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Spending Review 2021: Expanded Provision of Home Support and Total Costs of Long Term Care for Older Persons – A Scoping Review and Exploratory Analysis

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Executive Summary

This exploratory analysis sought to characterise how costs behave relative to changes in activity levels as a result of increased provision of home support, using available data on the current provision of long term care for older persons and findings from studies that have examined this in other settings.

The provision of long term care for older persons is of particular relevance to health policymaking in Ireland at present, given the Programme for Government commitment to introduce a statutory scheme to support people to live in their own homes that will provide equitable access to high-quality care and the Sláintecare commitment to expand community-based care. The financing model for the scheme has yet to be determined.

Results of a scoping review of the available literature suggest that implementing a statutory home support scheme has the potential to significantly increase costs of long term care. However, careful targeting of services and effective cost controls may help limit expenditure increased associated with enhanced service provision.

Results of an economic analysis showed that the degree to which increased home support provision substitutes for family/unpaid care is likely to be a more important cost driver than either the extent of any crowding out of private spending on home support care, or substitution of nursing home care by home support. Effective targeting of additional hours to current home support recipients is another key factor for controlling costs. The ranges within which these parameters would have to fall relative to each other for increased provision of home support to be cost saving are reported.

As well as being a useful tool for assessing the potential costs of expanded home support, the model can also be used to explore the degree of improvement in health related quality of life that would be needed for a new scheme to be considered cost effective using conventional willingness to pay thresholds in Ireland.

Important limitations of this work include the exclusion of hospital costs, client co-payments or contributions to the cost of care, and administrative and clinical assessment costs associated with enhanced provision of home support.

These findings are intended to highlight important considerations that can contribute to the design of a statutory home support scheme and inform the development of a plan to monitor and evaluate the scheme following implementation.

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Introduction

Long term care for older persons includes care provided in the community in people's own home, which can be unpaid care by family/friends or professional care provided by public or private providers, as well as residential care in public or private nursing homes. Total public expenditure on nursing home care in Ireland in 2021 is in excess of €1 billion, with an estimated €650 million allocated for home support services for older people.[1]

The provision of long term care for older persons is an increasingly important health policy issue in Ireland and internationally, due to rising demand and increased expenditure associated with population aging. Policy responses to address increased demand for services include more selective targeting of nursing home care and expansion of care in the community, while cost controls have tended to focus on prioritising less expensive forms of care, introduction of co-payments, and initiatives to reduce nursing home costs.[2]

Efforts to meet increased demand can significantly impact the clinical and economic characteristics of long term care provision. Greater targeting of nursing home care may change the clinical profile of the cohort of people in long term residential placements, and may result in greater per-person costs due to increased average care needs. This may be offset by cost savings from more people being cared for at home, but this depends on the extent to which increased home support can act as a substitute for nursing home care and the cost differential between the two. A useful distinction can be made here between either end of the care spectrum – on one side are people who require minimal help with activities of daily living to remain independent, but who may well need to transition to residential care in the absence of this support, and on the other are those with high levels of functional dependency that would require intensive home support packages to continue living at home. While the current population of people living in nursing homes in Ireland may include some of the former, we assume that efforts to target existing home support hours mean that any substitution effect of greatly expanded home support provision on nursing home admission will primarily be observed within the latter cohort.

Whether increased provision of home support helps contain costs has been the source of contention since at least the 1980's[3], when concerns were raised about the scale of any reduction in residential care admissions, the high costs associated with screening and selection of patients, and limited evidence of improved clinical outcomes.[4] A further barrier to cost-effective substitution of home support for nursing home care was the suggestion that a subset of older, more dependent patients at whom this would be targeted would be more costly to care for in the community than in nursing homes. [4]

Central to this policy debate is the previously documented phenomenon[5,6] whereby utilisation of a health programme increases significantly when eligibility is expanded or changed, due to enrolment of newly eligible people, as well as increased uptake among

those who may have already been eligible but were not availing of the service. In the context of older persons home support services, any such increase in utilisation could result in higher overall aggregate healthcare costs if increased expenditure on home support exceeds any cost saving as a result of lower rates of nursing home care. One of the potential mechanisms for this effect would be for home support to act as a substitute or compliment to family/unpaid care, rather than having the effect of displacing nursing home care.[7]

These issues are of particular relevance to health policymaking in Ireland at present, given the planned introduction of a statutory home support scheme with the aim of reducing "the number of people within long-term residential care and the length of time that they would spend there".[8] The proposed scheme is among the commitments in the current Programme for Government, and a Slaintecare deliverable.[9,10] While full details of the scheme are not yet agreed, analysis of projected demand funded by the Department of Health describes a service that is integrated with both nursing home and family/unpaid care, where care is provided on the basis of a standardised assessment, and where cost is not a barrier to accessing care.[11] This scheme is intended to be made available to all those aged 18 years or older, and the financing model has yet to be determined, with all options—ranging from full exchequer funding to flat-rate or means-tested user-contributions— currently under consideration.

The aim of this paper is to

1. conduct a scoping review of the available literature on the impact of increased provision of home support services on overall costs of long term care for older persons, and
2. to develop a framework for exploratory analysis of the main drivers of the cost and cost-effectiveness of expanded provision of home support in Ireland, and how these interact.

Section 1 – Scoping Review

S1 Methods

A search was conducted in Medline to August 2021 for studies examining the economic impact of increased provision of home support on long term care among older persons, using the search strategy reported in Appendix 1.

The search combined the concepts of 'nursing home', 'home support', 'older persons' and the Royle & Waugh[12] economic evaluations search filter to identify citations, which were then reviewed by a single author for inclusion or exclusion. A snowball search of key literature was used to identify additional studies.

Studies were included if they contained information on the impact of standard home support services on nursing home utilisation and costs of long term care for older persons. Studies that reported predictors of transitions between community and residential care, and clinical or quality of life outcomes, were also included.

Studies were excluded if they were not written in English, if they were limited to a specific patient cohort (e.g. dementia, hip fracture, diabetes), if they were non-comparative descriptive studies of a particular care programme in a given setting, if they focused solely on acute hospital discharges, if they were limited to assessment of private financing or insurance based systems only, or if the full text of the paper could not be retrieved.

No formal appraisal of study quality or statistical pooling of results was performed, and evidence synthesis was carried out via a narrative overview of selected primary and secondary studies.

S1 Results

The search identified a total of 3,106 citations. Following review 16 studies were identified that provided relevant information on costs, 19 studies on predictors of transition between community and residential care, 9 studies comparing clinical outcomes in community and residential care, and 6 studies examining factors associated with quality of life in community and residential care.

Costs & Resource Utilisation

A key challenge when trying to estimate the impact of substituting residential care with home support on the costs of long term care is determining the counterfactual, or what would have happened in the absence of increased home support provision. As patients self-select into the type of care they receive, direct comparison of average costs across different care pathways is of limited value because they include those for whom substitution of care is not an option. Experimental studies generally provide the most robust findings, but when randomised controlled trials (RCTs) are impractical or unethical a number of quasi-experimental approaches can be used to address inherent limitations of observational data.

Early studies examining the impact of expanded community care on nursing home costs included a number of US trials that were reviewed by Kemper et al. in 1987.[13] This included a subgroup of six RCTs that gathered complete data on nursing home utilisation that found no overall statistically significant change in nursing home use. However, most of the study cohorts turned out to have a relatively low risk of nursing home admission, and the one with the highest level of nursing home use in control and treatment groups also reported the highest comparative reduction. No significant effect on hospital admissions was observed, but there was evidence of a relatively minor substitution effect for family/unpaid care. While there was a lack of consistent findings about resource use, based on the totality of

evidence at the time the authors concluded that expanding long term care in the community is likely to result in higher aggregate costs, as the increased costs of home care are not matched by comparable savings in residential care. However, the review did report increased quality of life, and highlighted the importance of careful targeting of services to best identify those who would transition to nursing homes in the absence of the intervention as a way of improving cost effectiveness.

A collection of papers examining the impact of expanded provision of home and community care was published in 2013.[14] Among the contributions were an updated review of the available evidence[15] that reported similar findings of increased aggregate costs and modest impacts on nursing home admission rates and hospital stays. Two analyses of more recent data report conflicting results. One found that increased home support led to a 30% increase in community care recipients and a 5% decrease in nursing home residents, resulting in increased aggregate long term care expenditure.[16] However, the other found that this effect was limited to a subpopulation of people with intellectual disability (ID) and was not present in a non-ID older persons' subgroup, which the authors attributed to greater control of expenditure and nursing home reimbursement for older persons in their study setting.[17]

The importance of selective targeting of care was again highlighted in a 2015 Korean study[18] that employed a regression discontinuity design involving home care and nursing home subsidy thresholds to examine substitution of care among those on either side of a particular cut-off point. Results showed that at low cut-off thresholds for level of disability, substitution of home supports for residential care among those with less severe impairment led to higher total long term care spending, but this was not the case for higher cut-off thresholds, with the authors concluding that "publicly financed home care may have limited impact among the more able, but that it may be both more cost-effective and beneficial than institutional care for the least able".

Another quasi-experimental study[19] published in 2020 examined the effect of nursing home eligibility on costs in the Netherlands, using a measure of leniency among those assessing eligibility as the source of random variation, or instrument, with which to examine causal effects. This found that while being deemed eligible to publicly funded nursing home care increased utilisation by 18 percentage points within 6 months, substantial increases in the cost of residential care at 2 years follow up were offset by roughly equivalent decreases in home support costs, suggesting that postponing nursing home admission is not associated with cost savings.

Other approaches to tackling this research question have focused on the correlation, if any, between aggregate expenditure and expansion of home or community care. Once such study[20] examined long term care expenditure in Ohio, USA between 1995 and 2015, over

which time the mix of professional long term care provision changed from 80% nursing home-20% home support, to 49% nursing home-51% home support, and found this did not coincide with a significant change in long term care spending, adjusting for demographic changes and increased prevalence of chronic illness. This suggests that home support can be expanded considerably from a low base without raising costs. However, one of the limitations of this type of approach is that it does not adjust for other changes that may have happened over the same time period that may have had a bearing on the results.

As mentioned previously, a problem with directly comparing average costs of care in different setting is the difficulty in isolating those for whom one type of care can substitute for another. However, a 2007 Canadian study[21] that compared total costs of home care and nursing home care for people aged 65 or older is informative. Since the same care-level classification system was used in both pathways, it was possible to match cases on level of dependency, and costs for long term care (nursing home or home care), hospital care, physician services and drugs were recorded for all participants. The results showed that the total costs of home support were between 40% and 75% of the costs of nursing home care, depending on the level of need. This cost differential narrows considerably for patients whose care classification level changed, with total costs of home care for these ranging from 70% to >90% of nursing home costs. Among those who died over the course of the study, the costs of home support was higher for all levels of care than for nursing home residents who died. This again indicates that the economic effect of home support substitution for nursing home care is heterogeneous across dependency levels.

Other Outcomes

The search for included studies was focused on the impact of increased home support provision on costs of long term care. However, a number of studies reporting predictors of transition between care pathways, comparative clinical outcomes, and factors affecting quality of life were also identified. These are summarised briefly now with the aim of highlighting some points of relevance to any prospective analysis, rather than as an exhaustive account of the most relevant literature on these issues.

Transition Predictors

As we have seen above, costs for clinically similar patients can be lower in a community compared to a residential setting, but this can change when other factors, such as care classification levels, are taken into account. Predicting transitions to residential care and targeting services accordingly is difficult, however, since measured characteristics tend not to explain much of the variation in nursing home utilisation.[13]

Previous studies reporting analysis of care trajectories across available care pathways in the Netherlands[22], Taiwan[23] and Canada[24] illustrate the range of potential determinants of type of long term care, and also how these can vary between settings. The Canadian study

identified social structures (age, gender, urban/rural), social and economic factors (marital status, income) and health status (chronic disease, declining functional/cognitive ability) as key determinants. Data from the Netherlands show that controlling for age, women are less likely to transition to residential care, but are more likely than men to receive professional rather than family/unpaid home care. The finding that higher incomes are associated with greater probability of receiving professional care at home is confirmed by a later study from the same country.[25] In contrast, analysis of Taiwanese data fails to find a link between gender, income or geographical location on the use of different long term care services.

Other predictors of transition between older persons long term care services reported in the literature include regional supply of nursing home beds[26], living with a spouse[27], home ownership[28], and cognitive dysfunction.[29,30]

Preferences, Clinical Outcomes & Quality of Life

Even if expansion of professional care in the community does increase aggregate care costs, it may still be the optimal strategy if it is aligned with individuals' preferences and associated with sufficiently large improvements in clinical outcomes and quality of life.

A 2019 review of stated preferences for long term care identified 59 relevant studies that used a range of elicitation methods, including interviews, focus groups, Likert scales and choice-based approaches (time trade off, willingness to pay, and discrete choice experiments).[31] Approximately 50% of individuals included in the review were 60 years or older. Despite the degree of heterogeneity in the methods used, consistent findings emerged of preferences for home care among those with moderate care needs (with family/unpaid care being preferred to professional care), and residential care for those with extensive care needs. A range of personal, social and cultural factors were found to mediate preferences, with perceived ability to retain one's personal and social identity, self-image and autonomy influencing choice of long term care. Interestingly, a US study[32] examining care preferences and quality of life found that only 1 in 3 older persons were in receipt of care that matched their preferences, but there was no relationship between receiving preferred care and quality of life measures such as subjective well-being and satisfaction with living situation.

A 2017 Cochrane systematic review compared mortality, physical function, hospital admission and quality of life in home versus residential care for functionally dependent older persons.[33] The GRADE certainty of evidence[34] was rated very low for all outcomes. The authors reported that there was insufficient evidence to draw strong conclusions about the superiority of any particular model of care, but there was some suggestion that care in the community was associated with improved quality of life and physical function, but also an increased risk of hospitalization. The review also highlights a lack of evidence on the impact of long term care on caregivers. A subsequent study[35] examining the effect of professional

long-term care on caregiver wellbeing found that caregivers (defined as the family member or friend most involved in providing care) of nursing home residents reported greater stress than those receiving care in the community, which may be due to the fact that rather than withdrawing from caregiving, caregivers are faced with additional demands such as advocating for the person and coordinating their care with professional care staff.[36]

S1 Summary

Available evidence on the cost implications of expanded provision of professional home support services is characterized by a high level of heterogeneity in both the research methods used and the results obtained. Some studies, especially those conducted earlier, found that expanding home support led to significant increases in the aggregate costs of long term care, and more recent research using a robust identification strategy to compare costs among those at whom efforts to substitute home support for residential care would be targeted failed to find significant cost savings associated with postponing nursing home admission. While this challenges any assumption that increasing home support inexorably leads to reduced demand for nursing home care and lower costs, the review did suggest that savings are possible through careful targeting of services and appropriate costs controls.

An important component of targeting service is knowing what factors predict transitions between community and residential care. The results of this review show that a range of social, cultural and economic factors influence this, in addition to a person's health status.

A review of preferences for long term care found that rather than always favouring care in the home, preferences were heterogeneous across dependency levels, with those with the most extensive needs expressing a preference for receiving long term care in a nursing home.

A systematic review of clinical studies comparing home support and residential care for functionally dependent older people failed to find conclusive evidence of significant differences in a range of clinical outcomes, including mortality, physical function, quality of life, and hospitalization rates.

There are a number of limitations that pertain to the scoping review that should be considered when interpreting the findings. We limited our search to one citation database (Medline, via Pubmed) rather than including other relevant sources such as Embase, Cinahl, Cochrane Trials Register, etc., so it is highly possible that other relevant studies exist, which may change the above conclusions. The search was targeted at studies examining costs, with a brief summary of literature within that relating to transitions, outcomes and preferences provided for context. A comprehensive review of the available evidence on each of these would require search strategies specifically designed for each one. Finally, we

do not attempt to pool the results of identified studies to provide an overall estimate of effect, nor do we perform any appraisal of the applicability of international findings in an Irish context, by, for instance, comparing healthcare financing systems, population profiles, cultural norms, or other differences in how care is delivered or funded within each study setting.

Section 2 – Development of an Analytical Framework

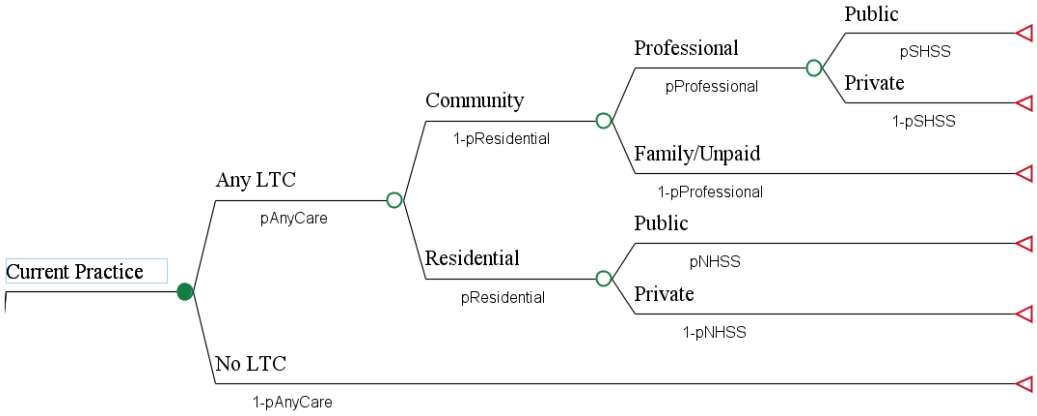
To reliably estimate the cost implications of expanded provision of home support services on long term care for older persons from the perspective of the publicly funded health and social care system in Ireland one would need accurate estimates of the degree to which it will substitute for or complement other forms of care, how it will affect the level and type of care needed within care pathways, and what effect all of this will have on expenditure. Based on the scoping review, there is a great deal of uncertainty around many of these issues, and the financing model for the scheme has yet to be determined, with options ranging from full-exchequer funding to flat-rate or means tested contributions, under consideration.

In this section changes in key parameters are mathematically modelled, in order to examine the key drivers of costs and the relationship between changes in each of these, and also to provide an indication of the range within which these changes would have to fall in order to avoid significant aggregate cost increases in the costs of long term care for older people.

S2 Methods

A decision tree model of the current provision of long term care for older persons was developed that simulated service utilisation and costs within an annual cohort of people aged 65 years or more in Ireland (Figure 1, see Appendix 2 for full decision tree). Only costs of publicly provided home support and nursing home care were included. Other types of public healthcare costs (acute hospitals, GP, drugs), out-of-pocket expenditures, costs of time spent providing family/unpaid care, and social welfare and wider exchequer costs of carer supports (e.g. Carer's Allowance, Carer's Benefit, Carer's Support Grant) were excluded.

Figure 1 Decision tree model of long term care pathways and costs in Ireland



LTC – Long Term Care

Among the simplifying assumptions made to facilitate this analysis were that residential and community care are mutually exclusive and no switching takes place in a given year.* It is also assumed that any decrease in the number of people entering long term residential care after the introduction of the scheme will be due to substitution by public (rather than private) home support services, and that any decrease in family/unpaid care in the community is also as a result of substitution by public (rather than private) home support. The model estimates the incremental gross cost of long term care for older persons, and no adjustment is made for cost-of-care contributions from NHSS residents or co-payments from prospective statutory home support scheme recipients. Administrative costs of a statutory home support scheme, such as cost of maintaining a National Home Support office, and the costs of a standardised clinical assessment process, are also excluded.

A list of model parameters is shown in Table 1, along with a brief description.

Table 1 Model Parameters

Parameter	Parameter Description	Estimate	Source
avgHShrs	Average number of home support hours per recipient per year	332 hours	HSE[i]
avgIntHShrs	Average number of home support hours per year for those in receipt of an intensive home care package recipient per year	1,352 hours	ESRI[11]
cHShr	Unit cost of 1 hr of home support	€25.86	DoH
cNHSS	Average annual cost of NHSS place	€61,308	DoH[ii]
pProfessional	Proportion of over 65's receiving community long term care that receive professional home support	0.358	ESRI/DoH[iii]
pImpaired	Proportion of total population aged 65+ who receive some form of long term care	0.299	Heger et al, 2018[37]
pNHSS	Proportion of over 65's in long term residential care that are in the NHSS	0.904	CSO, HSE, DoH[iv]
pResidential	Proportion of over 65's in any form of long term care that are in a nursing home	0.126	ESRI/DoH[iv]
pSHSS	Proportion of over 65's requiring professional care in the community that receive public home support services	0.822	ESRI[v]
hsQaly	Average utility values[vi] for general population aged 65+	0.757	Ara 2011[38,vi]

i – Calculated using data from Older Persons Services on total home support hours delivered divided by total persons in receipt of hours from the last 3 full years of available data (2020-2018)
ii – Based on weighted average of the weekly cost of private and public nursing home care as of July 2021.
iii – Calculated using CSO data on total population of over 65's, ESRI data[11] on total number of home support recipients and DoH estimates of total number of people living in nursing homes (NHSS and non-NHSS) in 2019
iv – Based on DoH data on total NHSS residents and estimated total number of non-NHSS residents in long term residential care in 2019
v – Based on base scenario (current standard of care) in ESRI report[11] on demand for statutory home support scheme
vi – Average age-specific EQ-5D scores among a general population with a history of health conditions (taken from Health Survey England) applied to age structure of 65+ cohort in Ireland in 2021
Note: Interpretation of proportions can be aided by cross-referencing with Figure 1.

*A recent ESRI paper (Walsh & Lyons 2021) reported that about 10% of home support recipients used convalescent care (short stay in a nursing home) in a given year

The model adopts a public health system perspective to estimate average annual incremental costs of care for those aged 65 years or more. Changes in costs arise due to the potential impact of a statutory home support scheme on a number of key variables that can affect resource utilisation. These are shown in Table 2, along with a note on how each may be affected.

Table 2 Variables that can be affected by expanded provision of home support

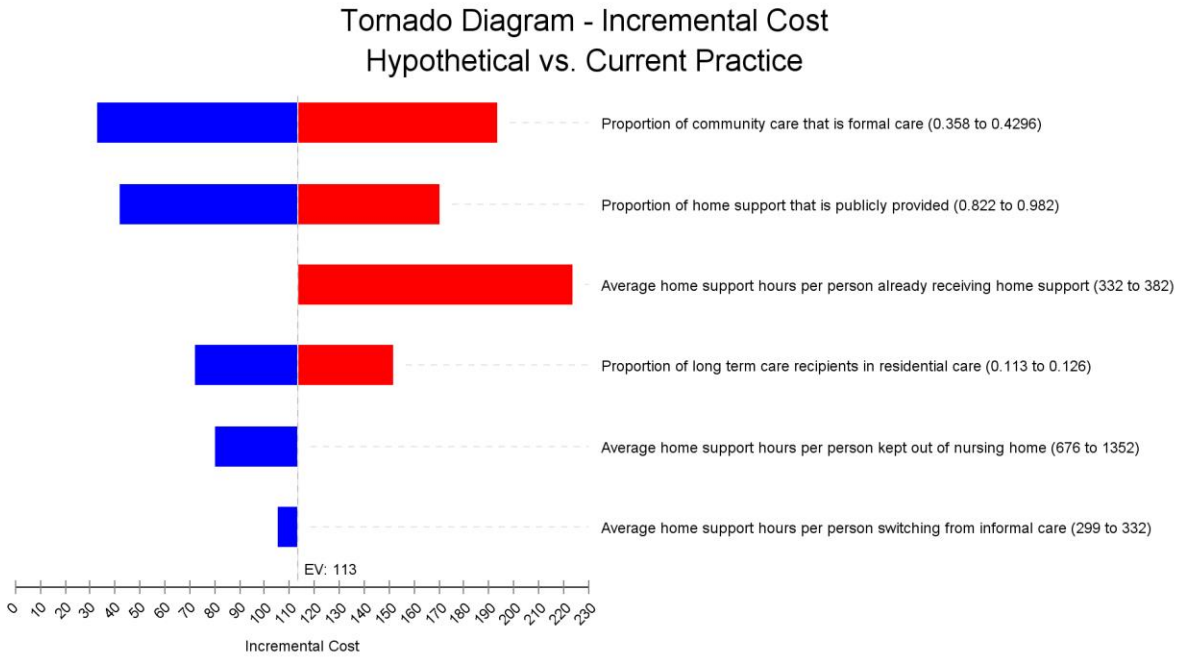
Variable	**Hypothesised change**	**Range [point estimate]**
Proportion of over 65's receiving some form of long term care	Removing barriers to accessing State funded services could potentially generate demand among those who are not currently in receipt of any professional or family/unpaid care. These could be people who are living independently at present with minor limitations who, by choice or otherwise, do not receive family/unpaid care from family or friends, and are not so severely impaired as to quality for home support hours at present. In the absence of data we assume that the any change in demand attributable to this cohort is marginal, and unlikely to have a significant effect on costs.	No change assumed.
Public/private split among those receiving home support services	An ESRI report[11] reported that in 2019 about 18% of those receiving home support accessed care exclusively through private providers, and assumed that the introduction of a statutory home support scheme would result in all private care being displaced by public care (i.e. a 100% reduction). While future decisions about the financing of the scheme will heavily influence this variable, it is unlikely that private provision of home care will be completely eliminated. It is estimated that about 10% of those in nursing homes elect to pay for private care rather than apply to the statutory scheme for residential care. In this analysis we examine the implications of a maximum reduction of 90% and a scenario whereby a statutory scheme had no impact on private care.	90% to 0% reduction in proportion of older people accessing private (compared to public) care. [50% reduction]
Professional/ 'family/unpaid' care split among those receiving long term care in the community	One of the main sources of increased demand is likely to be from those receiving home care only. For this analysis we assume that plausible bounds around the impact of increased public provision on enrolment in professional home support are between a 0% (no change) and 20% increase in the proportion of those receiving long term care in the community that opt for professional rather than family/unpaid care only.	0% to 20% increase in proportion of professional vs family/unpaid care. [10% increase]
Nursing home utilisation rate among over 65's in long term care	The scoping review showed that a high degree of uncertainty exists about the impact of increasing home support on nursing home utilisation, but that the effect size in likely to be relatively modest.[15,16] For the purpose of this exploratory analysis we assume that a steady state will be reached whereby increased home support will lead to a reduction of 5% in the rate of residential care utilisation among over 65's, with a range of 0% to 10%.	0% to 10% decrease in utilisation rate of residential care. [5% decrease]

Variable	Hypothesised change	Range [point estimate]
Average number of hours per recipient	Increased home support could have an effect on average care needs within this cohort, but the magnitude and direction of any effect is unclear. The model distinguishes between three different groups of home support recipients in an era of expanded provision of care. (i) Those who would otherwise be in a nursing home: In cases where home support acts as a substitute for residential care, the average number of hours of home support required per year is the same as for an intensive home care package. This is varied by -50% to 0% in a sensitivity analysis. (ii) Those who would otherwise be receiving family/unpaid care only: For cases where professional home support substitutes for family/unpaid care the average number of home support hours is the same as for existing clients. This is varied by -10% to 0% in a sensitivity analysis. (iii) Those already in receipt of home support: For those already receiving home support, we assume that a statutory scheme may increase the average number of hours by up to 15%, based on previous estimates from the ESRI.[11]	-50% to 0% in average number of home support hours where home support substitutes for NH care (assumed to be intensive home support package). [0%] -10% to 0% in average number of home support hours per recipient per year where home support substitutes for family/unpaid care. [0%] 0% to 15% increase in number of hours for those already in receipt of home support. [0%]
Annual cost of NHSS place	A statutory home support scheme that successfully kept those with care needs that could be met in the community out of full time residential care would have the effect of increasing the average care needs of the (smaller) cohort of people requiring nursing home admission. This may then lead to a higher average annual cost of care. As no information is available to guide estimation of any such potential impact, we assume no change in this parameter.	No change assumed.

S2 Results

Univariate sensitivity analysis was carried out by setting each of the parameters at their upper and lower bound while holding all others at their expected value, to provide an indication of the relative impact of each on overall costs. Per Figure 2 the degree to which increased home support provision substitutes for family/unpaid care is likely to be a more important cost driver than either the extent of any crowding out of private spending on home support care by public provision, or substitution of home support for nursing home care. Analysis of the impact of varying intensity of home support provision shows that increases in the average number of hours for those already in receipt of home support is likely to be the main driver of overall increases in aggregate care costs, and that even if this remained unchanged and nursing home admission could be postponed by the provision of half the average number of hours currently provided for intensive home care packages, it would still not offset the expected increase in the total cost of long term care.

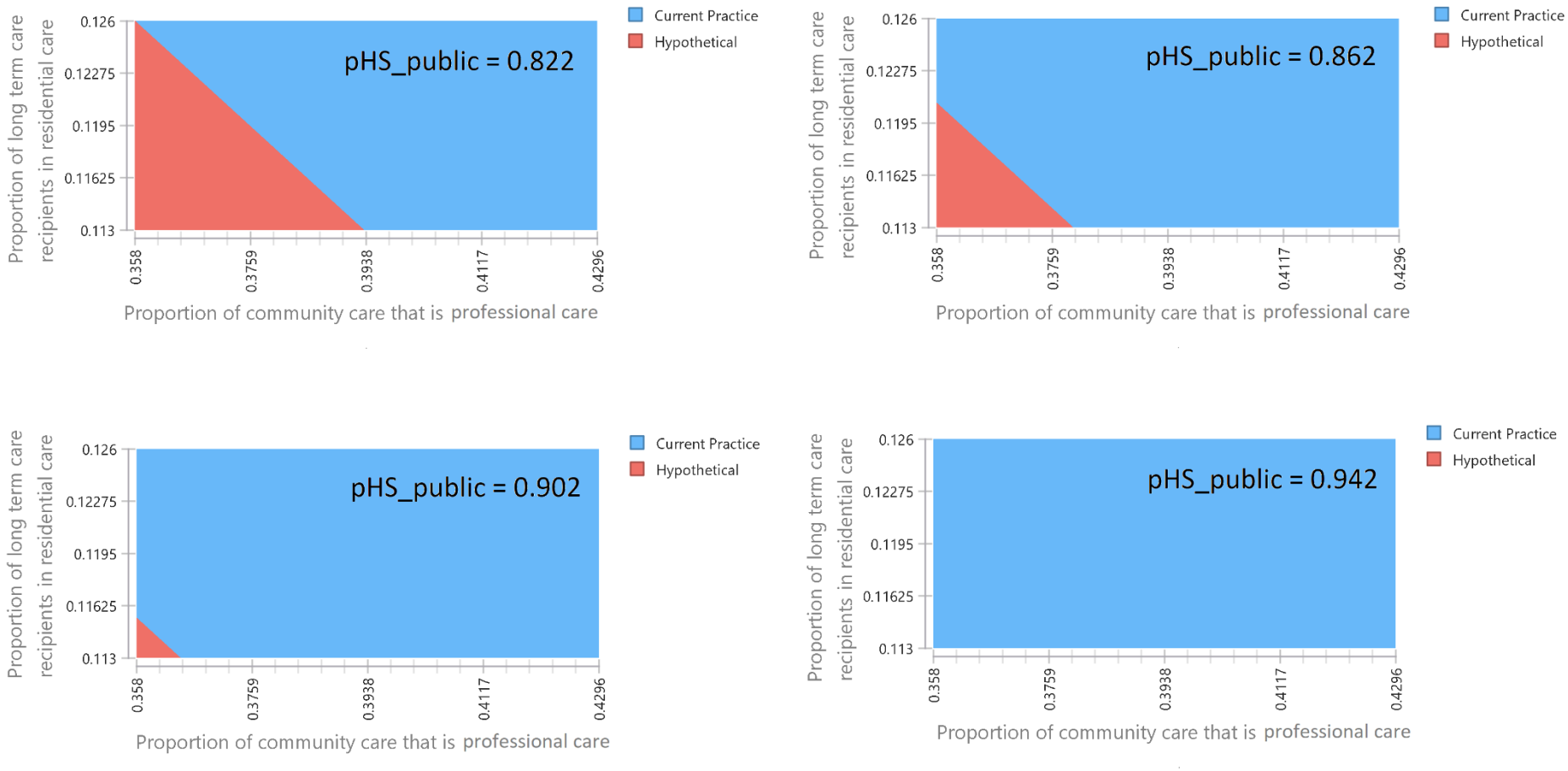
Figure 2 Univariate deterministic sensitivity analysis



EV – Expected value of the incremental cost per person when all parameters are set at their point estimates.

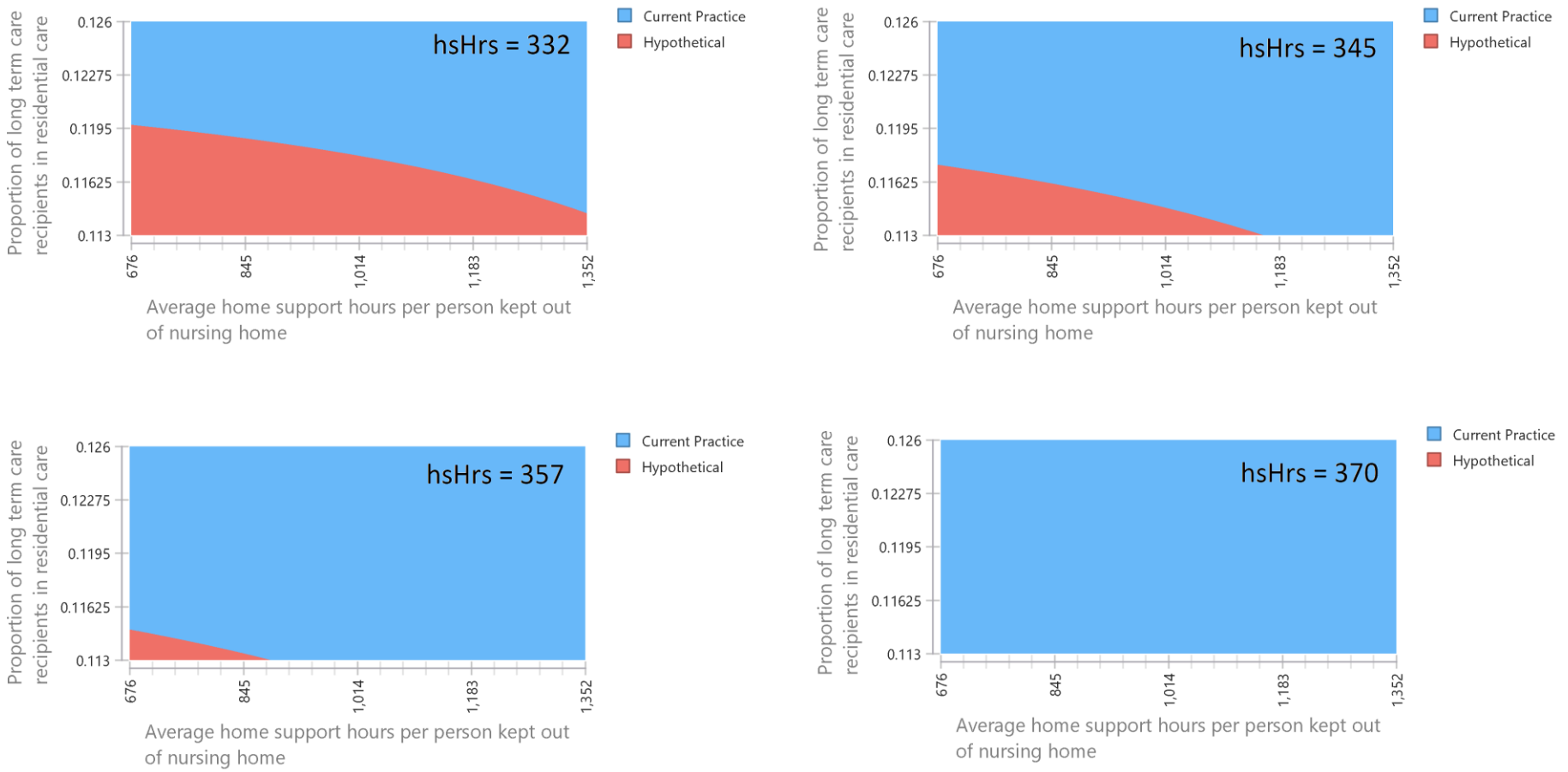
Multivariate sensitivity analysis examines the impact of varying two or more parameters simultaneously, to show how any interaction between them affects model outputs. Figure 3 shows the results of 3-way sensitivity analysis on residential care, professional versus family/unpaid care, and public home support provision, assuming no change in the average number of home support hours provided to those already receiving care. Figure 4 shows a 3-way sensitivity analysis on residential care, average number of home support hours required to prevent a transition to residential care, and average home support hours for those already in receipt of home support services, assuming a 50% reduction in the rate of privately purchased home support. See below for a note on interpretation of these graphs.

Figure 3 Three-way sensitivity analysis on proportion of long term care recipients in residential care, proportion of community care recipients receiving professional care, and proportion of professional care recipients receiving public home support services



pHS_public = Proportion of home support that is publicly provided

Figure 4 Three-way sensitivity analysis on proportion of long term care recipients in residential care, average home support hours per person who would otherwise have transitioned to residential care, and average increase in home support hours for those already in receipt of home support services



hsHrs = Average home support hours per person already receiving home support

Sensitivity plots show the range of values of each of the included parameters within which expanded home support can be achieved in a cost neutral or cost saving way. They can be interpreted as follows; blue areas indicate the combinations of values for which current practice is the cheapest option, and red areas show where these parameter values would have to fall in order for increased provision of home support to be cost saving. Figure 4 suggests that even if expanded home support provision was effective at reducing nursing home admission, any crowding out of private spending on home care or significant displacement of family/unpaid care could still lead to significant overall cost increases. Similarly, Figure 5 indicates that while cost containment is a possibility if intensive home support can effectively substitute for residential care, any savings from this can be reversed by relatively small increases in the average number of support hours provided to those already in receipt of care.

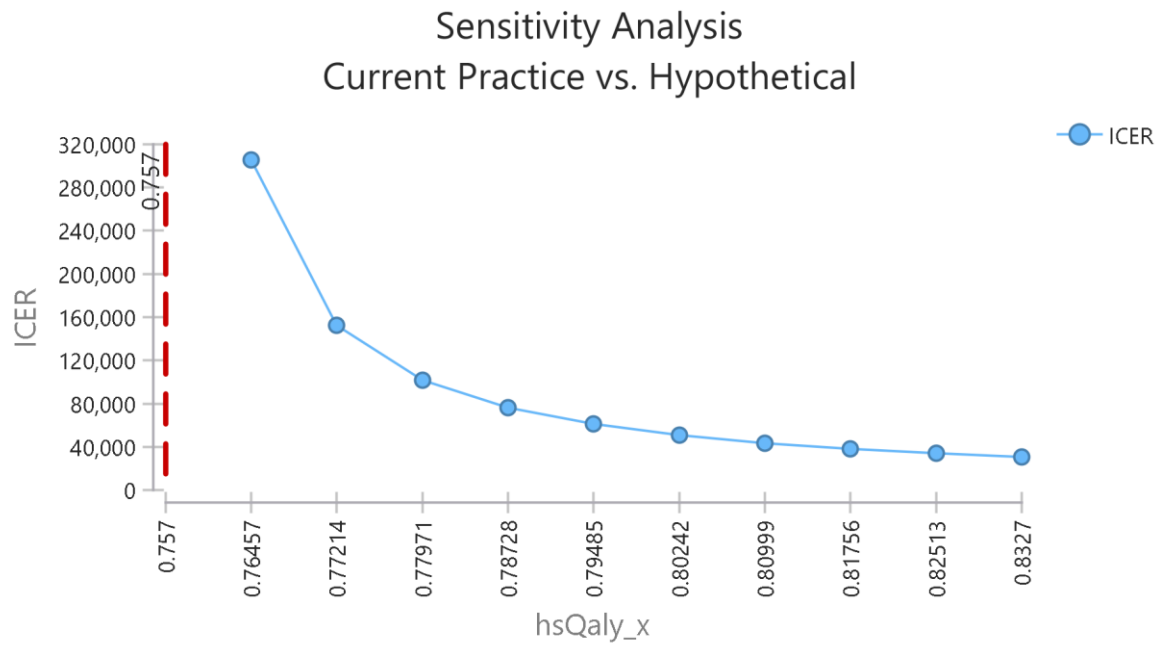
Even if expanded public provision of home support increases aggregate long term care expenditure, it may still represent the best use of these resources if it generates sufficiently large improvements in outcomes. To examine this issue, the model incorporated a notional utility gain among the cohort of people who would receive publicly funded home support services after the scheme is introduced. This would include those who would otherwise have transitioned to residential care, those who would otherwise have received family/unpaid care, and those already receiving home support who would see their number of allocated hours increase. Quality of life outcomes for carers were not included. This threshold analysis was carried out within a core scenario of a 15% increase in the average number of home support hours for those already in receipt, a 5% relative decrease in nursing home admission rates, a 10% increase in professional home support utilisation and a 50% decrease in the proportion of those receiving private, rather than public, home support. The utility gain is the aggregate increase in quality adjusted life years within the group whose care would be materially affected by the expansion of home support, as measured by notional increases in average quality adjusted life years (QALYs). No consideration is given to wider societal impacts or distributional effects across social (e.g. socioeconomic status, ethnicity, geographical area) or clinical categories (e.g. severity or type of functional limitation).

Figure 7 shows a threshold analysis of the incremental cost effectiveness ratio (ICER) for a 10% increase in average[†] utility scores for over 65's with a history of health conditions (0.76) receiving publicly provided home support. It suggests that at conventional willingness to pay thresholds in Ireland of €45,000/QALY, average utility-based health related quality of life

[†] The average utility score among a population with a history of health conditions is unlikely to accurately reflect average utility scores for those requiring long term care, however the use of population-based utility scores was considered acceptable for the purposes of this exploratory analysis, with more accurate figures to be inputted as they emerge. Use of average utility scores derived from Irish EQ-5D data (from O'Neill, C. (2018). *The Irish EQ-5D-5L Survey, 2015-2016*. [dataset]. Version 1. Irish Social Science Data Archive) produced similar estimates (0.05 QALY increment).

would have to increase by around 0.05 QALYs for enhanced provision of home support scheme to be considered good value for money. For simplicity, the model applies the same QALY gain across the three groups of people whose care would be affected by expanded home support provision.[‡] This is highly unlikely to be the case in reality, so expected changes in each of these groups can and should be examined individually when better information becomes available. As such, this analysis should be viewed as a demonstration of how value for money considerations can be incorporated into the design of an expanded home support scheme, and the importance of including quality of life measurement in any prospective evaluation plan.

Figure 5 Threshold analysis of incremental cost effectiveness ratios (ICERs) against average EQ-5D scores among public home support recipients



S2 Summary

This exploratory analysis sought to characterise how costs behave relative to changes in activity levels as a result of increased provision of home support. Plausible point estimates and ranges for the potential impact of expanded home support services on a number of key variables were modelled. It should be noted that these estimates are subject to a high degree of uncertainty and that the primary objective was not to produce a definitive estimate of the incremental costs, but to broadly examine the interaction between different cost drivers and help inform the design and evaluation of an expanded home support scheme.

[‡] These three groups are 1) those who would otherwise be in a nursing home, 2) those who would otherwise be receiving family/unpaid care only, and 3) those already receiving professional home support who would see their allocated number of hours increase.

Univariate sensitivity analysis showed that the degree to which increased home support provision substitutes for family/unpaid care is likely to be a more important cost driver than either the extent of any crowding out of private spending on home support care, or substitution of nursing home care by home support. Multivariate sensitivity analysis showed the ranges within which these parameters would have to fall relative to one another for increased provision of home support to be cost saving.

Exploratory cost-utility analysis suggests that relatively small increases in the overall average health related quality of life among those affected by the expansion of publicly funded home support (who otherwise would have received residential or unpaid/family care only, or would have received fewer hours) would need to be achieved for it to be considered good value for money using conventional willingness to pay thresholds in Ireland. However, more work needs to be done on baseline health related quality of life within each of these groups, and how this may change as a result of increased access to, or increased allocation of, home support services. This, in addition to uncertainty about cost parameters, mean that any ex ante estimate of cost-effectiveness is subject to a high degree of uncertainty. These results are primarily intended to show how the analytical framework described in this paper can be used to include value for money considerations into early stage policy formulation (by showing what level of improvement in outcomes would be needed for the expected level of expenditure), as well as highlighting key variables that should be included in any programme evaluation plan.

Important limitations of this work include the exclusion of hospital costs, and administrative and assessment costs associated with enhanced provision of home support. We also did not factor in contributions from NHSS residents or any co-payments that may form part of the statutory home support scheme, which could affect both unit costs and uptake of expanded home support services.

Conclusion & Future Work

This analysis sought to examine cost behaviours associated with increased public provision of home support services, using available data on the current provision of long term care for older persons and the findings from studies that have examined this in other settings. As such, it is exploratory in nature and results should be interpreted with caution. The primary purpose is to stimulate debate, inform policy development and aid in the design of a programme evaluation plan.

Results of a scoping review of the available literature suggest that implementing a statutory home support scheme has the potential to significantly increase costs of long term care. However, careful targeting of services and effective cost controls may help limit expenditure increased associated with enhanced service provision.

Evidence on clinical outcomes is mixed, with the most recent high-quality systematic review of clinical effectiveness failing to find conclusive evidence of differences between home support and residential care on a range of outcomes. No similar review of studies comparing clinical outcomes between professional and family/unpaid care was identified in our truncated search.

Results of an economic analysis showed the degree to which changes in key variables affect overall costs, and the range within which these would have to fall relative to each other for long term care cost to remain on their current trajectory.

It is important to note that there are broader linkages and interdependencies under Slaintecare Initiatives to progress the aim of shifting care to the community. The Enhanced Community Care Programme is reliant on increased provision of home care services over current levels, and has clear outputs that could potentially benefit the wider health system, including an estimated 10% reduction in bed usage in acute hospitals and a 20% reduction in admissions to ED for those aged 75 or older.[39]

There is also an argument that many of the benefits of expanded home support service provision are qualitative and challenging to capture within standard quality of life metrics, which presents challenges for performing meaningful cost-effectiveness analysis. Furthermore, it has been suggested that the cost-effectiveness of home care is dependent on having integrated systems of care, especially between primary and secondary care, with a 2002 evaluation of the cost-effectiveness of home care in Canada reporting that "developing greater coordination and/or integration between home care and hospital care may be required before the efficiencies of substituting home care services for acute care services can be fully realized".[40]

Future Work

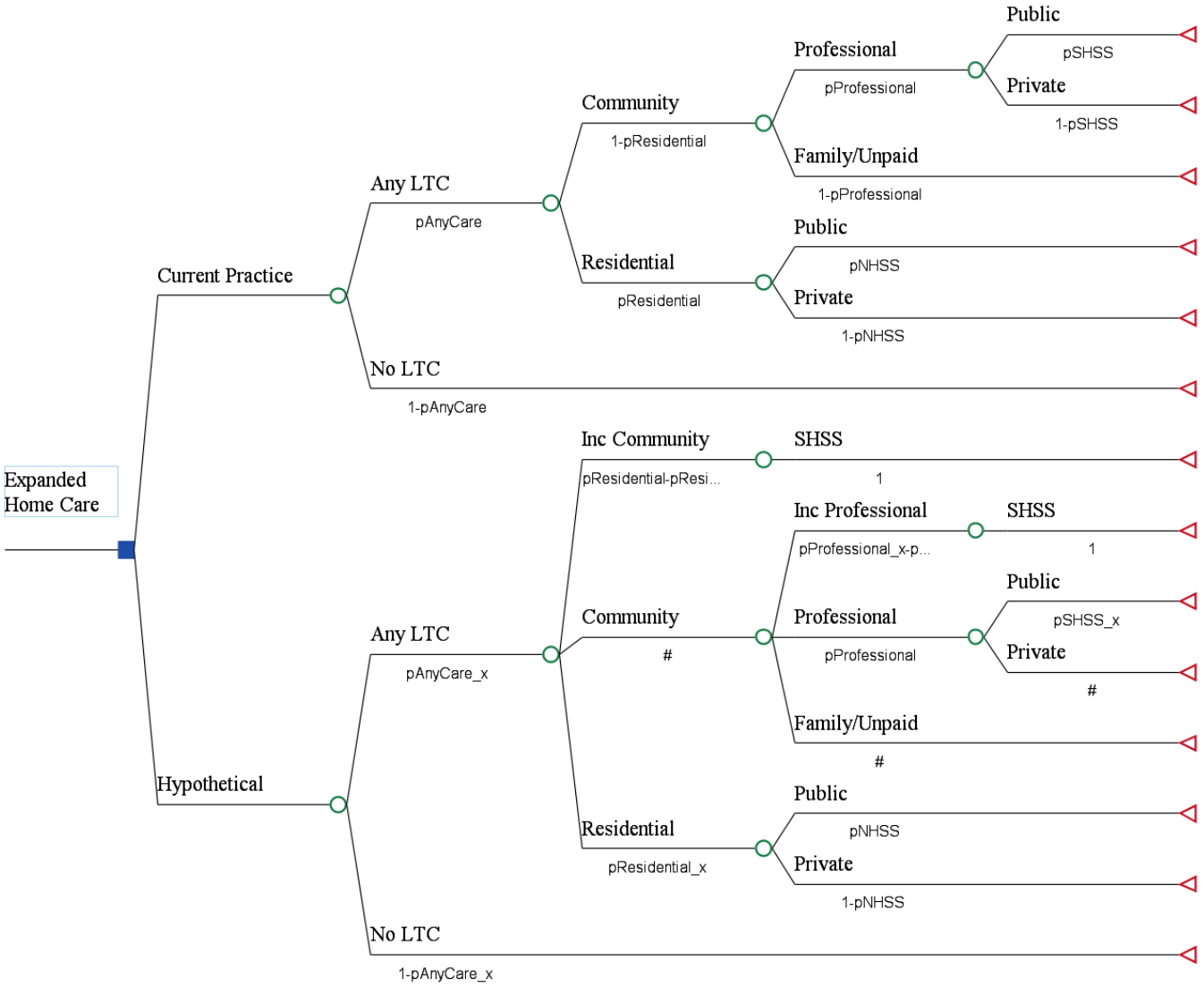
Among the areas for require further research in order to provide more reliable estimates of the costs and consequences of increased public provision of home support include;

- More detailed information on family/unpaid care provision, and utilisation of private long term care services.
- Differentiating between different type of home support (e.g. by intensity or type of care provided).
- Correlating model inputs, in cases where changes in one parameter are likely to affect other, rather than treating them all as being independent of each other.
- Information on the net cost of long term care from a public sector perspective, after factoring in any contributions or co-payments by those accessing these services.
- Inclusion of costs associated with administration of long term care schemes, including the costs of standardised clinical assessments.
- Inclusion of estimates of resource use and costs in other sectors of the health system, such as acute hospitals, primary care, GP costs, etc.
- Estimates of baseline health related quality of life among those receiving long term care, and the likely impact of increased home support on quality of life outcomes.
- Longitudinal (rather than cross-sectional) analysis of costs and outcomes that factors in any potential changes in average length of stay in residential care.

Appendix 1 – Search Strategy

Platform:	MEDLINE (via Pubmed)
Date of search:	23/08/2021
Economic filter:	Royle & Waugh
Search string:	((((nursing home[Title/Abstract]) OR (care home[Title/Abstract]) OR (long term[Title/Abstract] AND (resident*[Title/Abstract] OR care[Title/Abstract] OR domicil*[Title/Abstract]))) AND (home[Title/Abstract] AND (support[Title/Abstract] OR help[Title/Abstract] OR care[Title/Abstract] OR hours[Title/Abstract]) OR (in the home[Title/Abstract]))) AND (economic OR cost OR quality of life)) AND ((older AND (person OR adult OR people OR patient)) OR (elder*))

Appendix 2 – Decision Tree Diagram



References

[1] HSE Financial Progress Report, Net Expenditure by Division, July 2021

[2] Meijer, A., Van Campen, C. and Kerkstra, A. (2000), A comparative study of the financing, provision and quality of care in nursing homes. The approach of four European countries: Belgium, Denmark, Germany and the Netherlands. Journal of Advanced Nursing, 32: 554-561.

[3] Dunlop BD. Expanded home-based care for the impaired elderly: solution or pipe dream?. Am J Public Health. 1980;70(5):514-519.

[4] Weissert WG. Seven reasons why it is so difficult to make community-based long-term care cost-effective. *Health Serv Res*. 1985;20(4):423-433.

[5] Mitchell LaPlante. 2013. "The Woodwork Effect in Medicaid Long-Term Services and Supports," Journal of Aging & Social Policy, 25:2, 161–80.

[6] Julie Sonier, Michel H Boudreaux, and Lynn A. Blewett. 2013. "Medicaid 'Welcome-Mat' Effect of Affordable Care Act Implementation Could Be Substantial," Health Affairs 32:6, 1319–25.

[7] Francis G. Caro PhD (2013) Introduction: The Woodwork Effect, Journal of Aging & Social Policy, 25:2, 99-106

[8] Joint Committee on Health debate, 23/03/2021; www.oireachtas.ie/en/debates/debate/joint_committee_on_health/2021-03-23/3/

[9] Programme for Government Our Shared Future, https://www.gov.ie/en/publication/7e05d-programme-for-government-our-shared-future/

[10] Sláintecare mid-year Progress Report for 2021, https://www.gov.ie/en/publication/cce45-slaintecare-mid-year-progress-report-for-2021/

[11] Walsh B, Lyons S. (2021) Demand for the Statutory Home Care Scheme, ESRI Research Series 122.

[12] Glanville J, Kaunelis D, Mensinkai S. How well do search filters perform in identifying economic evaluations in MEDLINE and EMBASE. Int J Technol Assess Health Care. 2009 Oct;25(4):522-9.

[13] Kemper P, Applebaum R, Harrigan M. Community care demonstrations: what have we learned?. Health Care Financ Rev. 1987;8(4):87-100.

[14] Francis G. Caro PhD (2013) Introduction: The Woodwork Effect, Journal of Aging & Social Policy, 25:2, 99-106

[15] William G. Weissert PhD & Lucy Frederick MPH (2013) The Woodwork Effect: Estimating It and Controlling the Damage, Journal of Aging & Social Policy, 25:2, 107-133

[16] Robert L. Kane MD, Terry Y. Lum PhD, Rosalie A. Kane PhD, Patty Homyak MHA, Shriram Parashuram MPH & Andrea Wysocki PhD (2013) Does Home- and Community-Based Care Affect Nursing Home Use?, Journal of Aging & Social Policy, 25:2, 146-160

[17] Mitchell P. LaPlante PhD (2013) The Woodwork Effect in Medicaid Long-Term Services and Supports, Journal of Aging & Social Policy, 25:2, 161-180

[18] Kim, H., Lim, W., 2015. Long-term care insurance, informal care, and medical expenditures. J. Public Econ. 125, 128–142.

[19] Bakx P, Wouterse B, van Doorslaer E, Wong A. Better off at home? Effects of nursing home eligibility on costs, hospitalizations and survival. J Health Econ. 2020 Sep;73:102354.

[20] Diane Berish, Ian Nelson, Shahla Mehdizadeh & Robert Applebaum (2019) Is There a Woodwork Effect? Addressing a 200-Year Debate on the Impacts of Expanding Community-Based Services, Journal of Aging & Social Policy, 31:1, 85-98

[21] Hollander, M.J., & Chappell, N.L. (2007). A Comparative Analysis of Costs to Government for Home Care and Long-term Residential Care Services, Standardized for Client Care Needs. Canadian Journal on Aging / La Revue canadienne du vieillissement 26(1), 149-161.

[22] Portrait F, Lindeboom M, Deeg D. The use of long-term care services by the Dutch elderly. Health Econ. 2000 Sep;9(6):513-31

[23] Chou YC, Kröger T, Pu CY. Models of long-term care use among older people with disabilities in Taiwan: institutional care, community care, live-in migrant care and family care. Eur J Ageing. 2014 Sep 27;12(2):95-104

[24] Penning MJ, Cloutier DS, Nuernberger K, MacDonald SWS, Taylor D. Long-term Care Trajectories in Canadian Context: Patterns and Predictors of Publicly Funded Care. J Gerontol B Psychol Sci Soc Sci. 2018 Aug 14;73(6):1077-1087

[25] Tenand M, Bakx P, van Doorslaer E. Equal long-term care for equal needs with universal and comprehensive coverage? An assessment using Dutch administrative data. Health Econ. 2020 Apr;29(4):435-451

[26] Pilny A, Stroka MA. Determinants of received long-term care - Individual responses to regional nursing home provisions. Health Care Manag Sci. 2016 Dec;19(4):326-337.
[27] Kim W, Chun SY, Lee JE, Lee TH, Park EC. Factors Related to the Institutionalization of Older Aged Individuals Using Home- and Community-Based Care Services: Data From the South Korea Long-Term Care Insurance Program, 2008-2013. J Aging Soc Policy. 2019 Jul-Sep;31(4):321-337.
[28] Albertini M, Pavolini E. Unequal Inequalities: The Stratification of the Use of Formal Care Among Older Europeans. J Gerontol B Psychol Sci Soc Sci. 2017 May 1;72(3):510-521.
[29] Aspell N, O'Sullivan M, O'Shea E, Irving K, Duffy C, Gorman R, Warters A. Predicting admission to long-term care and mortality among community-based, dependent older people in Ireland. Int J Geriatr Psychiatry. 2019 Jul;34(7):999-1007.
[30] Bauer EJ. Transitions from home to nursing home in a capitated long-term care program: the role of individual support systems. Health Serv Res. 1996 Aug;31(3):309-26.
[31] Lehnert, T., Heuchert, M., Hussain, K., & Konig, H. (2019). Stated preferences for long-term care: A literature review. Ageing and Society, 39(9), 1873-1913.
[32] Judith D Kasper, PhD, Jennifer L Wolff, PhD, Maureen Skehan, MSPH, Care Arrangements of Older Adults: What They Prefer, What They Have, and Implications for Quality of Life, The Gerontologist, Volume 59, Issue 5, October 2019, Pages 845–855
[33] Young C, Hall AM, Gonçalves-Bradley DC, Quinn TJ, Hooft L, van Munster BC, Stott DJ. Home or foster home care versus institutional long-term care for functionally dependent older people. Cochrane Database Syst Rev. 2017 Apr 3;4(4):CD009844
[34] Hultcrantz M, Rind D, Akl EA, Treweek S, Mustafa RA, Iorio A, Alper BS, Meerpohl JJ, Murad MH, Ansari MT, Katikireddi SV, Östlund P, Tranæus S, Christensen R, Gartlehner G, Brozek J, Izcovich A, Schünemann H, Guyatt G. The GRADE Working Group clarifies the construct of certainty of evidence. J Clin Epidemiol. 2017 Jul;87:4-13.
[35] Eom K, Penkunas MJ, Chan AWM. Effect of caregiving relationship and formal long-term care service use on caregiver well-being. Geriatr Gerontol Int. 2017 Oct;17(10):1714-1721
[36] Keefe, J., & Fancey, P. (2000). The Care Continues: Responsibility for Elderly Relatives before and after Admission to a Long Term Care Facility. Family Relations, 49(3), 235-244
[37] Heger D, Korfhage T. Care choices in Europe: To Each According to His or Her Needs?. Inquiry. 2018;55:46958018780848.
[38] Ara R, Brazier JE. Using health state utility values from the general population to approximate baselines in decision analytic models when condition-specific data are not available. Value Health. 2011 Jun;14(4):539-45
[39] HSE National Service Plan 2021
[40] Hollander N, Chapell N, Final Report of the National Evaluation of the Cost-Effectiveness of Home Care: A Report Prepared for the Health Transition Fund, Health Canada, 2002, http://catalogue.iugm.qc.ca/GEIDEFile/ReportEvalCostHomeCare.PDF?Archive=191923591910&File=ReportevalcostHomecare%5FPDF