HEALTHY & POSITIVE AGEING INITIATIVE

International approaches to the development of Meals on Wheels and home-meals service guidelines in five OECD countries – An Evidence Brief

November 2020

The Healthy and Positive Ageing Initiative (HaPAI) is a joint research programme led by the Department of Health with the Health Service Executive, Age-friendly Ireland, and The Atlantic Philanthropies.

The following citation is suggested for this report:

Healthy and Positive Ageing Initiative. *International approaches to the development of Meals on Wheels and home-meals service guidelines in five OECD countries – An Evidence Brief.* Dublin: Department of Health; November 2020.

PREFACE

This report was completed by the Healthy and Positive Ageing Initiative (HaPAI) which is a research programme led by the Department of Health in association with the HSE, Age-Friendly Ireland, and The Atlantic Philanthropies. The HaPAI was established in order to achieve Goal 4 of the National Positive Ageing Strategy(1): *Support and use research about people as they age to better inform policy responses to population ageing in Ireland.* National Goal 4 involves two objectives:

- Continue to employ an evidence-informed approach to decision-making at all levels of planning; and
- Promote the development of a comprehensive framework for gathering data in relation to all aspects of ageing and older people to underpin evidence-informed policy making.

The HaPAI is also aligned with several goals and actions of Healthy Ireland – A Framework for Improved Health and Wellbeing 2013-2025(2), the national framework for the improvement of population health and wellbeing, and the WHO's Active Ageing: A Policy Framework(3) which provides key policy proposals for enabling active ageing in our societies. The HaPAI commenced in 2015 and is operational in several different areas of activity:

- The development of national indicators of older people's health and wellbeing, leading to the 2016 publication of a biennial report on the health and wellbeing of older people in Ireland.
- The establishment of a research fund to commission targeted additional research to fill identified data gaps required to cover all indicators, relevant to the design or configuration of future services and supports for older people; and
- At a local level, the development of indicators using either national data broken down to the county level where possible or additional data collected locally and published in a series of county reports in selected counties.

EXECUTIVE SUMMARY

The purpose of this evidence brief is to provide international evidence to support and inform progress under action 5.2 of the joint policy housing statement "Housing Options for Our Ageing Population". Action 5.2 aims to *"explore the structure of community-based social care supports and consider the role, model and expansion of services such as day care and ancillary services including meals-on-wheels aimed at keeping older people in their communities"*(4).

In Ireland, Meals on Wheels (MoW) services have been operating for over 100 years(5). The majority of services are currently provided by community-led groups and charities, with approximately 15% of services provided by local authorities(5). While MoW is not a state-run service, the HSE provides some financial support through grant aid to voluntary agencies(6)(7).

However, information on the operation and provision of MoW in Ireland is lacking and legislation regarding the nutritional value of these meals or national eligibility criteria for these services does not currently exist(5). Furthermore, the limited evidence available suggests that Irish recipients of MoW may not be receiving adequate nutritional intake from the meals provided(7), highlighting the need for the development of service guidelines and standards for existing and prospective meal providers, to support their efforts in improving the nutritional status and quality of life of older people in Ireland(7)(8).

Therefore, this evidence brief describes the international approaches used to develop Meals on Wheels and home-meals service guidelines in five OECD countries including Australia, the United Kingdom, the United States, Canada, and New Zealand. Also, an overview of the factors associated with the health and dietary behaviours of the older community-dwelling population in Ireland will be presented, as well as an analysis of the nutritional status of older people in receipt of MoW.

RESEARCH QUESTIONS

1. What are the health and dietary patterns of the older community-dwelling population in Ireland and what factors are associated with these behaviours?
2. What is the nutritional status of older community-dwelling adults receiving Meals on Wheels in Ireland?
3. What are the international approaches to developing Meals on Wheels and home-meals service guidelines?

FINDINGS

1. Health and dietary patterns of older community-dwelling adults in Ireland:

Population-based factors associated with the diet and eating patterns of the older community-dwelling population in Ireland which are important to consider in the development of MoW guidelines are presented in the table below.

Factors	Relevance for nutritional guidelines and meal-based standards
Adherence to the food pyramid & healthy weight	High obesity rates and poor adherence to dietary guidelines have been reported in the TILDA sample. 34% of older adults are obese and 45% are overweight, while only 21% are categorised as having a healthy weight. Also, this cohort is a high-risk group for lifestyle-related illness such as type 2 diabetes. A large proportion of older adults over-consume food and drinks high in fat, salt, and sugar and under-consume fruit and vegetables.
Frailty	Frailty affects 12.7% of adults aged 50+ and 21.5% of people aged 65+ in Ireland(9). Inadequate dietary intake has a significant role to play in the onset and development of frailty, particularly inadequate protein and energy intake which are essential for bone protection and muscle health functionality(10). However, frailty is preventable and reversible through nutritional and physical activity-based interventions(10). The Mediterranean diet (MeDi) might be able to delay or prevent the onset of frailty and improve physical frailty and cognitive function(11).
Disability	Nutrition is an important factor in the development of age-related diseases such as osteoporosis, cognitive decline, sarcopenia (muscle wasting), hearing loss and vascular diseases which can cause disability and a loss of independence(12). Disability is an important determinant for wellbeing and quality of life as it has been linked to an increase in depression, social isolation and loneliness(13)(14).
Cognitive function	24% of older Irish adults show signs of mild cognitive impairment(15). Inadequate intake of some nutrients (folic acid, vitamin B12, fatty acids) have been shown to be associated with an increased risk of Alzheimer's(12). Multidomain interventions including MeDi, exercise and brain stimulation have been found to delay cognitive decline in at-risk older adults(16).
Psychological and social wellbeing (loneliness, living alone, quality of life, depression)	A third of older adults (56+) live alone in Ireland. Living alone has been linked to feelings of social isolation and loneliness and those who are socially deprived or isolated may be at a greater risk of poor health(17). A study(18) on community-dwelling older adults found that mobility and social support were strong predictors of poor nutritional status. Furthermore, social isolation has been associated with poor self-rated health, functional limitations and depressive symptomology, with a stronger association found between loneliness and depression(17).

2. Nutritional status of older people receiving Meals on Wheels in Ireland

Below, the key results on the nutritional status of older TILDA participants receiving MoW are presented.

- Only 40 TILDA participants reported receiving MoW in wave 3.
- These participants were more likely to:
    - be 70 years or older
    - have lower levels of educational attainment
    - overconsume food and drink high in fat, salt, and sugar

    - under consume complex carbohydrates (bread, pasta, potatoes, rice)
    - experience higher levels of loneliness compared to those not receiving MoW
    - have a lower BMI than those not receiving MoW
    - and to experience poorer physical and mental health compared to those not receiving MoW.
- The vast majority of these participants (90%) did not adhere to the recommended daily intake of fruit and vegetables.

3. International approaches to the development of Meals on Wheels service guidelines:

Eight key documents (*N* = 8) were identified from a literature search on the international approaches to developing MoW guidelines in five countries. Following a synthesis of these findings, several key features, and important factors to consider in relation to the development process were identified and these are summarised in the tables below.

Considerations for Guidelines Development	
Development process & approach	• Multidisciplinary approach: engagement with multiple relevant stakeholders and experts in the field • Approaches to gathering information: Consultation with customers and service providers; literature search; collation of existing standards and guidelines
Target audience & format	• Determine intended users of the guidelines: customers, service providers, those implementing the guidelines? • The target audience informs the scope, objectives, format, and style of the guidelines
Updating the guidelines	• As recommended in the guidelines under review, guidelines should be updated regularly. This can be done through sharing standardised recipes, including tools and further information about recipes within the guidelines and providing online versions of the guidelines.

Key Features	
Supporting independence	Overall the primary objectives of the guidelines are to improve the nutritional status of older people and to provide a consistent standard for the nutritional quality of meals. Through achieving these objectives the guidelines support MoW services to achieve their aim of supporting older people to live independently.
Choice and variety	• Meal and menu planning are underpinned by the principles of choice and variety. • Services should provide opportunities for food choice based on individual need and cultural food preferences and provide a variety of healthy choices for people to choose from.

Social connectedness	The social aspects of eating and the social impact of meal provision are identified as important features of meal services. The guidelines describe how to make food nutritious, visually appealing, and affordable, which are central to enhancing the social experience of eating.
Screening and assessment	Nutritional screening is an effective tool for identifying people living in the community who might be at risk of malnutrition or overnutrition and in need of some form of intervention and this can be carried out by case managers/ service coordinators who can refer an at-risk person to a dietitian for a full assessment. Examples include the MNA-SF tool and the MUST tool.
Service evaluation	• Evaluation of service operations and outcomes is important to measure the effectiveness of the services in terms of meeting people needs and ensuring customer satisfaction. • Service process evaluation helps to answer key questions such as whether the right people are being served, whether costs are in line with the budget and whether customers are satisfied with the service. • Outcome's evaluation is a quantifiable measurement of the results of the service such as whether the service has benefited the service user in terms of increased socialisation, a reduction in nutritional risk, a change in behaviour related to diet etc.
Nutrient analysis software	• This software is used for the nutritional analysis of food and menu planning. • Examples of software include the CORA Menu Planner and the Food Processor. • These tools are used by service providers with oversight from dietitians.

Contents

Tables

Figures

CHAPTER ONE

INTRODUCTION

POLICY CONTEXT, RESEARCH PURPOSE AND OVERVIEW

1. INTRODUCTION

POLICY CONTEXT

The population of Ireland is growing rapidly and is estimated to increase by between 14-23% by 2030(19). Furthermore, the proportion of people aged 65 and above are projected to double, increasing significantly from 532,000 to 1.4 million (167%) by 2046, and the number of people aged 85 and over are projected to almost quadruple (by 273%)(20). As a result, there will be an increased demand for health and social care services, especially in the area of services for older people(19).

The high incidence of functional impairment and debilitating diseases in the older population can have a major impact on older people's capacity to carry out activities of daily living, increasing their need for professional services to remain at home for as long as possible(21). Furthermore, functional impairment can limit their ability to shop for and prepare nutritious meals, which further impacts their health status. Additional supports in the community such as Meals on Wheels (MoW), aim to meet these needs and improve energy and nutrient intake by delivering nutritious meals in older people's homes, particularly for those at higher nutritional risk(21). The service also aims to reduce social isolation by providing social contact to older people and those at risk of social exclusion(5).

In Ireland, MoW services were originally developed by local community groups and have been operating for over 100 years(5). The majority of services are provided by community-led groups and charities, with approximately 15% of services provided by local authorities(5). While MoW is not a state-run service, the HSE provides some financial support through grant aid to voluntary agencies(6)(7).

In countries where the systematic evaluation of MoW services are carried out and where legislation regarding the minimum standards for their operation has been established, the benefits of using MoW have been shown(22,23). In Ireland, however, information on the operation and provision of MoW is limited and currently, there are no statutory minimum standards or service guidelines for the nutrient content of meals, or the dietary composition of meals provided. Therefore, service provision, funding and standards vary greatly across the country(5). Furthermore, the limited evidence available suggests that Irish recipients of MoW may not be receiving adequate nutritional intake from the meals provided(7), highlighting the need for the development of service guidelines and standards for existing and prospective meal providers in Ireland, to support their efforts in improving the nutritional status and quality of life of older people in Ireland(7)(8).

In line with the National Positive Ageing Strategy (2013), a cross-departmental joint policy statement "Housing Options for our Ageing Population" was developed to address the lack of appropriate homes and supports available to older people that allows them to remain living independently in their home for as long as possible.

The statement outlines 40 actions under the themes of data gathering, collaborative working, delivering choice, support services, comfort and safety, and maintaining momentum to progress this objective(4).

Within the joint policy statement, and under the theme of 'Support Services', action 5.2 (Community-based social care supports) aims to "explore the structure of community-based social care supports and consider the role, model and expansion of services such as day care and ancillary services including meals-on-wheels aimed at keeping older people in their communities"(4). An expert working group was established in the Department of Health to develop guidelines for existing and prospective MoW service providers including the exploration of the development of MoW guidelines.

This information brief has been completed by the Healthy and Positive Ageing Initiative and on behalf of the Steering Committee, to provide international evidence to support and inform progress under action 5.2. The primary aim is to review and synthesise information on international approaches to developing guidelines for MoW and home-meals services.

PURPOSE & APPROACH

This evidence brief provides an overview of the international approaches used to develop MoW guidelines in a select number of comparable countries (United Kingdom, Australia, Canada, United States and New Zealand). To supplement this research, an overview of the health and dietary patterns of the older community-dwelling population in Ireland will also be presented, using the most recent and available data. Also, the nutritional status of older adults in receipt of MoW in Ireland will be presented. The research will be used by the interdepartmental/agency implementation group who are responsible for progressing the actions set out in the joint housing policy statement.

This evidence brief is guided by the following research questions:

1. What are the heath and dietary patterns of the older community-dwelling population in Ireland and what factors are associated with these behaviours?
2. What is the nutritional status of older community-dwelling adults receiving Meals on Wheels in Ireland?
3. What are the international approaches to developing Meals on Wheels and home-meals service guidelines? This will include information on the guidelines, standards and operational documents relating to the provision of MoW and home-meals services and this primary question includes the following sub-questions:
    - Who was involved with developing these guidelines?
    - How were the guidelines developed? (e.g. consultation with stakeholders?)
    - Who are the intended users of the guidelines?

- What is included in these guidelines (i.e. contents)?
- What are the key features?

OVERVIEW

This research brief is presented in five chapters. The next chapter (Chapter 2) provides an overview of the current health and dietary patterns of the older community-dwelling population, based on the most recent evidence from The Irish Longitudinal Study on Ageing (TILDA). In the following chapter (Chapter 3) the methods used to examine the nutritional status of older TILDA participants in receipt of MoW and the results of this analysis are presented. Chapter 4 examines the international approaches used to develop MoW guidelines in five countries including Australia, the U.K, U.S, Canada, and New Zealand. This chapter outlines the methods used to answer this research question and presents the findings for each of the five countries. A discussion outlining the key considerations for guideline development and the key features identified across all the guidelines, based on a synthesis of the findings, concludes the chapter. The final chapter (chapter 5) includes a summary of the findings concerning the three research questions.

CHAPTER TWO

HEALTH AND DIETARY PATTERNS OF THE OLDER COMMUNITY-DWELLING POPULATION IN IRELAND

FACTORS ASSOCIATED WITH THE DIET AND EATING BEHAVIOURS OF OLDER ADULTS

2. HEALTH AND DIETARY PATTERNS OF THE OLDER COMMUNITY-DWELLING POPULATION IN IRELAND

The following section outlines the factors associated with the diet and eating behaviours of older adults in Ireland, using evidence from the Irish Longitudinal Study on Ageing (TILDA).

Scientific Guidelines on Food-Based Dietary Guidelines for Older Adult nutritional and meal-based standards and guidelines for older adults are outside the scope of this review. However, guidelines and standards form an important component of prevention and early intervention to support older adults to live at home for as long as possible. Therefore, and from a *healthy ageing perspective*, there are several relevant population-based factors and characteristics to consider in the development of guidelines and standards: adherence to the food pyramid; physical health status - frailty, disability, healthy weight; cognition; psychological wellbeing (quality of life and depressive mood); and social wellbeing (loneliness and living alone).

FACTORS RELEVANT TO NUTRITIONAL GUIDELINES AND MEAL-BASED STANDARDS

Factors that may be used to inform the development of guidelines and meal-based standards for older adults are summarised in the following table. Data from TILDA is presented in the remainder of the section for each factor.

Table 1. Population-based factors related to nutrition and health of older adults.

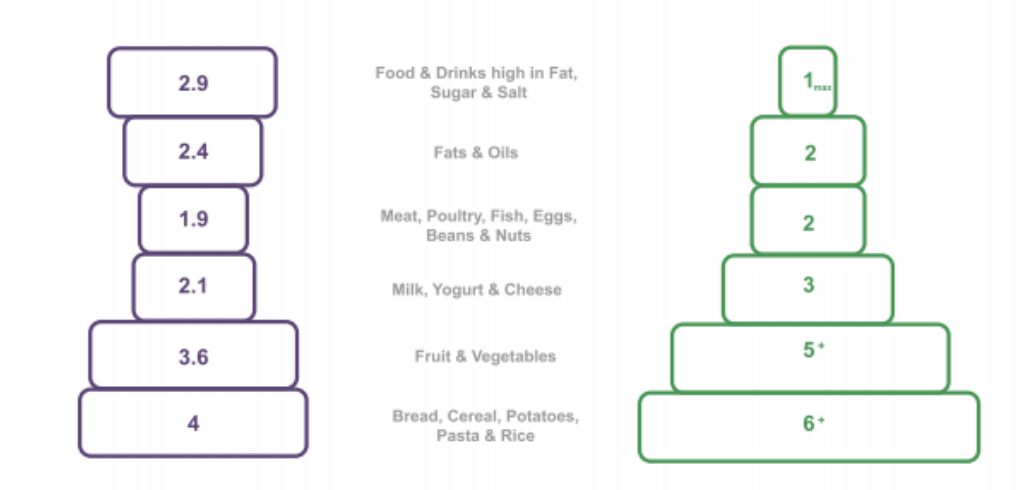
Factors	Relevance for nutritional guidelines and meal-based standards
Adherence to the food pyramid & healthy weight	High obesity rates and poor adherence to dietary guidelines have been reported in the TILDA sample. 34% of older adults are obese and 45% are overweight, while only 21% are categorised as having a healthy weight. In addition, this cohort is a high-risk group for lifestyle-related illness such as type 2 diabetes. A large proportion of older adults over-consume food and drinks high in fat, salt, and sugar and under-consume fruit and vegetables.
Frailty	Frailty affects 12.7% of adults aged 50+ and 21.5% of people aged 65+ in Ireland(9). Inadequate dietary intake has a significant role to play in the onset and development of frailty, particularly inadequate protein and energy intake which are essential for bone protection and muscle health functionality(10). However, frailty is preventable and reversible through nutritional and physical activity-based interventions(10). The Mediterranean diet (MeDi) might be able to delay or prevent the onset of frailty and improve physical frailty and cognitive function(11).

Disability	Nutrition is an important factor in the development of age-related diseases such as osteoporosis, cognitive decline, sarcopenia (muscle wasting), hearing loss and vascular diseases which can cause disability and a loss of independence(12). Disability is an important determinant for wellbeing and quality of life as it has been linked to an increase in depression, social isolation and loneliness(13)(14).
Cognitive function	24% of older Irish adults show signs of mild cognitive impairment(15). Inadequate intake of some nutrients (folic acid, vitamin B12, fatty acids) have been shown to be associated with an increased risk of Alzheimer's(12). Multidomain interventions including MeDi, exercise and brain stimulation have been found to delay cognitive decline in at-risk older adults(16).
Psychological and social wellbeing (loneliness, living alone, quality of life, depression)	A third of older adults (56+) live alone in Ireland. Living alone has been linked to feelings of social isolation and loneliness and those who are socially deprived or isolated may be at a greater risk of poor health(17). A study(18) on community-dwelling older adults found that mobility and social support were strong predictors of poor nutritional status. Furthermore, social isolation has been associated with poor self-rated health, functional limitations and depressive symptomology, with a stronger association found between loneliness and depression(17).

Adherence to the food pyramid

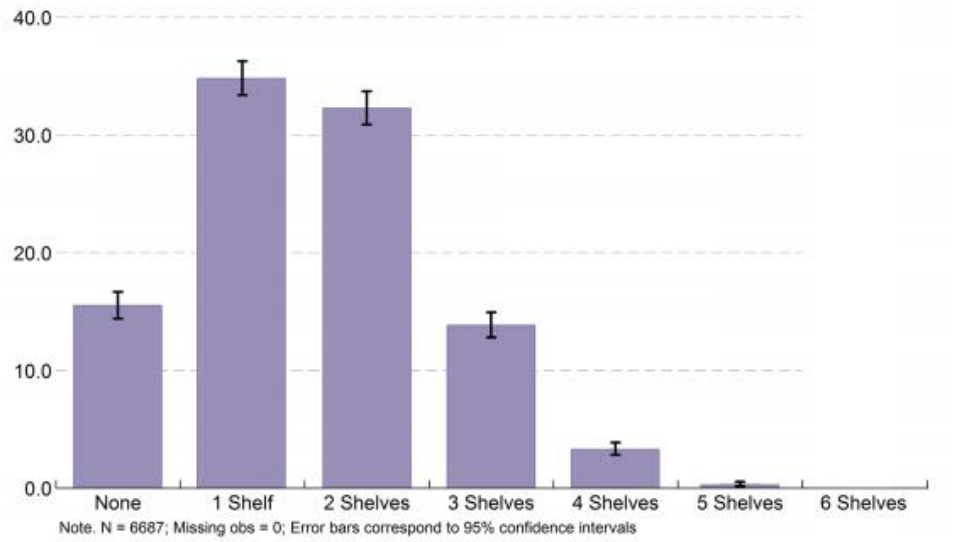
A Food Frequency Questionnaire (FFQ) was completed by 5,279 participants in TILDA Wave 3 (79% response rate). Results show that there is on average over-consumption of foods from the top of the pyramid, and under-consumption of foods from the bottom of the pyramid.

Figure 1. Overall mean (average) daily consumption of foods from each group compared to the recommended daily intake based on the 2021 Food Pyramid recommendations



The percentage of older adults adhering to the recommended daily intake of food from the shelves of the pyramid is low: the majority only adhere to 1 or 2 shelves.

Figure 2. Proportion (%) of adults aged 54 years and over meeting the recommended daily intake of food from the shelves of the Food Pyramid.



PROFILING THE HEALTH AND WELLBEING OF THE OLDER POPULATION

In terms of capturing the profile of older adults in a comprehensive way that is meaningful and relevant to the development of food-based guidelines for older adults it is relevant to consider the following indicators: frailty; disability - activities of daily living (ADLs) and instrumental activities of daily living (IADLs); and social connectedness.

Prevalence of frailty in the older adult population

The NPAS and HSE's Clinical Programme for Older People aiming to increase independence in the home, reduce nursing home admissions and reduce the number of falls in this population.

Although numerous models have been proposed to measure frailty the two most dominant approaches are the Frailty Phenotype(24) and the Frailty Index(25). The Frailty Phenotype conceptualises frailty as the presence of 3 or more of the following criteria: muscle weakness, slowness, low levels of physical activity, exhaustion, and unintended weight loss. Individuals are classified as prefrail if they exhibit one to two of the criteria and classified as robust if these criteria are not present.

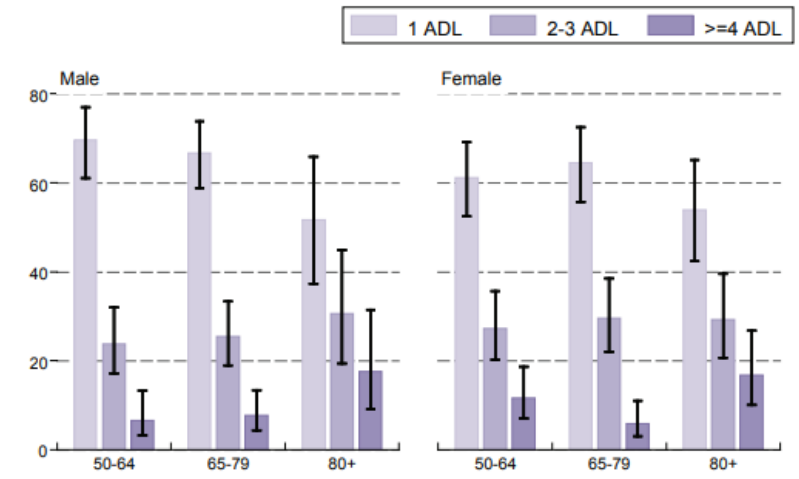
Based on the Frailty Index and using the TILDA sample (aged 50 and older, living at home), frailty is thought to affect 12.7% of those aged 50 and over in Ireland and 21.5% of those aged 65 plus. Prevalence of prefrailty among the over 50s is at

30.9% with the remaining 56.4% classified as robust. Frailty tends to be more prevalent in women than men but increases with age for both men and women.

Prevalence of disability by presence of ADL/IADL limitations

The term social care is used to denote assistance with activities of daily living (ADL) and with instrumental activities of daily living (IADL). ADL are the basic tasks of everyday life that pertain to personal care, such as eating, bathing, dressing, toileting, and moving about(9). IADL are activities performed by a person to live independently in a community setting, such as housekeeping, preparing meals, shopping, using the telephone, taking medications correctly and managing money(9).

Figure 3. Prevalence of IADL and ADL limitations within age groups

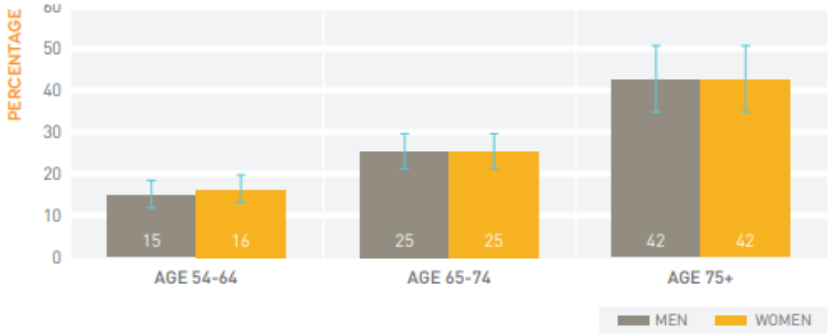


Note. N = 699; Error bars correspond to 95% confidence intervals

Cognitive function

The Montreal Cognitive Assessment Protocol (MOCA) is used in TILDA. This is a test of global cognitive ability and assesses function across multiple domains of cognition including memory recall, visuospatial ability, executive function, attention, language, and orientation to time/place. The test is frequently used in clinical practice and has a maximum score of 30. A MOCA test score of 23 or less is considered evidence of mild cognitive impairment, and this is 24% of those aged 54+ in Ireland(15).

Figure 4. Percentage of men and women with mild cognitive impairment, by age group



Source: National positive ageing indicators (2018)

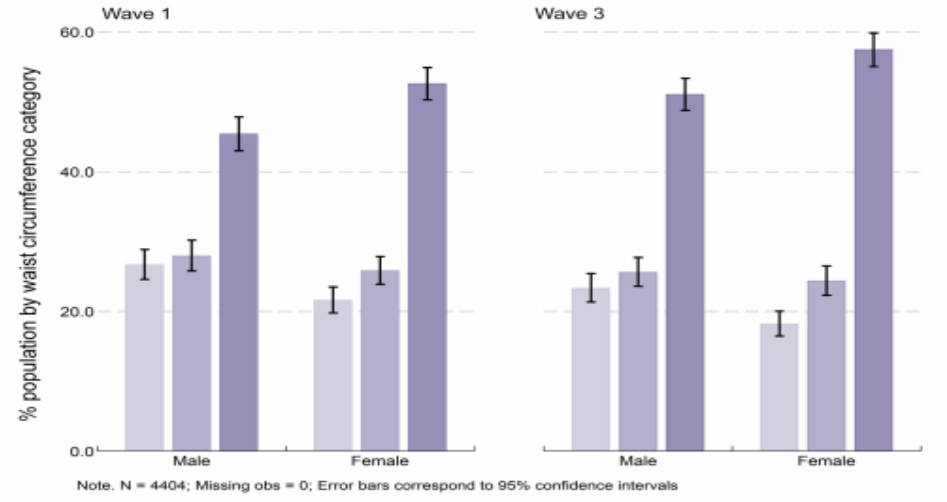
Prevalence of obesity in the older adult population (Healthy weight)

Obesity is commonly measured using Body Mass Index (BMI) (weight/height^2) and is reported using the World Health Organisation classifications (BMI 18.5-24.9 = normal; 25.0 – 29.9 = overweight; 30+ = obese). Using the TILDA sample, 45% of older adults are overweight and 34% are obese. (TILDA 2017)

Obesity is also measured using Waist Circumference (WC). WC is considered a more accurate way of measuring excess fat in older adults as it is a measure of visceral fat that is linked to metabolic disturbances, increased risk for cardiovascular disease, type 2 diabetes, and increased breast cancer. (TILDA 2017)

Based on WHO classifications (men – normal <94cm, increased 94-101cm, substantially increased ≥102; women – normal <80cm, increased 80-87cm, substantially increased ≥88cm) 54% of older adults have substantially increased WC and this is higher for women compared to men. Between Wave 1 and Wave 3, the proportion of older adults with a normal circumference decreased from 24% to 21%, while the proportion with a substantially increased WC increased by 5%.

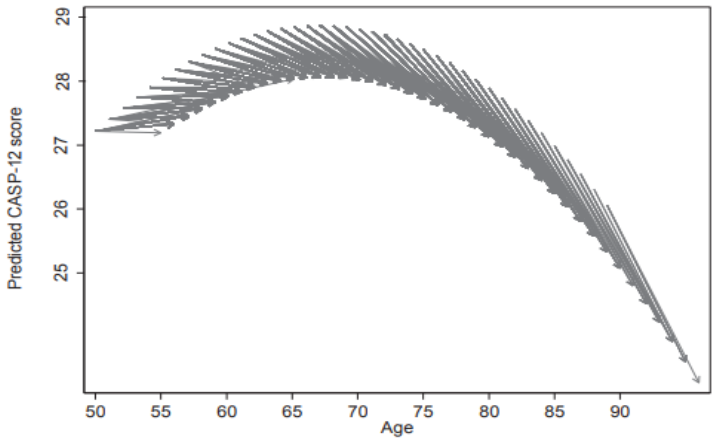
Figure 5. Proportion (%) of older adults in Ireland with normal, increased or substantially increased Waist Circumference at Waves 1 and 3, by age group and gender.



Quality of life

The Control, Autonomy, Self-realisation, and Pleasure (CASP 12) measurement is used in TILDA to assess Quality of Life in older adults (QOL). Some sample items included in CASP-12 are 'I can do the things that I want to do', 'I look forward to every day', and 'I feel that life is full of opportunities'. Each item is scored from 0 to 3 and summed to give an overall score (range 0 to 36) with higher scores denoting better quality of life. The mean quality of life score among TILDA participants is 27.3 in Wave 4, indicating that on average older adults in Ireland have a good quality of life. QOL increases to a peak at age 68 and begins to decline for both men and women.

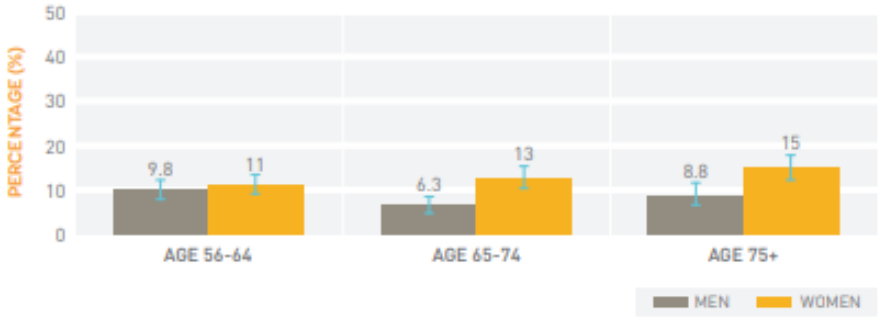
Figure 6. Changing trajectories of quality of life between Waves 1 and 4



Prevalence of depressive symptoms in the older adult population

Depression in older adults is measured by the Centre for Epidemiological Studies-Depression (CES-D 8) scale, an eight-item scale with scores ranging from 0-24, with clinically significant depression categorised as a score of 9 or above. The prevalence of depression in older adults aged 56+ is at 11% as of Wave 4. Higher levels of depression are seen in women compared to men, particularly in the older age groups (Age 65-74; 75+) and depression in women is more prevalent with increasing age.

Figure 7. Percentage of men and women aged 56+ with depression, by age group

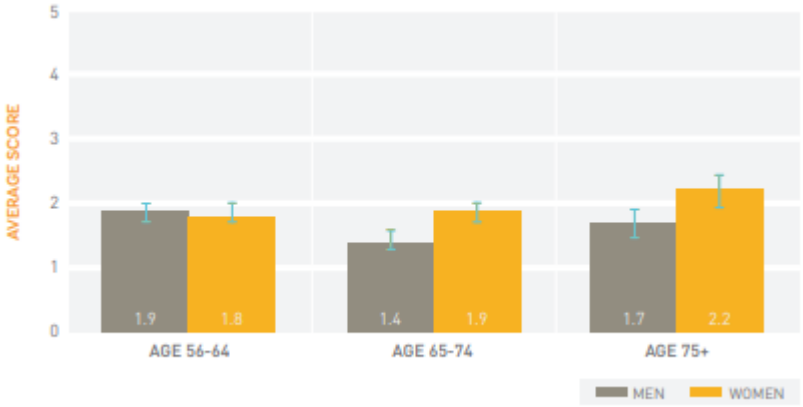


Source: National positive ageing indicators (2018)

Prevalence of loneliness among older adults in Ireland

The prevalence of loneliness among older adults aged 56 and over is at 5.4% with women having a higher loneliness score than men at all ages and this also increases with advancing age for women (Wave 4 TILDA). The loneliness score is based on a modified 5-item adaptation of the University of California, Los Angeles (UCLA) Loneliness scale. (24) The tool consists of the following items: 'How often do you feel left out?', 'How often do you feel isolated from others?', 'How often do you feel in tune with the people around you?' and 'How often do you feel lonely?'. Responses can range from 0 (hardly ever/never) to 2 (often) and these responses are summed to create an overall loneliness score ranging from 0 (not lonely) to 10 (extremely lonely).

Figure 8. Loneliness scores for men and women aged 56+, by age group



Living alone can exacerbate loneliness and social isolation and contribute to poor psychological wellbeing in older adults(26). In Wave 4 of TILDA, 28.5% of older adults (56+) in Ireland lived alone, and the proportion of those living alone more than doubled between the ages of 56-64 (20.5%) years and 75+ years (45.2%).

CHAPTER THREE

THE NUTRTIONAL STATUS OF OLDER ADULTS RECEIVING MEALS ON WHEELS IN IRELAND

METHODS, FINDINGS & CONCLUSION

3. THE NUTRITIONAL STATUS OF OLDER ADULTS RECEIVING MEALS ON WHEELS IN IRELAND

The first section of this chapter contains an extensive review of the literature relating to the nutritional status of older adults and examining the impact of MoW on this cohort. Section two provides an overview of the TILDA methodology. Section three provides the results of the association between receiving MoW and nutritional status in older people. The final section comprises a summary of the evidence.

BACKGROUND

Ireland has an ageing population, and by 2030, 20% of Irish residents will be 65 years or older(27). The greatest increase will be the number of those aged 80 years or older, which is likely to increase by 45% over the next ten years(27). This presents unique challenges as Ireland has one of the lowest life expectancy rates in Europe(27). A key issue facing older people is malnutrition, which is particularly common in older adults who are in hospital or residential care facilities(28). Furthermore, those older adults who have been discharged from hospital are particularly at risk of malnutrition(28). While calorie needs decrease with age, nutrient needs remain the same which can cause difficulties for older people who are homebound due to illness, disability or social isolation(29).

Evidence on the impact of MoW on the nutritional status of older adults is mixed(7,22). One study in Ireland(7) looking at the nutritional status of older Irish people in receipt of MoW and the nutritional content of the meals provided found that 38.5% of individuals were malnourished or at risk of malnourishment and 52.3% were overweight or obese. A nutritional content analysis of the meals provided revealed that vitamin C, vitamin D, folate, and calcium levels were below one-third of the Irish recommended daily amounts (RDA), and the energy content of meals accounted for 35-40% of RDA in males and 42-45% in females aged 65 years and over. The author suggested that Irish recipients of MoW may not be receiving adequate micro-nutrients from the meals provided and that minimum standards for the nutrient content of meals and more variation in the portion size available to improve the health status of older adults in receipt of home-delivered meals are required.

By contrast, two recent international reviews noted that the results supported the beneficial impact of MoW on dietary intake of energy, protein and/or certain micronutrients in older adults(22,23). Older adults receiving MoW had a significantly improved diet quality, increased nutrient intake, and reduced food insecurity(22). Some research has indicated that MoW or home-delivered meals improve dietary intake(29–31), nutritional status, wellbeing and food security(30,31). It also decreases loneliness(30) and the institutionalisation of older

people(29). International research examining the impact of MoW for 145 nationally representative participants found that service use was associated with a net increase in daily intake of nutrients, including protein, fibre and calcium(32). However, changes to total energy, fat and vitamin D were not statistically significant(32). A recent three-week pilot study in the United Kingdom noted that the daily provision of MoW to older adults noted that this population had a lower risk of malnutrition and self-rated themselves as significantly less depressed(33). MoW are most likely to positively impact older people who live alone and those with a poorer baseline nutritional status(31).

A recent study in the United States rolled out a multifaceted intervention, including home-delivered meals, a cooking class and a mobile market selling fresh fruit and vegetables at discounted prices to low income older adults(34). This was a community collaboration initiative that sought to address food insecurity at a grassroots level through screening for food insecurity and implementing evidence-based initiatives to support older adults to age in place(34). In terms of evaluating impact, food insecurity and dietary patterns are useful nutritional indicators of the impact of home-delivered meals(31). In summary, the available literature indicates that home-delivered meals can improve nutrient intakes among participants and may have a beneficial impact on healthy ageing and healthcare cost containment if delivered on a large enough scale(32).

METHODS

The Irish Longitudinal Study on Ageing (TILDA) is a prospective, nationally representative study of community-dwelling older adults in the Republic of Ireland(35). Since 2009, TILDA has collected information every two years on all aspects of health, economic and social circumstances from community-dwelling people aged 50 and over(35).

Participants were selected using multi-stage stratified random sampling whereby 640 geographical areas, stratified by socio-economic characteristics, were selected, followed by 40 households within each area(35). The Irish GeoDirectory listing of all residential addresses provided the sampling frame. The first Wave of data collection was conducted between October 2009 and July 2011 and a total of 8,504 participants were recruited(35). This represents 1 in 156 people aged 50 and over in Ireland. Wave 3 of the TILDA dataset was analysed for this chapter and began in 2014 and ended in 2015. The variables used within the TILDA dataset for this analysis include the following: age, gender, body mass index, depression, loneliness and whether participants receive the MoW service. Additionally, data on participants' dietary consumption patterns and their adherence to the Food Pyramid was examined, which was led by Ms Deirdre O'Connor and Dr Christine McGarrigle. Further information and analyses on TILDA participants' dietary consumption patterns can be found in the following report(36).

Introduction

This dataset comprises 6,618 participants (n = 3,679, 56% female; n = 2,939, 44% male). Nearly two-thirds of participants were aged 50-69 years (64%) compared to 36% aged 70 years and older. Over one-quarter of participants reported either none or primary school education, 39% reported secondary school education, while the remaining 34% reported third-level education.

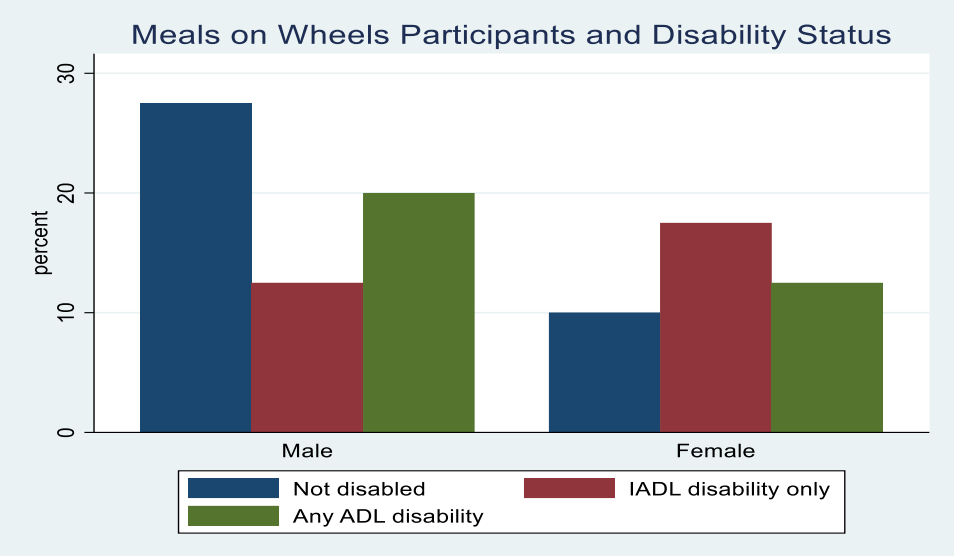
Demographic characteristics of TILDA participants receiving Meals on Wheels

Only 40 participants (0.6%) reported receiving MoW in wave 3 of TILDA. Of those, 60% (n = 24) were male and 40% (n = 16) were female. Over three-quarters of participants receiving MoW (80%) were aged 70 years or older. The majority (n = 17) of participants received MoW between one and ten days a month. Over half (52.5%) of participants receiving MoW had either none or primary school education, with 37.5% and 10% having secondary school and third-level education, respectively. Just 5% (n = 2) of participants receiving MoW were obese. As the sample size of those in receipt of MoW was low (n = 40) the following results should be interpreted with caution.

Prevalence of disability by presence of ADL/IADL limitations

Of those receiving MoW, 62.5% had a disability that required assistance with activities of daily living (ADL) or with instrumental activities of daily living (IADL). Figure 9 illustrates disability status by gender for those receiving MoW.

Figure 9. Disability status by gender for participants receiving Meals on Wheels.



Prevalence of loneliness

Just less than one-fifth of participants (18%) who received MoW reported they felt lonely a moderate amount or all the time, compared to just 8% of participants not receiving MoW. Most participants receiving MoW (32.5%; n = 13) self-reported their health as fair. The majority of those receiving MoW self-reported their mental/emotional health as good (37.5%).

Adherence to the Food Pyramid Recommendations

Of the forty participants that reported receiving MoW in Wave 3 of TILDA, just 22 participants provided FFQ data. One participant did not have data on their consumption of the top shelf of the food pyramid, leaving n = 21 participants for the analysis. Table two highlights TILDA participants' adherence to the food shelves of the food pyramid, with the majority not adhering to any shelves (n = 7) or adhering to two shelves (n = 7).

Table 2. Number of adults aged 50 years and over meeting the recommended daily intake of food from the shelves of the Food Pyramid (n=21)

	Adherence to no shelves	Adherence to 1 shelf	Adherence to 2 shelves	Adherence to 3 shelves	Total
	7	6	7	1	21
Total	7	6	7	1	21

Table three below highlights the mean serving per day and percentage adherence for each of the shelves of the Food Pyramid for participants receiving MoW. Participants were consuming a mean of over four times (m = 4.1; 95% CI: 2.8, 5.4) the recommended servings of food and drinks high in fat, salt, and sugar. Less than one-fifth of participants (18%) adhered to the recommended serving for this shelf of the Food Pyramid. The mean serving per day of bread, cereals, potatoes, and pasta was 4.5 (95% CI: 2.9, 6.0), which is lower than the recommended six servings per day, with one-quarter of participants adhering to the recommended servings per day.

Table 3. Mean servings of each shelf of the Food Pyramid and percentage adherence for participants receiving Meals on Wheels (n = 21)

Shelves of Food Pyramid	n	Recommended Servings	Mean Serving per Day (95% CI)	Percentage Adherence (95% CI)
Foods and Drinks high in Fat, Salt and Sugar	21	Maximum of 1 serving	4.1 (2.8,5.4)	18% (4,42)
Reduced Fat Spreads and Oils	22	2 servings per day	2.1 (1.2,2.9)	16% (4,45)
Meat, Poultry, Fish, Eggs, Beans and Nuts	22	2 servings a day	2.0 (1.4,2.6)	41% (21,66)
Milk, Yoghurt and Cheese	22	3 servings a day	2.6 (1.8,3.4)	8% (2,31)

Fruit and Vegetables	22	5 or more servings each day	3.3 (1.7,5.0)	11% (2,39)
Bread, Cereals, Potatoes, Pasta and Rice	22	6 or more servings each day	4.5 (2.9,6.0)	24% (8,53)

Figure 10 below illustrates that just under a third of the sample (31%; 95% CI: 13-56) did not adhere to any shelves of the food pyramid. Just under one quarter (23%; 95% CI: 9-47) adhered to one shelf. The largest proportion of the sample adhered to two shelves (42%; 20-68). Just 4% (95% CI: 0-30) adhered to three shelves of the food pyramid. No participant who received MoW adhered to four, five or all six shelves of the food pyramid.

Figure 10. Proportion (%) of adults aged 50 years and over meeting the recommended daily intake of food from the shelves of the Food Pyramid (n=21)

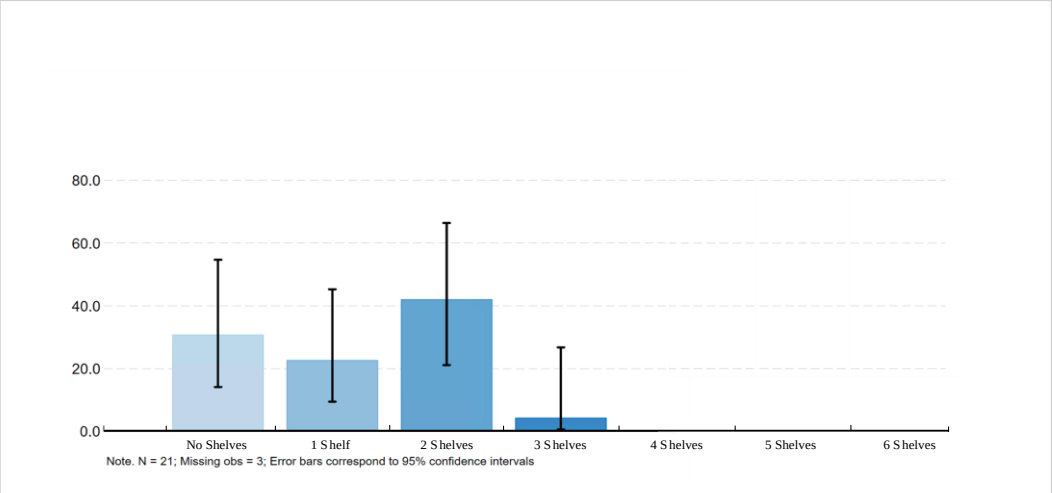


Figure eleven 11 below illustrates the mean overall daily consumption from each group of the Food Pyramid for MoW participants compared to the recommended daily intake. This figure emphasises the mean overconsumption from the top shelf and for fats and oils.

Figure 11. Overall mean (average) daily consumption of foods from each group compared to the recommended daily intake based on the 2012 Department of Health Food Pyramid Recommendations, among those receiving meals on wheels (n=22)

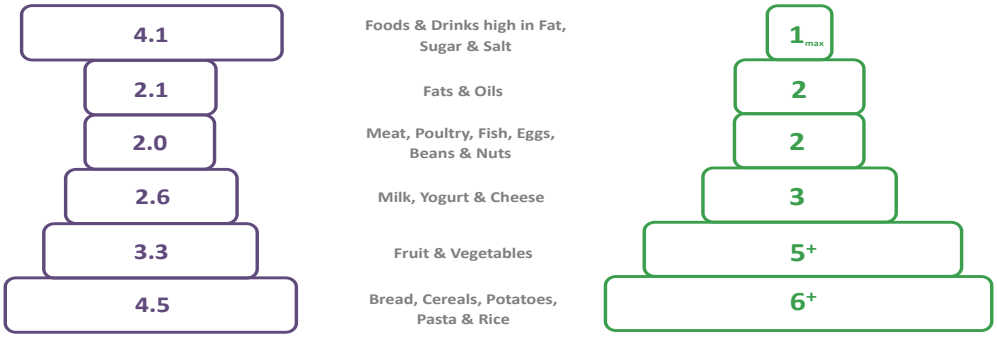
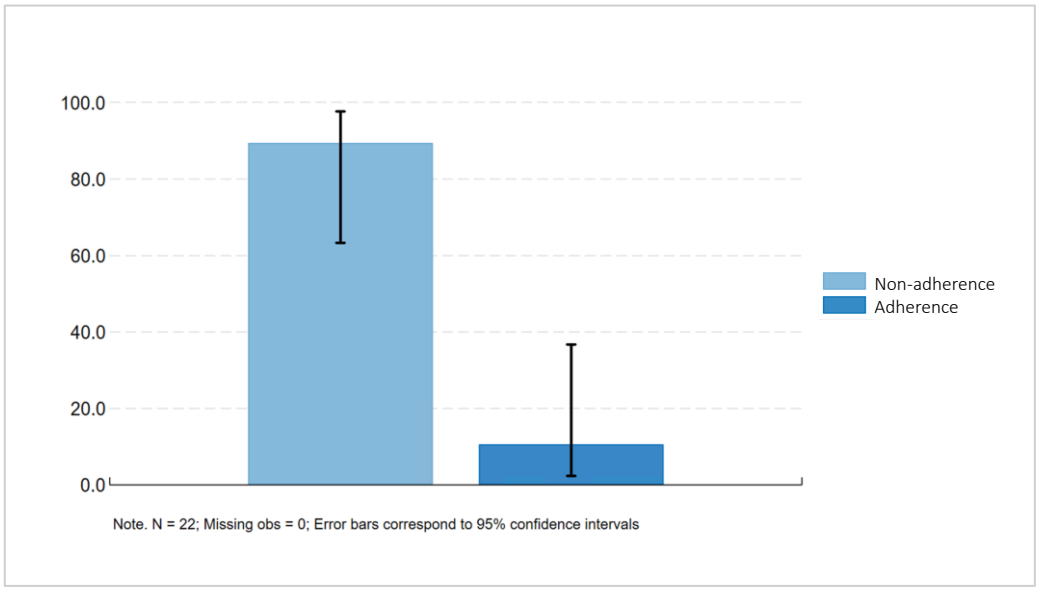


Figure 12 also highlights the underconsumption of complex carbohydrates, fruit and vegetables and milk, yoghurt, and cheese for MoW recipients. When the adherence to the fruit and vegetable shelf is examined in more detail, it is apparent that 90% of TILDA participants receiving MoW do not adhere to the recommended daily intake.

Figure 12. Adherence to Fruit and Vegetable Recommendations (5 or more servings each day) (n = 22)



Comparison of TILDA participants receiving vs. not receiving Meals on Wheels

Most TILDA participants self-reported they did not receive MoW. Those not receiving MoW had significantly higher educational attainment compared to those receiving MoW ($p < .001$). Mean BMI was higher for both males and females not receiving MoW. A significant difference in obesity between those who receive and do not receive MoW was also noted ($p = 0.01$). Of the participants not receiving MoW, 10% had a disability, compared to over 60% in those receiving MoW. A significant difference in disability status between those who receive and do not receive MoW was also noted ($p <.001$). Those not receiving MoW reported fewer feelings of loneliness compared to those receiving MoW. There was a significant difference in self-reported feelings of loneliness between those who receive and do not receive MoW ($p <.001$). Those not receiving MoW self-reported better overall health compared to those receiving MoW and this difference was significant ($p <.001$). Nine percent of those not receiving MoW classified their mental/emotional health as fair or poor compared to 20% of those receiving MoW. There is a significant difference in the mental/emotional health of participants who do and do not receive MoW ($p <.001$).

CONCLUSION

This research examined the socio-demographic and dietary factors of TILDA participants who received MoW. The findings of this analysis should be interpreted with caution due to the small sample size (n=40). However, while the numbers reporting receiving this service were small, a clear pattern emerged of this group being a particularly vulnerable cohort for a myriad of reasons. MoW participants were more likely to be older, have lower levels of educational attainment, experience higher levels of loneliness and have poorer mental and physical health, among other factors. In terms of dietary behaviours, MoW participants were having on average four times the recommended daily intake of foods and drink high in fat, sugar, and salt. MoW participants were under consuming complex carbohydrates, fruit and vegetables and dairy. Most MoW participants (90%) did not adhere to the recommended daily intake of fruit and vegetables. Given these dietary and socio-demographic characteristics, this group would benefit from a targeted intervention, that not only addresses the dietary limitations but also the health and social problems outlined in this brief. Addressing mental health factors, including loneliness may be beneficial in improving overall physical health and wellbeing(37) in older people receiving MoW services.

CHAPTER THREE

THE INTERNATIONAL APPROACHES TO THE DEVELOPMENT OF MEALS ON WHEELS AND HOME-MEALS SERVICE GUIDELINES

METHODS, FINDINGS & DISCUSSION

4. THE INTERNATIONAL APPROACHES TO THE DEVELOPMENT OF MEALS ON WHEELS AND HOME-BASED MEALS SERVICE GUIDELINES

Chapter four presents the findings on the international approaches to developing MoW guidelines across five OECD countries. The chapter begins with an overview of the methods used to answer this research question. After which, the findings for each country are presented. This chapter concludes with a discussion section on the key findings.

METHODS

Two search strategies were used to examine this research question including a targeted website search for grey literature (i.e. guidance, policy, and operational manuals; reports; websites) and consultation with representatives from Government departments and associated agencies and non-profit organisations in the area of nutrition and health for older people.

Targeted website search

First, relevant organisations, authorities and stakeholders' websites were identified by searching the topic on Google for each country using a combination of the following search terms: *guidelines, standards, policies, meals on wheels, home-delivered meals, meals, nutrition, programs, and older adults/people.* A filter was applied to the Google search to capture only websites from the selected countries. For example, under region settings, Canada was selected (i.e. google.ca) before the literature search and the same was repeated for the four other countries. The first five pages (representing 50 results) of each search were screened for relevant websites. Links to additional websites within some websites were found and included. A total of 76 websites (Appendix 1) were identified and links to each website were saved in a word document.

The next step involved searching each websites' search bar using the same combination of words. Websites that did not have a search bar were hand-searched. *N* = 113 potentially relevant records were identified after screening the titles and the descriptions underneath. This was followed by a more detailed screening process which involved screening the full document to determine eligibility for inclusion based on predetermined inclusion and exclusion criteria (Table 4). Also, sources of evidence/resources cited within these documents were also considered and screened.

A total of 8 documents met the inclusion criteria (Table 5), these included guidance documents, toolkits, policy manuals and websites on MoW guidelines. A full content review of each of these documents was conducted.

In addition, a brief overview of the guidelines, *A Recommended Standard for Meals on Wheels Community Meals (1992)* developed by the National Association of Care Catering (NACC), is provided. Full access to this document was not available, therefore a comprehensive review of these guidelines was not possible.

What data was extracted for the content review?

Information on the aims/goals of the document, the process of developing the guidelines including who developed the guidelines and how they were developed (i.e. establishment of the working group; consultation with stakeholders etc), and the content and organisation of the guidelines (i.e. what is included in the document? e.g. food safety regulations; assessments; program delivery guidelines).

Additional background information

During the initial screening process, other documents containing key background information regarding the policy context and the overall provision, administration, operation and structure of nutrition services and programs for older people as well as information on MoW organisations and other key organisations in each country were identified. It was decided that this information would be included in the evidence brief as it provides a context to the research question.

Table 4. Inclusion exclusion criteria for documents

Inclusion	Exclusion
Available in English	Not available in English
Included standards or guidelines or policies for meals around development/ partnerships/ governance/ funding /referral etc.	Only describe nutritional guidelines and not considerations
Intended for providers, service users of MOW and older adults in a community setting.	Does not describe the home/community setting.
Published by Gov or NGO in the countries under review	Draft document or summary version Published outside of these countries
MoW Described as a program involving the provision of meals at home or in the community for little to no cost	
Publications from 2000-2020	

Table 5. Guidelines included in the content review.

Country	Guidelines/toolkits/manuals
Australia	Australian Meals on Wheels. National Meal Guidelines - A Guide for Service Providers, Caterers and Health Professionals Providing Home Delivered and Centre Based Meal Programs for Older Australians. 2016
The U.K.	Caroline Walker Trust. Eating well for older people. 2004
United States	• Administration on Aging, Department of Health and Human Services. Older Americans Act Toolkit. 2005 • Administration on Aging, Department of Health and Human Services. Dietary Guidelines for Americans 2005, Nutrition Service Providers Guide • The National Resource Center on Nutrition and Aging – Online Platform
Canada	• Winnipeg Regional Health Authority. Congregate Meal Program Toolkit (2018) • Government of Saskatchewan. Home Care Policy Manual. 2015
New Zealand	Ministry of Health New Zealand. Meals on Wheels Service Tier Level Two Service Specification. 2012

Email correspondence

To supplement the targeted website search, key experts in the field of nutrition and health of older people from Ministries and associated agencies, and non-profit organisations were contacted via email. This was done to minimise the risk of omitting relevant documents and sources of information.

Key contacts were identified during the initial Google search to identify relevant stakeholders, authorities, and organisations. Contacts were emailed and informed of the research being undertaken and were asked to identify relevant guidelines/standards/operational documents or to signpost to relevant organisations. Email correspondence between the Healthy and Positive Ageing Initiative (HaPAI) and key contacts took place between August and September. Several contacts passed on the query or provided links to other organisations and websites. A list of the contacts that HaPAI were in correspondence with can be found in Appendix 2.

Although not all contacts responded to the initial query and subsequent follow-up emails, for those who did provide information, email correspondence proved to be a useful tool for clarifying the relevancy of the documents obtained in the targeted website search.

FINDINGS

The following section describes the international approaches used to develop MoW and home-meals service guidelines. A brief overview of how MoW and home-based meal programs for older adults are administered in each country is provided for context. This is followed by a description of the key documents related to MoW guidelines in all five countries under review.

Australia

Background

The Commonwealth Home Support Program (CHSP) was launched in 2015 to bring together four existing programs including the Commonwealth Home and Community Care Program, National Respite for Carers Program, Day Therapy Centres Program and Assistance with Housing and Care for the Aged Program(28). The CHSP is designed to enable older adults to access services and to maintain independence. Home-delivered meals for older adults are subsidised by the CHSP with contributions from individual service providers(38). Access to the service can be made by a service user or their carer via the My Aged Care online platform(28).

The Australian Meals on Wheels Association (AMOWA) provides strategic national leadership to over 600 local non-profit meal service providers across Australia(38). While all MoW services are underpinned by the same fundamental principles and committed to ensuring the health and wellbeing of the community(38), there is considerable variation across and between states and territories in how organisations are structured and governed(39). This includes differences in how the service operates, the mode of delivery, type of meal provided, rate of funding, meal preparation and providers of the service(40). A report (2014)(40) commissioned by AMOWA and the Australian Research Council, **'**Meals on Wheels: building towards a new social experiment for our times' outlines the challenges faced by MoW both nationally and internationally and identifies innovative service delivery models in response to these challenges. Included in the report is an overview of MoW service operations in each state and territory, as of 2013/2014. As stated,

> "MoW operates in different contexts and settings within each State and Territory. For example, some groups work with local government, charities, health, and homecare departments, and all are funded at different rates by various State governments and/or the Federal government (The funding model changed in all States other than WA and Victoria in July 2012, with the majority of funding now coming directly from the Commonwealth.) Some prepare their meals in specially designed kitchens whilst others are sourced commercially from hospitals, canteens, and nursing homes. Some only serve frozen meals, whilst others deliver fresh meals daily. Some groups use only volunteers, others have some paid staff, and a few are now only using paid staff due to the lack of volunteers. Government legislation, regulations, and requirements also differ across Australia" (pg11)

An overview of how service providers operate in each state/territory is further outlined in the report.[1]

Guidelines

National Meal Guidelines 2016

A discussion paper (2014)(41) on support for older people living at home by The Department of Social Services (DSS) in Australia, outlined key directions for the CHSP. One of the key recommendations was to develop voluntary National Nutritional Guidelines for delivered and centre-based meals, based on existing state guidelines. In line with this recommendation, the Australian Meals on Wheels Association (AMOWA) proceeded with the development of these guidelines, which were published in 2016.

The National Meal Guidelines(8) describe an innovative approach to menu design and meal provision that is focused on supporting the nutritional needs of the older population in Australia. As outlined in the document, the aim of the guidelines are to

> "...provide nationally consistent advice to CHSP meal providers; to support CHSP meal providers' existing efforts in enhancing the nutritional quality of meals; and to respond to the nutrient requirements and changing needs of older customers receiving meals who are living in the community" (pg. 15)

They also describe the benefits of MoW in terms of social wellbeing and as a useful tool to monitor both health and wellbeing:

> "Home delivered and centre-based meals also have the added advantages of providing an opportunity for social interaction and the potential to monitor a person's health and well-being – they are 'More than just a meal'." (pg. 18)

The primary intended users of the National Meal Guidelines are service providers of home-delivered, and centre-based meal programs funded by the CHSP. The guidelines are also intended as a resource for dietitians, health care providers and services, as well as for service users and their families to enable them to make informed choices. The guidelines are underpinned by a food-focused, practical, and modular approach that is informed by evidence-based information and are presented in a user-friendly format making it accessible to all potential users.

A toolkit approach is used in that existing resources, references and web links are referred to and incorporated into the meal guidelines. The guidelines are to be used in conjunction with these other key resources and together they form a package of information or a toolkit available to providers and services users.

---

[1] Available at: http://mealsonwheels.org.au/wp-content/uploads/2016/03/MOW-Building-Towards-A-New-Social-Experiment-For-Our-Times.pdf (pg. 11-14).

Development of the guidelines

The AMOWA commissioned researchers at the Smart Foods Centre, University of Wollongong to prepare and compile guidelines with additional support and guidance from members of a Steering Group. Steering group members included a representative from the Dietitians Association of Australia (DAA), a Service Operations Manager from Meals on Wheels South Australia and the Director of Hornsby Ku-ringai (area in Sydney) Meals on Wheels. The group was chaired by the President of MoW Victoria and AMOWA. Guidelines were informed by input from key stakeholders of home-delivered meals including customers, caterers, staff from service providers and representatives from nutrition and health organisations. This involved a formal consultation process including workshops, surveys, and telephone interviews. The guidelines were developed in 3 phases:

Phase 1: Establishment of the project steering group and collection of existing guidelines and standards: The process began with the establishment of a steering group that developed the guidelines with input from key stakeholders. Existing guidelines standards and documentation such as state-based hospital standards, aged care resources and community-based resources were reviewed. This included the following documents:

- MoW guidelines (2002)(42)
- Meals on Wheels (SA) Inc. Menus, Recipes & Nutrition (2007)(43)
- QLD MoW Nutrition Manual (2012)(44)
- Best Practice Food and Nutrition Manual (2015)(45)
- Eating Well - Nutrition Resource for Older People and their Carers (2015) (46)

A systematic review of the scientific literature on food and nutritional requirements for community-living older adults and evidence regarding the impact of guidelines on the provision of nutrition-based interventions in this population was also conducted.

Phase 2: Engagement and consultation with key stakeholders: In addition to five face-to-face meetings with the steering group, this phase included engagement and consultation with several stakeholders which involved the following:

- State-based workshops with customers and representatives of MoW members including providers and managers, representatives from nutrition and health organisations and the food industry.
- An online survey distributed to service providers, caterers, and health professionals.
- A paper-based survey of current customers of home-delivered and centre-based meals.
- Separate interviews with stakeholders on the development, review, and feedback on the final draft document.
- Input from key stakeholders in reviewing the National Meal Guidelines.

Phase 3: The Australian Dietary Guidelines(47) and the Nutrient Reference Values(48) (NRVs) frameworks were considered during the development of the National Meal Guidelines. NRVs were developed by the National Health and Medical Research Council (NHMRC) of Australia and provide the recommended intake of nutrients based on a person's age, gender, and stage of life.
The Australian Guide to Healthy eating(49) – a food selection guide that visually summarises the proportion of the five food groups recommended each day – was used as a reference for determining portion sizes and was applied to the meal component specifications for different food groups. As stated within the National Meal Guidelines, meal component specifications "set out the minimum quantities of ingredients in different food categories and recommend how much variety should ideally be available on a menu"(4)(pg. 30). To ensure nutritional adequacy of the meal component specifications, the NRVs for older adults (>70) were applied and were reviewed by Accredited Practicing Dietitians.

Organisation of the guidelines

The guidelines cover 6 key areas including the key nutritional issues for older adults, how to meet their specific nutritional needs, aspects related to meal planning and menu construction, managing meal presentation and enjoyment, and special dietary considerations. The appendices include a list of key resources and weblinks.

The key nutritional issues affecting such as weight loss and dietary restrictions are summarised in chapter 1, providing a context for the development of the guidelines. The next section describes the nutritional needs of older people with a focus on malnutrition, including the different screening tools used to assess the condition. The guidelines emphasise the importance of providing a variety of food groups and a need for higher amounts of nutrients to address nutritional needs.

The authors describe how meal programs can be used as a tool for simultaneously addressing nutritional issues and social isolation and emphasise the importance of considering both the social and economic aspects of food when providing meal services:

> "Providing home-delivered and centre-based meals are strategies designed to keep older adults healthier and to support their independence. Customers are often referred to meal services as a result of ill health or social circumstances. This highlights the need to achieve a balanced approach to ensuring that meals are nutritious, but also tasty and visually appealing, while at the same time affordable" (pg. 27)

Furthermore, the role of food in cultivating friendships and in improving wellbeing is highlighted:

> "Food is an essential and enjoyable part of life, particularly for older adults who may be less involved in activities outside of the home and for whom mealtimes become an important part of the day. Certain foods may evoke fond memories of past experiences and provide comfort and familiarity. The

> offer of friendship and socialisation is an integral part of home-delivered and centre based meal programs. Qualitative research with MoW customers confirms the social significance of the service and their logo, "More than just a meal"”. (pg. 28).

The chapter on meal and menu planning outlines what should be addressed when planning meals and what the key considerations are such as cultural considerations and vegetarian diets. The nutritional requirements for meals are described with examples of the minimum quantities needed in a serving of an entrée, main meal, and dessert. They also describe how to provide greater choice, variety, and a range of different textures and how to incorporate this into a menu cycle (4 week period). An example of a menu plan and how to construct a menu is provided. Food safety and food labelling instructions are also included.

The following section provides guidance for service providers about how to include greater sources of nutrients that older Australians often find difficult to consume. A list of the nutrients, sources of these nutrients, and how to incorporate them into meals, are outlined with examples. Also included in this section is information on enriching meals for small appetites, snack considerations, and a sample shopping list.

Chapter 5 provides tips for how to present meals to make them more appealing to customers including advice on the colour and shape of the meals, and food plating and placement. Packing and social and dining room considerations are also addressed.

The final section addresses special dietary and meal considerations and outlines some recommendations for people living with dementia. It also includes advice on various diet types (e.g. Diabetes; coeliac disease; food allergies) and the role of Allied Health Professionals in the provision of special diets.

United Kingdom

Background

In the United Kingdom, the provision of MoW services by local authorities has significantly decreased in the last number of years (50) (Table 6). The Association for Public Service Excellence(51) (APSE) was commissioned by the National Association of Care Catering (NACC) to conduct a survey on the provision of MoW and home-delivered meal services across the UK in 2018. The survey revealed a 24% reduction in the number of councils providing MoW services, with only 42% offering services in 2018 compared to 66% in 2014. ASPE reported that a significant number of councils simply provided a list of suppliers, signposting older people to external suppliers. Within the report, six local authority models were identified including local authorities who prepare and distribute meals, buy, and distribute, tender, and subsidise, tender with a standalone service and signpost to suppliers. With the reduction in local authorities providing meal services, private sector providers have filled this gap.

Table 6. Decrease in MoW provision in the UK (51)

COUNTRY	REGION	MOW SERVICE 2014	MOW SERVICE 2016	MOW SERVICE 2018
England	East of England	64%	64%	**45%**
	East Midlands	88%	50%	**50%**
	London	69%	59%	**41%**
	North East	25%	25%	**17%**
	North West	48%	17%	**13%**
	South East	67%	33%	**39%**
	South West	71%	53%	**41%**
	West Midlands	60%	53%	**47%**
	Yorkshire & The Humber	50%	44%	**20%**
Northern Ireland		100%	100%	**80%**
Scotland		94%	75%	**61%**
Wales		59%	50%	**45%**
UK		**66%**	**48%**	**42%**

The National Association of Care Catering (NACC) and the Caroline Walkers Trust (CWT) both provide nutritional guidelines and standards for meal providers in the UK. In a case study by Sustain, on MoW best practice guidelines, the nutritional content of meals by many of the providers in the study were based on CWT or NACC guidelines(50).

Guidelines

National Association of Care Catering Guidelines

The NACC is a voluntary association that represents and supports organisations working in the catering and care sector in the UK. Members of the association include chefs, catering managers, care homeowners and suppliers to the care sector(52). As described on its website, the NACC

> "through its inclusive programme of regional and national events, training, campaigning, research, and guidance documents it provides valuable support, information and advice to care caterers to help them achieve this. It also offers a valuable platform for like-minded professionals to connect and share ideas and best practice"(52).

Legislation for food and beverage provision in the care sector was made under Regulation 14 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2014(53). This is supported by Outcome 5 of the Essential Standards of Quality and Safety, which specifies that providers must ensure that "the nutritional and hydration needs of service users must be met"(53). In line with this regulation, the NACC and Care England produced guidance, How to Comply with Care Quality Commissions (CQC) Outcome 5: Meeting Nutritional Needs, to enable regulated service providers to incorporate nutritional wellbeing into good practice and to meet the fundamental standards of the CQC(54).

The NACC has produced several other publications related to nutritional standards, meal planning and best practice guidelines for food served in care homes and in the community including *A Recommended Standard for Meals on Wheels Community Meals*. However, regarding the current review, it was not possible to access the publication, therefore a complete review of this document was not conducted. Provided below is a brief overview of these standards as described by Johnson(54) (2015) of the NACC.

A Recommended Standard for Meals on Wheels Community Meals (NACC, 1992)

This manual was first published by the NACC in 1992 and has been updated regularly since. The most recent manual contains the ten key characteristics of good community meals service(55). It provides practical advice to service providers about operations and specifications related to the provision of meals in the community. Johnson(54) states that many local authorities have adopted this guidance as the standard for community meal provision. Included in the document is current evidence and information on the nutritional needs of older people and the requirements needed to meet these needs. It also includes information on component specifications for all meals including breakfast, lunch, and dinner. There is a section on training and development specifically related to food safety and

implementation of the National Vocational Qualifications[2]. Cultural and special dietary considerations (medical diets) are also addressed, as well as best practice guidance on aspects related to meal transportation. (54)

The Caroline Walker Trust – Eating Well for Older People Guidelines

The Caroline Walker Trust (CWT) is a longstanding charitable organisation in the UK that undertakes specific projects related to public health and nutrition. A central part of their work is to produce expert group reports and to develop nutritional guidelines for vulnerable populations including older people and children. *Eating Well for Older People*(56) is a practical and nutritional guide for meals served in residential and nursing homes as well as for meals served in the community. The guidelines were first published in 1995 as CWT identified a need for practical guidelines nutrition for providers of meals in residential and community settings were updated in 2004 to reflect more recent findings from the *National Diet and Nutrition Survey of people aged 65 years and over*(57) which were published after the first edition of the guide in 1998.

As described in the report the guidelines are intended "to act as a resource document for those working for better standards of nutrition both for people in long-term residential or nursing care and for those in receipt of community meals" (pg. 15). Furthermore, the report aims to provide evidence on the relationship between nutrition and health in older people and to outline the current nutritional intake of this population and what their specific needs are. It provides clear information and advice to stakeholders on how to meet the nutritional needs of older people through developing suitable menu plans and how to translate this information into practical action.

Development process

An Expert Working Group was established by CWT to compile the first edition of the report. Members of the group included nutrition and health academics and specialists from various universities and organisations across the UK, geriatric consultants, dietitians, voluntary organisation representatives as well as three observers which included a representative from the Department of Health, London, the Ministry of Agriculture, Fisheries and Food, and a nursing home staff representative. The group was chaired by a Trustee of the Caroline Walker Trust. The first edition of the report was researched by Dr Katia Herbst and the second edition was updated and researched by Dr Helen Crawley of CWT. DGAA Homelife, the Department of Health, England and Tesco plc provided financial support when developing the first edition of the report.

[2] The NVQ is a work-based qualification which recognises the skills and knowledge a person needs to do a job(96)

In the first edition of the Eating Well report, the nutritional guidelines were primarily based on reports from the Department of Health, Committee on Medical Aspects of Food Policy (COMA)[3], including *The Nutrition of Elderly People* (1992)(58) and *Dietary Reference Values for Food Energy and Nutrients for the UK (1991)*(59) reports. The second edition was updated to include findings from the latest version of the *National Diet and Nutrition Survey of people aged 65 years and over*(57).

While the Expert Working group consisted of representatives from various organisations within the health and social care sector, there is no indication that a consultation process took place with key stakeholders in the development of these guidelines. The process mainly involved a review of existing scientific evidence on nutrition and health among older people and a collation of data from previous reports and surveys.

Organisation of the guidelines

The Eating Well guidelines are similar to the Australian Meal guidelines in terms of content, however, they include nutritional information for both meals provided in residential homes and the community, whereas the Australian meal guidelines are only directed at MoW providers and service users. An overview of the key content covered in the Eating Well report is provided in Table 7.

Table 7. Organisation of the Australian Meals guidelines

Sections	Description
A profile of Providers	Recommendations by the Working Group on the monitoring of meal standards and meal considerations for black and ethnic minorities.
Evidence on the association between health and nutrition	Evidence on the main nutritional and health issues affecting the older population, i.e. malnutrition. Recommendations on improving factors that impact health including living conditions and physical exercise.
Nutritional requirements	A description of the requirements and sources of each nutrient. Based on the Dietary reference Values prepared by COMA.
Nutritional guidelines	The Dietary Nutritional Values are translated into practical guidelines for meals prepared in residential accommodation and community meals
Examples of menus	Examples of menus are provided in this section regarding the CORA Menu Planner – a computer-based program that includes a recipe library database of dishes including recipes for ethnic foods, complete with a nutritional analysis of items and recipes. It also includes a weekly menu planner.

[3] COMA has since been disbanded and replaced by the Scientific Advisory Committee on Nutrition (SACN) that advises the government on diet and health. SACN revised the population recommendations for estimated energy requirements and made new recommendations for various nutrients.

	Advice on the delivery of food in the community to more vulnerable groups is outlined.
Nutritional assessment tools	Information on how to identify older people at risk of malnutrition using the "Must Tool". Includes a checklist to assess the quality of food and equipment.
Enhancing meals	Advice on how to provide variety and choice, how to prepare food and the timing and frequency of meals. Addresses the importance of food in building social relations. Recommends that community meal providers adhere to the NACC standards

The report does not include guidelines on special dietary and meal considerations, such as special considerations for people with dementia. While compiling the first edition of the Eating Well for Older People guidelines members of the Working Group acknowledged that they had not included the specific needs of older people with dementia as they felt it required special consideration. A further expert group was established to compile evidence on the influence of nutrition on older people with dementia. The Expert Working Group was set up with the support of the Caroline Walker Trust and the Department of Health and with oversight from VOICES, an umbrella group of voluntary organisations involved in the care of older people. This report, *Eating Well for Older People with Dementia*(60), was published in 1998. The report provided good practice guidance for residential and nursing homes, and for other groups involved in caring for older people with dementia. Furthermore, in 2011 CWT published *Eating well: Supporting Older People and Older People with Dementia*(61), a practical guide that is based on the nutritional guidelines of both the Eating Well reports. This document acts as a toolkit for meal providers in residential and nursing homes, providing clear and simple information and advice and includes a CD ROM with photos and examples of meals and snacks and suggested portion sizes and recipes for these meals.

Further to these guidelines and reports, in 2017 Public Health England (PHE) produced the toolkit, *Healthier and more sustainable catering*(62), which provides catering guidance to for organisations serving food to older people in residential care and other settings but are not specifically aimed at people living at home(63). It includes information related to the Government Buying Standards for Food and Catering Services (GBSF), to enable "organisations to buy, cook and serve healthier, more sustainable food" (62)(pg. 7). However, the toolkit is aimed at services providing food to healthy 19-74-year-olds and does not include nutrient standards or make recommendations for individuals with special dietary needs (e.g. diabetes).

United States

Background

The Older Americans Act (OAA) Nutrition Program is a federal program that supports the health and wellbeing of older people in the United States through access to nutrition services. The program includes congregate nutrition services (meals served in group settings), home-delivered nutrition services (MoW) and the nutrition services incentives program. It is geared toward low socioeconomic status people who are aged 60 years and over including those who have low-income; are racial or ethnic minorities; are living rurally; have limited English proficiency; and those at risk of institutionalisation. (64)(65)(66)

OAA programs are administered by a federal entity, the Administration on Aging (AoA), now situated within the Administration for Community Living in the Department of Health and Human Services. The AoA allocates OAA funds to State Units on Aging (SUAs) who operate at the state level and oversee funds to Area Agencies on Aging at the local level, these area agencies oversee the delivery of nutrition programs by local nutrition providers who consist of public (35%) and private non-profit (61%) organisations(65). Essentially, the program is a public-private partnership. The chart below illustrates the flow of funding and administrative structure of OAA nutrition programs(64):

Source: Meals on Wheels America. The Older Americans Act Nutrition Program (TITLE III-C).

MoW is the largest organisation providing both congregate and home-delivered meals to older people under funding from the OAA. Meals on Wheels America (MOWA) is a national network of over 5,000 local service providers across the country that aims to empower local providers to strengthen communities by providing leadership, education, research, advocacy and funding(67).

Different policies existing at federal, state, and local levels, which impacts the nutritional quality of meals served. As outline by the ACL(68), at the federal level,

> "The OAA requires that all meals served using OAA funds adhere to the current Dietary Guidelines for Americans, provide a minimum of one-third of the Dietary Reference Intakes, meet state and local food safety and sanitation requirements, and be appealing to older adults." (Nutritional Quality Standards section)

OAAs are designed to enable each state to translate these federal requirements into guidelines that best fit the needs of their older population. SUAs develop State Plans on Aging which contain the specific goals for nutrition programs in that state,

therefore, because the nutritional goals within each state plan differ, the content of the nutritional guidelines varies between states (68). Furthermore, information on the degree to which AAA's or local service providers adopt specific nutrition standards beyond state guidance has been made publicly available(65)

In the absence of robust national nutrition and meal guidelines, the Center for Science in the Public Interest has made recommendations to advance comprehensive food service guidelines(65). They recommend that further research is needed into how statutory requirements translate into state and local guidelines and provider menus to inform future advocacy efforts. They also recommend consultation with key stakeholders at each level of service oversight to provide greater insight into policies and procedures to improve the nutritional quality of meals, as well as research to identify best practices for including nutrition programs for older adults in foodservice guidelines policy adoption and implementation.

Guidelines

The following section provides an overview of three documents that provide guidance to service providers and other stakeholders of the OAA nutrition program. The first is the *Older Americans Act Toolkit*(69) which was developed in 2005, the second is *Dietary Guidelines for Americans 2005, Nutrition Service Providers Guide*(70) and the third is the *National Resource Center on Nutrition and Aging* online portal which was developed in 2011(71).

Older Americans Act Toolkit

In 2005 the National Resource Center on Nutrition, Physical Activity and Aging at Florida International University, with support from the AoA developed an Older Americans Act Toolkit to assist SUAs in revising and updating their nutrition-related regulations, policies, procedures, and guidelines. This toolkit was developed before the establishment of the Administration for Community Living in 2012.

As outlined in the toolkit the primary objectives of the toolkit are to,

> "…provide technical assistance and guidance to the Aging Network; to identify best practices and emerging areas for planning new approaches to implementing the OAA; to identify mechanisms for collaboration and partnership building; to identify resources to improve methods of service delivery; and to provide continuous, up-to-date information and resources (to be updated regularly)" (pg. 3).

Development process

The toolkit was developed by nutritionists and dietitians from the National Resource Center on Nutrition, Physical Activity and Aging and regional dietitians from the Administration on Aging. A Technical Review Committee was also established and consisted of nutritionists from various governmental departments in the area of health and ageing across the U.S, and a Nutrition Program Manager from MOWA.

The process of developing the toolkit is outlined in the document and was as follows. Development began with the AoA requesting all states and territories to send copies of documents related to state policies, procedures, rules, regulations, operational manuals, guidelines, and standards for administering OAA nutrition programs. A list of topics and subtopics was provided with the request, to suggest content areas of the document submitted by SUAs. In total, 44 states from across the country responded and submitted relevant files.

After gathering documentation, a manual content analysis of each states' documents was conducted. This involved coding parts of the document into categories based on the list of topics and subtopics provided. Topics and subtopics were then summarised using descriptive statistics including frequencies and percentages. The Authors noted limitations regarding the methods of data gathering and analysis, which were that some of the topics and subtopics may have been overlooked in the content review or that some SUAs may have failed to submit pertinent documents.

Organisation of the toolkit

The toolkit contains 12 chapters, and each chapter is divided into sections that contain the main components of the OAA nutrition program. Throughout each section reference is made to the OAA legislation, sample SUA policies and procedures that correspond to the OAA regulations, and links to additional resources such as articles, internet websites, catalogues and state booklets are provided to assist SUAs with the planning, implementation, monitoring, and evaluation of their nutrition services. For an overview of the topics covered in the toolkit see Table 8.

Table 8. OAA Toolkit Contents

Section	Description
Introduction	An overview of the history and current issues of the OAA Nutrition Program
Meal Service	An overview of the different types of meal services (congregate and home-delivered)
Menu and nutrient requirements	Includes information on the following: the nutritional needs of older people; nutrition recommendations; menu planning; special dietary needs; menu review and approval; meal service options; nutrient analysis tools (e.g. Food Processor).
Food safety and sanitation	Includes SUA standards and guidelines for food safety; food safety training; food handling; and food safety monitoring. Food safety training and education
General State and Area responsibilities	Information on the AoA including the AoA Office for American Indian, Alaska Native, and

	Native Hawaiian Programs; SUAs; AAAs; eligibility assessment; and outreach.
Personnel requirement (Staff/training)	Information on: Federal employment laws; staffing levels; staff and volunteer resources; and training.
Evaluation	Information on types of evaluation; planning for evaluation; guidelines and standards for evaluation; and outcome measurement results;

Below is an overview of the key features within these guidelines including the menu planning process, food safety and training and evaluation:

The menu planning process: As outlined in the document SUAs establish guidelines and standards for menu planning. The guidelines state that menu plans should include input from service users through focus groups, advisory councils, suggestion boxes, or surveys, as well as input from Food Production staff, site managers, home-delivered meal drivers, and food purveyors. The guidelines state that SUAs and AAAs should rely on dietitians or nutritionists to assist in the development and that the menu should reflect local food preferences and provide variety and choice.

Food safety training: Training of nutrition program staff and volunteers is needed to ensure food safety and managers and/or supervisors should be responsible for ensuring that safety and sanitation training is conducted. Some SUAs require training for all program staff. For example, food service managers and other staff may need to complete a course to be certified as a food handler. The guidelines outline a range of foodservice certification courses in the guidelines.

Evaluation: The OAA toolkit includes a detailed section on evaluation, specifically the evaluation of meal program operations and how to measure outcomes. They state that this is necessary to address the following questions:

- Is the nutrition program achieving the aim of promoting better health through improved nutrition?
- Is it meeting the needs of frail older adults including ethnic minorities with health disparities?
- Do the nutrition programs link with broader health and social systems?
- Is there culturally appropriate nutrition-related services and professional expertise that contributes to the evidence?

They outline two types of evaluation. The first is Process evaluation, which adopts both qualitative and quantitative methods and describes the amount, type and quality of services provided. The second is outcomes evaluation which is a quantifiable indicator of a program such as whether there has being increased socialisation or a reduction in nutritional risk.

Further to this toolkit, the AoA developed the Dietary Guidelines for Americans 2005, Nutrition Service Providers Guide(70), which is described below.

Dietary Guidelines for Americans 2005, Nutrition Service Providers Guide.

While the OAA toolkit provides technical assistance regarding the implementation of the OAA, the purpose of the Nutrition Service Providers Guide, as outlined in the document:

> "…is to provide technical assistance for implementing the *Dietary Guidelines for Americans* (DGAs) in the Older Americans Act (OAA) nutrition programs. This technical assistance provides guidance in menu planning, food purchasing, food production, and food service. Since programs differ, this guidance should be tailored to meet the unique needs and situation of each program. This guidance should supplement the input from a registered dietitian (RD) as well as State and Tribal policies, procedures and guidance" (70)(pg. 3).

Organisation of the guidelines

The guidelines are organised into two parts. Part 1(70) provides guidance on program planning considerations and tips for menu planning for OAA nutrition programs with key recommendations regarding nutrient and energy intake, physical activity, and food safety.

Part 2(72) provide technical assistance on how to apply DGAs in planning menus for OAA nutrition programs and includes examples of menus that are consistent with the DGAs, meet the Dietary Reference Intakes, the number of services from all food groups. Also, a computer-generated nutrient analysis of each menu is provided and quantity recipes for food items in these menus. These menus were developed by the National Resource Centre on Nutrition, Physical Activity and Aging and nutrient analysis were performed using Elizabeth Stewart Hands and Associates (ESHA) Research computer software called *Food Processor.* This nutrition analysis tool "combines an extensive and meticulously researched food and ingredient database with an uncluttered, easy-to-use interface for accurate and comprehensive nutrition analysis…[and] is a powerful tool for nutrition analysis, diet and exercise tracking, and menu planning"(73)

Development process

This document was developed by the same organisations and individuals involved in developing the OAA toolkit. The AoA within the Department of Health and Human Services provided primary leadership with the developing process, with support and input from the Office of Disease Prevention and Health Promotion and other organisations and individuals: Representatives from the National Resource Center on Nutrition, Physical Activity and Aging at Florida International University provided guidance on menu planning, AoA Regional Nutritionists provided input on the applicability to state, tribal and local programs, and State Nutritionists and Administrators provided input. All organisations were involved in reviewing the final drafts.

Both the OAA toolkit and the Nutrition Providers Guide are 15 years old and since their development, the US Dietary Guidelines(74) have been updated, in 2015. The National Resource Centre on Nutrition and Aging (NRCNA) is a more recent resource providing up-to-date guidance for providers of MoW.

The National Resource Center on Nutrition and Aging

In 2011, the ACL awarded a three-year grant to MOWA to establish a new National Resource Center on Nutrition and Aging (NRCNA) and were re-awarded another 3-year grant in 2017 to continue operating the Center(75). As described by the ACL, the aim of the NRCNA is:

> "to increase the capacity of the aging services network to meet the nutrition services needs of a rapidly growing population of older adults. The Center provides educational opportunities, tools and resources that cover best practices and emerging trends in the fields of nutrition, aging, healthcare integration, and innovative business models. It also works to enhance the aging service network's knowledge of the role of nutrition services in health promotion and disease prevention, as well as the scientific and clinical evidence that support both healthy meals and other nutrition services".(75) (para. 2)

The Center developed an online portal[4] using a toolkit approach whereby a range of tools and resources are available under different sections on the website.

Development process

In 2018, the website was redesigned to improve user experience by enabling ease-of-navigation, creating a responsive website, providing curated resources, and reducing content overload. The primary goals of the redesign were to educate, engage and empower users of the website, a full list and description of these goals is provided in Table 9. Several research strategies were employed to gather information on the topic during the redesign process including consultation with customers and other key stakeholders using surveys, as well as google analytics, competitor analysis, usability testing/studies and quality assurance checks. (76)

Table 9. Goals of the website redesign

Educate	Engage	Empower
• To provide content that is aligned to the user needs with a focus on training.	• Increased opportunities for interaction: Getting help	To empower users by enabling ease of navigation with updated ways to search and

[4] National Resource Center on Nutrition and Aging Website: https://nutritionandaging.org/

• Popular content areas include Nutrition, Food and Health; Operations; Training and Education; Public Policy; Resources and Tools. • Unpopular content removed or reimagined	with using the website by clicking on the question icon. • Option to give feedback/rate content	find content and new curated resources for key user groups (e.g. Nutrition professionals)

Organisation of the website

The website includes two main sections: A primary section – the homepage or landing page of the website – which includes a navigation menu with links to the following topics: Nutrition, Health and Food; Public Policy; Training and Events; and Resources; and a secondary section on the footer which leads users to specific pages within the site, such as links to data and statistics and peer resources. The website also has a dynamic section with changing content, such as slideshows and a health calendar.

A range of resources such as toolkits and e-learning modules are available, as well as online and live training. The toolkits provide information and guidance on various aspects of the OAA nutrition program such as cultural and special dietary considerations, cost analysis of meals, food safety, meal planning and recipes, enhancing meals, sustainability, best practices, and information on meal service operations during COVID.

These toolkits contain audio recordings and slideshows from presentations by experts in the field, which can be downloaded, as well as links to other key resources. The following is a list of the key toolkits provided on the website which are of relevance to this information brief:

- Toolkit: Recipe Development Techniques for Memorable and Marketable Meals
- Combatting Older Adult Malnutrition: Tools and Best Practices for Community-Based Organizations
- Toolkit: Preparing Gluten-Free Senior Meals Parts 1 & 2
- Toolkit: Identifying the Actual Cost of a Meal – Parts 1 and 2
- Toolkit: Food Safety on the Go
- Healthy Native Foods Toolkit
- Senior SNAP Outreach Best Practices Toolkit
- Toolkit: Components of a Quality Nutrition Program – Part 1

Canada

Background

In contrast to the United States, there are no nationally legislated meal programs for older adults in Canada. In Canada, Home and Community Care services include both health care (e.g. physiotherapy) and home support services (e.g. MoW) that

are delivered at home and in the community. Non-medical home supports such as meal services are not part of the "insured health services" and are therefore not insured under, or subject to the national standards of the Canada Health Act (CHA) – Canada's federal legislation for funded health care insurance(77). Services insured under the Act include hospital, physician, and surgical-dental services(78).

Furthermore, Home and Community Care services are recognised as "extended health care services" under section 2 of the CHA, and while not insured by the Act, these services can be provided at the discretion of provinces and territories(77), meaning that each province and territory can develop legislation, policies and regulations to govern the provision of these services(79). As outlined in the Canada Health Act annual report 2018-2019, "in addition to the medically necessary hospital and physician services covered by the Canada Health Act, provinces and territories also provide a wide range of other programs and services" (77)(pg. 14) including home care services(78). The federal government provides federal support for these services via transfer payments to provinces and territories, which decide on where funding is best placed, based on locally assessed needs(78). In addition, the federal government directly provides home care supports to on-reserve First Nations and Inuit in designated communities, members of the armed forces and the RCMP, federal inmates, and eligible veterans(78).

MoW services are mostly locally-based non-profit organisations or charities that rely heavily on volunteers and are administered by regional health authorities (RHAs) in all provinces across Canada. Financial support is provided by a mix of public-private funding. For example, Meals on Wheels Winnipeg receives financial support from Winnipeg RHA, government agencies and other non-profits such as United Ways, as well as donations from companies, charities and individuals(80). Meal preparation and coordination is provided by a range of facilities and suppliers including hospitals, senior centres, and long term care facilities. In Canada, MoW has a strong volunteer base, with individuals and groups from charities and churches providing support by delivering meals. (80)(81)(82)(83)

Guidelines

There are no national meal service guidelines currently available in Canada. In contrast to the United States, the U.K. and Australia, no documents specifically on national MoW guidelines for providers were identified in the literature search. Several documents on provincial/regional guidelines for meals served at home and in the community were identified, including:

- The Winnipeg Regional Health Authority (WRHA) developed the *Congregate Meal Program Toolkit* for living well at 55+. Although this does not specifically relate to MoW, a brief review of this document was conducted as it describes meals serviced in a community setting.
- The Saskatchewan Ministry of Health developed *a Home Care Policy Manual*(84) with some guidance and standards for MoW and other home

care services in that province and a brief description of this manual is provided.

Congregate Meal Program Toolkit – Winnipeg Regional Health Authority

The Winnipeg Regional Health Authority (WRHA) Community Development & Healthy Aging Services developed this toolkit to be used as a guide for healthy living and nutritional resources and information. The toolkit was updated in 2018 and contains a list of documents and reports on communal meal programs in Winnipeg which can be found on the WRHA website[5]. As defined by the WRHA:

> "congregate meal programs offer seniors the opportunity to enjoy well-balanced, affordable meals in a social setting. Seniors are encouraged to participate in planning, cooking meals, setting tables, and helping with clean up. Hot nutritious meals are offered to seniors three to five days per week in a group setting, such as an apartment block or senior centre."(85)(pg. 2)

Organisation of the toolkit

The web-based toolkit provides access to 56 tools and resources relevant to congregate meal programs as well as background information on, and an overview of the toolkit. The 56 tools are grouped into 7 different sections:

1. Congregate meal program toolkit (background/overview): Includes visual depictions of the nutrition barriers faced by older adults, the Community Development Health Aging Framework and visual representation of the Logical Model[6] for programming, planning and evaluation which includes the processes, underlying assumptions and expected outcomes of the program. Also, a Client Satisfaction Survey questionnaire and sample Meal Program Survey is provided.
2. Meal Guidelines:
    - This section includes program guidelines that cover needs assessment and resources assessment, how to implement meal programs, daily operations, and nutrition education.
    - Information on food handling training. As stated in this section "in accordance with the City of Winnipeg Food Service Bylaw: No person shall operate a food service establishment unless the

[5] Available at: https://wrha.mb.ca/support-services-to-seniors/community-resources/congregate-meal-toolkit/

[6] Available at: https://wrha.mb.ca/wp-content/site-documents/community/seniors/files/congregate-meal-toolkit/1.6LogicModelforProgramming.pdf

person in charge has successfully completed the Certified Food Handler Training program".[7] (pg. 2)

- A description of the Program Coordinator position.

3. Food Safety: all aspects of food safety, meal transportation and emergency planning.
4. Menus: Including a 6-week menu cycle and tips on light desserts.
5. Nutrition and Health: the relationship between nutrition and health; information on medical conditions (e.g. diabetes); signposting to dietitians.
6. Purchasing Food: tips on grocery shopping; how to buy in bulk; A list of wholesale food distributors; local food sources; where to buy indigenous foods; an inventory list; and menu cost report.
7. Resources: recipes; senior resource finder in other languages.

Development of the toolkit

The toolkit was developed based on the feedback from and consultation with various Community Development & Healthy Aging staff, and reports and evaluations related to the topic. No additional information is provided in the overview section regarding the development process of the toolkit.

Home Care Policy Manual – Saskatchewan Ministry of Health

In 2020, the Saskatchewan Ministry of Health revised the *Home Care Policy Manual*(84) which was originally developed in 2006. The manual provides guidance to the Saskatchewan Health Authority who is responsible for the delivery of the Home Care Program and is "designed to ensure consistency of home care services and home care standards throughout the province"(84). The program expectations in the delivery of home care are addressed and information regarding policy and guidance for all types of home care services are provided: including assessment, case management and care coordination, nursing services, homemaking services, meal service, home maintenance services, volunteer service and therapy services.

Organisation of MoW section

Guidance for meal services including MoW and wheels-to-meals is provided in section 11.2.5 of the manual. This section includes guidance on the following:

- Policy: The primary policy objectives of MoW are to improve/maintain the nutritional status of the service user and to assist them to become as self-reliant as possible in meal preparation.

[7] Available at https://wrha.mb.ca/wp-content/site-documents/community/seniors/files/congregate-meal-toolkit/2.3FoodHandlersTraining.pdf

- Guiding principles of meal provision: The guidelines describe a restorative approach to care for older people, with an emphasis placed on supporting and enabling independence and self-reliance. As stated in the document the meal service should,

  > "...be provided to maintain the client's health and independence; support self-reliance in meal preparation and good nutrition; be provided until the client's strengths, abilities/or motivation enable them to become self-reliant; be part of a respite component when the primary caregiver is not available; and clients or their supporter should be taught to prepare meals independently" (11.2.5, pg. 1)

- Sources of meals: This includes a short description of the organisations that are contracted by the Saskatchewan Health Authority to prepare meals including an affiliate as defined in The Provincial Health Authority Act, public establishments, and private meal providers.
- Meal content: This section covers considerations for cultural, ethnic, and religious food preferences and considerations for special dietary needs such as therapeutic diets, with a focus on variety and age-appropriate foods.
- Therapeutic diets: The manual outlines that therapeutic diets must be provided under the direction of the service user's physician in consultation with a dietitian.
- Packaging and transportation: This includes information on the use of appropriate containers for hot and cold foods, the adequate temperature of delivered foods and the transportation of meals by volunteers.
- Food safety and hygiene: Guidance on food safety and hygiene for private meal providers is outlined in this section.
- Information on quality, monitoring, and improvement such as the structure, process and outcome process of meal services are provided in section 16.4.

In addition to these documents, two other documents related to meal service provision in other settings were identified, and although these guidelines do not specifically refer to MoW services and therefore did not warrant a full review, a short overview of each document is provided as they contain information that is relevant to the development of MoW guidelines. These include the documents, *Meals and More: A Foods and Nutrition Manual for Homes of Adults and Children with Persons or Fewer in Care*(86) produced by BC Ministry of Health and *Providing Nutritious and Safe Food: Guidelines for Food Distribution Organizations with Grocery or Meal Programs*(87) by the BC Centre for Disease Control.

Meals and More: A Foods and Nutrition Manual for Homes of Adults and Children with Persons or Fewer in Care – BC Ministry of Health

In British Colombia (BC) the Ministry of Health developed the guidance manual, *Meals and More: A Foods and Nutrition Manual for Homes of Adults and Children*

with Persons or Fewer in Care (86) for services that assist adults and children living in specialised care or small residential community care facilities with up to 24 residents. The manual is a "how-to guide" for providers of meals in these settings and contains information on a range of topics including nutrition care planning, healthy eating, planning menus, buying and storing supplies, preparing and serving quality foods, supportive dining and emergency planning. (86)

Providing Nutritious and Safe Food: Guidelines for Food Distribution Organizations with Grocery or Meal Programs – BC Centre for Disease Control

The BC Centre for Disease Control produced guidance for Food Distribution Organisations (FDOs), *Providing Nutritious and Safe Food: Guidelines for Food Distribution Organizations with Grocery or Meal Programs*(87), which was revised in 2019. These guidelines were developed in conjunction with the *Industry Food Donation Guidelines,* which are " intended to raise awareness of inequitable access to food, increase the quality of donated food, and support the development of positive working relationships between FDOs and food businesses" (pg. 9). FDOs offer a range of programs including community kitchens, cooking demonstrations, food skills training, afterschool and breakfast programs, food banks/grocery programs, and meal programs such as soup kitchens and food banks. The guidelines contain information on the following: food access; inspections and liability; donor relations; evaluations for safety; safe food handling and training; food storage; traceability; transportation; food waste reduction and disposal; and building maintenance and safety.

New Zealand

Background

In New Zealand, all District Health Boards (DHBs) are required to provide nutritional support to older community-dwelling adults, including for support services such as MoW(88). Typically MoW services are carried out by non-profit organisations such as NZ Red Cross, whose role it is to coordinate volunteers to deliver meals(88). According to their annual report in 2018(89), the NZ Red Cross reported its volunteers delivered over 535,000 meals nationwide for the year.

MoW contributes to the New Zealand Healthy Ageing Strategy, which replaced the Health of Older People Strategy (2002) in 2016 and is aligned with the New Zealand Health Strategy 2016. *The National Health Food and Drinks Policy* document was developed by DHBs and the Drinks Environments Network in 2019 as guidance for DHB's and associated providers and partners; however, the policy excludes inpatient meal services and MoW as different standards exist for these services. (90)

Guidelines

Meals on Wheels Nationwide Service Specification Guidelines

Guidelines and standards for MoW services can be found within the Nationwide Service Specifications which describe the national minimum requirements that some health services must adhere to when contracting or providing these services(91). Moreover, service specifications "describes the service to be funded and delivered, in a measurable manner, and incorporates the relevant purchase units and reporting requirements"(91) and is one of two mandatory components within the Nationwide Service Framework. This framework "is a collection of business rules and guidelines used by the Ministry of Health and DHBs to support the funding, planning and delivery of health and disability services"(92).

All current Nationwide Service Specifications are organised by service group, with MoW categorised under Community health, transitional and support services. A hierarchical 3-tier structure is used for all service specifications(91):

- **Tier 1** are overarching service specifications that contain generic principles and content common to all the tiered specifications below it. (May also contain service guidelines in the appendices for services without service specifications).
- **Tier 2** includes the elements specific to that service and includes a reference to its generic overarching document so that the total service requirements are explicit.
- **Tier 3** are more detailed specific service descriptions for specific services (Section: How are Service Specifications structured?)

The Tier One Service Specification for Community health, transitional and support services(93) contains general information on the following: service objectives; service users; access; service components; service linkages; exclusions; and quality requirements. The Tier Two Meals on Wheels Service Specification(94) is to be used in conjunction with Tier One. The following section describes the document on Tier Two specifications for MoW services.

Development process

The process for developing all current Nationwide Service Specifications is outlined in the National Service Framework Library(95).

Development of the service specifications goes on a joint working program with DHBs General Managers Planning and Funding coordinated by an Accountability team. The Accountability team then establish an Advisory Group composed of expert representatives from the MoH, DHBs and NGO's who lead the development process. A final draft is sent on to relevant staff and key stakeholders (e.g. portfolio managers, Chief Operating Officers, Service Managers and Clinical Directors, Director of Head of Nursing and Allied Health etc as needed.) for consultation and these service specifications are updated as needed with mandatory service specifications usually being updated within a five-year cycle.

Using this process, an Advisory Group was established to develop the nationwide Tier Two MoW service specifications to ensure an integrated service for customers of MoW and the document is published on the National Service Framework library website[8].

Organisation of the document

This document contains more specific and detailed information on all aspects described in Tier One, and includes the following:

- A service definition of MoW and a description of individuals who do not meet the criteria for MoW service provision, for example, for people receiving DHB or Ministry of Health-funded services where meals are already provided as part of that service.
- General service objectives and specific objectives for the Maori population are outlined: Overall the service aims to support ageing in place, maximise independence and quality of life and improve service user health through the provision of meals that meet their nutritional needs. Specific objectives for Maori people are outlined in the Tier One service specifications. As described in this document:

[8] Available at: https://nsfl.health.govt.nz/service-specifications/current-service-specifications

"Achieving Pae Ora (healthy futures for Māori), including Mauri Ora (health individuals), Whānau Ora (healthy families) and Wai Ora (healthy environments), is an overarching aim of the health and disability system". (Tier 1, 5.2).

- The objectives are underpinned by the principles of *Options, Equity, Active Protection, Information,* and *Partnership.*
- Information on how the service can be accessed (i.e. referral pathways and entry and exit criteria) is provided: assessment of need is a key feature of the MoW service in New Zealand. An individual must meet the access criteria for service provision which is based on the Needs Assessment Risk Framework. The referral pathways for older people (>65), people with health conditions, and people with disabilities are as follows:
    - Service users of disability support services are assessed by a Needs Assessment and Service Coordination (NASC) team who are contracted by the Ministry of Health.
    - Older people and those with chronic health conditions can access the service through are assessment from the DHB Needs Assessment and Service Coordination team.
- A description of service components such as menu planning and meal preparation, meal delivery and management of drivers and management of food safety, and re-assessment and evaluation of the service is provided. Regular re-assessment by an appropriate needs assessment service coordination service should be carried out every 6-12 months of long term service users need for ongoing service provision. Evaluation of the nutritional value of the meals should also be carried out by the DHB dietician.
- A section on service linkages is included, which refers to how MoW services should demonstrate effective relationships with other services including independent assessment services contracted by the Ministry of Health, assessment, treatment, and rehabilitation (AT&R) services, Needs Assessment and Service coordination service, allied health services, primary health care services and community and social care services.
- Effectiveness of the service includes information on the nutritional analysis of meals, how to ensure customer satisfaction and how to cater to individual and cultural preferences:
    - A nutritional analysis of the menu should be conducted every 6 months by a Dietitian.
    - For every service user's assessment of the need for the service a collaborative approach with the service user and their significant others should be adopted and should be based on their specific need and condition.

    - Every service user should be provided with meaningful information about the service.
- Service user and carer satisfaction surveys should be undertaken to determine their satisfaction with their meals, satisfaction with the level of information provided and how well their cultural needs are recognised and met.
- In addition, a general overview of meal component specifications is described regarding the Nutrient Reference Values for Australia and New Zealand Ministry of Health Standards of Nutritional Quality, and the Food and Nutrition Guidelines for Healthy Adults and Food and Nutrition Guidelines for Older People 2010. The remainder of the document outlines the purchase unit and reporting requirements.

DISCUSSION

The following section outlines the main considerations for guideline development for MoW based on a synthesis of the results above, as well as a description of the key features found across all the guidelines.

Considerations for Guideline Development

Methodological process and approach

A multidisciplinary approach was adopted to develop the guidelines, this typically involved engaging with stakeholders from all relevant professional groups including dietitians, nutritionists, academics, researchers, representatives from service providers, government departments and ministries and NGOs, as well as customers and service users. As stated in the Australian meal guidelines widespread engagement and consultation with stakeholders was a critical component of the guidelines, particularly engagement with service users. Another important aspect to consider is the process or stages of developing the guidelines. For example, a three-stage approach was adopted for the Australian Meal guidelines which included a review of scientific literature a collation of existing standards and guidelines and consultation with all relevant stakeholders.

Target audience and format

The intended users of the various guidelines included service providers, caterers, health professionals, those implementing the guidelines such as regional, provincial, and local authorities and service users. In each of the guidelines the target audience was clarified, and this subsequently informed the guidelines scope, objectives, format, and style of writing. For example, the CWT, NRCNA website and Australian guidelines were directed at service providers, health professionals and service users, and these guidelines were user friendly, visually appealing and included practical and digestible information. In contrast, the OAA, Saskatchewan policy manual and New Zealand Service Specifications were directed more towards those implementing and providing the service such as regional health authorities and

district health boards. These guidelines included more technical information and guidance on the implementation of guidelines and how to adhere to the legislation and the dietary guidelines within each country.

Updating the guidelines

Guidelines in the U.S., U.K and Australia recommended that guidelines should be updated regularly to reflect the needs of older adults in receipt of MoW. The Australian Meal guidelines list several recommendations to assist with keeping the guidelines up-to-date such as the sharing of standardised recipes, including tools and further information about recipe analysis within the guidelines and providing an online version of the guidelines. During the consultation process with service users for the Australian guidelines, they suggested that a web version of the guidelines would increase functionality and ease when updating the resource. The NRCNA website is a good example of this, in that it acts as a live document whereby information can be updated regularly.

Key Features

Overall the purpose of the guidelines is to assist with and ensure consistency in the provision of meal services for older people across the country, state etc. The guidelines under review can be further categorised into two types of guidelines based on their purpose and contents: 1) a document that provides technical assistance and 2) a document that acts as a practical guide/information resource that is more geared toward the service user. For example, the purpose of the OAA toolkit is to provide technical assistance to States regarding the implementation of legislation and to assist states with updating their regulations, policies, and guidelines. Similarly, the New Zealand Meals on Wheels Service specifications provides a technical overview of MoW service provision including information on quality assurance, a description of the key features and functions of the service and a service definition. In contrast to these documents, the purpose of Australian Meal guidelines is to provide practical guidance and advice to service providers, to act as a resource for dieticians and other healthcare providers and more broadly to assist older people and their families to make informed choices. It uses a step-by-step approach, providing clear and comprehensible information that is user friendly.

The following is a brief overview of the key features that emerged across all the guidelines that are of relevance to the guideline development process.

Supporting independence

Broadly speaking the guidelines primary objectives are to improve the nutritional status of older people and to provide a consistent standard for the nutritional quality of meals – this is essential to support the functional independence of older people to live well at home for as long as possible(8). For example, the New Zealand Service Specifications state that the service objectives for the overall population are to support ageing in place, maximise independence and encourage self-reliance in terms of meal preparation. Furthermore, the Australian guidelines are designed to

allow providers to construct menus that are appropriate to the specific needs of the users of their service, which can support their independence. For example, in relation to food plating and placement for service users with cognitive impairment, the Australian guidelines recommend that plates and food containers should not have a pattern design and should be different to the colour of the tablecloth or placemat. The various guidelines from each country include guidance on food packaging and tips on how to make it easy for service users to open packaging, particularly those with functional or cognitive impairments.

Choice and Variety

The guiding principles of meal and menu planning across all the guidelines are the principles of choice and variety. As an example, the Nutrition Providers Guide in the United States recommends that nutrition programs provide opportunities for food choice based on individual need and cultural food preferences and provide a variety of healthy choices for people to choose from. Variety in terms of visual presentation and taste can be achieved by using a range of colours, shapes and textures when designing menus. The Australian Meal guidelines provide very practical advice on how to produce variety, for instance, they describe how dressings and sauces can be used to enhance flavour and texture, as well as how different ways of cooking foods can enhance both visual presentation and taste.

Social connectedness

The social dimensions of meals are touched upon throughout several of the documents, particularly the Australian guidelines and the CWT guidelines in the U.K. Within these documents they state that the primary aim of the meal service is to improve the nutritional status of older people, but they also highlight the importance of meal services in addressing other key factors that are associated with poor health, such as social isolation. The social aspects of eating and the social impact of meal provision are identified as important features of meal services and the guidelines recommend that meal providers ensure the vital socialising benefits of community meals are made available to older people. For example, through recognising the social importance of food, in the chapter on “Managing Presentation and Meal Enjoyment” the Australian guidelines provide guidance on how to make food nutritious, visually appealing, and affordable, which are central to enhancing the social experience of eating. They also recommend that where possible older people should be encouraged to attend communal meal settings. Social wellbeing can be measured through consultation with customers, using tools such as surveys and interviews to gather feedback. The Australian guidelines include findings from qualitative studies examining the experiences of older people in receipt of MoW which highlight the important role of meal services in building friendships and improving social wellbeing in older people.

Screening and assessment

Both nutritional assessment and nutritional screening are addressed in all the guidelines. Nutritional screening is a tool used to identify people living in the community who might be at risk of malnutrition or overnutrition and in need of some form of intervention and is typically a brief assessment that is carried out by case managers/workers or service coordinators. An example of a tool used to determine nutritional risk is the Mini Nutritional Assessment Short Form (MNA-SF) which has been validated in community-living older people, as described by the Australian guidelines. Other tools include the "MUST" tool from the CWT guidelines, which is a clinically validated tool used to detect both overnutrition and malnutrition, as well as the Assessment Grid – a screening tool that can be used by people in close contact with older adults such as family members, friends and neighbours and healthcare professionals. The CWT guidelines suggest that lay members would benefit from training by a dietitian on how to use the screening tool. The Australian guidelines also state that some providers may be trained by a dietitian to use screening tools, while other providers may seek assistance from dietitians. Following this initial screening process, at-risk individuals can be referred to a dietitian for a full nutritional assessment. It is recommended the guidelines that reassessment or re-screening should take place every 6 months to determine the continued need for meal services.

Service evaluation

It is also important to evaluate service operations (i.e. methods of production/delivery) and outcomes to measure whether the service is meeting the needs of older people and meeting the overall objective of improving their nutritional status and to determine the overall effectiveness of the meal service. The OAA toolkit outlines two types of evaluation objectives including process objectives and outcomes. Service process evaluation helps to answer key questions such as whether the right people are being served, whether costs are in line with the budget and whether customers are satisfied with the service. This latter objective can be measured by obtaining feedback from customers through surveys and interviews. Outcomes evaluation is a quantifiable measurement of the results of the service such as whether the service has benefited the service user in terms of increased socialisation, a reduction in nutritional risk, a change in behaviour related to diet etc. The Logic Model or the Input-Activities-Output-Outcomes framework can be used to link the services planned objectives to the intended results. Furthermore, indicators can show the degree to which the results have been achieved and data collection for indicators can be obtained using various tools such as focus groups, pre/post-tests, and assessment forms.

Nutrient Analysis Software

Nutrient analysis software for the nutritional analysis of food and menu planning is a common feature throughout all the guidelines. In Australia, several nutrient analysis software programs for analysing standard recipes are available to service

providers, and if these are not available, service providers can use a nutrition calculator which is available on the Food Standards Australia New Zealand (FSANZ) website. In the U.K the CWT guidelines refer to the CORA Menu Planner, a computer program that contains a nutritional analysis of recipes. The Food Processor nutrient analysis tool is commonly used by State Units on Aging in the U.S. due to its low cost, ease of use its comprehensive database. In New Zealand, the guidelines state that nutrient analysis of food should be carried out by a dietitian every 6-months to ensure customers' needs are being met. The Canadian policy manual does not refer to nutrient analysis tools.

CHAPTER FOUR

CONCLUSION

5. CONCLUSION

This evidence brief summarises the international approaches to guideline development for Meals on Wheels (MoW) and home-meals services in five countries (United Kingdom, Australia, Canada, United States and New Zealand). The purpose of this research was to provide international evidence to support and inform progress under action 5.2 of the joint policy housing statement "Housing Options for Our Ageing Population" which aims to *"explore the structure of community-based social care supports and consider the role, model and expansion of services such as day care and ancillary services including meals-on-wheels aimed at keeping older people in their communities"*(4).

This is supplemented by an overview of the health and dietary patterns of the older community-dwelling population in Ireland, as well as the nutritional status of older adults in receipt of MoW using data from The Irish Longitudinal Study on Ageing (TILDA). In short, this evidence brief set out to answer three research questions:

1. What are the health and dietary patterns of the older community-dwelling population in Ireland and what factors are associated with these behaviours?
2. What is the nutritional status of older community-dwelling adults receiving Meals on Wheels in Ireland?
3. What are the international approaches to developing Meals on Wheels and home-meals service guidelines?

In relation to the first research question, the key population-based factors associated with the diet and eating behaviours of older adults in Ireland that are relevant to the development of MoW guidelines are outlined. These factors include frailty; disability - activities of daily living (ADLs) and instrumental activities of daily living (IADLs); and social connectedness. Frailty affects 12.7% of the population aged 50 years and over in Ireland and affects 21.5% of people aged 65 and above. Nutrition has an important role to play in the onset, development and management of frailty and other conditions such as osteoporosis, cognitive decline, sarcopenia (muscle wasting), hearing loss and vascular diseases which can cause disability and a loss of independence(8). Furthermore, disability, as well as living alone which is common in this population, has been linked to feelings of social isolation, loneliness and depression(13)(14)(13). MoW aims to support older adults with and without disabilities to access nutritious meals and to improve their nutritional status. These results highlight the relationship between health and nutrition in older adults in Ireland and show the key areas of concern that need to be addressed in food-based guidelines for older adults.

Findings from an analysis of the health and dietary factors of TILDA participants who received MoW revealed that this group is a particularly vulnerable cohort for many reasons. When comparing participants who were not receiving MoW with those

who were, fewer participants not receiving MoW had a disability, they self-reported fewer feelings of loneliness and better overall health and had a higher level of educational attainment. Therefore, those receiving MoW were more likely to be older, have lower levels of educational attainment, report higher levels of loneliness, and have poorer mental and physical health. Most of these participants (90%) did not adhere to the recommended daily intake of fruit and vegetables, and under-consumed complex carbohydrates and dairy. Also, MoW participants were having on average four times the recommended daily intake of foods and drink high in fat, sugar, and salt. These results are not surprising given that MoW is aimed at those at risk of poor nutritional status. However, further research should include an analysis of the nutritional content of meals to ensure that that the composition of meals meet recommended daily requirements. Given these dietary and socio-demographic characteristics, this group would benefit from a targeted intervention, that not only addresses the dietary limitations but also the health and social problems outlined. It also emphasises the need for MoW guidelines to address the social impact of meals and to provide practical guidance to service providers on how to incorporate these social dimensions into their service delivery model, to address the deficits in psychological and social wellbeing found among older adults receiving MoW.

The results of the literature search on the international approaches to the development of MoW guidelines showed that while the approaches varied from country to country, they shared many similarities. Following a synthesis of the findings, important considerations for guideline development were identified including the *development process and approach*, the *target audience and format* of the guidelines and the process of *updating the guidelines*. A multidisciplinary approach involving engagement with relevant stakeholders and experts in the field and consultation with service providers and older people in receipt of MoW is important when developing the guidelines. Approaches to gathering information included consultation with customers and providers, an extensive review of the literature on the key nutritional issue affecting older people and how to address their needs and a collation of existing standards and guidelines. Clarifying the intended users (i.e. customers; service providers; governing bodies; health professionals) of the guidelines is also important because the target audience informs the scope, objectives, format, and style of the guidelines. The final consideration concerning the development process includes the process of updating the guidelines. Based on the findings, it is recommended that the guidelines should be updated regularly. This can be done through sharing standardised recipes, including tools and further information about recipes within the guidelines and providing online versions of the guidelines.

Also, several key features were identified relating to the aims and objectives of the guidelines, the core principles underpinning the guidelines, the social dimensions of meals, nutritional assessment and screening, service evaluation, and the nutritional analysis of food.

Overall, the primary objectives of the guidelines were to improve the nutritional status of older people and to provide a consistent standard for the nutritional quality of meals. Through achieving these objectives the guidelines support MoW services to achieve their aim of supporting older people to live independently. Guidance for meal preparation and menu planning was underpinned by the principles of choice and variety. This highlights the need for services to provide opportunities for food choice based on individual need and cultural food preferences and to provide a variety of healthy choices for people to choose from. Furthermore, the social aspects of eating and the social impact of meal provision were identified as important features of meal services. The guidelines provide advice on how to make food nutritious, visually appealing, and affordable which are central to enhancing the social experience of eating.

Nutritional screening and assessment, service evaluation and nutritional analysis were other important features identified across the guidelines. Nutritional screening tools such as the MNA-SF and the MUST tool were described as effective tools for identifying people living in the community who might be at risk of malnutrition or overnutrition and in need of some form of intervention. As outlined in the guidelines nutritional screening is typically carried out by case managers or service coordinators who can refer at-risk individuals to dietitians for a full assessment. Evaluation of the operations and service outcomes was described as an important tool for measuring the effectiveness of the service in terms of meeting peoples' needs and ensuring customer satisfaction. Specifically, evaluation helps to answer key questions such as whether the right people are being served, whether costs are in line with the budget, whether customers are satisfied with the service, and whether the service has benefited the service user in a quantifiable way such as through an increase in socialisation, a reduction in nutritional risk or a change in behaviour related to diet etc. Finally, nutrient analysis software for the nutritional analysis of food and menu planning was described as important tools for ensuring that food composition is appropriate for the varying needs of older people, especially for those who have special dietary needs.

REFERENCES

1. Department of Health. THE NATIONAL POSITIVE AGEING STRATEGY: POSITIVE AGEING-STARTS NOW! Dublin; 2013.
2. Healthy Ireland. A framework for improved health and wellbeing 2013-2025. 2013.
3. World Health Organisation. ACTIVE AGEING: A POLICY FRAMEWORK [Internet]. Madrid; 2002 [cited 2020 Jul 8]. Available from: http://www.who.int/hpr/
4. Department of Housing P and LG. Housing Options for Our Ageing Population-Policy Statement. 2019.
5. O'Dwyer C, Timonen V. The Role and Future Development of the Meals-on-Wheels Service for Older People in Ireland [Internet]. 2008 [cited 2021 Jun 14]. Available from: http://www.tara.tcd.ie/bitstream/handle/2262/34610/O%27Dwyer and Timonen on Meals on Wheels.pdf?sequence=1&isAllowed=y
6. Health Service Executive. Community & Voluntary Support Grant for Older Persons [Internet]. 2019 [cited 2021 Jun 16]. Available from: https://www.hse.ie/eng/services/list/4/olderpeople/support-grant-for-older-persons/
7. O'Dwyer C, Corish C, Timonen V. Nutritional Status of Irish Older People in Receipt of Meals-on-Wheels and the Nutritional Content of Meals Provided. J Hum Nutr Diet. 2009;22(6):521–7.
8. Australian Meals on Wheels Association. National Meal Guidelines: A Guide for Service Providers, Caterers and Health Professionals . 2016.
9. The Irish Longitudinal Study on Ageing. Wellbeing and Health in Ireland's over 50's 2009-2016 [Internet]. 2018 [cited 2020 Nov 15]. Available from: https://tilda.tcd.ie/publications/reports/pdf/w4-key-findings-report/TILDA-Wave4-Key-Findings-report.pdf
10. O'Connell ML, Coppinger T, McCarthy AL. The role of nutrition and physical activity in frailty: A review [Internet]. Vol. 35, Clinical Nutrition ESPEN. Elsevier Ltd; 2020 [cited 2020 Nov 15]. p. 1–11. Available from: http://clinicalnutritionespen.com/article/S2405457719304966/fulltext
11. shankar ghosh T, rampelli simone, Jeffery ian B, santoro aurelia, neto M, capri M, et al. Mediterranean diet intervention alters the gut microbiome in older people reducing frailty and improving health status: the NU-AGE 1-year dietary intervention across five European countries. Gut [Internet]. 2020 [cited 2020 Nov 15];69:1218–28. Available from: http://gut.bmj.com/
12. UCD Institute of Food and Health Policy Seminar Series. Nutrition and Health in an Ageing Population [Internet]. 2010 [cited 2020 Nov 15]. Available from:

www.ucd.ie/foodand

13. Barry LC, Soulos PR, Murphy TE, Kasl S V, Gill TM. Association Between Indicators of Disability Burden and Subsequent Depression Among Older Persons. Med Sci Cite J as J Gerontol A Biol Sci Med Sci [Internet]. 2013 [cited 2020 Nov 15];68(3):286–92. Available from: https://academic.oup.com/biomedgerontology/article/68/3/286/707505

14. Sexton E, King-Kallimanis BL, Layte R, Hickey A. How does chronic disease status affect CASP quality of life at older ages? Examining the WHO ICF disability domains as mediators of this relationship. Aging Ment Heal [Internet]. 2015 Jul 3 [cited 2020 Nov 15];19(7):622–33. Available from: https://pubmed.ncbi.nlm.nih.gov/25209970/

15. Maguire T, Carroll B, Shannon S, Brennan C, David M, Callaghan O'. POSITIVE AGEING INDICATORS 2018. Department of Health; 2018.

16. Ngandu T, Lehtisalo J, Solomon A, Levälahti E, Ahtiluoto S, Antikainen R, et al. A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): A randomised controlled trial. Lancet [Internet]. 2015 Jun 6 [cited 2020 Nov 15];385(9984):2255–63. Available from: https://pubmed.ncbi.nlm.nih.gov/25771249/

17. Ward M, Layte R, Kenny RA. Loneliness, social isolation, and their discordance among older adults Findings from The Irish Longitudinal Study on Ageing (TILDA). 2019 [cited 2020 Nov 15]; Available from: https://www.doi.org/10.38018/TildaRe.2019-03

18. R R, A.M. C, Cunningham CU, S S, D P, R.A. K, et al. Psychosocial and functional correlates of nutrition among community-dwelling older adults in Ireland [Internet]. the Journal of Nutrition, Health & Aging. 2011 [cited 2020 Nov 15]. Available from: http://mural.maynoothuniversity.ie/11160/1/DP_Psychosocial_2011.pdf

19. ESRI. Demand for healthcare projected to increase substantially with rapid growth and ageing of population [Internet]. 2017 [cited 2020 Nov 15]. Available from: https://www.esri.ie/news/demand-for-healthcare-projected-to-increase-substantially-with-rapid-growth-and-ageing-of

20. CSO. Press Release Population and Labour Force Projections 2016-2046 - CSO - Central Statistics Office [Internet]. 2013 [cited 2020 Nov 15]. Available from: https://www.cso.ie/en/csolatestnews/pressreleases/2013pressreleases/pressreleasepopulationandlabourforceprojections2016-2046/

21. Payette H. Meals-on-wheels improves energy and nutrient intake in a frail free-living elderly population. J Nutr Heal Aging [Internet]. 2006 [cited 2020 Jul 2];1–2. Available from: https://www.researchgate.net/publication/6617796

22. Zhu H, An R. Impact of home-delivered meal programs on diet and nutrition

among older adults: A review. Nutr Health [Internet]. 2013 [cited 2020 Nov 26];22(2):89–103. Available from: https://pubmed.ncbi.nlm.nih.gov/24916974/

23. Walton K, do Rosario VA, Pettingill H, Cassimatis E, Charlton K. The impact of home-delivered meal services on the nutritional intake of community living older adults: a systematic literature review [Internet]. Vol. 33, Journal of Human Nutrition and Dietetics. Blackwell Publishing Ltd; 2020 [cited 2020 Nov 26]. p. 38–47. Available from: https://pubmed.ncbi.nlm.nih.gov/31266095/

24. Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, et al. Frailty in Older Adults: Evidence for a Phenotype [Internet]. Vol. 56, Journal of Gerontology: MEDICAL SCIENCES Copyright. 2001 [cited 2020 Nov 15]. Available from: https://academic.oup.com/biomedgerontology/article/56/3/M146/545770

25. Rockwood K, Mitnitski A. Unconventional Views of Frailty Review Article Frailty in Relation to the Accumulation of Deficits [Internet]. 2007 [cited 2020 Nov 15]. Available from: http://myweb.dal.ca/amitnits/STable.htm.

26. Coyle CE, Dugan E. Social isolation, loneliness and health among older adults. J Aging Health [Internet]. 2012 Dec [cited 2020 Nov 15];24(8):1346–63. Available from: https://pubmed.ncbi.nlm.nih.gov/23006425/

27. TILDA. The Irish Longitudinal Study on Ageing (TILDA) - Trinity College Dublin [Internet]. 2017 [cited 2020 Nov 26]. Available from: https://tilda.tcd.ie/about/background/

28. Charlton KE, Tjong M, North J, Walton K, Charlton K. Meals on Wheels: Who's referring and what's on the menu? Wiley Aust J Ageing [Internet]. 2019 [cited 2020 Sep 11]; Available from: https://agedcare.royalcommission.gov.au/system/files/2020-06/DAA.0001.0001.0046.pdf

29. Sahyoun NR, Vaudin A. Home-delivered meals and nutrition status among older adults [Internet]. Vol. 29, Nutrition in Clinical Practice. Nutr Clin Pract; 2014 [cited 2020 Nov 26]. p. 459–65. Available from: https://pubmed.ncbi.nlm.nih.gov/25030738/

30. Wright L, Vance L, Sudduth C, Epps JB. The Impact of a Home-Delivered Meal Program on Nutritional Risk, Dietary Intake, Food Security, Loneliness, and Social Well-Being. J Nutr Gerontol Geriatr [Internet]. 2015 Apr 3 [cited 2020 Nov 26];34(2):218–27. Available from: https://pubmed.ncbi.nlm.nih.gov/26106989/

31. Frongillo EA, Wolfe WS. Impact of participation in home-delivered meals on nutrient intake, dietary patterns, and food insecurity of older persons in New York State. J Nutr Elder [Internet]. 2010 [cited 2020 Nov 26];29(3):293–310. Available from: https://pubmed.ncbi.nlm.nih.gov/20711924/

32. An R. Association of Home-Delivered Meals on Daily Energy and Nutrient Intakes: Findings from the National Health and Nutrition Examination Surveys. J Nutr Gerontol Geriatr [Internet]. 2015 Apr 3 [cited 2020 Nov 26];34(2):263–72. Available from: https://pubmed.ncbi.nlm.nih.gov/26106992/

33. O'Leary MF, Barreto M, Bowtell JL. Evaluating the Effect of a Home-Delivered Meals Service on the Physical and Psychological Wellbeing of a UK Population of Older Adults–A Pilot and Feasibility Study. J Nutr Gerontol Geriatr [Internet]. 2020 Jan 2 [cited 2020 Nov 26];39(1):1–15. Available from: https://pubmed.ncbi.nlm.nih.gov/31682788/

34. Diallo AF, Falls K, Hicks K, McQueen Gibson E, Obaid R, Slattum P, et al. The Healthy Meal Program: A food insecurity screening and referral program for urban dwelling older adults. Public Health Nurs [Internet]. 2020 Sep 1 [cited 2020 Nov 26];37(5):671–6. Available from: https://pubmed.ncbi.nlm.nih.gov/32744376/

35. Donoghue OA, McGarrigle CA, Foley M, Fagan A, Meaney J, Kenny RA. Cohort profile update: The Irish Longitudinal study on ageing (TILDA). Int J Epidemiol [Internet]. 2018 Oct 1 [cited 2020 Nov 26];47(5):1398-1398L. Available from: https://academic.oup.com/ije/article/47/5/1398/5071919

36. O'connor D, Leahy S, Mcgarrigle C. Consumption Patterns and Adherence to the Food Pyramid. Health and Wellbeing: Active Ageing for older adults in Ireland: Evidence from The Irish Longitudinal Study on Ageing. 2017.

37. Hagan R, Manktelow R, Taylor BJ, Mallett J. Reducing loneliness amongst older people: A systematic search and narrative review. Aging Ment Heal [Internet]. 2014 Aug 18 [cited 2020 Nov 26];18(6):683–93. Available from: https://www.tandfonline.com/doi/abs/10.1080/13607863.2013.875122

38. Meals on Wheels Victoria. About - Meals on Wheels Victoria [Internet]. [cited 2020 Sep 11]. Available from: https://www.mealsonwheelsvictoria.org.au/about/

39. Australian Meals on Wheels Association. Australian Meals on Wheels - State by State. 2016.

40. Oppenheimer M, Warburton J, Richards J. MEALS ON WHEELS: BUILDING TOWARDS A NEW SOCIAL EXPERIMENT FOR OUR TIMES [Internet]. 2014 [cited 2020 Sep 11]. Available from: http://mealsonwheels.org.au/wp-content/uploads/2016/03/MOW-Building-Towards-A-New-Social-Experiment-For-Our-Times.pdf

41. Department of Social Services Australia. Discussion Paper: Key directions for the Commonwealth Home Support Program - Basic support for older people living at home [Internet]. 2014 [cited 2020 Sep 17]. Available from: https://apo.org.au/sites/default/files/resource-files/2014-05/apo-nid40067.pdf

42. J Krassie and Associates Pty Ltd. Good Nutrition. 2002.

43. Meals on Wheels (SA) Inc. Menus, Recipes & Nutrition. Adelaide, Meals on Wheels (SA). 2007.

44. Malberg A. Meals on Wheels Nutrition Manual. Strathpine; 2012.

45. Meals on Wheels Victoria. Best Practice Guidelines [Internet]. 2015 [cited 2020 Sep 18]. Available from: www.mealsvictoria.org.au

46. Bunney C, Bartl R. Eating Well. A Nutrition Resource for Older People and their Carers. Central Coast Local Health District.; 2015.

47. National Health and Medical Research Council. Australian Dietary Guidelines [Internet]. Vol. 47. 2013. 245–251 p. Available from: https://www.eatforhealth.gov.au/sites/default/files/files/the_guidelines/n55a_australian_dietary_guidelines_summary_book.pdf

48. National Health and Medical Research Council. Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes. Austarlian Government. 2006. 254 p.

49. National Health and Medical Research Council. Australian Guide to Healthy Eating [Internet]. 2016 [cited 2020 Sep 17]. Available from: https://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating

50. Sustain and Partners. Meals on wheels: good practice case studies [Internet]. 2018. [cited 2020 Sep 25]. Available from: https://www.sustainweb.org/publications/meals_on_wheels_good_practice_case_studies/

51. Association for Public Service Excellence (ASPE). Meals on Wheels Survey 2018. 2018.

52. National Association of Care Catering. What We Do [Internet]. [cited 2020 Sep 25]. Available from: https://www.thenacc.co.uk/what-we-do/

53. Care Quality Commission. Regulation 14: Meeting nutritional and hydration needs | Care Quality Commission [Internet]. 2017 [cited 2020 Sep 25]. Available from: https://www.cqc.org.uk/guidance-providers/regulations-enforcement/regulation-14-meeting-nutritional-hydration-needs#legislation-links

54. Johnson D, National Association of Care Catering. Legislation and practices for textured food for institutional food. In: Modifying Food Texture: Volume 2: Sensory Analysis, Consumer Requirements and Preferences. 2015. p. 223–37.

55. National Association of Care Catering. A Recommend Standard for Meals on Wheels Community Meals [Internet]. [cited 2020 Sep 25]. Available from: https://www.thenacc.co.uk/shop/publications/a-recommend-standard-for-meals-on-wheels-community-meals

56. Caroline Walker Trust. Eating well for older people. 2004.

57. Finch S, Doyle W, Lowe C, Bates C, Prentice A, Smithers G, et al. National Diet and Nutrition, Nutrition Survey: people aged 65 years and over. Volume 1: Report of the diet and survey. London, UK; 1998.

58. Committee on Medical Aspects of Food Policy. The Nutrition of Elderly People. London; 1992.

59. Committee on Medical Aspects of Food Policy. Dietary References Values for Food Energy and Nutrients for the United Kingdom. London, UK; 1991.

60. VOICES. Eating Well for Older People with Dementia. 1998.

61. Crawley H, Hocking E. Eating well: supporting older people and older people with dementia Practical guide [Internet]. Caroline Walker Trust; 2011 [cited 2020 Oct 6]. Available from: www.nuffieldfoundation.org

62. Public Health England. Healthier and more sustainable catering: A toolkit for serving food to adults [Internet]. London; 2017 [cited 2020 Oct 6]. Available from: www.facebook.com/PublicHealthEngland

63. Public Health England. Helping older people maintain a healthy diet: A review of what works [Internet]. 2017 [cited 2020 Oct 6]. Available from: https://www.gov.uk/government/publications/helping-older-people-maintain-a-healthy-diet-a-review-of-what-works/helping-older-people-maintain-a-healthy-diet-a-review-of-what-works

64. Meals on Wheels America. THE OLDER AMERICANS ACT NUTRITION PROGRAM (TITLE III-C) [Internet]. 2020 [cited 2020 Oct 13]. Available from: www.mealsonwheelsamerica.org

65. Silverman J. A ROADMAP FOR COMPREHENSIVE FOOD SERVICE GUIDELINES. 2019 Sep.

66. DEPARTMENT OF SOCIAL & HEALTH SERVICES. Senior Nutrition Program Standards. 2016.

67. Meals on Wheels America. Learn More - National Office [Internet]. [cited 2020 Oct 8]. Available from: https://www.mealsonwheelsamerica.org/learn-more/national

68. Administration for Community Living. Nutrition Services - Nutrition Quality Standards [Internet]. 2020 [cited 2020 Oct 8]. Available from: https://acl.gov/programs/health-wellness/nutrition-services

69. Wellman NS. Older Americans Act Nutrition Program Toolkit [Internet]. 2005 [cited 2020 Oct 16]. Available from: http://nutritionandaging.fiu.edu2005

70. Department of Health and Human Services. Dietary Guidelines for Americans, 2005: Nutrition Service Providers Guide Part 1. 2005.

71. National Resource Center on Nutrition and Aging [Internet]. [cited 2020 Oct 16]. Available from: https://nutritionandaging.org/

72. Services D of H and H. Dietary Guidelines for Americans, 2005: Nutrition Service Providers Guide Part 2. 2005.

73. ESHA Research. Food Processor Program: Nutrient Analysis Software [Internet]. [cited 2020 Nov 2]. Available from: https://esha.com/products/food-processor/

74. United States Department of Agriculture. Dietary Guidelines for Americans 2015-2020 [Internet]. 2015 [cited 2020 Oct 28]. Available from: http://health.gov/dietaryguidelines/2015/guidelines/.

75. Administration for Community Living. ACL awards grant for National Resource Center on Nutrition and Aging Grant to Meals on Wheels America | ACL Administration for Community Living [Internet]. 2017 [cited 2020 Oct 16]. Available from: https://acl.gov/news-and-events/announcements/acl-awards-grant-national-resource-center-nutrition-and-aging-grant

76. Akobundu U. Getting Smarter with the NRCNA - Website Relaunch. Vol. 0. 2018. p. 72–4.

77. Government of Canada. Canada Health Act Annual Report 2018-2019. 2018.

78. Government of Canada. Core community supports to age in community. 2019.

79. National Institute on Ageing. Enabling the Future Provision of Long-Term Care in Canada. 2019.

80. Meals on Wheels Winnipeg. 2019 Annual Report Meals on Wheels Winnipeg. 2019.

81. Meals on Wheels Ottowa. Annual Report [Internet]. 2019 [cited 2020 Oct 21]. Available from: www.mealsonwheels-ottawa.org

82. Langley Meals on Wheels. Annual Report. 2018.

83. Meals on Wheels Calgary. 2019 Annual Report. 2019.

84. Government of Saskatchewan. Home Care Policy Manual. 2015.

85. Winnipeg Regional Health Authority. Congregate Meal Program Guidelines [Internet]. 2018. Available from: https://wrha.mb.ca/support-services-to-seniors/community-resources/congregate-meal-toolkit/

86. Ministry of Health British Colombia. Meals and More: A Foods and Nutrition Manual for Homes of Adults and Children with Persons or Fewer in Care . 2008.

87. BC Centre for Disease Control. Providing Nutritious and Safe Food: Guidelines for Food Distribution Organizations with Grocery or Meal Programs [Internet]. 2019 [cited 2020 Oct 22]. Available from: www.bccdc.ca/health-professionals/professional-resources/food-donation-guidelines

88. New Zealand Red Cross. Meals on Wheels [Internet]. [cited 2020 Oct 26].

Available from: https://www.redcross.org.nz/what-we-do/in-new-zealand/meals-wheels/

89. New Zealand Red Cross. 2018 Annual Report. 2018.

90. National District Health Board Food and Drink Environments Network. National Healthy Food and Drink Policy. 2016.

91. Nationwide Service Framework Library. About service specifications [Internet]. 2018 [cited 2020 Oct 26]. Available from: https://nsfl.health.govt.nz/service-specifications/about-service-specifications

92. Nationwide Service Framework Library. About this site [Internet]. 2016 [cited 2020 Oct 26]. Available from: https://nsfl.health.govt.nz/about-site

93. Minstry of Health New Zealand. COMMUNITY HEALTH, TRANSITIONAL AND SUPPORT SERVICES (DHB FUNDED) TIER ONE SERVICE SPECIFICATION. 2012.

94. Ministry of Health New Zealand. MEALS ON WHEELS SERVICE TIER LEVEL TWO SERVICE SPECIFICATION.

95. Minstry of Health New Zealand. NATIONWIDE SERVICE SPECIFICATION PROCESS OVERVIEW.

96. Vocational Training Org. What is an NVQ? (National Vocational Qualification) [Internet]. [cited 2020 Sep 25]. Available from: https://www.vocationaltraining.org.uk/nvq-overview

APPENDICES

Appendix 1. Websites identified for the targeted website search.

Country	Website
Canada	1. https://www.carebc.ca 2. https://www.mealsonwheels-ottawa.org 3. https://www.von.ca/en/service/meals-wheels 4. https://www.cornwall.ca 5. https://www.tcare.ca 6. https://sndmow.com 7. http://www.bccdc.ca 8. www.kiwanisvillage.ca 9. www.greatersudbury.ca 10. https://www.diabetes.ca 11. https://www.canada.ca 12. https://www.albertahealthservices.ca 13. http://www.vch.ca 14. https://www.dietitians.ca/ 15. https://www.foodsafety.ca 16. https://wrha.mb.ca/ 17. https://www.nia-ryerson.ca/ 18. www.gov.bc.ca 19. https://www.mealswinnipeg.com/ 20. https://www.mealsonwheels.com/ 21. https://lmow.ca/ 22. https://www.saskatchewan.ca/
United Kingdom	23. https://www.kent.gov.uk 24. https://www.thenacc.co.uk 25. https://www.hertfordshire.gov.uk 26. https://www.food.gov.uk 27. https://www.newcastle.gov.uk 28. https://www.ageuk.org.uk 29. https://www.dumgal.gov.uk 30. http://www.wakefield.gov.uk 31. https://www.cwt.org.uk 32. http://www.wales.nhs.uk 33. https://www.rqia.org.uk/ 34. https://www.bda.uk.com/ 35. https://www.sustainweb.org/ 36. https://www.gov.uk/government/organisations/public-health-england 37. https://www.publicsectorcatering.co.uk/ 38. https://www.cqc.org.uk/ 39. https://apse.org.uk/apse/
New Zealand	40. https://www.cdhb.health.nz 41. https://www.foodstandards.govt.nz

	42. https://www.health.govt.nz 43. https://www.redcross.org.nz 44. https://www.wcdhb.health.nz 45. https://www.nmdhb.govt.nz 46. https://www.diabetes.org.nz 47. www.healthed.govt.nz 48. https://www.diabetes.org.nz/food-and-nutrition 49. https://nsfl.health.govt.nz/
Australia	50. https://mealsonwheels.org.au 51. Found in Ref National meal guidelines: 52. www.mealsonwheelsvictoria.org.au 53. https://agedcare.royalcommission.gov.au/
United States	54. United States 55. https://www.mealsonwheelsamerica.org 56. https://nutritionandaging.org/ 57. https://acl.gov/programs 58. http://goea.louisiana.gov/ 59. https://www.aging.pa.gov 60. https://www.tcoa.org 61. http://www.coawfla.org 62. https://www.seniorresourcesinc.org 63. http://publichealth.lacounty.gov 64. http://toolbox.naccho.org 65. https://www.nutrition.gov 66. https://www.dshs.wa.gov/ 67. https://dphhs.mt.gov 68. https://fas.org 69. https://www.gao.gov 70. https://www.aging.ca.gov 71. https://www.mealsonwheelsamerica.org 72. https://mnraaa.org 73. https://www.officeonaging.ocgov.com 74. https://frac.org/ 75. https://nutrition.fiu.ed 76. https://www.aarp.org/

Appendix 2. Email Correspondence with Key Organisations

Country	Organisation	Date of the first contact	Key Contact/Respondent
US	AARP (formerly called the American Association of Retired Persons)	24/08	Kathleen Ujvari, Senior Strategic Policy Advisor, Public Policy Institute. kujvari@aarp.org
	Meals on Wheels America (MOWA)/ National Resource Centre on Aging (NRCNA)	04/09	Ucheoma Akobundu, Senior Director, Nutrition Strategy, MOWA uche@mealsonwheelsamerica.org
UK	National Association of Care Catering (NACC)	26/08	Response: Need to purchase documents
Canada	Institute on Ageing, Canada Institute of Health Research (CIHR)	25/08	Joanne Goldberg, Assistant Director, CIHR Institute of Aging joanne.goldberg@uwo.ca
	B.C Ministry of Health	26/08	Anna Wren, Policy Lead, Office of the Provincial Dietitian, Healthy Living & Health Promotion Branch Population & Public Health, B.C. Ministry of Health Anna.Wren@gov.bc.ca
New Zealand	Office for Seniors, New Zealand Government	28/08	Passed on the query to Ministry for Health. No response