, a focus group including Canadian staff of LTC facilities have identified training alongside leadership that supports staff as an essential supports to ensure healthy and competent workers.⁶⁰

The Canadian Experience

In total, the majority of included Canadian publications originated from the body of grey literature. These tended to focus more on characterizing the need for alternative approaches to LTC in Canada and the need for novel approaches, such as the small house model, rather than reporting on specific operations in place.^{36,61} Additionally, several reports outlined the different approaches to small house models and touched on the feasibility of implementation in a Canadian context.^{8,9,16} Beyond these generalized reports and publications, several grey literature pieces reported specifically on the Butterfly model. Two of these described the success of the model in Ontario with mention of improved QoL for residents (e.g., reduced pain, antipsychotic drugs, depression, and falls) and more empowered and engaged staff.^{28,62}

Another report investigated the opinions on the Butterfly model from the perspective of staff, health care professionals, and family of residents in Alberta-based homes that had recently transitioned to this model of care for dementia residents.⁶³ Overall, the interviewees were supportive of the model.⁶³

Most of the peer-reviewed publications reported on small house models operating within the US or the Netherlands. Only 2 studies provided Canadian-specific information. One study that explored the differences in health and behaviours of residents with dementia at a small house model home and a larger LTC facility in British Columbia, found that personalization, familiarity, home likeness, and stimulation were significantly higher in the small house model.¹⁹ These residents also experienced improvements in irritable behaviours, oral health, and nutritional conditions; were happy more often; and less withdrawn. A second publication was a case study that investigated the in-depth daily life of caregivers and residents at a small house-modelled facility in Nova Scotia. Through interviews, staff identified teamwork, culture of care, regulating risk, the physical environment, and staff empowerment as common themes of importance in the new model and highlighted the need to balance risk with resident autonomy.²³

Limitations

This ES is not intended to be a systematic or comprehensive review of the topic of LTC. No exclusions were made on the basis of study design; therefore, the findings are based on a heterogeneous mix of study designs.

Heterogeneity in the evidence base is compounded by heterogeneity among the various small house models themselves. The literature suggested there can be significant operational disparities between individual small house-modelled homes, reducing the extent to which any singular comparison can be made to a traditional model of care. Furthermore, the literature identified in the ES did not facilitate rigorous and explicit comparisons among the small house models identified. To the extent that the small house models are similar, it is important to note that the unified definition of the small house model — person-centred care offered to a small number of residents living within a functioning unit — makes it difficult to dissect the effects of the person-centred care from the fewer residents. It is possible that person-centred care and fewer resident have an unequal, or even mutually exclusive, impact on resident outcomes.

Some publications included in the ES specified the researched population as dementia-specific or a mixed population (with residents both with and without dementia), while others did not reference cognitive impairment at all. Furthermore, none of the studies described the physical abilities or stratified the study population by level of infirmity. This lack of specificity in the research populations may have obscured outcomes that only apply to a subgroup of the aged population.

Certain topics within the scope of the ES could not be addressed, either at all or in detail, by the information identified. None of the literature identified in the ES addressed any prescriptive approach to staffing small home models or the regulatory barriers that may exist. Similarly, none of the literature identified in the ES explicitly addressed the adaptation of small house models typically make to account for efficiencies for operational activities,

smooth workflow, or the integration of technology. Literature from Canadian jurisdictions was limited, particularly with respect to information on funding. Information on funding came primarily from US sources. This limits the extent to which this information can be considered generalizable to a Canadian jurisdiction. The publications reporting funding data from Australia may offer some comparability to the Canadian context.

The search period was limited to 2016 to 2021, with the intention of identifying the most recent evidence. Consequently, information concerning earlier 'small house' models may have been missed, unless explicitly described in the context of more recent work.

Conclusions

Complementing this ES is a Rapid Response report prepared by CADTH in 2019 that pertains to home-like models in LTC. The report was updated in late 2021 and is available free of charge on the CADTH website.^{16,64}

This ES used a literature review to identify publications reporting on the small house model of LTC. Specifically, the full text from 70 peer-reviewed journal articles and grey literature pieces were reviewed. These publications reported 1 or more features of the small house model including: design, philosophy of care, resident outcomes, and implementation or provided comparisons with the traditional LTC model. Many publications reported information on multiple features. Among the included publications, 6 distinct small house models of care were identified, including Butterfly, Clustered Domestic, Dementia Village, Green Care Farm, Green House, and Shared Housing Arrangement. However, nearly half of the publications did not provide information on 1 specific model; rather, the "small house" model was referred to more generally.

Key Characteristics

The common design tenet among the models is a residential ambience including private bedrooms and bathrooms with common kitchen and living spaces contained in a unit that typically houses 5 to 20 people. These homes strive to provide residents with person-centred care and offer freedom of choice and autonomy for the residents. Prescriptive routines and schedules are avoided in favour of a more flexible approach to care that encourages residents to be meaningfully engaged in, and take ownership of, their care. Caregivers provide a holistic style of care including housekeeping, dietary, and clinical services. Therefore, staff are cross-trained in a range of tasks so that they may provide living support over and above any health-related activities. Some specific models, such as the Dementia Villages or Green Care Farms, offer additional unique services like onsite cafés and salons or agricultural activities. Most funding information was presented from experience with the Green House model in the US where residents are usually privately funded.

Key Differences Compared With the Traditional Model

The small house model differs from the traditional LTC facilities with respect to design, philosophy of care, organizational structure, and possibly funding. They have fewer residents living in a home-like setting as opposed to an institutional environment. Likewise, the institution-centred approach to care is shifted to a resident-centred approach. To support

the shift to person-centred care, the small house model has re-invented the built design and organizational structure of LTC. Units are designed with a home-like atmosphere with house-type kitchens and dining areas, residents have access to outdoor areas, and social engagement is promoted. From an organizational perspective, hierarchies and management-led decisions are replaced with amalgamated job descriptions and a team approach to problem-solving and decision-making. Although the staff profile of in the small house model still includes an assortment of staff skill levels (e.g., registered nurses and nurse assistants), these models tend to have a higher proportion of lesser-skilled staff-hours. Based on international examples, there is some evidence that the small house models could be less costly to operate than the traditional LTC facilities and, based on a ratio of gross floor area, may have a comparable build cost.

Outcomes

The literature addressing small house resident outcomes is inconsistent. Some studies reported improvements in resident QoL and quality of care while others did not identify any significant differences between the small house model and the traditional approach. These findings are in line with that of earlier systematic literature reviews on the topic.⁶⁰ It is possible that the inconsistent results stem from the heterogeneity between model designs and operations or that outcomes are dependent on the physical capabilities, cognitive abilities, or acuity level of the residents.

Issues, Challenges, and Lessons Learned

The small house model is frequently implemented adjacent to a larger facility. Alternatively, the small house units are built in clusters with several units established on a campus. This allows for shared use of administrative resources, supply chain logistics, and access to specialized care. Erosion of the small house model is common. A strong buy-in from leadership; self-managed, universal work teams; frontline staff with strong interpersonal skills and leadership characteristics; and a coached collaborative approach to decision-making are all key factors in a successful and enduring implementation of the model. Although there were many publications suggesting the model be implemented in Canadian jurisdictions, 4 reported on examples currently in operation: 1 each in Alberta, British Columbia, Nova Scotia, and Ontario. Two of these, the British Columbia and Nova Scotia examples, were peer-reviewed studies.

Final Remarks

This ES identified a lack of peer-reviewed evidence, particularly in a Canadian-specific context. Although there are instances of the small house model implemented in Canadian jurisdictions, the paucity and the heterogeneity of evidence limits the extent to which one may conclude that these facilities have achieved the purported benefits, such as improved clinical or QoL outcomes, for residents. However, the publications largely indicate that residents are more satisfied and prefer the small house model. The lack of evidence is even more apparent when evaluating the cost-effectiveness and funding mechanisms for such facilities because none of the publications provided specific evidence regarding the construction or operational costs of the small house model in Canada. Publications from Canadian jurisdictions with experience with these models could help support decision-making across the country.

References

1. Cornelison L. The Culture Change Movement in long-Term Care: Is Person-Centered Care a Possibility for the Looming Age Wave? *NAELA Journal*. 2016;12(2):121 - 131.
2. Zimmerman S, Dumond-Stryker C, Tandan M, et al. Nontraditional Small House Nursing Homes Have Fewer COVID-19 Cases and Deaths. *J Am Med Dir Assoc*. 2021;22(3):489-493. [PubMed](#)
3. Canadian Institute for Health. Canada's seniors population outlook: Uncharted territory. *Seniors in Transition: Exploring Pathways Across the Care Continuum* <https://www.cihi.ca/en/infographic-canadas-seniors-population-outlook-uncharted-territory>. Accessed November 25, 2021.
4. Cohen LW, Zimmerman S, Reed D, et al. The Green House Model of Nursing Home Care in Design and Implementation. *Health Serv Res*. 2016;51 Suppl 1:352-377. [PubMed](#)
5. Calkins MP. From Research to Application: Supportive and Therapeutic Environments for People Living With Dementia. *Gerontologist*. 2018;58(suppl_1):S114-S128. [PubMed](#)
6. Cristobal LA. *Application Of The Green House Model To The U.S. Geriatric Veteran Population*. School of Nursing. *Elischolar*. Yale University; 2016.
7. Van Steenwinkel I, Dierckx de Casterle B, Heylighen A. How architectural design affords experiences of freedom in residential care for older people. *J Aging Stud*. 2017;41:84-92. [PubMed](#)
8. Wrublowsky R. Design Guide for Long Term Care Homes. Facility Guidelines Institute; 2018: <https://fgiguidelines.org/resource/design-guide-long-term-care-homes/>. Accessed November 22, 2021.
9. Long-Term Care Homes & Services - Interim General Manager. *Review of Dementia Care Models*. City of Toronto; 2019.
10. Bowers B, Nolet K, Jacobson N, Collaborative TR. Sustaining Culture Change: Experiences in the Green House Model. *Health Serv Res*. 2016;51 Suppl 1:398-417. [PubMed](#)
11. Baumann SL. Innovative Communities: A Global Nursing Perspective. *Nurs Sci Q*. 2021;34(3):316-321. [PubMed](#)
12. Dementia Villages: Innovative Residential Care for People With Dementia. Ottawa: CADTH; 2020: <https://www.cadth.ca/brief-dementia-villages-innovative-residential-care-people-dementia>. Accessed November 22, 2021.
13. de Boer B, Hamers JP, Zwakhalen SM, Tan FE, Beerens HC, Verbeek H. Green Care Farms as Innovative Nursing Homes, Promoting Activities and Social Interaction for People With Dementia. *J Am Med Dir Assoc*. 2017;18(1):40-46. [PubMed](#)
14. Grasko J, Schmidt A, Wolf-Ostermann K. More staff = better quality of life for people with dementia? results of a secondary data analysis in German shared-housing arrangements. *Isr J Health Policy Res*. 2019;8(1):26. [PubMed](#)
15. Dyer SML, E.; Gnanamanickam, E.S.; Milte, R.; Easton, T.; Harrison, S.L.; Bradley, C.E.; Ratcliffe, J.; Crotty, M. Clustered domestic residential aged care in Australia: fewer hospitalizations and better quality of life. *The Medical Journal of Australia*. 2018.
16. Gray C, Farrah K. *Homelike Models in Long Term Care: A Review of Clinical Effectiveness, Cost-Effectiveness, and Guidelines*. Ottawa (ON): CADTH; 2019: <https://www.cadth.ca/homelike-models-long-term-care-review-clinical-effectiveness-cost-effectiveness-and-guidelines>. Accessed November 22, 2021.
17. de Boer B, Beerens HC, Katterbach MA, Viduka M, Willemsse BM, Verbeek H. The Physical Environment of Nursing Homes for People with Dementia: Traditional Nursing Homes, Small-Scale Living Facilities, and Green Care Farms. *Healthcare (Basel)*. 2018;6(4). [PubMed](#)
18. Chaudhury H, Cooke HA, Cowie H, Razaghi L. The Influence of the Physical Environment on Residents With Dementia in Long-Term Care Settings: A Review of the Empirical Literature. *Gerontologist*. 2018;58(5):e325-e337. [PubMed](#)
19. Lee SY, Chaudhury H, Hung L. Effects of Physical Environment on Health and Behaviors of Residents With Dementia in Long-Term Care Facilities: A Longitudinal Study. *Res Gerontol Nurs*. 2016;9(2):81-91. [PubMed](#)
20. Charras K, Eynard C, Viatour G. Use of Space and Human Rights: Planning Dementia Friendly Settings. *J Gerontol Soc Work*. 2016;59(3):181-204. [PubMed](#)
21. Carnemolla P, Debono D, Hourihan F, Hor S, Robertson H, Travaglia J. The influence of the built environment in enacting a household model of residential aged care for people living with a mental health condition: A qualitative post-occupancy evaluation. *Health Place*. 2021;71:102624. [PubMed](#)
22. Van Hecke L, Van Steenwinkel I, Heylighen A. How Enclosure and Spatial Organization Affect Residents' Use and Experience of a Dementia Special Care Unit: A Case Study. *HERD*. 2019;12(1):145-159. [PubMed](#)
23. Roberts E. Negotiated risk and resident autonomy: Frontline care staff perspectives on culture change in long term care in Nova Scotia, Canada. *Work*. 2016;54(4):837-851. [PubMed](#)
24. Fishman NW, Lowe JI, Ryan SF. Promoting an Alternative to Traditional Nursing Home Care: Evaluating the Green House Small Home Model. An Introduction from the Funders and the Green House Project. *Health Serv Res*. 2016;51 Suppl 1:344-351. [PubMed](#)
25. Bogner MP, Ivanitskaya LV, Jeong YR, DeLellis NO. Nursing staff member experiences with household model implementation in a nursing home setting. *Geriatr Nurs*. 2021;42(3):748-755. [PubMed](#)
26. Hermer L, Bryant NS, Pucciarello M, Mlynarczyk C, Zhong B. Does Comprehensive Culture Change Adoption via the Household Model Enhance Nursing Home Residents' Psychosocial Well-being? *Innov Aging*. 2017;1(2):ix033. [PubMed](#)

27. Tonarelli L. *Relationships are key to a homelike atmosphere*. Nurse Aide-VIP. 2016.
28. Knowlton JC, M. The Butterfly Model: The Feeling of Home in Changing Times. Paper presented at: Ontario's Long-Term Care COVID-19 Commission 2021; Region Peel.
29. Fontinelle A. Pros and Cons of Small-Scale Long-Term Care Facilities. *Investopedia*. 2021. <https://www.investopedia.com/articles/personal-finance/122315/pros-cons-smaller-longterm-care-facilities.asp>. Accessed November 22, 2021.
30. Adams J, Verbeek H, Zwakhalen SM. The Impact of Organizational Innovations in Nursing Homes on Staff Perceptions: A Secondary Data Analysis. *J Nurs Scholarsh*. 2017;49(1):54-62. [PubMed](#)
31. Rill L, Gonzalez L. Culture Change in Skilled Nursing: An Exploratory Comparison of a Traditional Home to a New Model. *Journal of Housing For the Elderly*. 2019;33(4):433-452.
32. Brown PB, Hudak SL, Horn SD, et al. Workforce Characteristics, Perceptions, Stress, and Satisfaction among Staff in Green House and Other Nursing Homes. *Health Serv Res*. 2016;51 Suppl 1:418-432. [PubMed](#)
33. Waters R. The Big Idea Behind A New Model Of Small Nursing Homes. *Health Aff (Millwood)*. 2021;40(3):378-383. [PubMed](#)
34. Palmer JA, Parker VA, Berlowitz D, Snow AL, Hartmann CW. Resident Choice: A Nursing Home Staff Perspective on Tensions and Resolutions. *Geriatr Nurs*. 2018;39(3):271-278. [PubMed](#)
35. Vermeerbergen L, Van Hootegem G, Benders J. A comparison of working in small-scale and large-scale nursing homes: A systematic review of quantitative and qualitative evidence. *Int J Nurs Stud*. 2017;67:59-70. [PubMed](#)
36. BC Care Providers Association. Creating Dementia-Friendly Care Homes in B.C. 2018; <https://bccare.ca/2018/12/creating-dementia-friendly-care-homes-in-b-c/>. Accessed November 15, 2021.
37. Proffitt MA. *Exploring the Costs and Values of the Household Model in Long Term Care*. UWM Digital Commons: Architecture, University of Wisconsin-Milwaukee; 2017.
38. Van Humbbeeck L. Review: Working in small-scale, homelike dementia care: effects on staff burnout symptoms and job characteristics. A quasi-experimental, longitudinal study. *J Res Nurs*. 2018;23(2-3):123-124. [PubMed](#)
39. Beirne M. *Homelike Settings Ease Job Conditions*. McKnights Long-Term Care News. 2018.
40. Eisenberg JS. Journal Highlights From the August Issue of JAMDA - Care in Homelike Settings. *JAMDA*. 2016;17(8):16-17.
41. Ausserhofer D, Deschodt M, De Geest S, et al. "There's No Place Like Home": A Scoping Review on the Impact of Homelike Residential Care Models on Resident-, Family-, and Staff-Related Outcomes. *J Am Med Dir Assoc*. 2016;17(8):685-693. [PubMed](#)
42. Harrison SL, Dyer SM, Milte R, Liu E, Gnanamanickam ES, Crotty M. Alternative staffing structures in a clustered domestic model of residential aged care in Australia. *Australas J Ageing*. 2019;38 Suppl 2:68-74. [PubMed](#)
43. Grabowski DC, Afendulis CC, Caudry DJ, O'Malley AJ, Kemper P, Collaborative TR. The Impact of Green House Adoption on Medicare Spending and Utilization. *Health Serv Res*. 2016;51 Suppl 1:433-453. [PubMed](#)
44. de Boer B, Hamers JPH, Zwakhalen SMG, Tan FES, Verbeek H. Quality of care and quality of life of people with dementia living at green care farms: a cross-sectional study. *BMC Geriatr*. 2017;17(1):155. [PubMed](#)
45. Reinhardt JP, Cimarolli VR, Burack OR, Minahan J, Marshall TL, Weiner AS. The Small House Model of Long-Term Care: Association With Older Adult Functioning. *J Am Med Dir Assoc*. 2019;20(2):222-223 e221. [PubMed](#)
46. Dyer SM, Tilden D, Valeri M, Judd S, Crotty M. Is a pandemic another reason the additional capital cost of home-like clustered domestic residential aged care homes is justified? *Age Ageing*. 2020;49(6):928-929. [PubMed](#)
47. Friesen RP. The case for moving long-term care into small households. 2020; <https://policyoptions.irpp.org/magazines/june-2020/the-case-for-moving-long-term-care-into-small-households/>. Accessed November 15, 2021, 2021.
48. de Boer B, Verbeek H, Zwakhalen SMG, Hamers JPH. Experiences of family caregivers in green care farms and other nursing home environments for people with dementia: a qualitative study. *BMC Geriatr*. 2019;19(1):149. [PubMed](#)
49. Bowers B, Roberts T, Nolet K, Ryther B, Collaborative TR. Inside the Green House "Black Box": Opportunities for High-Quality Clinical Decision Making. *Health Serv Res*. 2016;51 Suppl 1:378-397. [PubMed](#)
50. Gnanamanickam S, Dyer EM, Milte S, Liu R, Ratcliffe E, Crotty M. Clustered domestic model of residential care is associated with better consumer rated quality of care. *Int J Qual Health Care*. 2019;31(6):419-425. [PubMed](#)
51. Duan Y, Mueller CA, Yu F, Talley KM, Shippee TP. The Relationships of Nursing Home Culture Change Practices With Resident Quality of Life and Family Satisfaction: Toward a More Nuanced Understanding. *Res Aging*. 2021:1640275211012652. [PubMed](#)
52. Afendulis CC, Caudry DJ, O'Malley AJ, Kemper P, Grabowski DC, Collaborative TR. Green House Adoption and Nursing Home Quality. *Health Serv Res*. 2016;51 Suppl 1:454-474. [PubMed](#)

53. Yoon JY, Brown RL, Bowers BJ, Sharkey SS, Horn SD. The effects of the Green House nursing home model on ADL function trajectory: A retrospective longitudinal study. *Int J Nurs Stud*. 2016;53:238-247. [PubMed](#)
54. Kok JS, van Heuvelen MJ, Berg IJ, Scherder EJ. Small scale homelike special care units and traditional special care units: effects on cognition in dementia; a longitudinal controlled intervention study. *BMC Geriatr*. 2016;16:47. [PubMed](#)
55. Kok JS, Berg IJ, Blankevoort GCG, Scherder EJA. Rest-activity rhythms in small scale homelike care and traditional care for residents with dementia. *BMC Geriatr*. 2017;17(1):137. [PubMed](#)
56. Kok JS, Nielen MMA, Scherder EJA. Quality of life in small-scaled homelike nursing homes: an 8-month controlled trial. *Health Qual Life Outcomes*. 2018;16(1):38. [PubMed](#)
57. Kok JS, Oude Voshaar RC, Scherder EJA. Psychotropic drug use in residents with dementia living in small-scaled special care facilities; a longitudinal study. *Aging Ment Health*. 2020;24(4):689-696. [PubMed](#)
58. Bortnick KN. An Ecological Framework to Support Small-Scale Shared Housing for Persons with Neurocognitive Disorders of the Alzheimer's and Related Types: A Literature Review. *Hong Kong J Occup Ther*. 2017;29(1):26-38. [PubMed](#)
59. Brownie S, Nancarrow S. Effects of person-centered care on residents and staff in aged-care facilities: a systematic review. *Clin Interv Aging*. 2013;8:1-10. [PubMed](#)
60. Kay K. *Clinician Consultation to Inform a National Long Term Care Services Standard*. Ontario, Canada: Provincial Geriatrics Leadership Ontario;2021.
61. National Institute on Aging. *Enabling the Future Provision of Long-Term Care in Canada*. 2019.
62. Region of Peel. Butterfly Home Project. <https://www.peelregion.ca/ltc/butterfly-home/> Accessed November 22, 2021.
63. Norquest College. *Life My Way – Living Well with Dementia: The Perspectives of Families, Staff, and External Health Professionals on the Impact of the Butterfly Care Model*. Alberta Health Services; 2018.
64. Goring S, Loshak H. CADTH Health Technology Review: Homelike Models of Long-Term Care: A 2021 Update. *Canadian Journal of Health Technologies*. 2021;1(11). <https://canjhealthtechnol.ca/index.php/cjht/article/view/rc1393/406>. Accessed November 15, 2021.